No. 09-10876

In The
Supreme Court of the United States

DONALD BULLCOMING,

Petitioner,

v.

NEW MEXICO,

Respondent.

On Writ Of Certiorari To The New Mexico Supreme Court

BRIEF OF AMICUS CURIAE THE INNOCENCE NETWORK IN SUPPORT OF PETITIONER

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INTEREST OF AMICUS CURIAE[1]

The Innocence Network (the Network) is an affiliation of organizations dedicated to providing pro bono legal and/or investigative services to prisoners for whom evidence discovered after conviction can provide conclusive proof of innocence. The 63 current member organizations of the Innocence Network represent hundreds of prisoners with innocence claims in all 50 states and the District of Columbia, as well as Canada, New Zealand, the United Kingdom, and Australia.[2]

Over the past two decades, the Network has helped introduce DNA evidence into courtrooms through its successful exoneration of hundreds of individuals. Drawing on the lessons from these cases, the Network advocates for reforms to ensure that future wrongful convictions are prevented.

It has become clear that problems involving forensic science and their applications are pervasive and mechanisms are needed to prevent forensic error and false information from undermining justice in the courtroom. The misapplication of forensic disciplines and erroneous evidence has played a role in more

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[1] Pursuant to Rule 37.3(a), letters from the parties consenting to the filing of this brief are on file with the Clerk of the Court. No counsel for a party authored this brief in whole or in part, and no person, other than the amicus curiae, its members, or its counsel made any monetary contribution to the preparation or submission of this brief.

[2] The member organizations are listed in the appendix.

than half of the first 225 exonerations proven by DNA testing. In these cases, forensic scientists and prosecutors presented fraudulent, exaggerated, or otherwise tainted evidence to the judge or jury, which led to the wrongful conviction.[3]

This experience has given amicus curiae a particularly strong interest in ensuring that criminal convictions are premised upon valid and accurate forensic science—an interest that is directly implicated by Petitioner Donald Bullcoming's case. When a forensic report, recognized as testimonial by the New Mexico Supreme Court,[4] is offered against a defendant, the author of that testimony must be subject to confrontation. The exoneration cases and several recent crime lab scandals highlight the degree to which forensic error, inconsistency, and fraud frustrate the criminal justice system. They also illustrate the necessity of subjecting the purveyors of forensic testimony—and not their surrogates—to the rigors demanded by the Confrontation Clause.

[3] *See* Innocence Project, *Facts on Post-Conviction DNA Exonerations*, http://www.innocenceproject.org/Content/351.php (listing cases).

[4] *State v. Bullcoming*, 226 P.3d 1, 8-9 (N.M. 2010).

STATEMENT OF THE FACTS

In the interest of brevity, amicus curiae adopts by reference the statement of facts as set forth in Petitioner's Brief.

SUMMARY OF ARGUMENT

In courts across the country, forensic science plays a vital role in the fact-finding process. Increasingly, law enforcement and the courts turn to science to solve crimes and adjudicate guilt, while accused and convicted individuals rely on scientific evidence to vindicate their claims of innocence. Nonetheless, the reliability of such evidence—particularly as it is relayed in forensic reports—is not guaranteed. The prevalence of wrongful convictions based on faulty forensic science, and the rash of crime lab scandals around the nation, have shown that the unchecked use of forensic evidence does not come without a price.

In *Melendez-Diaz v. Massachusetts*,[5] this Court made clear that forensic reports are testimonial, and therefore their authors must be subject to confrontation.[6] Indeed, the confrontation of the analyst who prepares the forensic report is *essential* to the

[5] 129 S. Ct. 2527 (2009).

[6] *Id.* at 2532.

fact-finder's ability to evaluate that testimony.[7] That analyst—and that analyst alone—can explain the circumstances and expectations surrounding the analysis, and how those factors impacted the forensic report.

In this case, the New Mexico Supreme Court agreed the blood alcohol report introduced against Mr. Bullcoming was testimonial,[8] but oddly ignored the portion of *Melendez-Diaz* that held that the authors of testimonial reports should be subject to confrontation.[9] Instead, the court found that the in-court testimony of a surrogate analyst, who had nothing to do with generating the forensic report, satisfied the Confrontation Clause and provided sufficient basis for admission of the report. As justification, the court trivialized the importance of confronting the

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[7] Scholars and scientists alike have noted the subjective nature of forensic reports and the need for rigorous cross-examination. In a study of juror responses to the presentation of scientific evidence at trial, Joel Lieberman noted:

> "Without adequate cross-examination, most jurors [are] not cognizant of the potential for observer effects or the importance of proficiency testing and therefore were unable to accurately assess the reliability of the lab."

Joel D. Lieberman, *Gold Versus Platinum: Do Jurors Recognize the Superiority and Limitations of DNA Evidence Compared to Other Types of Forensic Evidence?* 14 Psych. Pub. Pol. and L. 27, 50 (2008); *see also* Jessica Gabel, *Forensiphilia: Is Public Fascination with Forensic Science a Love Affair or Fatal Attraction?*, 36 N.E. J. on Crim. & Civ. Con. 233, 239 (2010).

[8] *Bullcoming*, 226 P.3d at 8-9.

[9] *Melendez-Diaz*, 129 S. Ct. at 2532, 2538.

testing analyst himself, suggesting that the analyst played no meaningful role in generating his own testimonial statement, and that the gas chromatograph machine used by the analyst was Mr. Bullcoming's real accuser.[10] This departure from confrontation has no doctrinal basis and, just as critically, displays a fundamental lack of understanding about blood alcohol testing and problems with forensic science generally.

Our knowledge of the problems involved in forensic disciplines is evolving rapidly. In the past year, the National Academy of Sciences released a groundbreaking report shattering any perception that the forensic sciences are beyond reproach. Similarly, the wrongful conviction and subsequent exoneration of individuals such as Dwayne Allen Dail,[11] and the disturbing number of crime lab scandals in states such as North Carolina, California, and Virginia, have illuminated the problems of inaccuracy, inconsistency, and fabrication in forensic analyses.

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[10] *Bullcoming*, 226 P.3d at 8-9.

[11] In the case of Dail, a forensic analyst testified at trial that she had found semen on vaginal smears and on panties. On cross-examination, however, the analyst was forced to explain that the semen did not match Dail. Although Dail was subsequently convicted, the testimony of the analyst developed on cross-examination allowed Dail's post-conviction attorneys to discern that an error in analysis was likely. Dail was eventually exonerated by DNA testing, after spending 18 years in prison. Innocence Project, *Know the Cases, Dwayne Allen Dail*, http://www.innocenceproject.org/Content/832.php.

The fact that a machine is used in the course of forensic analysis does not eliminate the specter of human error. Blood alcohol analysis requires skill and diligence, and the analysts who prepare samples for testing and operate testing machines, like any witness, are prone to mistakes, bias and dishonesty. While a surrogate can testify to proper procedure, he is entirely incompetent to speak to implementation of that procedure in a particular case, or to the truth of a testimonial forensic report.

