

Landmark DNA Court Cases

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DNA fingerprinting technology has been described as the greatest forensic tool in the history of forensic science, and as such it has widespread applications in the courtroom. However the acceptance of any new technology in the U.S. legal system is not always straightforward. New technologies are allowed only after a series of landmark cases that establish legal precedence for its acceptance. In this chapter we describe some of the U.S. court cases that affected the use of DNA evidence.

Frye v. United States, 1923

In 1923, James Alphonzo Frye was convicted of second-degree murder. However the case was appealed to the Supreme Court of the District of Columbia based on the defense that Frye had previously passed a “lie detector test proving his innocence”. Lie detector tests were new at that time, and were based on the theory that increases in systolic blood pressure result from a suspect’s fear of being detected. The supreme court questioned whether this new technology was generally accepted in the scientific community, and whether scientific studies had been completed to support Frye’s argument that changes in blood pressure accurately demonstrate whether a test subject is giving honest answers. The Supreme Court eventually ruled the lie detector technology was not generally accepted, and that the district court had properly excluded this evidence from the earlier case. The court explained:

Just when a scientific principle or discovery crosses the line between the experimental and demonstrable stages is difficult to define. Somewhere in this twilight zone, the evidential force of the principle must be recognized, and while courts will go a long way in admitting expert testimony deduced from a well-recognized scientific principle or discovery, the thing from which the deduction is made must be sufficiently established to have gained general acceptance in the particular field in which it belongs (Frye v. United States, 1923).

Thus the original guilty verdict stood (Frye v. United States, 1923). Three years after the court ruled against his appeal, Frye was released from his life sentence because another person confessed to the crime. However, this general acceptance criterion was used for several decades in subsequent U.S. cases, eventually becoming known as the Frye Standard or Frye Test, which set the bar to determine whether evidence has a valid scientific basis (Bernstein, 2001).

Determining “general acceptance” according to the Frye standard is a two-step procedure: (1) identifying the particular field(s) into which the scientific principle or discovery falls and the relevant scientific community; and (2) determining whether that community accepts the technology, principle, or discovery (Coleman and Swenson, 2003).

Virtually every federal and state court addressing the general acceptance standard has adopted the Frye test. However, the Frye test is a rather limited, conservative standard that is hard to actually achieve in the courtroom, therefore several courts subsequently adopted the more lenient Rule 702 (see below). DNA evidence did not achieve the Frye standard until the case of *U.S. v Two Bulls*, 1990.

Federal Rule of Evidence 702, 1975

Because the Frye Standard for accepting new technologies was difficult to prove in the courtroom, in 1975 Congress adopted the more lenient Federal Rules of Evidence 702 (Federal Rules of Evidence Online, 2003; Moenssens, 2004). These rules are clearly descriptive, and when determining the admissibility of scientific evidence, they stress helpfulness, reliability, and relevance (not general acceptance). In particular, Rule 702 embodies a more flexible general relevance test for admissibility of opinion testimony by expert witnesses not allowed by the Frye test.

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case (Federal Rules of Evidence Online, 2003).

In effect, this rule reformed the Frye standard relying more on the reliability of the technique used instead of its general acceptance, and making it less strict as to the type of person who could appear in court as an expert. Federal Rule of Evidence 702 provides a uniform approach to be followed by every trial court to assess the reliability and helpfulness of expert testimony.

U.S. v. Downing, 1985

In 1985, John W. Downing was charged with mail fraud, wire fraud, and interstate transportation of stolen property. Downing was accused of leading a scheme to defraud several vendors by a group of individuals calling themselves the Universal League of Clergy. The prosecution's case consisted primarily of 12 eyewitness testimonies claiming Downing was the man they knew as Reverend Claymore who had defrauded them. The defense argued that eyewitness testimony was generally unreliable, and wished to use a psychologist as expert. However, the court denied the defense request, ruling the psychologist's testimony did not meet the helpfulness standard of Rule 702. The jury found Downing guilty of all counts, except the interstate transportation of stolen property, and convicted him in the U.S. District Court for the Eastern District of Pennsylvania (*U.S. v. Downing*, 1985).

