

"I made an error in my computations." --Spock

"This may be an historic occasion." --McCoy

Tomorrow is Yesterday, Star Trek, TOS

Exonerated by Science

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Convicted by Juries, Exonerated by Science, a research report commissioned by the National Institute of Justice (NIJ), reviews a number of case studies in which convicted persons were released from prison as a result of posttrial DNA testing of evidence. In most of these cases, eyewitness identification was a key element in obtaining the conviction. Although eyewitness testimony is notoriously unreliable, it continues to impress juries, and it is often readily available to investigators. Also in many of these cases, non-DNA forensic evidence such as serological or hair comparisons was introduced to implicate a suspect. Barring laboratory error, the failure to exclude an innocent suspect from having contributed an evidentiary sample based on any one of the myriad types of physical evidence is simply a demonstration of the practical limits of that particular test. More disturbing is the apparent lack of in-depth case review by the laboratory and the alleged misconduct on the part of some individuals involved in laboratory analysis.

The impact of DNA testing per se on reversing a conviction is perhaps less important than the general issues that led these men to be wrongly imprisoned in the first place. Thus, the issues we address in this commentary apply to all forensic disciplines. We consider two general areas, the work standard in forensic science and the role of science in justice.

Forensic laboratories must not only produce accurate, reliable, and unbiased analyses, they must convince the judicial system and the general public that they hold to the highest possible standard. DNA testing, with its potential to not only exclude, but individualize, has focused an enormous amount of scrutiny on forensic science in general. The trial of O.J. Simpson for homicide and recent allegations of misconduct at the FBI laboratory bring into sharp relief issues of quality assurance, laboratory and analyst qualifications, ethical standards and the continuing evolution of the state of the practice of forensic science.

Any technology has the potential to be misused, and charlatans exist in all fields. It is incumbent upon the forensic science community as a whole to monitor its members in the use of DNA or any forensic analysis. As a group, those involved in forensic science on a daily basis are highly qualified to set analytical and ethical standards and to judge the veracity of an opinion; they also have the most to lose if an analyst commits abuses that reflect on the forensic community as a whole. Peer pressure is often the most effective method of ensuring ethical conduct; however peers must be willing to challenge each other for this to be effective.

Several programs exist to assess the quality of a forensic work product; they include laboratory accreditation and analyst certification. Accreditation relates to

laboratory-wide issues such as evidence handling, validation and institution of proper scientific protocols, education and training, proficiency testing programs, and case review procedures. Laboratories may be accredited by the American Society of Crime Laboratory Directors-Laboratory Accreditation Board (ASCLD-LAB), a standing which must be renewed at regular proscribed intervals in order to be retained. Analyst certification may be obtained by passing a general, and subsequently a specialty, written exam, administered by the American Board of Criminalistics (ABC). In order to retain specialty certification, an analyst must also pass a hands-on proficiency test at regular intervals.

Accreditation and certification serve two main functions. First, these quality assurance programs serve to measure and improve the work standard of laboratory and analyst. Additionally, but of no lesser importance, these programs provide a measure by which the judicial system and lay public may judge a forensic work product. Currently, all of these programs are voluntary, but expectations are increasing both from within and from outside the forensic science community to measure and demonstrate competence. Accreditation and certification establish minimum standards; it is our hope and expectation that minimum acceptable standards will increase as the profession continues to mature. While some analysts argue to the contrary, the move towards laboratory accreditation and analyst certification can only raise the level of professionalism in the field, and in the not-to-distant future such measures may become mandatory.

A number of the cases cited in the NIJ report appear to have slipped through the proverbial cracks due to insufficient review either within the testing laboratory or by an independent reviewer. Case review is a method of catching and correcting honest mistakes, as well as intentional falsification of results, before permanent damage is wrought. Casework must be reviewed by an independent analyst or other qualified individual internal to the lab or by a qualified independent expert on behalf of the court or opposing counsel. Analysts are human beings; the question is not "will an error occur?", but "when an error occurs, how can it be detected and corrected?". A series of checks and balances must be in place to assure a reliable work product. These measures must include analytical controls and standards, as well as an appropriate and detailed review process. Valid, proven analytical techniques and thoughtful interpretation are obviously essential to a competent analysis; the proper education, training and certification of forensic analysts and independent reviewers, accreditation of laboratories and the maintenance of high standards, implementation of proper quality control and quality assurance protocols, and internal and external review procedures are no less critical to the output of a high quality forensic work product. Execution of these operations requires a firm commitment of both human and economic resources; further, implementation requires acceptance by and support from all levels of personnel from legislative bodies to laboratory technicians.