The present case is particularly troubling because so little is known about the analyst, Curtis Caylor, or his work in this case. Mr. Caylor had been placed on unpaid leave at the time of trial, and his surrogate did not know the reasons for his suspension. Mr. Caylor's testimonial report says nothing specific about the steps he followed in conducting his chemical analysis. Consequently, Mr. Bullcoming and the fact-finder were left with no insight on why Mr. Caylor had been suspended, what steps he took to analyze the blood sample in this case, whether he had understood the testing protocol, whether he followed that protocol, or the judgments he made in the course of analysis. The surrogate, speaking in Mr. Caylor's stead, *assumed* a certain test was conducted, that it was based on lab protocol, and that it was performed properly and impartially. These assumptions, however, do not satisfy the Confrontation Clause. Rather disturbingly, the New Mexico Supreme Court ruling would permit a system of professional witnesses to testify in place of a careless or less honest forensic

witness who crafted reports explicitly for litigation. Such a ruling inevitably weakens the truth finding process and diminishes the integrity of criminal adjudications.

Previous decisions of this Court, including *Pointer v. Texas*[12] and *Delaware v. Van Arsdall*,[13] have illustrated the importance of confrontation to verify accuracy and credibility in forensic testing. As recognized by this Court in *Melendez-Diaz*, confrontation of the testing analyst is a basic constitutional safeguard against faulty forensic science.[14] Such a safeguard is only functional, however, when the witness confronted is the testing analyst himself: the person who conducted the test and certified its results. Confrontation of a surrogate is no confrontation at all.

ARGUMENT

Forensic science has the power to illuminate the truth in certain circumstances, but it is by no means flawless, and it should not be used to undermine our traditional means of determining guilt or innocence. Forensic testimony is, at its core, no different from any other testimony. It is the product of human

[12] 380 U.S. 400, 404 (1965) (addressing confrontation to expose falsehood).

[13] 475 U.S. 673, 682-83 (1986) (addressing confrontation to expose bias).

[14] *Melendez-Diaz*, 129 S. Ct. at 2536-37.

beings, with the same potential prejudices and inconsistencies inherent in any human expression. When forensic testimony is produced for the purpose of litigation and is offered against a defendant in a criminal trial, as it was in this case, the Confrontation Clause plainly requires the author of that testimony to present it personally and be subject to cross examination to ensure its reliability.[15] As a practical matter, confrontation of the forensic analyst is also necessary to help expose pervasive problems in forensic analyses.

In 2009, the National Academy of Sciences (NAS), in response to a Congressional charge,[16] issued a comprehensive report on the forensic science community.[17] The report presented a scathing assessment of forensic science, noting widespread failures in a variety of forensic disciplines. The report attributed failures in individual cases to a range of serious problems, including lax oversight in the crime labs, unscientific methods, biased analysts, incompetence, and misconduct. To illuminate and correct these problems, the report recommended increased neutrality,

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[15] *Id.* at 2537.

[16] S. Rep. No. 109-88, at 46 (2005).

[17] The NAS formed a diverse committee of some of the nation's leading forensic scientists, medical examiners, legal experts, and statisticians to address the issue. *See* National Research Council of the National Academies [hereinafter "NRC"], *Strengthening Forensic Science in the United States: A Path Forward* (National Academies Press 2009), *available at* http://books.nap.edu/catalog.php?record_id=12589.

transparency, and responsibility in all aspects of forensic analyses, from the development of methods, to implementation of the methods in practice, to reporting of results.

The NAS report stemmed in part from exonerations of the wrongfully convicted, cases that confirm that forensic science errors have played a major role in convicting the innocent. Of the first 225 wrongful convictions overturned by DNA testing, more than 50% (116 cases) involved faulty forensic evidence that went undetected at the time of trial (if in fact a trial occurred).[18] The reasons for forensic errors in the innocence cases are manifold, but the pattern is consistent: a forensic analyst presents false, mistaken, or misleading testimony, and this testimony helps convict an innocent person.

As this Court stated in *Melendez-Diaz*, confrontation of the analyst who prepares inculpatory testimony is essential to the fact-finder's ability to

[18] The vast majority of criminal cases result in guilty pleas, and forensic evidence in these cases does not receive the scrutiny of a trial. Nonetheless, the DNA exonerations have exposed forensic science errors even in guilty plea cases. *See* Brandon L. Garrett & Peter J. Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 Va. L. Rev. 1, 12 (2009); Innocence Project, *Wrongful Convictions Involving Unvalidated or Improper Forensic Science that Were Later Overturned through DNA Testing*, http://www.innocenceproject.org/docs/DNA_Exonerations_Forensic_Science.pdf.

evaluate that testimony.[19] That analyst is uniquely positioned to explain how various circumstances and expectations affected his or her analysis and reporting. Where ambiguities exist in the written documentation of the analysis, the analyst alone is capable of clarifying them with any degree of certainty. Confrontation provides a critical opportunity for defendants to work backward with the analyst to examine the processes used, and to ensure that the testimony presented in the report is not biased toward law enforcement,[20] but is sufficiently based in science and fact.

Confrontation serves precisely this truth-seeking purpose in blood alcohol cases such as this one. Here, the New Mexico Supreme Court conceded that the blood alcohol report introduced at trial was testimonial, but it paradoxically excused the analyst, who had been put on unpaid leave for unknown reasons, from testifying in person.[21] The court justified its ruling by minimizing the role of the analyst in developing his own testimonial report, referring to the gas chromatograph machine as Mr. Bullcoming's true accuser. In the report, the suspended analyst attested,

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[19] *Melendez-Diaz*, 129 S. Ct. at 2537 ("Confrontation is designed to weed out not only the fraudulent analyst, but the incompetent one as well.")

[20] *See Melendez-Diaz*, 129 S. Ct. at 2536 ("A forensic analyst responding to a request from a law enforcement official may feel pressure—or have an incentive—to alter the evidence in a manner favorable to the prosecution.")

[21] *Bullcoming*, 226 P.3d at 8-9.

at least in general terms, to using a gas-chromatograph testing method to generate the numerical blood alcohol result. The court seemed to ignore the analyst's use of this method and its incumbent opportunities for error, however, when it labeled the analyst a "mere scrivener."[22] In allowing a surrogate to vouch for the unproven result provided in the report, instead of requiring the suspended analyst to testify himself, the court disallowed Mr. Bullcoming any opportunity to determine whether the analyst conducted an accurate, truthful analysis in this particular case, and ultimately, whether the analyst's conclusions had meaningful evidentiary value.

The fact that the analyst used a machine in the final stages of analysis should not excuse him from confrontation. Print-outs from a machine are still the work products of the analyst and may contain within them manifestations of human error that only confrontation of the analyst can reveal. The wrongful conviction cases and recent reviews of the nation's crime labs demonstrate the alarming frequency of these errors, as well as falsehoods in forensic reporting, and thereby signal the importance of confronting the analyst who prepares a report to be offered at trial. A system as authored by the New Mexico Supreme Court—that presumes truthful reporting and competent forensic analysis while concomitantly setting aside core constitutional concerns in the

[22] *Id.* at 9.

truth-seeking process—has far reaching consequences for a judicial system struggling with endemic problems that persist in forensic evidence.

