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**682 N.E.2d 1289**  
**David McGREW, Defendant-Appellant,**  
**v.**  
**STATE of Indiana, Plaintiff-Appellee.**  
**No. 86S05-9705-CR-320.**  
**Supreme Court of Indiana.**  
**July 8, 1997.**

William E. Daily, Danville, for defendant-appellant.

Jeffrey A. Modisett, Attorney General, Priscilla J. Fossum, Deputy Attorney General, Indianapolis, for plaintiff-appellee.

John A. Larson, Williamsport, Stephen J. Johnson, Indianapolis, Indiana Prosecuting Attorneys Council, Amicus Curiae.

ON PETITION TO TRANSFER

DICKSON, Justice.

The defendant-appellant, David McGrew, was convicted of Criminal Deviate Conduct 1 stemming from an incident on the evening of July 26, 1993, in which he forced an adult female to perform oral sex on him while they both were seated in his automobile. The victim reported the incident to the police the next morning. On August 13, 1993, the Sheriff searched the defendant's automobile pursuant to a valid warrant. Hair specimens

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were collected from the vehicle and evaluated by an Indiana State Police analyst. Immediately prior to the analyst's testimony during the trial, the defendant challenged the admissibility of the hair comparison analysis. The trial court ruled that the evidence was admissible.

The Court of Appeals found that the trial court erroneously admitted the expert testimony on hair comparison analysis and reversed the defendant's conviction. *McGrew v. State*, 673 N.E.2d 787 (Ind.Ct.App.1996). Having previously granted oral argument on the issue of hair comparison evidence, we thereafter granted the Appellee's Petition to Transfer and now affirm the defendant's conviction.

The defendant accurately contends that "before the results of scientific tests are admissible, the proponent of the scientific evidence has the burden to prove the reliability of the scientific test." Brief of Appellant at 33. See *Hopkins v. State*, 579 N.E.2d 1297, 1303 (Ind.1991). He then asserts that "the prosecution failed to sustain its burden," *id.* at 37, arguing that the analyst's testimony at the hearing "did not satisfy the criteria established in *Daubert*." *Id.* (citing *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993)). The defendant's claim fails.

The Indiana Evidence Rules provide that "[e]xpert scientific testimony is admissible only if the court is satisfied that the scientific principles upon which the expert testimony rests are reliable." Ind.Evidence Rule 702(b). This subsection differs from the Federal Rules of Evidence in its express requirement that expert testimony be based upon reliable scientific principles. *Steward v. State*, 652 N.E.2d 490, 498 (Ind.1995); *Jervis v. State*, 679 N.E.2d 875, 881 n. 9 (Ind.1997).

As discussed in *Steward*, federal case law interpreting the Federal Rules of Evidence is not binding upon the determination of state evidentiary law. Regarding *Daubert*, we noted only that "[t]he concerns driving *Daubert* coincide with the express requirement of Indiana Rule of Evidence 702(b) that the trial court be satisfied of the reliability of the scientific principles involved." *Steward*, 652 N.E.2d at 498. Contrary to the arguments made by the defendant, when analyzing Indiana Evidence Rule 702(b)--the adoption of which preceded *Daubert*--we find *Daubert* helpful, but not controlling.

As noted in *Steward*, possible means by which reliability may be established include judicial notice or sufficient foundation to convince the trial court that the relevant scientific principles are reliable. *Id.* In the present case, immediately prior to the analyst's testimony during the trial, the defendant challenged the admissibility of the hair comparison analysis under Indiana Evidence Rule 702(b). In a hearing outside the presence of the jury, the defendant called the Indiana State Police analyst to the stand. When asked by the defendant what "scientific principle is used to base the reliability of hair sample technique" the analyst testified, "Scientific principle? It's just simply a physical comparison of one hair directly to another one." Record at 614. He testified that he uses a microscope 2 to make "a physical comparison of one hair to another," Record at 614, looking at several "different physical characteristics." Record at 621. Specifically, he testified that he compares the medulla, cortex, cuticle, root, tip, cortical fusi, ovoid bodies, pigment, thickness, gapping, condition of hair, whether the hair had been cut with a

razor or scissors, and whether it had been dyed or specially treated. 3 Record at 614, 621. He testified that these characteristics are "physically observed through a microscope." Record at 614.

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The defendant then questioned the analyst about the statistical error ratio for hair comparison as compared to the statistical error ratio for blood/DNA typing. The analyst testified that, while blood/DNA typing had statistical error ratios, he was not aware of any statistics with regards to "the probability of a hair sample belonging to someone else," due to the nature of hair comparison. Record at 618. The defendant questioned further, asking whether there was "no other way to determine this scientifically, except for your own physical observations?" Record at 619. The analyst answered "yes" and testified that this was accepted in the scientific community, and that there were "absolutely no articles or journals that [he was] aware of that dispute this method." Record at 620.

On cross-examination, the State asked the analyst whether "microscopes [were] generally accepted in the scientific community" and whether he was "qualified in the State of Indiana as an expert in this area." Record at 621. The analyst replied that they were generally accepted and that he was an expert. The State further asked "whether or not this is a generally accepted methodology and subject matter of expert testimony in other states?" Record at 621. The analyst answered that it was "generally accepted" 4 and that, as far as he knew, no state disallows hair comparisons. Record at 622. On redirect, the defendant offered no new questions as to the general acceptance of hair comparison analysis. The defendant did not call any other witnesses during the hearing.

