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Expert Testimony

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EXPERT TESTIMONY

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The admissibility of expert testimony depends on several factors: (1) the subject matter of the testimony, (2) the qualifications of the expert, (3) the conformity of the evidence to a generally accepted explanatory theory, and (4) whether the probative value of the testimony outweighs other considerations. *See* United States v. Amaral, 488 F.2d 1148, 1153 (9th Cir. 1973); State v. Chapple, 135 Ariz. 281, 660 P.2d 1208, 1218 (1983); Ibn-Tamas v. United States, 407 A.2d 626, 632-39 (D.C. 1979), *appeal on remand,* 455 A.2d 893 (D.C. 1983).

The fourth factor deals with the trial court's discretion to exclude evidence when its probative value is substantially outweighed by dangers of unfair prejudice, misleading the jury, confusion of issues, or considerations such as undue delay and needless presentation of cumulative evidence. Federal Rule of Evidence 403 governs this issue. The standard that the appellate courts use to review a trial court's decision under Rule 403 is an abuse of discretion. *See* 1 J. Weinstein & M. Berger, Weinstein's Evidence ¶ 403[02] (1982). Although this standard grants the trial court wide discretion, this discretion is not limited. For example, in United States v. Dwyer, 539 F.2d 924 (2d Cir. 1976), the accused's attempt to call a second expert to tesitify on an insanity defense was rejected by the trial court. The trial court, however, refused to explain the basis for its decision despite a defense request for an explanation. The Second Circuit reversed:

> Although Rule 403 has placed great discretion in the trial judge, discretion does not mean immunity from accountability. . . . Unfortunately, where the reasons for a discretionary ruling are not apparent to counsel, they will probably not be apparent to an appellate court. We therefore find it difficult to comprehend the district judge's adamant refusal to respond to defense counsel's inquiries. The spirit of Rule 403 would have been better served had the judge "confront[ed] the problem explicity, acknowledging and weighing both the prejudice and the probative worth" of the proffered testimony. *Id.* at 928.

SUBJECT MATTER OF EXPERT TESTIMONY

An expert may tesitfy only on a matter that is a proper subject for expert testimony. *See* J. Maguire, Evidence, Common Sense and Common Law 30 (1947) ("The field of expertness is bounded on one side by the great area of the common place, supposedly within the ken of every person of moderate intelligence, and on the other by the even greater area of the speculative and uncertain. Of course, both these boundaries constantly shift. . . ."). The trial court is entrusted with determining whether the testimony is a proper subject for an expert. As the Supreme Court has noted, the trial court has "broad discretion in the matter of the admission or exclusion of expert evidence, and his action is to be sustained unless manifestly erroneous." Salem v. United States Lines Co., 370 U.S. 31, 35 (1962).

Federal Rule of Evidence 702 provides that expert testimony is admissible if "scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue." *See generally* 3 D. Louisell & C. Mueller, Federal Evidence § 382 (1979); 3 J. Weinstein & M. Berger, *supra* ¶ 702 [01]. According to the federal drafters:

> The rule is broadly phrased. The fields of knowledge which may be drawn upon are not limited merely to the 'scientific' and 'technical' but extend to all 'specialized' knowledge. . . . Thus within the scope of the rule are not only experts in the strictest sense of the word, e.g., physicians, physicists, and architects, but also the large group sometimes called "skilled" witnesses, such as bankers or landowners testifying to land values. Advisory Committee's Note, Fed. R. Evid. 702.

The standard adopted by Rule 702 — whether expert testimony will "assist the trier of fact" — is a more liberal formulation of the subject matter requirement than that which is found in many common law opinions, which often phrased the requirement as whether the subject was beyond the comprehension of laymen. *E.g,* Fineberg v. United States, 393 F.2d 417, 421 (9th Cir. 1968) ("beyond the knowledge of the average layman") ; Jenkins v. United States, 307 F.2d 637, 643 (D.C. Cir. 1962) ("beyond the ken of the average layman"). Under Rule 702, "the test is not whether the jury could reach some conclusion in the absence of the expert evidence, but whether the jury is qualified without such testimony 'to determine intelligently and to the best possible degree the particu-

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lar issue without enlightenment from those having a specialized understanding of the subject. . . .' " State v. Chaple, 135 Ariz. 281, 660 P.2d 1208, 1219-20 (1983).