I. Crime Labs Lack the Standards and Oversight to Control Human Error.

Many forensic errors are attributable to inadequate methods and standards at the crime labs, which in turn stem from inconsistency and subjectivity in the forensic sciences themselves. Despite their portrayal in the media as scientific and unimpeachable,[23] most forensic sciences have little, if any, scientific foundation and are based instead on subjective pattern recognition, intuition, or presumptions that have not been validated.[24] Consequently, the methods, interpretation, and terminology employed by forensic analysts can vary widely within each discipline, and even within a single lab. Because most states do not require that labs be accredited, labs face little pressure to standardize their protocols or ensure that individual analysts are conducting tests properly. This variability makes it difficult to determine, based

[23] Forensic scientist Thomas Mauriello noted the glamorous portrayal of forensic science on the popular television show CSI and estimated that upwards of forty percent of the so-called forensic science employed on the show simply does not exist. Gabel, *supra*, at 239.

[24] NRC, *supra*, at 22, 187-191.

on test results alone, whether an individual analyst is reaching accurate conclusions.

The NAS report emphasized that most forensic disciplines have never been subjected to rigorous scientific study to determine their accuracy and reliability, noting that "[w]ith the exception of nuclear DNA analysis . . . no forensic method has been rigorously shown to have the capacity to consistently, and with a high degree of certainty, demonstrate a connection between evidence and a specific individual or source."[25] Most forensic disciplines lack standard protocols, and in the rare case where protocols are in place, "they often are vague and not enforced in any meaningful way."[26] Even methods with relatively well-established scientific roots, such as DNA and certain chemistry-based analyses,[27] can be the subject of rigorous debate in litigation because the testing protocol may be insufficient to eliminate the risk of sample contamination and other errors in analysis.[28]

In most states, the minimum standards for operating a crime lab do not inspire confidence. According

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[25] NRC, *supra*, at 7.

[26] NRC, *supra*, at 6.

[27] NRC, *supra*, at 7 (noting that certain chemical and biological disciplines have a stronger scientific basis than other disciplines).

[28] *See, e.g., Dist. Attorney's Office for Third Judicial Dist. v. Osborne*, 129 S. Ct. 2308, 2329 (2009) (Alito, J., concurring) (noting virtually all aspects of lab practice in DNA analysis are prone to attack in litigation).

to the NAS report, "Several commentators appearing before the committee noted that nearly anyone with a garage and some capital theoretically could open a forensics laboratory and start offering services."[29] Eric Lander, co-chair of President Obama's Council of Advisors on Science and Technology, has noted, "[C]linical laboratories must meet higher standards to be allowed to diagnose strep throat than forensic labs must meet to put a defendant on death row."[30]

Only about 10 states require crime laboratories to be accredited according to specific standards for quality assurance.[31] Although accreditation alone cannot guarantee increased quality (as demonstrated in the North Carolina example discussed below) it is one way of monitoring crime lab processes. Labs in states that do not require accreditation may pursue it voluntarily, but are not prohibited from operating if they lose or fail to gain accreditation. In the absence of accreditation, courts have virtually no assurance that the analysts from these labs are properly trained or monitored, or that they perform their jobs properly.[32] The defendant must have the ability, through

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[29] NRC, *supra*, at 193.

[30] Paul C. Giannelli, *Crime Labs Need Improvement*, Issues in Science and Technology Online (Fall 2003), http://www.issues.org/20.1/giannelli.html.

[31] *See, e.g.,* Mo. Rev. Stat. § 650.060 (Vernon 2010); Neb. Rev. Stat. § 71-6833 (Westlaw 2010); N.Y. Exec. § 995-b (McKinney 2010); Okla. Stat. tit. 74 § 150.37 (Westlaw 2010); Tex. Crim. Proc. Code art. 38.35 (Vernon 2009).

[32] NRC, *supra*, at 193.

confrontation, to determine whether the analyst is competent and truthful.

II. Wrongful Conviction Cases and Crime Lab Scandals Demonstrate the Prevalence of Errors and Fraud in Forensic Analyses.

The NAS report and studies of wrongful convictions illuminate the problems with certain forensic methods, and also the mistakes forensic analysts can make when applying these methods in the lab. In referring to the gas chromatograph machine as Mr. Bullcoming's real accuser, the New Mexico Supreme Court made a critical implicit presumption: it presumed that there was zero potential for human error, fraud or bad judgment when Mr. Caylor prepared the blood sample for analysis, operated the gas chromatograph machine, recorded the results, and memorialized those results in his report. Scientific literature indicates, and courts have confirmed, that this presumption is misguided.[33]

Systematic reviews of forensic labs across the country have further demonstrated the potential for problems throughout the analytical process, from pre-analysis (the work performed before "raw data"

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[33] *See, e.g., Melendez-Diaz*, 129 S. Ct. at 2537-38 (citing Paul Giannelli & Edward Imwinkelried, *Scientific Evidence* 532-33, 607 (4th ed. 2007) and James Shellow, *The Application of Daubert to the Identification of Drugs*, 2 Shepard's Expert & Scientific Evidence Quarterly 593, 600 (1995)).

are generated) through interpretation and reporting. In some cases, the problems stemmed from fraud or misrepresentation, but in many others, the problems were attributable to the incompetence or bias of the individual analyst. Regardless of the cause, the end product is faulty forensic analyses.

A. Incompetence and Negligence Cause Errors.

Perhaps the most notorious illustration of forensic incompetence involved an audit of the Houston crime laboratory by the Texas Department of Public Safety in 2006.[34] The audit revealed routine failure by the lab and its employees to run required scientific controls, follow procedures to minimize the risk of sample contamination, document work, and calculate statistics properly. Judge Harry Edwards, co-chair of the committee that produced the NAS report, noted that the Houston case "highlights the sometimes blatant lack of proper education and training of forensic examiners."[35]

The problem of incompetence is not new or isolated. A 2009 study found that invalid forensic

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[34] *See* Roma Khanna & Steve McVicker, *Police Lab Tailored Tests to Theories, Report Says; Investigators Hope to Establish Whether Mistakes Were Deliberate*, Houston Chronicle, May 12, 2006, at A1.

[35] Harry T. Edwards, *Solving the Problems That Plague the Forensic Science Community*, 50 Jurimetrics 5, 9 (2009).

testimony contributed to more than 50% of wrongful convictions.[36] Recent crime lab reviews have uncovered negligence or outright deception among forensic analysts, including blood analysts, in at least 17 states.[37] In 2008, the entire Detroit crime lab was shut down, including the chemistry unit, after an audit revealed erroneous or false findings in 10% of 200 random cases, and a "shocking level of incompetence" in the lab.[38] That same year, Baltimore's crime lab director was fired after investigation revealed that employees had contaminated DNA samples.[39]

Most recently, a 2010 review of the San Francisco crime lab, prompted by allegations that a particular analyst was stealing cocaine from evidentiary samples, revealed several alarming patterns of neglect.[40]

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[36] Brandon Garrett & Peter Neufeld, *Invalid Forensic Science Testimony and Wrongful Convictions*, 95 Va. L. Rev. 1, 14 (2009).

