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PRACTITIONER ESSAYS

LEGAL CRITICISMS OF DNA TYPING: WHERE'S THE BEEF?

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I. INTRODUCTION

DNA typing has dramatically altered the criminal legal process.¹ Hearings to determine the admissibility of DNA typing are often lengthy, some lasting several weeks or months.² The legal discovery process has scrutinized virtually every aspect of the procedures that testing laboratories use to evaluate DNA evidence. These measures are typically government funded, and significant expenditures of effort, time and money are involved in litigating the admissibility of DNA evidence. One would think, therefore, that DNA typing evidence has routinely been used to convict defendants where a conviction would have been impossible without the evidence. However, DNA evidence merely provides corroborative evidence in all but a handful of cases.

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¹ This form of forensic evidence testing compares biological evidence associated with criminal activity with known samples. The evidence may consist of sexual assault samples, where the comparison is made with a suspect's known sample. It may also consist of blood or other biological material from a victim of a violent crime, which is located on something associated with a suspect. When the evidence and the known sample compare favorably, an estimate is calculated as to the commonness of the comparison. This form of forensic evidence is described as "associative evidence."

What sets DNA typing apart from previous forms of biological evidence comparisons is the strength of the association. Once the evidence and the known samples have been compared and appear to match, calculations are performed to show how frequently these matching patterns might occur in some general reference population. Typically, these calculations are performed from databases which have been collected and analyzed from major groups such as Caucasians, African Americans, and Hispanics.

² See, e.g., *People v. Castro*, 545 N.Y.S.2d 985, 986 (N.Y. Sup. Ct. 1989); *People v. Barney*, 10 Cal. Rptr. 2d 731 (Cal. Ct. App. 1992); *People v. Axell*, 1 Cal. Rptr. 2d 411 (Cal. Ct. App. 1991); *United States v. Yee*, 134 F.R.D. 161 (N.D. Ohio 1991).

Critics of DNA typing have suggested that innocent people have been convicted by DNA evidence and, conversely, that innocent people have been convicted because DNA typing was not performed.³ Both of these statements cannot be correct.⁴ This is simply rhetoric designed to convince trial courts to continue to allow each defendant to challenge the DNA evidence, whether or not the law affords the right to such challenges. In most cases involving DNA evidence, tried by court or jury, the DNA evidence was merely corroborative evidence of the defendant's guilt.⁵ Two separate cases in which this author was involved demonstrate this point. These cases were prosecuted separately and were initially assigned to different appellate panels for review. The appellate panel re-assigned and consolidated the appeals *sua sponte*.⁶

In responding to these criticisms, this article will consider various interpretations of legal admissibility standards in order to appreciate the impact DNA has had on the legal process in this area. It will then discuss the overreaction of the legal system to DNA typing evidence and will comment on the wave of admissibility litigation which has engulfed the legal system. It will describe how the evidence typically is presented to juries and will finally discuss the use of DNA typing in the post-conviction setting.

II. LEGAL ADMISSIBILITY DEBATE ISSUES⁷

Legal admissibility criteria ensure that evidence which is to be

³ Peter J. Neufeld, an outspoken critic of DNA typing, has declared that "hundreds of innocent people may be behind bars because courts never doubted DNA evidence." Peter J. Neufeld, *DNA Evidence May Be Used in Legere Trial*, TELEGRAPH-J. (Fredericton, N.B., Canada), Aug. 11, 1990, at 3. Recently, Neufeld's colleague, Barry Scheck, declared: "There are probably far more people rotting in jail who didn't commit crimes than any of us believed." Rorie Sherman, *DNA Unraveling*, NAT'L L.J., Feb. 1, 1993, at 1. This latter comment was made to urge that DNA evidence be used to free these innocent people.

⁴ Research has not disclosed any case in which it has been demonstrated that a DNA testing laboratory's incorrect match of two samples contributed to the conviction of an innocent defendant.

⁵ See, e.g., *Castro*, 545 N.Y.S.2d at 985; *Barney*, 10 Cal. Rptr. 2d at 731; *Axell*, 1 Cal. Rptr. 2d at 411. In fact, in most cases in which trial courts excluded the prosecution's DNA evidence, the defendants were convicted on the basis of the remaining evidence. See, e.g., *State v. Pennell*, No. IN88-12-0051 (New Castle Co., Del. Super. Ct. 1989); *State v. Wheeler*, No. C89-0901CR (Washington Co., Or. Cir. Ct. Mar. 8, 1990); *State v. Passino*, No. 185-1-90 (Franklin Co., Vt. Dist. Ct. May 13, 1991); *People v. Fleming*, No. 90-CR-2716 (Cook Co., Ill. Cir. Ct. Mar. 12, 1991); *State v. Despain*, No. 15589 (Yuma Co., Ariz. Super. Ct. Feb. 12, 1991).