This test is consistent with Wigmore's formulation of the test for expert testimony: "On *this subject* can a jury receive from *this person* appreciable help?" 7 J. Wigmore, Evidence § 1923, at 29 (Chadbourn rev. 1978). *See also* Ladd, *Expert Testimony,* 5 Vand. L. Rev. 414, 418 (1952): "There is no more certain test for determining when experts may be used than the common sense inquiry whether the untrained layman would be qualified to determine intelligently and to the best possible degree the particular issue without enlightenment from those having a specialized understanding of the subject involved in the dispute."

The difference between the two standards can be illustrated by two examples. First, many courts have excluded expert testimony concerning the unreliability of eyewitness identifications because "the trustworthiness in general of eyewitness observations [is] not beyond the ken of the jurors. . . ." State v. Porraro, 121 R.I. 882, 892, 404 A.2d 465, 471 (1979). *See also* United States v. Thevis, 665 F.2d 616, 641-42 (5th Cir.), *cert. denied,* 456 U.S. 1008 (1982); United States v. Fosher, 590 F.2d 381, 383 (1st Cir. 1979); United States v. Amaral, 488 F.2d 1148, 1152-53 (9th Cir. 1973); Perry v. State, 277 Ark. 357, 370-71, 642 S.W.2d 865, 872 (1982); Johnson v. State, 393 So.2d 1069, 1072 (Fla. 1980); Commonwealth v. Francis, 390 Mass. 89, 453 N.E.2d 1204, 1207-09 (1983); State v. Helterbridle, 301 N.W.2d 545, 547 (Minn. 1980).

In State v. Chapple, 135 Ariz. 281, 660 P.2d 1208 (1983), however, the Arizona Supreme Court ruled that the trial court had abused its discretion in excluding such testimony in light of the facts of that case. According to the court, "[e]ven assuming that jurors of ordinary education need no expert testimony to enlighten them to the danger of eyewitness identification, the offer of proof indicated that [the expert's] testimony would have informed the jury that there are many specific variables which affect the accuracy of identification and which apply to the facts of this case." 660 P.2d at 1220. *See also* United States v. Downing, 753 F.2d 1224, 1231-32 (3d Cir. 1975); United States v. Smith, 736 F.2d 1103, 1106-07 (6th Cir. 1984); People v. McDonald, 37 Cal.3d 351, 690 P.2d 709, 721, 208 Cal. Rptr. 236, 248 (1984).

A second example involves expert testimony concerning the battered woman syndrome. The battered woman syndrome describes a pattern of violence inflicted on a woman by her mate. Typically, evidence of the syndrome is offered to a support a self-defense claim in a homicide prosecution of the woman for the death of her mate. Some courts have upheld the exclusion of expert testimony on this issue because "the subject of the expert testimony is within the understanding of the jury." State v. Thomas, 66 Ohio St.2d 518, 521, 423 N.E.2d 137, 140 (1981).

In contrast, other courts have held this testimony admissible because it tends to explain two elements of the self-defense claim: (1) the woman's subjective fear of serious injury or death and (2) the reasonableness of that belief. For example, the battered woman syndrome may explain why a battered woman has not left her mate. *See* State v. Kelly, 97 N.J. 178, 196, 478 A.2d 364, 372 (1984) ("Only by understanding these unique pressures that force battered women to remain with their mates, despite their long-standing and reasonable fear of severe bodily harm and the isolation that being a battered woman creates, can a battered woman's state of mind be accurately and fairly understood."). According to these courts, the evidence supplies "an interpretation of the facts which differed from the ordinary lay perception. . . ." Ibn-Tamas v. United States, 407 A.2d 626, 634-35 (D.C. 1979), *appeal on remand,* 455 A.2d 893 (D.C. 1983). In so holding, these courts have taken the position that the test for admission is whether the expert testimony sheds light on a relevant issue which a lay person, without expert assistance, would not perceive from the evidence itself. *Id.* at 633. *Accord* Hawthorne v. State, 408 So.2d 801, 806 (Fla. Dist. Ct. App. 1982); Smith v. State, 247 Ga. 612, 619, 277 S.E.2d 678, 683 (1981): State v. Anaya, 438 A.2d 892, 893-94 (Me. 1981).