[37] Maurice Possley, Steve Mills & Flynn McRoberts, *Scandal Touches Even Elite Labs*, Chicago Tribune, October 21, 2004, *available at* http://www.chicagotribune.com/news/watchdog/chi-041021forensics,0,3075697.story.

[38] Edwards, *supra*, at 9 (citing George Hunter, *Workers Rip Crime Labs Closing*, Detroit News, Oct. 1, 2008 at 5B); Paul Egan, *Lab Woes Linked to Theft Case*, Detroit News, March 31, 2009, at 3A.

[39] *See* Julie Bykowitz & Justin Fenton, *City Crime Lab Director Fired: Database Update Reveals Employees DNA Tainted Evidence, Throwing Lab's Reliability Into Question*, Balt. Sun, Aug. 21, 2008, at A1.

[40] Terry Collins & Brooke Donald, *San Francisco Crime Lab Scandal Strains Justice System*, Associated Press, April 3, 2010.

The review found that overworked analysts often left drug evidence in unsecured boxes or lockers, failed to note when evidence was opened for sampling, and failed to calibrate scales when weighing drugs. The drug testing lab was closed indefinitely. Incompetence and dishonesty were exposed in the DNA unit of the San Francisco lab as well. On the eve of a 2008 criminal trial, DNA analysts mixed up an evidentiary sample with a control sample. Subsequent review revealed that lab personnel destroyed records of the mix-up in an apparent attempt to cover it up.[41] San Francisco Police Chief George Gascón admitted his lab was plagued by widespread and substantial negligence and stated rather bluntly, "Anybody who doesn't see the magnitude of this problem is either blind or stupid."[42]

Not all crime lab supervisors acknowledge the potential for error in their labs, however. Earl Washington, Jr., was exonerated by DNA testing after 17 years in prison—9 of them on death row. When confronted with evidence that a DNA analyst at a Virginia state crime lab made an error that led to the denial of Washington's absolute pardon, lab director Paul Ferrara rejected the notion that one of his analysts had made a mistake. "As far as we're

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[41] Jaxon Van Derbeken, *San Francisco Police Crime Lab Accused of Cover-up*, San Francisco Chronicle, December 4, 2010, at A1, *available at* http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/12/03/MN7I1GLK0L.DTL#ixzz17AuloZjh.

[42] Collins & Donald, *supra*.

concerned, there is no error at all except in the minds of [critics] . . . ," Ferrara said.[43] Ferrara refused to conduct a review of the case or of the analyst who made the error. Virginia governor James Gilmore later pardoned Washington, and Governor Mark Warner, Gilmore's successor, ordered the review that Ferrara had resisted.[44] The review confirmed that the DNA analyst had indeed made a serious error.[45] Notably, the review also concluded that the technical peer-review system in the lab had failed because the "technical reviewer did not observe the errors in the processes and the reported results. . . ."[46]

The example of Earl Washington, Jr., illustrates the critical importance of confronting the analyst who performed the test at issue, rather than a supervisor or colleague who is further removed from the test and who may have a motive to minimize the mistakes in the lab.

B. Bias Causes Errors.

Even in labs where analysts are well trained and supported, analysts may still be susceptible to

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[43] Possley et al., *supra*.

[44] *Id.*

[45] ASCLD/LAB Limited Scope Interim Inspection Report 19, Apr. 9, 2005, *available at* http://www.dfs.virginia.gov/services/forensicBiology/externalReviewAuditReport.pdf (on file with authors).

[46] *Id.* at 17.

mistakes because of observer bias, a pervasive problem in crime labs and in clinical testing generally. Observer bias occurs when an individual unconsciously allows emotion and pre-conceived notions to influence the interpretation of data.[47] In clinical trials of new medicines, for example, a scientist's pre-existing knowledge of a drug can skew his or her conclusions regarding the drug's efficacy. Observer bias does not occur consciously and is not something that can be purposefully willed away.[48] Rather, specialized protocols and procedures are necessary to minimize observer bias effects.[49]

In the criminal context, analysts sometimes receive extraneous information about forensic samples that can lead to observer bias and compromise the analyst's objectivity.[50] Extraneous information might include the theory of the case developed by law enforcement, the origin of the samples they are testing, or other evidence regarding the guilt of the suspect. This problem is exacerbated by the pressure an analyst may feel to produce findings favorable to

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[47] NRC, *supra*, at 122-24.

[48] *Id.*

[49] *Id.*

[50] *See* I.E. Dror, D. Charlton & A.E. Peron, *Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications*, 156 Forensic Science International 74-78 (2006).

the prosecution.[51] Bias in this context can lead to false inclusions or exclusions, wrongful prosecutions, and failure to pursue true perpetrators.[52] As a result, human cognition and forensic specialists recommend the use of blind testing in criminal cases.[53]

Few crime labs, if any, however, use blind testing or any comparable safeguard in regular forensic testing to guard against bias.[54] Such concerns are at their zenith when law enforcement engages a crime lab to produce forensic evidence for the purpose of litigation. Defendants in criminal cases seldom know

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[51] *See Melendez-Diaz*, 129 S. Ct. at 2536; ASCLD/LAB VA audit, *supra*, at 14, 17 (noting internal and external pressures on a lab analyst that may have led to errors).

[52] Scientists specializing in human cognition have concluded that extraneous information can have a powerful effect on interpretation of forensic data. *See, e.g.*, Robert B. Stacey, *Report on the Erroneous Fingerprint Individualization in the Madrid Train Bombing Case*, 7 Forensic Science Communications (2005); I.E. Dror & J. Mnookin, *The Use of Technology in Human Expert Domains: Challenges and Risks Arising From the Use of Automated Fingerprint Identification Systems in Forensics*, 9 Law, Probability and Risk 47 (2010). In one study, researchers took forensic fingerprints that had been previously assessed by fingerprint experts as matching certain suspects. Dror & Mnookin, *supra*. The researchers then presented these same fingerprints again, to the same experts, but also suggested to the analysts that it was unlikely the fingerprints could be matched to a suspect. Given this extraneous information, most of the fingerprint experts made different judgments, contradicting their own previous identification decisions. *Id*.

[53] *Id*.

[54] *See* NRC, *supra*, at 124, 207.

what biasing information an analyst may have received from law enforcement or prosecutors until the defendant has the opportunity to confront the analyst at trial.