⁶ *Barney*, 10 Cal. Rptr. 2d at 731.

⁷ Use of the term "controversy" does not accurately reflect the level of disagreement which occurs in a typical admissibility hearing. Defense testimony usually criticizes certain specifics of how the tests were performed and describes areas in which

presented to juries meets some minimum threshold.⁸ Some jurisdictions define these criteria by statute,⁹ while other jurisdictions have developed the standards through case law.¹⁰ In either instance, once the foundational predicate is demonstrated, the jury is allowed to hear the evidence in order to assist it in deciding whether or not a criminal defendant is guilty. In the area of new scientific techniques, the general acceptance of the technique often plays a key role in deciding the admissibility of the evidence.¹¹

DNA typing evidence has significantly altered the manner in which admissibility litigation is conducted. Previously, once a scientific technique was ruled admissible, the defense had no right to an admissibility hearing, at which the prosecution had to demonstrate the requisite foundation.¹² An early New York trial court ruling involving DNA, *People v. Castro*,¹³ dramatically changed the scope of the foundational requirements. In addition to requiring a showing of general acceptance, the trial court also insisted that the proponent of the DNA evidence demonstrate the quality of the work actually performed for the specific case. This additional element meant that legal precedent concerning a new scientific technique would not put an end to the requirement for admissibility hearings. The defense would *always* have the right to challenge the admissibility of

errors might be made. Defendants rarely have their own analyses performed. Most defense experts have never performed forensic DNA tests. See generally James Wooley & Rockne P. Harmon, *The Forensic DNA Brouhaha: Science or Debate?*, 51 AM. J. HUM. GENETICS 1164-65 (1992).

The debate presently focuses on the statistical aspect of forensic DNA typing. The term "controversy" in this setting only perpetuates the myth that innocent defendants might be wrongly convicted based on DNA evidence.

⁸ The foundational facts may vary. The issue may be voluntariness of a statement, suggestiveness of an identification, or general acceptance of a new scientific technique.

⁹ See, e.g., *United States v. Jakobetz*, 955 F.2d 786, 793-96 (2d Cir. 1992) (holding that Federal Rule of Evidence 702 "applies even to something as complicated as DNA profiling"); *State v. Brown*, 470 N.W.2d 30, 30-32 (Iowa 1991) (holding DNA evidence admissible under Iowa Rules of Evidence 702 and 703); *Prater v. State*, 820 S.W.2d 429, 431 (Ark. 1991) (holding DNA evidence admissible under Arkansas Rules of Evidence 402 and 702).

¹⁰ See, e.g., *People v. Fishback*, 851 P.2d 884 (Colo. 1993); *Barney*, 10 Cal. Rptr. 2d at 731; *United States v. Yee*, 134 F.R.D. 161, 163-66 (N.D. Ohio 1991); *State v. Ford*, 392 S.E.2d 781, 782-83 (S.C. 1990); *People v. Wesley*, 589 N.Y.S.2d 197 (N.Y. App. Div. 1992).

¹¹ General acceptance is the key question in jurisdictions that follow *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923). The same question also plays a significant role in jurisdictions that have adopted the Federal Rules of Evidence. See generally Rockne P. Harmon, *General Admissibility Considerations for DNA Typing Evidence: Let's Learn From the Past and Let Scientists Decide This Time Around*, in FORENSIC DNA TECHNOLOGY (Mark A. Farley & James J. Harrington eds., 1991).

¹² *People v. Kelly*, 549 P.2d 1240 (Cal. 1976); *Fishback*, 851 P.2d at 884.

¹³ 545 N.Y.S.2d 985, 987, 998-99 (N.Y. Sup. Ct. 1989).

the evidence, no matter how well established the technique had become.¹⁴ Some jurisdictions have adopted the *Castro* rationale.¹⁵ Others have expressly rejected it and have declined to provide a legal forum for a perpetual admissibility debate.¹⁶ The first *appellate* decision in New York expressly rejected *Castro's* expanded admissibility criteria.¹⁷

III. DNA TYPING EVIDENCE IN PRACTICE: *BARNEY* AND *HOWARD*

A. *PEOPLE v. BARNEY*¹⁸

Ralph Edwards Barney accosted his victim in the South Hayward Bay Area Rapid Transit ("BART") parking lot. He forced his way into her car, demanding money and wielding a knife. He forced the victim to drive several blocks, where "he penetrated her vagina with his fingers, attempted unsuccessfully to rape her and force her to perform oral copulation, and ejaculated on her clothing."¹⁹ He took her car keys, approximately \$2.00 in change and her BART ticket with \$3.80 remaining on it.²⁰ The victim called the police after she found Barney's wallet on the car floor. When the police arrived, she identified Barney from a California identification found in his wallet. Officers arrested Barney at the address on the identification found in the wallet.²¹ The police seized a knife, a BART ticket with \$2.20 remaining on it and \$1.82 in change found in Barney's possession and on his front porch. The BART ticket had last been used to enter the transit system at the South Hayward BART station, and the BART fare between that station and one near Barney's address was \$1.60, the same amount by which the victim's BART ticket was reduced after the assault.²² At police headquarters, the victim identified Barney as her assailant. She subsequently identified him at a lineup, at the preliminary examination and at trial.²³ Before trial, she identified two knives, one of which was the seized knife. She also identified the BART ticket found in Barney's posses-