This case took an interesting twist when Downing appealed his conviction claiming that eyewitness testimony is accurate. Judge Becker of the U.S. Court of Appeals for the Third Circuit held that the district court was wrong in its decision to exclude the psychologist's expert testimony, and remanded the case back to the district court with instructions to conduct an evidentiary hearing on the admissibility of expert testimony. If the district court found the expert

testimony should have been included, a new trial should be granted. If not, then the guilty verdict would be reinstated. After the hearing, the district court declined to admit the psychologist's testimony, and reinstated the original guilty verdict (*U.S. v Downing*, 1985). The court reinstated the conviction on the grounds that: (1) the psychologist's testimony did not carry with it a sufficient degree of reliability to aid the jury in reaching an accurate resolution, (2) admitting the evidence would overwhelm, confuse, or mislead the jury, and (3) the expert testimony would not be of value because the eyewitness encounters in this case were numerous and of extensive duration.

The *Downing* case established the standard that when there is a serious question regarding the reliability of evidence, it is important for the court to exercise an evidentiary relevancy hearing. This pretrial hearing may be the most efficient procedure that a court can use to determine reliability, and this procedure outweighs the *Frye* general acceptance standard (Harvard Law Publications, 1999).

Andrews v. State of Florida, 1988

Tommie Lee Andrews was a suspect in more than twenty assaults in the Orlando area in 1986. His luck ran out in February of 1987 when, during another rape, he left his semen at the crime scene as usual, but this time DNA fingerprinting was applied to the sample. Scientists from Lifecodes Corporation in Valhalla, New York, were able to connect Andrews to the crime with DNA identification evidence. Dr. Michael Baird of Lifecodes claimed there was a one in ten billion chance that the match of the rapists' and Andrew's DNA was a coincidence (*Andrews v. State*, 1988).

But DNA testing had not yet been used in a U.S. criminal case. Before the prosecution could use the results of the DNA testing, it had to go through an evidentiary hearing. The court applied the rigorous *Frye* standard of admissibility, and the new scientific technology passed the test of general acceptability in the scientific community. Although DNA analysis had not quite established a sound reputation, it proved to be scientifically reliable in method, theory, and interpretation, and positively reviewed by peers (*Andrews v. State*, 1988). After a long and intense hearing, the judge admitted the DNA evidence into Andrews's first trial, but would not permit the impressive statistical evidence that the prosecution could not validate. The first trial ended in a hung jury.

At the retrial, the strong DNA evidence was again admitted. But this time applying the *Downing* relevancy test and the Rule 702 reliability test, the court also admitted the statistical data. The DNA evidence was accompanied by Andrew's regular fingerprints left on a windowsill, and his identification by the most recent victim in a photo-lineup. It took the jury only a short time to conclude Andrews was guilty. Andrews was convicted on October 20, 1988, in the Circuit Court of Orange County of aggravated battery, sexual battery, and armed burglary of a dwelling (*Andrews v. State*, 1988). Tommie Lee Andrews became the first person in the U.S. convicted of a crime based on DNA evidence. Andrews appealed the verdict, but on November 22, 1988, the original convictions and sentences were affirmed (*Andrews v. State*, 1988).

Soon after that trial, Andrews DNA was found to match that of other several other victims in the Orlando area, and his prison sentence went from an initial twenty-two years for rape, to over a one hundred years for serial rape. Following *Andrews v. State*, DNA testing can now more easily be applied to future cases involving sexual assault and other crimes of violence. Such evidence is especially important in such cases since reliable eyewitness identification is often not available (Coleman and Swenson, 2003).

People of the State of New York v. Joseph CASTRO, 1989

The case against Joseph Castro was the first time the admissibility of DNA evidence in U.S. courts was critically questioned (Coleman and Swenson, 2003). Joseph Castro, a thirty-eight year old Hispanic, was accused of murdering his pregnant neighbor, twenty-year old Vilma Ponce, and her two-year old daughter (*People v. Castro*, 1989). Both victims were stabbed to death in their Bronx apartment building. In July of 1987, Lifecodes Corp. analyzed a bloodstain on Castro's watch for a match to the victims. The DNA from the blood of Ponce matched that on the watch. Lifecodes Corp. testified that the frequency of the resulting DNA profile in the Hispanic population was approximately one in one hundred million. Regardless, Castro swore the blood was his own, and the prosecutors wanted to counter attack with the DNA evidence.