C. Forensic Results Can Be Fabricated.

Crime lab scandals have brought to light not only forensic errors, but also the alarming prevalence of "drylabbing," the utter fabrication of scientific results.[55] In drylabbing cases, the forensic analyst reports the results of testing that was never conducted. Like incompetence and bias, instances of drylabbing are not isolated to a small group of labs, but can be found in labs throughout the country.

Many cases of drylabbing occur in toxicological analysis. In San Francisco's 1994 crime lab scandal, a toxicologist was found to have certified evidence as a controlled substance without conducting a chemical test.[56] In Dallas, Texas, police allegedly field-tested a questioned substance and found it to be cocaine; in reality, the substance was powdered gypsum

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[55] *See* NRC, *supra*, at 193; Paul C. Giannelli, *The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories*, 4 Va. J. Soc. Pol'y &L. 439 (Winter 1997).

[56] *See* Jim Herron Zamora, *Lab Scandal Jeopardizes Integrity of S.F. Justice: Sting Uncovered Bogus Certification*, San Francisco Examiner, Sept. 16, 1994, at A7.

wallboard.[57] The Houston lab scandal described above also included four cases of drylabbing by toxicologists who created false documents to reflect procedures that were not performed.[58]

One of the most egregious cases of drylabbing involved West Virginia State Police laboratory employee Fred Zain.[59] Upon investigation, it was revealed that Zain had repeatedly falsified evidence in criminal prosecutions. At least 10 people had their convictions overturned as a result, and subsequent reviews questioned whether Zain was ever qualified to perform scientific examinations.

Even FBI analysts have engaged in drylabbing. In May 2004, an FBI analyst, Jacqueline Blake, pled guilty to a misdemeanor of making false statements about following protocol in approximately 100 DNA analysis reports.[60]

Melendez-Diaz noted the importance of confronting the analyst who provides false results. This Court rightly found that such an analyst might reconsider

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[57] Thomas Korosec, *Report Hammers Dallas Police*, Houston Chronicle, Oct. 21, 2004, *available at* http://www.chron.com/disp/story.mpl/metropolitan/2858764.html.

[58] M.R. Bromwich, *Final Report of the Independent Investigator for the Houston Police Department Crime Laboratory and Property Room 1* (2007), *available at* www.hpdlabinvestigation.org.

[59] *See* NRC, *supra*, at 44.

[60] Possley et al., *supra*.

his false testimony when under oath in open court, and that the prospect of confrontation will deter forensic fraud in the first place.[61]

D. Forensic Reports Can Be Incomplete and Misleading.

It is sometimes difficult to distinguish between drylabbing and simple misrepresentation in forensic analyses, because forensic reports generally do not capture the full spectrum of tasks an analyst performs on a case.[62] According to the NAS report, "The norm is to have no description of the methods or procedures used, and most reports do not discuss measurement uncertainties or confidence limits."[63] The NAS report strongly recommended that the reports use standardized vocabulary and that reports describe, at a minimum, methods used, procedures, results, conclusions, and sources of uncertainty.[64] At present, few labs meet that reporting standard.[65] In most cases, the level of detail in a report is dependent upon the analyst who produced it. Where detail is lacking, courts cannot be certain that the tests were properly performed or that important information was not omitted.

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[61] *Melendez-Diaz*, 129 S. Ct. at 2536-37.

[62] NRC, *supra*, at 186.

[63] *Id*.

[64] NRC, *supra*, at 185-86.

[65] NRC, *supra*, at 186.

The analyst's report in this case is illustrative. The only information provided by the analyst is the date of analysis, two handwritten digits indicating the analyst's conclusion regarding blood alcohol content, and a checkmark next to a preprinted statement reading, "The seal of this sample was received intact and broken in the laboratory."[66] The report does not discuss the steps of his chemical analysis, and the space for remarks is empty.[67]

Incomplete or misleading forensic reporting is troublingly pervasive. Improper forensic reporting marred the FBI investigation of the 1995 Oklahoma City bombing, for example. A report by the U.S. Department of Justice inspector general's office stated that the conclusions of the analyst in the case, a supervisory agent in the lab's explosives unit, were scientifically unsound, not explained in the body of the report, and biased in favor of the prosecution.[68] The report noted that the analyst was likely biased because he was made aware that the defendant, Terry Nichols, had purchased ammonium nitrate prior to the bombing. Another example of improper reporting involved veteran Washington state DNA analyst John Brown. In 1997, Brown conducted two DNA tests on a rape kit sample, but his final report mentioned only

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[66] JA 62.

[67] JA 62-65.

[68] CNN, *FBI Lab Botched Oklahoma Bombing Evidence*, March 22, 1997, *available at* http://www.cnn.com/US/9703/22/okc.fbi.report/.

the second test.[69] Brown destroyed the draft report mentioning the first test, and falsely claimed that he had never performed it.

Similarly, analysts may report identical results in different ways, even within a single lab.[70] In such labs, it is virtually impossible for one analyst to review the work of a different analyst, especially when the reviewer did not participate in the analysis. It is not enough for the reviewer to state that he, too, is aware of the lab protocols, because the reviewer cannot know what steps were actually taken by the testing analyst in coming to a conclusion. Indeed, the reviewing analyst may not even know the full range of tests that the testing analyst performed.

The problem of incomplete and inconsistent forensic reporting within a single lab, and the role confrontation can play in addressing this problem, is perhaps best illustrated by a recent scandal involving the North Carolina State Bureau of Investigation (SBI) Laboratory. In 1993, Gregory Taylor was convicted of homicide in North Carolina.[71] A forensic report produced prior to conviction stated that a test conducted on samples recovered from Mr. Taylor's

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[69] Ruth Teichroeb, *Oversight of Crime-Lab Staff Has Often Been Lax*, Seattle Post-Intelligencer, at A1, July 23, 2004, *available at* http://www.seattlepi.com/local/183203_crimelab23.html.

[70] *See, e.g.,* Chris Swecker & Michael Wolf, An Independent Review of the SBI Forensic Laboratory (2010) (on file with authors).

[71] Swecker & Wolf, *supra*, at 5 (2010).

vehicle demonstrated "chemical indications for the presence of blood."[72] The report omitted the critical fact, however, that the conclusion was based only on an initial, presumptive test, and that subsequent, more sensitive confirmatory tests reflected "negative" or "inconclusive" results.[73] Notably, the serology analyst who produced the report, SBI Special Agent Duane Deaver, did not testify at Mr. Taylor's trial, but his report was admitted through a local police detective, and the detective testified to its (misleading) contents. After the report was introduced, both the prosecution and defense attorneys referred to the evidence as "blood" for the duration of the trial, despite the fact its presence had not been confirmed.[74] Mr. Taylor's eventual exoneration in 2010, the first by the North Carolina Innocence Inquiry Commission,[75] prompted the North Carolina Attorney General's Office to review reporting practices at the lab and to identify why the error had occurred.[76]

The review revealed that analysts at the lab—and later the lab itself—had adopted policies that specifically permitted individual analysts to choose whether to report the results of confirmatory tests for the presence of blood.[77] If an analyst decided, based

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[72] *Id.*

[73] *Id*. at 6.