¹⁴ See generally Rockne P. Harmon, *How Has DNA Evidence Fared? Beauty is in the Eye of the Beholder*, 1 EXPERT EVID. REP. NO. 6, 149, 150-52 (1990).

¹⁵ See *State v. Ford*, 392 S.E.2d 781, 783 (S.C. 1990); *State v. Schwartz*, 447 N.W.2d 422, 425-27 (Minn. 1989).

¹⁶ See *Smith v. Deppish*, 807 P.2d 144 (Kan. 1991); *State v. Pierce*, 597 N.E.2d 107 (Ohio 1992).

¹⁷ *People v. Wesley*, 589 N.Y.S.2d 197, 198-99 (N.Y. App. Div. 1992).

¹⁸ *People v. Barney*, 10 Cal. Rptr. 2d 731 (Cal. Ct. App. 1992).

¹⁹ *Id.* at 733.

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

²³ *Id.*

sion at trial.²⁴ DNA analysis by Cellmark Diagnostics ("Cellmark") indicated that Barney's DNA pattern matched the DNA pattern in semen found on the victim's clothing. The frequency of such a pattern is 1 in 7.8 million in the African-American population.²⁵

The admissibility hearing was held in the summer of 1989.²⁶ Four prosecution witnesses and three defense witnesses testified over a period of three weeks. In addition, the court took judicial notice of the admissibility hearing transcript in *People v. Axell*.²⁷

B. *PEOPLE v. HOWARD*²⁸

Octavia Matthews was found bleeding from multiple head wounds with a rope wrapped around her neck.²⁹ She died soon after of blunt trauma to the head and asphyxia caused by blunt neck trauma.³⁰ Kevin O'Neal Howard, one of Matthews' tenants in another building, was behind in his rent payments and previously had been served with an eviction notice.³¹ Police found Howard's wallet at Matthews' home under some newspaper on a bloodstained couch, and his fingerprint was found on a postcard in a bedroom.³² According to conventional blood group analysis, Howard's blood and some of the crime scene bloodstains shared an unusual blood type found in approximately 1.2 persons out of 1,000 in the African-American population. This blood type is not found at all in the caucasian population.³³ DNA analysis indicated that Howard's DNA pattern matched the pattern in the bloodstains. The frequency of this pattern in the African-American population is 1 in 200 million.³⁴

The trial court conducted a *Kelly-Frye* hearing to determine the admissibility of the DNA evidence.³⁵ The court heard expert testimony from both sides and admitted transcripts of the previous *Kelly-*

²⁴ *Id.*

²⁵ *Id.* at 734.

²⁶ California's admissibility standard is known as the *Kelly-Frye* rule because California adopted *Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923), in *People v. Kelly*, 549 P.2d 1240 (Cal. 1976).

²⁷ *Barney*, 10 Cal. Rptr. 2d at 734.

²⁸ Although factually unrelated, *Barney* and *Howard* were consolidated for review because they involved similar identity issues and underlying scientific principles. *Id.* at 732.

²⁹ *Id.* at 733.

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

Frye hearings in *People v. Barney* and *People v. Axell*.³⁶ The court ruled that the evidence was admissible under *Kelly-Frye*. At trial, Howard testified that he had gone to Matthews' home to discuss his rent and get a receipt for a prior payment. While searching for a receipt, he emptied a pouch filled with his personal items, including his wallet, which he accidentally left at the Matthews' home. He stated that he never attacked Matthews, and she was still alive when he left her home.³⁷ Howard's defense suggested that another tenant of Matthews may have committed the homicide.³⁸ A jury convicted Howard of second-degree murder with great bodily injury. He was sentenced to prison for fifteen years to life.³⁹

Admissibility hearings were held in both *Barney* and *Howard*.⁴⁰ The testimony heard pertained to the issues as they existed *at that time*. The hearing records were supplemented by judicial notice of other trial court hearing records in which additional witnesses testified. In each case, the actual testimony took about three weeks. At the end, each trial judge ruled the evidence admissible. In *Barney*, the defendant waived his right to a jury trial. In *Howard*, the jury had no difficulty deciding the identity of the murderer when it considered the DNA evidence in the context of the remaining evidence.