QUALIFICATIONS OF EXPERTS

Federal Evidence Rule 702 provides that a witness may qualify as an expert by reason of "knowledge, skill, experience, training, or education." *See generally* 3 D. Louisell & C. Mueller, *supra,* § 381; 3 J. Weinstein & M. Berger, *super* ¶ 702 [04]. The rule comports with Wigmore's view; he wrote that the witness' expertise "may have been attained, so far as legal rules go, in any way whatever; all the law requires is that it should have been attained." 2 J. Wigmore, Evidence § 556, at 751 (Chadbourn rev. 1979).

Determining whether a witness is properly qualified is a matter entrusted to the trial court's discretion and thus is reviewable on appeal only for an abuse of discretion. *See* Fed. R. Evid. 104(a) ("Preliminary questions concerning the qualification of a person to be a witness. . .shall be determined by the court. . . ."); Salem v. United States Lines Co., 370 U.S. 31, 35 (1962) (trial court has "broad discretion in the matter of the admission or exclusion of expert evidence, and his action is to be sustained unless manifestly erroneous."). Although the trial court is given wide latitude on this issue, there are certain recognized limitations on this discretion. For example, in reversing a trial court's ruling that a defense fingerprint expert was unqualified, the Sixth Circuit wrote:

> An expert need not have certificates of training, nor memberships in professional organizations. . . . Nor need he be, as the trial court apparently required, an outstanding practitioner in the field in which he professes expertise. Comparisons between his professional stature and the stature of witnesses for an opposing party may be made by the jury, if it becomes necessary to decide which of two conflicting opinions to believe. But the only question for the trial judge who must decide whether or not to allow the jury to consider a proffered expert's opinion is, "whether his knowledge of the subject matter is such that his opinion will most likely assist the trier of fact in arriving at the truth." United States v. Barker, 553 F.2d 1013, 1024 (6th Cir. 1977).

Similarly, the D.C. Circuit reversed a trial court's ruling that psychologists were not qualified to testify on the issue of insanity because they lacked medical training. Jenkins v. United States, 307, F.2d 637, 643 (D.C. Cir. 1962). The court, however, was careful to point out that a witness' qualifications must be based on the nature and extent of his knowledge and not on his title. *Id.* at 644-45. On one hand, many psychologists would not be qualified to express an opinion on insanity because their "training and experience may not provide an adequate basis for their testimony." *Id.* at 644. On the other hand, other psychologists, because of their training and experience in the diagnosis and treatment of mental disorders, may be qualified. *Id.*

Courts also have recognized that experience alone may qualify a witness to express an opinion. For example, an FBI agent is qualified to testify that a substance is cocaine based on four years of experience during which time he identified cocaine by sight on 35 occasions and his identifications had been confirmed by laboratory analysis in most cases. United States v. Bermudez, 526 F.2d 89, 97-98 (2d Cir. 1975), *cert. denied,* 425 U.S. 970 (1976). *See also* United States v. Johnson, 575 F.2d 1347, 1360-61 (5th Cir. 1978) (experienced marijuana smoker qualified to testify that certain marijuana came from Columbia), *cert. denied,* 440 U.S. 907 (1979); State v. Essick, 67 N.C. App. 697, 314 S.E.2d 268, 270 (1984) (detective better qualified than jury to draw inference that vegetable matter was marijuana). *But see* People v. Park, 72 Ill.2d 203, 380 N.E.2d 795 (1978) (deputy sheriff not qualified to identify marijuana). *See generally* DeFoor, Consumer Testimony as Proof of Identity of the Controlled Substance in a Narcotics Case, 33 U.Fla. L. Rev. 682 (1981).