[74] *Id.*

[75] *Id*. at 5.

[76] *Id*. at 2.

[77] *Id.* at 17-20.

on his or her subjective opinion, that a confirmatory test was inconclusive due to inadequate sample size, the analyst could omit the fact that the confirmatory test was performed.[78] Further complicating the matter, certain analysts at the lab had been trained that there was no such thing as an inconclusive test, and some analysts reported inconclusive results even when their notes reflected a negative test result.[79]

In his testimony before the three-judge panel comprising the Innocence Commission, Agent Deaver stated that the practice of not reporting negative confirmatory blood tests results in the final lab report was the "policy" of the SBI lab in 1993, and that the language used in his lab report was standard verbiage prescribed by SBI and the American Society of Crime Laboratory Directors/Laboratory Accreditation Board (ASCLD/LAB), the organization that had accredited SBI.[80] The independent review concluded, however, that the ASCLD/LAB had never provided specific language to be used in a report, despite the fact that analysts such as Deaver had clearly understood that to be so.[81]

In total, the review discovered 230 SBI cases in which the analyst had produced a report that misrepresented test results. In 40 of these cases, no

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[78] *Id.*

[79] *Id.*

[80] *Id.* at 7.

[81] *Id.* at 12.

suspect was charged. Out of a total of 269 individuals charged in the remaining 190 cases, 80 were still serving sentences at the time of the review (four were on death row), three were executed, and five died in prison.[82] None of these files contained documentation that relevant lab notes were provided to the accused for review at the time they were charged or before trial.[83]

This scandal starkly illustrates the importance of confronting the analyst regarding his or her own report. Individual analysts may be subject to regulation and protocol, but it is not enough simply to present the jury with the protocols as they stand on paper. Instead, individual analysts must be called to relay their individual understandings of the processes, and what steps they actually performed both in conducting the tests and drafting their reports. In North Carolina, two analysts looking at the same data—namely, negative results for tests indicating the presence of blood—interpreted and reported the data in a number of ways, many of which had dire consequences for defendants.[84]

Further, at least some analysts were mistaken about what the lab protocol provided, and this misunderstanding was not illuminated until the review took place. This could easily be true in the case of

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[82] *Id*. at 3.

[83] *Id*. at 4.

[84] *Id.* at 3.

Mr. Bullcoming, who has yet to hear Mr. Caylor explain what he understood about the testing methods he implemented in the New Mexico lab, the conclusions he reported, and how he reported them. Confrontation could have permitted this.

The poor quality of most lab reports makes confrontation of the analyst a necessity. Unlike peer-reviewed scientific studies, which typically contain thorough explanations of methodology, interpretations, and sources of error, the usual forensic report, especially in the realm of forensic toxicology, contains only brief, conclusory statements, as this case illustrates.[85] The person against whom the report is offered has no way to determine how the analyst reached his or her conclusions, and in many cases, what the analyst meant by them. These are issues on which a surrogate analyst can only speculate.

III. Blood Alcohol Analysis, Like Other Forensic Disciplines, Is Prone to Human Error.

A blood alcohol analyst is a type of forensic toxicologist who must be well trained and diligent to produce accurate forensic testimony. The analyst who authored the testimonial blood alcohol report in this case, and who had been put on unpaid leave for undisclosed reasons, was excused from confrontation because the New Mexico Supreme Court found that

[85] JA 62; *see also Melendez-Diaz*, 129 S. Ct. at 2531.

the analyst did nothing more than transcribe numbers from a machine print-out.[86] Crime lab manuals and scientific literature contradict this finding, however, and illustrate that blood alcohol reports are the attestations of the analyst, not a machine. Confrontation of the analyst himself is required to expose the human role in generating the report.

A. Training Is Required for Blood Alcohol Analysts and Other Forensic Toxicologists.

When a lab hires a blood alcohol analyst, it does not hire a typist, it hires a chemist. The American Academy of Forensic Sciences explains that forensic toxicology tests are complex and difficult for laypeople to understand and appreciate, and it recommends that students pursuing entry-level forensic toxicologist positions obtain undergraduate education in chemistry and pharmacology.[87] Forensic labs generally require blood alcohol analysts to have similar academic backgrounds,[88] and several states require that blood alcohol analysts receive state certification, which typically involves training and passage of a

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[86] *Bullcoming*, 226 P.3d at 9.

[87] American Academy of Forensic Sciences, *So You Want to be a Forensic Scientist!*, http://aafs.org/choosing-career#Toxicology.

[88] *See, e.g.,* Colorado Springs Police Department position opening announcement for forensic chemist whose duties include blood alcohol analysis, November 3, 2010, http://www.aafs.org/employment/2010-11-03/forensic-chemist (on file with authors).

proficiency test, to ensure they are performing tests properly and generating sound results.[89] These requirements suggest the analyst must do more than transcribe numbers.

B. There Is Potential for Human Error When Raw Toxicological Data Are Generated.

Raw data in toxicological analyses are the products of human effort and are not infallible. Before raw data are generated, the analyst must perform several tasks to prepare the sample and testing equipment.[90] The process, called pre-analysis, is not automatic and requires diligence and judgment to be performed properly. Human errors in pre-analysis can cause the testing machine to generate false or misleading data, which in turn result in erroneous reports.

The American Board of Forensic Toxicologists (ABFT) recognizes the potential for mistakes in pre-analysis and it requires that accredited labs implement special procedures to minimize such mistakes

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[89] California, Louisiana and Massachusetts are among the states with such requirements. *See* 17 Cal. Code Regs. § 1216.1 (Westlaw 2010); La. Admin. Code tit. 55, pt. I, § 553 (Westlaw 2010); 501 Mass. Reg. § 2.18 (Westlaw 2010).

[90] *See* Rolf E. Aderjan, 6 *Handbook of Analytical Separations*: *Aspects of Quality Assurance in Forensic Toxicology* 773-75 (Elsevier B.V. 2008).

and to ensure the integrity of the sample.[91] According to the ABFT lab accreditation manual, the toxicologist should begin the process of pre-analysis by checking a wide range of factors, including but not limited to: the external packaging of the vial that contains the blood sample; the vacuum seal on the vial; whether the vial contains anticoagulants and proper preservatives; the expiration date on the vial; the time that passed between collection of the sample and analysis; whether the sample was properly refrigerated prior to analysis; whether the sample appears decomposed; and the sample weight or volume.[92] Lab manuals and vial manufacturers warn that imperfect seals, expired or improper vials, improper refrigeration or extended storage prior to analysis can indicate the sample was not properly preserved and could generate a false result if tested.[93] The ABFT manual also states that the analyst should

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[91] ABFT Forensic Toxicology Laboratory Accreditation Manual 10-12 (2009), *available at* http://abft.org/files/ABFTLaboratory Manual.pdf.