C. THE BARNEY/HOWARD APPELLATE PROCESS

These two separate cases were consolidated after the appellate briefs in *Barney* had been filed. In February 1992, after the final briefs were filed in *Howard*, the appellate court invited the parties to file supplemental briefs addressing a pair of conflicting articles appearing in the prestigious journal, *Science*.⁴¹ Several months later, in June 1992, before the appellate court had scheduled the cases for oral argument, the court invited the parties to file supplemental

³⁶ *Id.* at 734.

³⁷ *Barney*, 10 Cal. App. 2d at 733.

³⁸ *Id.*

³⁹ *Id.*

⁴⁰ The hearing in *Barney* was in 1989. The hearing in *Howard* was in 1990.

⁴¹ See Richard C. Lewontin & Daniel L. Hartl, *Population Genetics in Forensic DNA Typing*, 254 *SCIENCE* 1745 (1991); Ranajit Chakraborty & Kenneth K. Kidd, *The Utility of DNA Typing in Forensic Work*, 254 *SCIENCE* 1735 (1991).

Lewontin and Hartl asserted that estimates produced by forensic DNA tests *may* be in error by a factor of 100 in either direction. The errors they claimed were due to ethnic groups in which there may be differences in frequencies. They insisted that these ethnic groups must be sampled to determine the magnitude of these frequency differences, if any.

The article by Chakraborty and Kidd is a reply to the article by Lewontin and Hartl. The authors point out errors in the article and insist that there is no need to sample the ethnic groups because forensic frequency differences are not as great as Lewontin and Hartl claim they *might* be.

briefs addressing the report just released by the National Research Council ("NRC").⁴² After considering these supplemental briefs, the court held that the two trial courts' admissibility rulings were erroneous, in light of the *Science* articles and the NRC report.⁴³

There is one aspect of the decision that could have a profound effect on the use of scientific evidence in the legal system. In ruling that DNA evidence had not satisfied California's *Kelly-Frye* rule,⁴⁴ the court based its decision on criticisms and articles that were not even in existence at the time of the admissibility hearings in either of the two cases. Specifically, the court relied on the apparent conflict of opinions expressed in the two articles in *Science*⁴⁵ when it noted a level of disagreement, which appeared to undermine the scientific community's general acceptance of forensic DNA frequency estimation procedures.⁴⁶ The court declined to evaluate the competing contentions, explaining:

Our task is not to choose sides in this dispute over the reliability of the statistical calculation process. Once we discern a lack of general scientific acceptance—which in this instance is palpable—we have no choice but to exclude the "bottom line" expression of statistical significance in its current form.⁴⁷

In other words, the court conducted its own limited review of scientific literature, found a level of diverging scientific opinion, and ruled the evidence inadmissible. The court expressly refused to assess the competing contentions it had discovered in its own research.

What is wrong with this standard of review? First, the opinion fails to address *any* of the issues that were debated during the two

⁴² COMMITTEE ON DNA TECH. IN FORENSIC SCIENCE, NAT'L RESEARCH COUNCIL, DNA TECHNOLOGY IN FORENSIC SCIENCE (1992).

⁴³ Since the *Barney/Howard* appeal was decided in August 1992, one additional appellate DNA case has been decided by the same panel that decided *Barney/Howard*. See *People v. Wallace*, 17 Cal. Rptr. 2d 721, 724-26 (Cal. Ct. App. 1993). Until other geographic appellate districts decide cases arising from within their own areas, it is too soon to assess the full impact of the legal analysis relied upon by the *Barney* court.

The rationale in *Barney* has also been relied upon in at least one other jurisdiction. See *United States v. Porter*, 618 A.2d 629 (D.C. 1992).

⁴⁴ *People v. Kelly*, 549 P.2d 1240 (Cal. 1976).

⁴⁵ Lewontin & Hartl, *supra* note 41; Chakraborty & Kidd, *supra* note 41.

⁴⁶ *People v. Barney*, 10 Cal. Rptr. 2d 731, 743 (Cal. Ct. App. 1992).