Testimony by police experts on the modus operandi of various types of crime has also been admitted. *See* United States v. Burchfield, 719 F.2d 356, 358 (11th Cir. 1983) (counterfeiting techniques); United States v. Kampiles, 609 F.2d 1233, 1247 n.19 (7th Cir.), *cert. denied,* 446 U.S. 954 (1979); United States v. Scavo, 593 F.2d 837, 843-44 (8th Cir. 1979) (bookmaking operations); United States v. Jackson, 425 F.2d 574, 576-77 (D.C. Cir. 1970) (pickpocketing). *See also* United States v. Pugliese, 712 F.2d 1574, 1581 (2d Cir. 1983) (agent qualified to testify regarding typical characteristics of heroin addicts). *See generally* Note, *Police Expert Witnesses and the Ultimate Issue Rule,* 44 La. L. Rev. 211 (1983).

An expert's testimony must relate to the subject matter on which he is qualified. In other words, a witness may be qualified to express an opinion on one matter but not on another. For example, a criminologist may be qualified to testify that no fingerprints were found on an object but not qualified to testify that the absence of fingerprints resulted from the fact that gloves were used or that the prints were wiped away: "The government has failed to show that [the expert's] training qualifies him as an expert with respect to the reason no fingerprints were found. . . ." United States v. Booth, 669 F.2d 1231, 1240 (9th Cir. 1981). Similarly, a witness may be an expert on one aspect of a scientific technique but not on other aspects. Accordingly, courts must "differentiate between ability to operate an instrument or perform a test and the ability to make an interpretation drawn from use of the instrument." People v. King, 266 Cal. App.2d 437, 457, 72 Cal. Rptr. 478, 491, (1968). For example, a police officer may be qualified to operate a breathalyzer but not qualified to interpret the results. *See* French v. State, 484 S.W.2d 716, 719 (Tex. Crim. App. 1972). The training and experience needed to perform these two distinct functions is very different. *See* State v. James, 68 Ohio App. 2d 227, 229, 428 N.E.2d 876, 878 (1980) (state trooper qualified as an expert in the operation of intoxilyzer, but did not possess sufficient learning and knowledge to testify about effects of alcohol consumption).

BASES OF EXPERT TESTIMONY

Expert witnesses are permitted to express opinions. As the drafters of the Federal Rules noted, however, an expert is not required to testify in the form of opinions, and thus Federal Rule 702 provides that an expert may testify "in the form of an opinion or otherwise." Accordingly, an expert "may give a dissertation or exposition of scientific or other principles relevant to the case, leaving the trier of fact to apply them to the facts." Advisory Committee's Note, Fed. R. Evid. 702.

Expert opinion testimony may be based on three different types of facts in a particular case: (1) the expert's personal knowledge, (2) assumed facts supported by evidence in the record, typically in the form of a hypothetical question, and (3) information supplied to the expert outside of the trial. Federal Rule 703 recognizes all three sources; many jurisdictions do not recognize (3). *See generally* 3 D. Louisell & C. Mueller, *supra,* §§ 387-90; 3 J. Weinstein & M. Berger, *supra,* ¶ 703 [01].

Expert witnesses frequently express opinions based on their personal observations. For example, the forensic chemist who examines a substance and concludes it is a controlled substance will express an opinion concerning the identity of the substance based on his firsthand knowledge. Similarly, the forensic pathologist who expresses an opinion about the cause of death in a homicide case, after conducting an autopsy, is basing his opinion on personal observation.

Hypothetical Questions

Experts may also base their opinions on assumed facts that are supported by evidence in the record. In some jurisdictions, an expert who has attended the trial is permitted to assume that the evidence adduced at trial is true and express an opinion based on this evidence. *See* 2 J. Wigmore, Evidence § 681 (Chadbourn rev. 1979); C. McCormick, Evidence § 14 (3d ed. 1984). The major deficiency of this procedure is that the jury may not understand which facts the expert is assuming to be true, a problem which is particularly pronounced in a long, complicated trial or where the evidence is conflicting.