[92] ABFT Lab Manual, *supra*, at 10-12; *see also* Virginia Dept. of Forensic Science, *Toxicology Procedures Manual* 23-26 (2010), *available at* http://www.dfs.virginia.gov/manuals/toxicology/procedures/220-D100%20Toxicology%20Procedures%20Manual.pdf; North Dakota Office of Attorney General, Crime Laboratory Division, *Standard Operating Procedure: Blood Alcohol Analysis* (2008), *available at* http://www.ag.nd.gov/CrimeLab/BloodAlcohol Program/StanOperProcBlAlcoAnaMethod/11-03-08.pdf.

[93] *See, e.g.,* Va. Lab Manual, *supra*, at 23-26; Becton, Dickinson & Co., *Vacutainer Product FAQs, Venous Blood Collection*, http://www.bd.com/vacutainer/faqs/; Harald Schütz et al., *Pitfalls of Toxicological Analysis*, 5 Legal Medicine 6 (2003).

compare the sample label to the accompanying documentation to check for errors in labeling, and each sample should be marked for identification to ensure accurate reporting once the sample is analyzed.[94] Any inconsistencies or problems with the sample should be documented.[95]

An analyst who fails to prepare a gas chromatograph machine properly may cause it to produce false or misleading data. The best-selling gas chromatograph machine in history was made by Hewlett Packard from 1984 through the 1990s, and variants of that model are still in widespread use.[96] The 290-page operating manual for this machine explains the wide range of controls that must be set, checked or measured by the analyst immediately prior to processing of the sample, including but not limited to: the temperatures of the sample injection port, valves, internal tubing and detector; the pressures of various gasses in different parts of the machine; the sample flow rate; the attenuation and range controls; and various elements of the detector.[97] The machine is

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[94] ABFT Lab Manual, *supra*, at 10.

[95] *Id.*

[96] John Buie, *Evolution of Gas Chromatography*, Lab Manager Magazine, Feb. 8, 2010, *available at* http://www.labmanager.com/articles.asp?ID=483.

[97] Hewlett-Packard Company, *HP5890 Series II Operator's Manual* (1994).

highly sensitive, and variations in the controls can affect results.[98]

Many labs require that the analyst inject a series of controls and cleaning solutions into the machine before and after the forensic sample is tested, to flush contaminants and to verify that the machine is generating accurate data.[99] The controls and blood sample must be mixed and diluted in certain proportions.[100] The analyst should invert or rock the sample and controls and then pour them into clean test tubes to view any clotting in the sample and prevent possible contamination.[101] When injecting the sample into the machine, the analyst must start with a clean syringe, bring the sample to room temperature,[102] and measure a precise amount of sample for injection, with air bubbles on either side of the sample in the syringe.[103] The syringe should be injected quickly and

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[98] *Id*. at 73; *see also* Fulton G. Kitson, Barbara S. Larsen, & Charles N. McEwen, *Gas Chromatography and Mass Spectrometry: A Practical Guide* 329-34 (Academic Press 1996) (stressing attention to proper temperatures, gas flow rates, and injection procedure); Gerhard Schomburg, *Gas Chromatography* 155-73 (VCH Publishers 1990) (noting injection port temperatures, improper sample introduction and other factors as causes of peak distortion in a chromatogram).

[99] *See, e.g.,* N.D. Lab Manual, *supra*, at 4-5; Va. lab manual, *supra*, at 49-51.

[100] *Id.*

[101] *See, e.g.,* Va. Lab Manual, *supra*, at 50.

[102] *See* Daniel C. Harris, *Quantitative Chemical Analysis* 538 (W.H. Freeman & Co. 2007); Va. Lab Manual, *supra*, at 50.

[103] Harris, *supra*, at 538.

removed promptly after injection, or the machine may read residue from the needle, which could affect the chromatogram.[104] Certain older machines also require the analyst to mark injection times on paper chart recorders.[105] Newer machines may allow for partial automation of the injection process, but still require proper measurement of the sample and controls to be injected.[106]

Each step required in pre-analysis and calibration represents an opportunity for error. Scientists have documented and categorized human error in chromatography for decades, and much of this research has emphasized the errors that analysts frequently make in pre-analysis.[107] These errors can include mistreatment of the sample, or misuse of the machine, each of which can impact the accuracy of the data generated.[108]

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[104] Schomburg, *supra*, at 160; Dean Rood, *A Practical Guide to the Care, Maintenance, and Troubleshooting of Capillary Gas Chromatograph Systems* 92-93 (Huthig 1991).

[105] Wake Forest College, Department of Chemistry, *Gas Chromatography*, http://www.wfu.edu/chem/courses/organic/GC/index.html.

[106] *See, e.g.,* N.D. Lab Manual, *supra*, at 4-6.

[107] *See, e.g.*, 2 Paul Giannelli & Edward Imwinkelried, *Scientific Evidence* 532-33 (Matthew Bender & Co. 2007) (noting critical errors in gas chromatography/mass spectrometry that will render the analyst's opinion unsound); Schütz et al, *supra*; Rood, *supra*, at 148 ("Without any doubt, the improper setup, maintenance and use of capillary GC systems is the major cause of most chromatographic problems.").

[108] *Id*.

All these points, and several others, can be the subject of a robust cross-examination, but only if the analyst who performed the test is present. Only the testing analyst is aware of how the sample appeared, how he or she prepared it for testing, and how he or she operated the machine in a particular test. The process of testing goes well beyond transcription of the results processed by the machine.

C. Use of a Machine in Analysis Does Not Correct Human Error.

The fact that a toxicologist uses a machine in the course of analysis does not cleanse the analysis of human error. In its opposition to the petition for certiorari, the State concedes that forensic analysts are almost always prohibited from testifying about the determinations or conclusions of a nontestifying analyst, and that several courts prohibit testimony about a nontestifying analyst's "scientific findings and observations."[109] The State argues, however, that the analyst's testimony against Mr. Bullcoming should be admitted absent the analyst because the testimony includes "raw data," a statement of the machine itself.[110] In support of this view, the State cites certain federal and state cases that deem raw data non-testimonial, including a recent New York Court of

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[109] Respondent's Brief in Opposition to Petition for Writ of Certiorari, at 16.

[110] *Id.* at 13.

Appeals case decided after *Melendez-Diaz* that concluded a DNA analyst's report was nontestimonial because it contained no subjective analysis and "consisted of merely machine-generated graphs, charts and numerical data."[111] This line of cases is disturbing.

Machines are operated by humans, and humans make mistakes. The notion that raw data are not subject to such error completely ignores the human role in preparing forensic samples, operating the testing machine, recording results and interpreting them. It is unclear whether the analyst's report in this case was the product of subjective analysis, but it is undeniable that the report was the product of an error-prone, human endeavor. Mr. Bullcoming is therefore entitled to confront the analyst. The use of a machine in the final stages of this analysis does not change this fact, nor does labeling the report "raw data."[112] In this case, the so-called raw data are simply forensic results, produced by a *human*, with the aid of a machine. This would have been a simple point for Mr. Bullcoming to illustrate, if the analyst

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[111] *Id*. at 15 (citing *People v. Brown*, 918 N.E.2d 927, 931 (N.Y. 2009) (noting the analyst's report did not involve conclusions, interpretations, comparisons, or any form of subjective analysis)).