⁴⁷ *Id.* The court could not see the forest from the trees. The original estimate presented in the trial in *Barney* was 1:7 million. Based on Lewontin and Hartl's criticisms, this estimate could be anywhere from 1:70,000 to 1:700 million. When the calculations were performed in accordance with the National Research Council's recommendations, the estimate was 1:6 million. The court felt that the dispute over these powerful estimates warranted excluding any and all estimates from the factfinder's consideration. *Id.*

different admissibility hearings.⁴⁸ It also defines a new level of appellate review, whereby changes of scientific opinion which occur while convictions are being slowly processed through the appellate system can be used to undermine trial court admissibility rulings which addressed all existing issues. At least one state supreme court has recognized the danger of attempting such an assimilation. The Colorado Supreme Court refused to consider developments in the scientific community which occurred *after* the trial court's admissibility decision.⁴⁹ Recently, the Arizona Supreme Court expressly rejected Colorado's analysis and sided with *Barney's* method of review.⁵⁰ The decision held that "the [trial] court erred in admitting the probability testimony based on the product rule calculations."⁵¹ Later, the decision recognized that "[i]t is somewhat incongruous to call the trial court's ruling 'error.' Nearly all the scientific literature and case law on which we rely was unavailable when the evidence was admitted at trial."⁵² The Arizona Supreme Court referred to the analysis in *People v. Fishback*⁵³ as a "snapshot."⁵⁴ The decision recommends "viewing the motion picture[] of technological advancement,"⁵⁵ as employed in *Barney/Howard*,⁵⁶ as the appropriate method to review DNA typing evidence. The characterization of the two competing and irreconcilable approaches as a "snapshot" on the one hand, and a "motion picture" on the other, is not as simple as it seems. Once an appellate decision is rendered, even under the motion picture analysis, the movie stops and becomes a snapshot just as the trial court's decision was a snapshot at the time it was rendered. This appellate "snapshot" cannot be legal precedent because the "motion picture[] of technological advancement"⁵⁷ con-

⁴⁸ At the time of the admissibility hearings in these cases, neither Lewontin nor Hartl had ever testified or publicly voiced an opinion on this subject. In addition, the National Research Council had not yet formed a committee to conduct its review. The admissibility hearing focused on many technical issues having to do with the testing procedures, as well as with statistical tests performed on the databases by one of the defense experts.

⁴⁹ *People v. Fishback*, 851 P.2d 884, 896, 900 (Colo. 1993). This decision found that forensic DNA evidence was generally accepted. It placed the burden on the defense to show that subsequent changes in scientific opinion were significant enough to undermine the finding of general acceptance and cause the evidence to be excluded. This principle also exists in California law in *People v. Kelly*, 549 P.2d 1240, 1246 (Cal. 1976). It is unclear why *Barney* did not adhere to this principle.

⁵⁰ See *State v. Bible*, No. CR-90-0167-AP, 1993 WL 306544 (Ariz. Aug. 12, 1993) (en banc).

⁵¹ *Id.* at *28.

⁵² *Id.* at *55 n.33.

⁵³ 851 P.2d 884 (Colo. 1993) (en banc).

⁵⁴ *Bible*, 1993 WL 306544 at *55 n.33.

⁵⁵ *Id.*

⁵⁶ 10 Cal. Rptr. 2d 731 (Cal. Ct. App. 1992).

⁵⁷ *Bible*, 1993 WL 306544 at *55 n.33.

tinues beyond the date of the appellate decision and must be reviewed by subsequent courts. In California, death penalty appeals, which go directly to the California Supreme Court, can take seven years or more before an appellate decision is rendered. How will these courts be able to assimilate seven years of scientific evolution of opinion, if they are asked to do so? If this form of appellate analysis is correct, shouldn't it also be carried over into habeas corpus proceedings? For example, should a defendant whose conviction has been affirmed on appeal be entitled to habeas corpus relief because the "scientific landscape" of opinion has changed since his conviction was affirmed?⁵⁸

The *Barney/Howard* decision constitutes judicial abdication of the court's role on another significant legal point. The court performed its own limited survey of scientific literature. When it found some level of disagreement, it declined to try to resolve the issues, claiming this would exceed its role under *People v. Kelly*.⁵⁹ The court depended on an article by two prominent scientists to create this impasse.⁶⁰ In an amicus curiae brief, the appellate court was reminded that Lewontin and Hartl had presented their views in live testimony in two earlier cases and the evidence was ruled admissible in spite of their critical opinions.⁶¹ In these two earlier cases, the judges admitted the DNA evidence by distinguishing between criticisms that were relevant to the weight of the evidence, criticisms that were relevant to the admissibility of the evidence and criticisms which were relevant to the weight to be given to the evidence once admitted. Such distinctions are based in law, not in science. The *Barney* decision dodged this issue with the statement: "[o]ur task under *Kelly-Frye* is not to choose sides . . ." ⁶² This comment ignores long-standing legal precedent in California that questions about statistics derived from biological evidence testing relate to the

⁵⁸ This exact scenario is presently being played out in California. *People v. Axell*, 1 Cal. Rptr. 2d 411 (Cal. Ct. App. 1991), was the state's first appellate ruling on the admissibility of DNA evidence. The decision pre-dates *Barney/Howard* and found the technology passed *Frye*. Ms. Axell has sought habeas corpus relief based on the *Barney/Howard* decision because of the perceived change of scientific opinion. Interestingly, the admissibility hearings in *Axell* and *Barney* were being conducted at the same time. The trial judge in *Axell* has denied Axell's request for habeas corpus relief.