Ignoring the 1988 Andrews ruling based on the Downing relevancy test, and the Rule 702 reliability test, the New York Supreme Court investigated the admissibility of DNA tests in a pretrial hearing applying the rigorous Frye standard. Thousands of pages of expert testimony accumulated from the pretrial. After twelve weeks, the court completed its legal examination of DNA tests in general, and the methods employed by Lifecodes Corp. in this particular case (*People v. Castro*, 1989). Four of the expert witnesses, representing both the prosecution and the defense, met for an unusual review of the DNA evidence after they had already testified. These four expert witnesses put in writing two pages worth of inadequacies of the DNA evidence and the legal procedures for evaluating the evidence. Although the document was not accepted as evidence in the pretrial hearing, two of the expert witnesses provided testimony on its material. In August 1989, Judge Gerald Sheindlin decided on the admissibility of the tests. A three-pronged test was developed to determine whether DNA evidence should be admitted:

- I. Is there a generally accepted theory in the scientific community which supports the conclusion that DNA forensic testing can produce reliable results?
- II. Are there techniques or experiments that currently exist that are capable of producing reliable results in DNA identification, and which are generally accepted in the scientific community?
- III. Did the testing laboratory perform the accepted scientific techniques in analyzing the forensic samples in this particular case? (*People v. Castro*, 1989).

On August 14, 1989, the New York Supreme Court held that "DNA identification theory (prong-1) and practice (prong-2) are generally accepted in the scientific community, DNA forensic identification techniques and experiments are not novel, and DNA forensic identification evidence meets the Frye standard," (*People v. Castro*, 1989). However, the court ruled that in this case the third prong was not met since Lifecodes did not use generally accepted scientific techniques for

obtaining their results, so the DNA evidence was ruled inadmissible. Judge Sheindlin also recommended extensive discovery guidelines for DNA pretrial hearings in the future. Castro's case was never tried; he confessed to the murders in late 1989.

The Castro 3 prong test serves as a standard for which future DNA evidence can be judged in pre-trial hearings. The case highlighted the need for rigorous experimental standards for performing DNA fingerprinting, including proper positive and negative controls, so the FBI created its "Technical Working Group on DNA Analysis Methods" or TWGDAM, whose universal recommendations remain in effect to this date (Federal Bureau ...1998).

U.S. v. Matthew Sylvester TWO BULLS, 1990

In 1990, the U.S. District Court for the District of South Dakota sentenced Matthew Two Bulls to prison for aggravated sexual abuse and sexual abuse of a minor. The charges arose from the rape of a teenage girl on the Pine Ridge Indian Reservation in South Dakota. The girl's underwear had been recovered, and the FBI used DNA profiling to determine there was a very high probability that the semen on the underwear came from Two Bulls (U.S. v. Two Bulls, 1990). The defense argued to have the DNA evidence made unavailable, however, the district judge determined the DNA evidence admissible after hearing only one testimony supporting the scientific community's acceptance of DNA evidence. Two Bulls appealed.

During the appeal with the U.S. Court of Appeals 8th Circuit, his sentence was postponed and he was released on bond. Two Bulls argued that the standard in which the trial court applied when determining the admissibility of the DNA evidence should have used the more rigorous Frye standard, not Rule 702 (U.S. v. Two Bulls, 1990). In addition to deciding whether the scientific community generally accepts DNA evidence, Two Bulls also argued (like Castro) that the testing's reliability and performance should also have been questioned. The appellate court ruled the district court had made a mistake allowing the DNA evidence without questioning the Frye standard, and specific test performance. A new pretrial hearing was to determine the admissibility of the DNA evidence by applying the standards of Frye, Rule 702, Castro, and two additional standards added by the Court of Appeals to make a new 5-prong test:

- I. Whether DNA evidence is generally accepted by the scientific community?
- II. Whether the testing procedures used in this case are generally accepted as reliable if performed properly?
- III. Whether the test was performed properly in this case?
- IV. Whether the evidence is more prejudicial than probative in this case?
- V. Whether the statistics used to determine the probability of someone else having the same genetic characteristics is more probative than prejudicial under Rule 403 (United States v. Two Bulls, 1990)?

After lengthy deliberation, on October 31, 1990, the appellate court ruled the DNA evidence admissible, and upheld Two Bulls original conviction of aggravated sexual assault and sexual assault of a minor.

This case illustrates the general acceptance by 1990 of the underlying theory of DNA testing, and its new role at the national level. As with *People v. Castro*, this case cautions future cases not to be too accepting of DNA testing unless it is performed properly.

PEOPLE of the State of Illinois v. Reggie E. MILES, 1991

In 1991, Reggie Miles was convicted by the State of Illinois of two counts of home invasion, five counts of aggravated criminal sexual assault, one count of criminal sexual assault, one count of aggravated unlawful restraint, one count of armed robbery, and two counts of residential burglary (*People v. Miles*, 1991). The evidence included regular fingerprints and semen stains, whose DNA was found to match Miles by scientists at Cellmark Diagnostics, a DNA identification company in Maryland who followed the then newly established TWIGDAM guidelines publicized by the FBI.