Prior to dismissing the expert, the trial court directed several questions to the analyst:

Court: [I]n regard to the examination. It is simply a physical, visual examination of the hair.

Analyst: Yes sir.

Court: You simply say that one hair looks like another one or it doesn't look like another one.

Analyst: I say it's sufficiently similar to have come from that person or it is dissimilar.

Court: And if you say that it ... [is] similar to come from that person ... that doesn't mean that it comes from that person.

Analyst: It just simply means that it could have come from that person.

Court: And you do not know the statistical percentages of how many people would have similar hair?

Analyst: There are no statistics. It's hard to say.

Record at 623-25. The court then heard arguments from the State and the defendant. Finding the evidence to be admissible, the trial court concluded:

As I see it, what we're talking about is not the traditional scientific evaluation. We are talking about simply a person's observations under a microscope, which is a magnification to compare some hairs to one another, much as an expert in handwriting analysis compares handwriting. They can't tell you how many people out

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there have the same ... handwriting. They just say whether it's sufficiently similar. I believe that it has been accepted in the State. Although I don't know of any ... specific cases. I know that it has been utilized here before.... It seems to me as though it goes to the weight of the evidence and it is, of course, highly subject to the questions about [the] statistical comparisons and, apparently, there are none .... but it can say that this hair looks like the other hair.... So what [the analyst] has observed through the microscope will be admissible.

Record at 632-33.

In determining reliability, while various factors have been identified, 5 there is no specific "test" or set of "prongs" which must be considered in order to satisfy Indiana Evidence Rule 702(b). The decision of the trial court as to reliability under Indiana Evidence Rule 702(b) will be reviewed for abuse of discretion. *Jervis*, 679 N.E.2d at 881; *Davis v. State*, 598 N.E.2d 1041 (Ind.1992).

In the present case, we conclude that the trial court exercised appropriate discretion as to the reliability of the proffered hair comparison analysis. The analyst testified that the hair comparison he performed was a comparison of physical characteristics, as seen under a microscope. Inherent in any reliability analysis is the understanding that, as the scientific principles become more advanced and complex, the foundation required to establish reliability will necessarily become more advanced and complex as well. The converse is just as applicable, as demonstrated by the trial court's conclusion that "what we're talking about is not the traditional scientific evaluation. We are talking about simply a person's observations under a microscope." Record at 632. This conclusion is not unlike our recent statement in *Jervis* 6 that the evidence at issue was more a "matter of the observations of persons with specialized knowledge" than "a matter of 'scientific principles' governed by Indiana Evidence Rule 702(b)." 679 N.E.2d at 881.

The trial court did not abuse its discretion in admitting the evidence. Except with respect to Part III of the opinion of the Court of Appeals, we now summarily affirm the Court of Appeals. Ind.Appellate Rule 11(B)(3). The judgment of the trial court is affirmed.

SHEPARD, C.J., and SULLIVAN, SELBY and BOEHM, JJ., concur.

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1 IND.CODE § 35-42-4-2 (1993).

2 A "central light type microscope that allows various different magnifications," unlike an electron microscope. Record at 620.

3 We note that, although these words may sound technical and scientific, the meanings are quite simple. For example, the medulla, cortex and cuticle are the layers of hair follicles. The "external layer" is the cuticle, the next layer is the cortex, and the "central row of cells" is the medulla. 6 JAMES G. ZIMMERLY, M.D., J.D., M.P.H., LAWYERS MEDICAL CYCLOPEDIA § 45.2, at 768 (3rd ed. 1991) Similarly, the cortical fusi are the "dark spots within the hair." Record at 621.

4 We disagree with the defendant's contention that, after Daubert, general acceptance in the relevant scientific community (the Frye test) is an "insufficient basis for establishing reliability of scientific evidence." Brief of Appellant at 35. Daubert did not overrule Frye as a means by which reliability could be established. Rather, the United States Supreme Court found that Frye required "too much" foundation, not "too little," concluding that the new Federal Rules of Evidence did not intend the "rigid 'general acceptance' requirement" of the Frye test to be an "absolute prerequisite to admissibility." Daubert, 509 U.S. at 588, 113 S.Ct. at 2794, 125 L.Ed.2d at 480. In citing the "liberal thrust" of opinion evidence under the Federal Rules of Evidence and the "general approach of relaxing the traditional barriers to 'opinion' testimony," the Court held that Frye would no longer be the "exclusive test for admitting expert scientific testimony." Id. at 588-89, 113 S.Ct. at 2794, 125 L.Ed.2d at 480. However, the Court noted that:

[G]eneral acceptance can yet have a bearing on the inquiry. A "reliability assessment does not require, although it does permit, explicit identification of a relevant scientific community and an express determination of a particular degree of acceptance within that community." Widespread acceptance can be an important factor in ruling particular evidence admissible and "a known technique that has been able to attract only minimal support within the community" may properly be viewed with skepticism.

Id. at 594, 113 S.Ct. at 2797, 125 L.Ed.2d at 483 (emphasis added) (internal citations omitted).

5 Such factors may include, but are not limited to: 1) whether the technique has been or can be empirically tested; 2) whether the technique has been subjected to peer review and publication; 3) the known or potential rate of error, as well as the existence and maintenance of standards controlling the technique's operation; and 4) general acceptance within the relevant scientific community. See generally, Daubert, 509 U.S. at 593-95, 113 S.Ct. at 2796-97, 125 L.Ed.2d at 482-83 ("Many factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test. But some general observations are appropriate.").

6 We note that the trial court's conclusion came almost three years prior to Jervis.