⁵⁹ 549 P.2d 1240 (Cal. 1976).

⁶⁰ Lewontin & Hartl, *supra* note 41, at 1745.

⁶¹ The two cases are *United States v. Jakobetz*, 955 F.2d 786 (2d Cir. 1992) and *United States v. Yee*, 134 F.R.D. 161, 165 (N.D. Ohio 1992). Both cases ruled that the DNA evidence passed *Frye*, notwithstanding the views of Lewontin and Hartl.

⁶² *People v. Barney*, 10 Cal. Rptr. 2d 731, 743 (Cal. Ct. App. 1992). This statement is even more perplexing when one considers that the range of estimates agreed upon by all, even Lewontin and Hartl is from 1:70,000 to 1:700 million, and the estimate presented at the trial was 1:7 million.

weight to be given to the evidence, not its admissibility.⁶³ The *Barney/Howard* court's refusal to make the legal distinction between weight and admissibility leaves it hopelessly mired in a controversy of its own making.

The *Barney/Howard* court concluded its discussion of the current state of affairs of forensic DNA typing with a reference to the National Research Council's report on forensic DNA typing, which was released in spring 1992.⁶⁴ After determining that there was a change in the scientific consensus based on the *Science* article by Lewontin and Hartl, the court suggested that the report provided a generally accepted "common ground"⁶⁵ for future cases. The NRC report recommends a modification of past estimation procedures to produce more conservative estimates, which would also satisfy Lewontin and Hartl's concerns.

Since the NRC report was issued, it has been utilized in many different ways by appellate courts. At least one appellate court has refused to consider it because it was not part of the trial court record.⁶⁶ Some courts have followed the *Barney* approach and used the report to rule that the methods used in the trial court were inappropriate even though the report was not in existence at the time of the admissibility hearing.⁶⁷ Others have considered the report and found that the methods used earlier pass the admissibility standard.⁶⁸ Recently, the same appellate panel which decided *Barney* chastised the scientific community for criticizing aspects of the report in the peer review literature.⁶⁹

Clearly, courts can reach a number of quite different, and often irreconcilable, conclusions about scientific evidence. Unfortunately, the end result often depends on how the courts define the extent of their legal responsibilities, not on the quality of scientific evidence before them. This is unfortunate because it is the inconsistent use or abuse of some principle of law that results in evidence being

⁶³ *People v. Yorba*, 257 Cal. Rptr. 641, 647 (Cal. Ct. App. 1989).

⁶⁴ COMMITTEE ON DNA TECH. IN FORENSIC SCIENCE, *supra* note 42.

⁶⁵ *Barney*, 10 Cal. Rptr. 2d at 745.

⁶⁶ *State v. Myers*, No. 03C019108CR00255, 1992 WL 297626 at *1 (Tenn. Ct. App. Oct. 22, 1992).

⁶⁷ *People v. Pizarro*, 12 Cal. Rptr. 2d 436 (Cal. Ct. App. 1992); *United States v. Porter*, 618 A.2d 629 (D.C. 1992); *State v. Cauthron*, 846 P.2d 502 (Wash. 1993).

⁶⁸ *State v. Pierce*, 597 N.E.2d 107, 112-13, 115 (Ohio 1992); *State v. Jobe*, 486 N.W.2d 407, 419-20 (Minn. 1992); *Satcher v. Commonwealth*, 421 S.E.2d 821 (Va. 1992).

⁶⁹ *People v. Wallace*, 17 Cal. Rptr. 2d 721, 725-26 (Cal. Ct. App. 1993). The overwhelming weight of peer review scientific literature has criticized the statistics section of the report as being unnecessary, unscientific, and arbitrary. *See, e.g.*, Peter Aldhous, *Geneticists Attack NRC Report as Scientifically Indefensible*, 259 SCIENCE 755, 755-56 (1993).

withheld from the factfinder, and not some deficiency in the science. Trial judges who see witnesses in person, view exhibits while the witnesses are actually pointing to them and often ask their own questions, rarely have difficulty ruling the evidence admissible. To date, hundreds of trial judges have ruled DNA typing evidence admissible. Only recently have the mixed results previously discussed⁷⁰ emerged at the appellate level where face-to-face contact and cross examination do not occur. What is there about seeing DNA typing evidence presented live which makes seeing believing?