A line must be drawn between the reliability and appropriate application of any underlying technology and the execution of a particular forensic test by an analyst; these factors must be assessed independently. The technology underpinning forensic DNA testing, for instance, may be generally accepted and reliable, but the particular procedures implemented by each laboratory and the adherence to the laboratory's written protocols by the individual analyst must be scrutinized on a case-by-case basis. That said, the fact remains that no two cases are alike, and no

protocol can cover every eventuality. Forensic science at its best is truly an art grounded in scientific principles. The successful analyst will use all the tools at his disposal and will employ a written protocol as a guideline, implementing suitable deviations when appropriate to elicit the greatest amount of relevant information from a sample. Thinking is allowed. Independent review is the crucible in which the scientific reasonableness of the analysis, including any deviations from it, are tested.

By its very nature, the field of forensic science has always attracted radically self-sufficient and self-reliant individuals; after all, the stand can be a pretty lonely place when one is being cross-examined. Recent attention to standardization and oversight has, quite understandably, touched a nerve in many highly competent analysts. Because no two cases are alike, each requires on-the-spot decision-making during the actual analysis. When will the analyst cross some arbitrarily-determined line between "allowable deviations" from a standard protocol and "non-adherence" to the protocol? No matter how brilliant the analyst, it is not unreasonable to expect him to conform to general procedures and practices that have been deemed essential by the field as a whole. However, a certain amount of flexibility must also be built into the scientific and legal review process to allow the analyst to utilize all her education, training and experience to conduct the best analysis possible; protocols should be considered guidelines not boilerplates. With this in mind, forensic scientists should welcome the establishment of professional guidelines.

It is important to acknowledge that the goals of science and justice are not inexorably commensurate. Science seeks to explain the physical universe, while the judicial system administers justice. Because the dispensation of justice often relies on knowledge about physical evidence, science is invited to contribute to the fact-finding process as defined by the legal system. Not infrequently, justice may be dispensed without reference to, or in disregard of, a particular scientific result; this inherent discordance produces an ongoing tension between science and law that cannot be ignored. Professionals in both worlds are often uncomfortable working within the other's frame of reference; each seeks to define ground rules within a familiar sphere. Attorneys should and do act as advocates. We suggest that it might better serve the administration of justice if the forensic scientist were allowed to assist the court rather than the attorneys representing each side. In this scenario, the court would retain discretion in soliciting witnesses and would have uniform access to any scientist who might be helpful in understanding the significance of a piece of physical evidence. Science could better aid the judicial fact-finding process if analytical conclusions and alternate interpretations were allowed to be presented without the filter of advocacy.

Ultimately, the buck stops with that entity for which the service was performed—the judicial system. Detectives, attorneys, and judges must educate themselves about the type of testing that the laboratory has been requested to perform. It is not expected that someone who spent their academic career avoiding any and all science classes will instantly become fluent in the language of science. However, it is of utmost importance to achieve, at a minimum, an appreciation of the limitations of any forensic test. For example, if a rogue analyst insists that individualization is possible using hair comparisons, the attorney must be conversant enough with the technology to know that this is fundamentally

incorrect. Yes, the analyst should be responsible for advising the detective or attorney as to the best use and interpretation of forensic tests. But the very nature of the American judicial system constrains the scientist from independently pursuing an investigation and reporting the results. Without a legal question to answer, the forensic analyst has no function. So, practically, the judicial system is the ultimate arbiter; the final decision as to if and how scientific evidence is allowed in any particular case, warranted or not, falls to the courts.

The case studies presented in the NIJ report are excellent examples of wrongs that were righted using one of the most powerful tools in forensic science today, DNA testing. DNA technology should be used to its fullest advantage to support both exoneration and conviction. By the same token, equivalent standards must apply to the handling and interpretation of all samples; the technology does not discriminate between prosecutorial and defense evidence. Potential errors such as sample switches can occur in either case, and measures must be taken at all levels to both minimize and identify false results. The power of DNA analysis tempered with the strength of proper review and quality assurance measures provides the judicial system with the most effective avenue of inquiry to date into the probative value of biological evidence. All physical evidence is circumstantial; it is not analyzed in a vacuum nor can it establish guilt. Forensic analysis of physical evidence is simply a tool, albeit a potentially powerful one; it must be used with its limitations strictly in mind, and the care appropriate to its strength.

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