Miles appealed the convictions in the Appellate Court of Illinois, Fourth District, arguing the State did not provide evidence that the techniques used by Cellmark produced reliable results. However, after validating all the DNA results, on August 6, 1991, the appellate court denied his appeal, upholding the earlier State's conviction. This case ended with a general strong support for DNA evidence, and faith that the techniques recommended by TWGDAM can produce reliable results. After years of considering the admissibility of DNA evidence, in the Illinois case of the *People v. Miles*, most of the brutal questioning finally came to a stop.

Daubert v. Merrell Dow Pharmaceuticals, 1989, 1991, 1993

Daubert v. Merrell Dow Pharmaceutical was a landmark case that questioned whether the Frye general acceptance test for admitting scientific expert testimony had been superseded by Rule 702 of the Federal Rules of Evidence (*Daubert v Merrell Dow*, 1989; 1991; 1993). The parents of Jason Daubert and Eric Schuller sued Merrell Dow Pharmaceuticals, Inc., arguing Dow's drug Bendectin, taken by the children's mothers to control nausea during pregnancy, caused the babies' birth defects. Merrell Dow moved the suit from the state of California to the federal district court.

As expected, Merrell Dow provided experts testifying "that none of the more than thirty published studies, involving more than one hundred and thirty thousand patients, showed any evidence that Bendectin caused birth defects, and that none of the studies had found Bendectin to be capable of causing malformations in fetuses," (*Daubert v Merrell Dow*, 1993). The plaintiff's responded with the testimony of experts who relied on animal studies and a reexamination of the published studies to prove that Bendectin did indeed cause birth defects. However, the judge dismissed the plaintiff's claims on the basis that the scientific theories of the experts failed to meet the Frye general acceptance standard. The district court stated that scientific evidence is admissible only if the principle upon which it is based is "sufficiently established to have general acceptance in the field to which it belongs," (*Daubert v Merrell Dow*, 1993).

The plaintiff's appealed to the U.S. Court of Appeals for the Ninth Circuit, who affirmed the district trial court's ruling, it went on to declare that the experts' opinion was based on a methodology that diverged "significantly from the procedures accepted by recognized authorities

in the field... and cannot be shown to be generally accepted [i.e. Frye test] as a reliable technique” (Daubert v Merrell Dow, 1991).

The plaintiffs appealed to the U.S. Supreme court, arguing that when the Federal Rules of Evidence were revised, those rules abandoned the Frye test. The U.S. Supreme Court agreed, finding that the Rules of Evidence were proposed to expand the range of admissible evidence, assigning to the trial judge the task of ensuring that an expert’s testimony both rests on a reliable foundation and is relevant to the task at hand. The decision is now known as the Daubert Standard of Evidence Admissibility (Daubert v Merrell Dow, 1993). After analyzing the details of the Frye standard and the Federal Rules of Evidence, the Court put forth 5 criteria to characterize the weight of evidence:

- I. Whether the theory or technique has been tested?
- II. Whether the theory or technique has been subjected to peer review and publication?
- III. Whether the theory or technique has a known or potential rate of error.
- IV. Whether the theory or technique has standards for controlling the technique’s operation.
- V. The degree to which the theory or technique has been accepted in the relevant scientific community (Daubert v Merrell Dow, 1993).

Since 1993, these new Daubert criteria, based on an expansion of Rule 702, have been used as the fundamental basis for admitting scientific expert testimony. Upon applying these criteria, the trial judge will determine whether the expert will be testifying “to scientific knowledge that will assist the trier fact to understand or determine a fact in issue,” (Daubert v Merrell Dow, 1993).

The Supreme Court reversed the appellate court’s exclusion of evidence, and sent the case back to the Appellate Circuit court to be reconsidered. Applying the Daubert standards established by the Supreme Court ruling, the Circuit court reevaluated trial court’s exclusion on the plaintiff’s proffered testimony. The Circuit court found that the trial court’s reasoning under the Frye standard also included sufficient justification to exclude the evidence under the new Daubert test, so the Circuit court then reinstated the trial courts exclusion of the evidence (Daubert v Merrell Dow, 1993).

This Daubert case finally established that the Federal Rules of Evidence (and rule 702) supersede Frye, and put to death the singular use of the Frye standard for evidence inclusion (Lyons, 1997; Green et al, 1999; Blackmun, 2004). The Daubert standard has been applied to DNA evidence in post 1993 cases.