IV. TRIAL PRESENTATION OF DNA TEST RESULTS

DNA evidence is usually corroborative evidence of a defendant's guilt. The fact that the convictions of defendants Barney, Howard, and Wallace were affirmed based *solely* on the other evidence provided against them demonstrates this point quite clearly.⁷¹ Yet, the *Barney* decision justifies the need for continued, expanded legal scrutiny of DNA evidence due to its concern that jurors must not be asked "to decide the substantive merits of competing scientific opinion as to the reliability of a novel method of scientific proof."⁷² Cases that depend exclusively on DNA evidence are actually very rare. A jury should not be expected to understand DNA typing within the confines of the jury box and in the contentious atmosphere of a criminal trial.⁷³ When the evidence is presented in the context of the entire body of additional evidence, the jury can appreciate that it is yet another piece of information which continues to support the hypothesis that the defendant is guilty, and supports no other reasonable hypothesis. Yet appellate decisions such as *Barney* seem driven by the need to protect jurors from being overwhelmed by DNA evidence, while at the same time the decisions concede that it is harmless error for the evidence to have been admitted.⁷⁴

The end product of the DNA typing process is called an autora-

⁷⁰ See *Wallace*, 17 Cal. Rptr. 2d at 725-26; *Pizarro*, 12 Cal. Rptr. 2d at 436; *Porter*, 618 A.2d at 629; *Jobe*, 486 N.W.2d at 419-20; *Pierce*, 597 N.E.2d at 112-13, 115; *Myers*, 1992 WL 297626 at *1; *Satcher*, 421 S.E.2d at 821; *Cauthron*, 846 P.2d at 502.

⁷¹ *Wallace*, 17 Cal. Rptr. 2d at 727; *People v. Barney*, 10 Cal. Rptr. 2d 731, 747-48 (Cal. Ct. App. 1992).

⁷² *Barney*, 10 Cal. Rptr. 2d at 742.

⁷³ Does anyone complain that the intoxilyzer, the neutron activation test, or the scanning electron microscope are not easily understood by a lay jury? In civil cases, are juries really expected to understand the methods used to calculate the value of a lost life in a wrongful death/product liability action?

⁷⁴ In *Wallace*, the court expanded the criticisms it voiced in *Barney* and at the same time it upheld the serial rape convictions because there was ample evidence to convict without the DNA. *Wallace*, 17 Cal. Rptr. 2d at 721.

diograph or autorad. The process itself is nothing more than a biological side-by-side comparison test to see if known and unknown samples *might* have had a common origin. The autorad is a piece of film which shows these comparison results in columnar form. Usually four separate tests are performed, each producing its own autorad.⁷⁵ A typical rape case illustrates the raw graphic power of DNA typing. The evidence in such a case often consists of a vaginal swab, a stain from an item of clothing, perhaps also from a bed-sheet, or a car seat. The known samples usually consist of the victim's blood sample, the samples of one or more suspects, and frequently a sample from the victim's last known consensual sex partner. If all of these samples were run in the same series of tests, the most dramatic observation a juror would make is that all the known samples produce very different patterns. Very seldom would any of these samples appear to be even remotely similar on any one of the autorads. Even if there was a similarity, the next autorad would show that the samples are actually very different. If all of the sperm DNA patterns in the evidence samples previously described matched one of the known samples and were easily distinguished from the other samples, the impact of the evidence would be powerful without understanding anything about biology.

The statistical estimates, which are calculated to provide some sense for how rare the matching pattern may be, are the focal point of today's admissibility debate. But even in the typical rape case, or in factual settings comparable to those which occurred in *Barney/Howard* or *Wallace*, the fact of the match alone can be considered along with the rest of the case in deciding whether or not the defendant is guilty.

Several years ago, claims were made that innocent suspects were being convicted based on DNA evidence because DNA typing was rushed into the legal system by allegedly mercenary private labs.⁷⁶ These claims have never been substantiated. There has never been a case in which opposing sides have each had their own DNA analyses performed and conflicting, irreconcilable results were produced.⁷⁷ Now, there is a great rush to have biological evidence in old cases tested, after all appellate remedies have been ex-

⁷⁵ See William C. Thompson, *Evaluating the Admissibility of New Genetic Identification Tests: Lessons from the "DNA War,"* 84 J. CRIM. L. & CRIMINOLOGY 22, 33-42 (1993) for a detailed discussion of DNA typing.

⁷⁶ Neufeld, *supra* note 3, at 3.

⁷⁷ Defense analysis of prosecution evidence in criminal cases is quite rare. The fact that those few defense analyses which have been performed have not been presented in court to impeach prosecution results suggests that the analyses corroborated the first results.

hausted.⁷⁸ Significant media attention has been given to a few cases in which defendants were ultimately exonerated by post-conviction DNA typing. Most of those cases were prosecuted before the advent of DNA typing.