[112] *See, e.g.,* Paul C. Giannelli, *Admissibility of Lab Reports: The Right of Confrontation Post-Crawford*, 19 Crim. Just. 26, 33 (2004) ("[A] lab report is nothing but the affidavit of an expert."); Pamela R. Metzger, *Cheating the Constitution*, 59 Vand. L.Rev. 475, 511 (2006) ("There can be no question that forensic laboratory reports are testimonial.").

had been available at trial to explain, first-hand, the functions he performed in preparing the machine and sample for testing.

IV. Mistakes, Bias and Malfeasance in a Forensic Analysis Can Be Exposed Only Through Confrontation of the Analyst Who Performed the Test.

The exonerations of the wrongfully convicted demonstrate that false conclusions in forensic analyses result from a variety of problems, including incompetence, bias, fraud, incomplete reporting, and misleading terminology. Though these problems arise for different reasons, they share two important similarities. First, the effect of these problems is frequently the same: an innocent person is placed behind bars.[113] Second, they are all expressed through the work of the analyst who performed the test. Thus, the full set of facts that can demonstrate whether any of these problems exists in a particular case is within the exclusive purview of a single person: the analyst himself.

This Court has repeatedly held that the importance of the confrontation of witnesses cannot be trivialized. In *Crawford v. Washington*, this Court rejected the theory that unconfronted testimony was admissible as long as it appeared reliable.[114]

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[113] *See* NRC, *supra*, at 37.

[114] *Crawford v. Washington*, 541 U.S. 36, 61-62 (2004), *overturning Ohio v. Roberts,* 448 U.S. 56 (1980).

Melendez-Diaz further emphasized that analysts who prepare forensic reports are subject to confrontation, and that a court's assessment of whether the report is reliable is irrelevant to that issue.[115]

Likewise, the importance of confrontation in the forensic context cannot be trivialized given the obvious risks of false forensic testimony. The scientific literature demonstrates that gas chromatograph machines are not self-operating and self-correcting. They require properly trained, diligent operators to work properly and to generate accurate results. Any errors the analyst makes in pre-analysis or in operation of the machine can cause the machine to generate false data. Unless the data are so false as to appear ridiculous on their face, any colleague who reviews the data may fail to recognize the possibility of error. Because of this, confrontation and cross-examination are vital to evaluating the reliability of forensic evidence.

Certain reported cases have demonstrated that a capable defense attorney, through confrontation of the analyst, can expose false forensic data or conclusions. In *State v. Bedford*, for example, a forensic chemist in a pre-trial hearing acknowledged that she did not understand the science behind many of the tests she performed, and that she failed to perform some

[115] *Melendez-Diaz*, 129 S. Ct. at 2537.

standard tests on blood samples.[116] She stated she did not record certain test results, and at the conclusion of cross-examination, she admitted that her "entire analysis [wa]s absolutely worthless."[117] Similarly, in *Ragland v. Kentucky*,[118] a bullet-lead composition analyst conceded during cross-examination that she had lied in earlier statements. The analyst admitted afterward, "It was only after the cross-examination at trial that I knew I had to address the consequences of my actions."[119] Many more examples undoubtedly exist, but have gone unreported because cross-examination resulted in acquittal.

Unfortunately for Mr. Bullcoming, such cross-examination never occurred at his trial. It is unknown what Mr. Caylor would have testified to had he appeared in court, and we can only speculate as to whether the jury would have found his report more or less reliable had he been exposed to rigorous cross-examination. What is certain, however, is that without testimony from Mr. Caylor himself, the contents of his report, including Mr. Bullcoming's blood alcohol content, should not have been admitted under the Confrontation Clause.

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[116] Stephanie Hanes, *Chemist Quit Crime Lab Job After Hearing, Papers Show: She Acknowledged Report Was Worthless In 1987*, Balt. Sun, Mar. 19, 2003, at B1.

[117] *Id.*

[118] 191 S.W.3d 569 (Ky. 2006).

[119] *Id*. at 581.

CONCLUSION

This Court made clear in *Melendez-Diaz* that forensic reports are testimonial, and that their authors must be subject to confrontation. Confrontation of a surrogate is insufficient; the reliability of a forensic report can be assessed only through confrontation of the analyst who prepared the machine, conducted the tests, and drafted the report. Despite the New Mexico Supreme Court's suggestion otherwise, reports that involve the use of machines are still forensic reports, subject to the same problems of human error and interpretation, and with the potential to produce the same troubling results: the conviction of innocent persons.

For all of the foregoing reasons, and those presented by Petitioner, the judgment of the New Mexico Supreme Court should be reversed.

Respectfully submitted,

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APPENDIX

The Innocence Network member organizations include the Alaska Innocence Project, Association in Defence of the Wrongly Convicted, California Innocence Project, Center on Wrongful Convictions, Committee for Public Counsel Services Innocence Program, Connecticut Innocence Project, Delaware Office of the Public Defender, Downstate Illinois Innocence Project, Duke Center for Criminal Justice and Professional Responsibility, Exoneration Initiative, Georgia Innocence Project, Griffith University Innocence Project, Hawaii Innocence Project, Idaho Innocence Project, Indiana University School of Law Wrongful Conviction Clinic, Innocence Institute of Point Park University, Innocence Network UK, Innocence Project, Innocence Project Arkansas, Innocence Project at UVA School of Law, Innocence Project New Orleans, Innocence Project New Zealand, Innocence Project Northwest Clinic, Innocence Project of Florida, Innocence Project of Iowa, Innocence Project of Minnesota, Innocence Project of South Dakota, Innocence Project of Texas, Irish Innocence Project at Griffith College, Justice Brandeis Innocence Project, Justice Project, Inc., Kentucky Innocence Project, Life After Innocence Project, Maryland Innocence Project, Medill Innocence Project, Michigan Innocence Clinic, Mid-Atlantic Innocence Project, Midwestern Innocence Project, Mississippi Innocence Project, Montana Innocence Project, Nebraska Innocence Project, New England Innocence Project, North Carolina Center on Actual Innocence, Northern

Arizona Justice Project, Northern California Innocence Project, Ohio Innocence Project, Office of the Ohio Public Defender Wrongful Conviction Project, Osgoode Hall Innocence Project, Pace Post-Conviction Project, Palmetto Innocence Project, Pennsylvania Innocence Project, Reinvestigation Project, Rocky Mountain Innocence Center, Sellenger Centre Criminal Justice Review Project, Texas Center for Actual Innocence, Texas Innocence Network, Thomas M. Cooley Law School Innocence Project, Thurgood Marshall School of Law Innocence Project, University of British Columbia Law Innocence Project, University of Leeds Innocence Project, Wake Forest University Law School Innocence and Justice Clinic, Wesleyan Innocence Project, and the Wisconsin Innocence Project.