These cases may not be as easy to resolve as they might appear at first blush. Several points must be considered when presented with a request to make biological evidence in a previously adjudicated case available for DNA typing. First, the materiality of the evidence must be considered. Is the evidence truly material to the issue of identification? Is the victim alive? Is there a possibility of previous, unreported consensual sex? If there is an apparent exclusion of the convicted defendant, could the result be from an unreported sex act? If all of these questions cannot be clearly answered in advance, there is little reason to perform a DNA test since it is known that the results might not provide a definitive answer.

The strength of the case is also at issue. The potential for an exculpatory result should be assessed in the context of the balance of the existing evidence. If the evidence against the defendant is overwhelming, it would make little difference that DNA typing of the biological evidence might exclude him.⁷⁹

Once appellate remedies are exhausted, most jurisdictions provide little or no access to physical evidence for evaluation by a convicted defendant. Often, requests for such evidence are labeled "discovery"⁸⁰ and are justified under the authority of *Brady v. Maryland*.⁸¹ However, requests that rely on *Brady* are erroneous since *Brady* "does not stand for the proposition that the right to postjudgment discovery is of federal constitutional dimension."⁸² It should also be remembered that the material withheld in *Brady* was clearly exculpatory on its face. One court refused to include the biological evidence within the *Brady* purview because the exculpatory potential of the evidence was "purely speculative."⁸³ Another court extended the protection afforded in *Brady* to material that only has the *potential* to be exculpatory.⁸⁴

No one should deny the possibility that a suspect can be

⁷⁸ See generally *DNA Exclusions: New Grounds for Attacking Old Convictions*, BNA CRIMINAL PRACTICE MANUAL (1992).

⁷⁹ See *State v. White*, 617 A.2d 272 (N.J. Super. Ct. 1992).

⁸⁰ *Sewell v. State*, 592 N.E.2d 705 (Ind. Ct. App. 1992); *Commonwealth v. Brison*, 618 A.2d 420 (Pa. Super. Ct. 1992).

⁸¹ 373 U.S. 83 (1963).

⁸² *People v. Ainsworth*, 266 Cal. Rptr. 175, 180 (Cal. Ct. App. 1990).

⁸³ *People v. Buxton*, 593 N.Y.S.2d 87 (N.Y. App. Div. 1993).

⁸⁴ *Sewell*, 592 N.E.2d at 705.

wrongly convicted.⁸⁵ Requests for post-conviction DNA testing should be treated seriously by both prosecution and defense. However, claims have been made that there are many more innocent people in prison, simply based on the handful of exclusions which have occurred to date.⁸⁶ Rhetoric such as this serves no useful purpose. These few exceptions demonstrate two things quite clearly. First, the legal system is already capable of detecting those injustices by statutes and precedent already in place.⁸⁷ Second, the very same DNA technology that is being strenuously resisted by many attorneys and scientists may be the only means to rectify those few wrongs.

V. CONCLUSION

DNA evidence burst into the media spotlight with great fanfare in 1988.⁸⁸ The early litigation in opposition to the evidence was minimal.⁸⁹ Now, the legal system finds itself having created new, expanded protections for defendants based on the misconception that the potential power of the evidence necessitated the changes.⁹⁰ Five years later, all that can really be said about the changes is that they cost the taxpayers significant amounts of money. Defendants continue to be convicted, with or without DNA testing. Improper convictions are detected and remedied because of DNA testing. Yet the rhetoric continues to flow.

⁸⁵ See, e.g., *State v. Woodall*, 385 S.E.2d 253 (W. Va. 1989). Woodall's conviction was affirmed by the West Virginia Supreme Court. He was granted a new trial based on DNA test results performed on the biological evidence which showed that he was not the source of the semen which could only have come from the assailant. *Woodall v. Legursky*, No. 89-C-1332 (Cabell Co., W.Va. June 28, 1991). The prosecution subsequently elected not to retry Woodall, and the charges were dismissed.

In pursuing his claim of innocence, Woodall discovered serious irregularities in the evidence that was used to convict him in his original trial. The State of West Virginia awarded him one million dollars for the erroneous conviction. John MacCormack, *Embattled Crime Lab Tech Fired*, SAN ANTONIO EXPRESS NEWS, July 28, 1993, at 1F.

⁸⁶ Neufeld, *supra* note 3, at 3.

⁸⁷ See generally *DNA Exclusions: New Grounds for Attacking Old Convictions*, *supra* note 78. This article describes successful attempts to obtain biological evidence for DNA testing within the existing legal framework.

⁸⁸ See *Andrews v. State*, 533 So. 2d 851 (Fla. Dist. Ct. App. 1988).

⁸⁹ *Id.*

⁹⁰ "It is the expression of statistical meaning, stated in terms of vanishingly small match probabilities, that makes the evidence so compelling." *People v. Barney*, 10 Cal. Rptr. 2d 731, 742 (Cal. Ct. App. 1992).