An expert also may express an opinion based on assumed facts that are stated in the form of a hypothetical question. The hypothetical question has two principal advantages. First, it informs the jury of the

facts upon which the expert's opinion is based. Second, it provides the opposing party with an opportunity to object before an opinion is expressed, if the question contains assumed facts which are not supported by evidence admitted at trial. Despite these advantages, the hypothetical question has been criticized as a cumbersome and unwieldly device which often precludes the expert from fully explaining his opinion to the jury. As one court has noted, "[r]ather than inducing a clear expression of expert opinion and the basis for it, [the hypothetical question] inhibits the expert and forecloses him from explaining his reasoning in a manner that is intelligible to a jury." Rabata v. Dohner, 45 Wis.2d 111, 129, 172 N.W.2d 409, 417 (1969). Federal Rule 703 permits an expert to give an opinion without resort to a hypothetical question, even if the expert lacks personal knowledge of the underlying facts.

If a hypothetical question is used to elicit expert opinion testimony, there may be an issue concerning the adequacy of the facts assumed in the hypothetical. There is a danger that the question will contain a one-sided view of the relevant issues; for example, adverse facts may be omitted from the hypothetical question. In such a case the jury may give undue weight to the expert's opinion without fully appreciating the inadequacy of the underlying factual bases. Because of this problem, some jurisdictions require the hypothetical to include the "material" facts in the case. C. McCormick, *supra,* at 37. Other jurisdictions reject this requirement, leaving the opponent with the responsibility of highlighting such omissions in cross-examination or reformulating the hypothetical question to include the omitted facts. *Id.*

Non-Record Facts

In addition, Rule 703 permits an expert to express an opinion based on information that has not been admitted at trial and, indeed, may be inadmissible: "If of a type reasonably relied upon by experts in the particular field in forming opinions or inference upon the subject, the facts or data need not be admissible in evidence." Fed. R. Evid. 703. *See also* Soden v. Freightliner Corp., 714 F.2d 498, 502-03 (5th Cir. 1983) (the inquiry under Rule 703 "must be made on a case-by-case basis and should focus on the reliability of the opinion and its foundation rather than on the fact that it was based, technically speaking, on hearsay").

This rule permits an expert to base his opinion on hearsay evidence. According to one court: "The rationale in favor of the admissibility of expert testimony based on hearsay is that the expert is fully capable of judging for himself what is, or is not, a reliable basis for his opinion. This relates directly to one of the functions of the expert witness, namely to lend his special expertise to the issue before him." United States v. Sims, 514 F.2d 147, 149 (9th Cir.), *cert. denied,* 423 U.S. 845 (1975). For example, in United States v. Arias, 678 F.2d 1202 (4th Cir.), *cert. denied,* 459 U.S. 910 (1982), a chemist, based on a comparison of quaaludes seized from the defendants and quaaludes supplied by DEA agents in Columbia, testified that the seized quaaludes were made by the same machine as the other tablets from Colombia. The defendants objected to this testimony on the ground that the expert's opinion regarding the origin of the sample tablet was based on hearsay. The court rejected the argument: "Under F.R.E. Rule 703. . .an expert may base his testimony upon the type of hearsay he would normally rely upon in the course of his work. . . . D.E.A. forensic scientists rely upon agents in the field to submit samples and to establish their authenticity as is shown by the fact that the pill in question was catalogued and kept for sample use by the D.E.A." *Id.* at 1206.

The admissibility of expert opinions based on non-record facts raises several issues. First, how does the trial court determine what types of information are reasonably relied upon in a particular field? The federal drafters provided little guidance on this issue. The Advisory Committee's Note merely comments that the "opinion of an 'accidentologist' as to the point of impact in an automobile collision based on the statements of bystanders" would not satisfy the requirement. While the court must decide whether there is reasonable reliance in a particular field, the rule does not permit the court to substitute its own notion of what reliance is reasonable. One court has written that the "proper inquiry is not what the court deems reliable, but what experts in the relevant discipline deem it to be." Zenith Radio Corp. v. Matsushita Elec. Indus. Co., 723 F.2d 238, 276 (3d Cir. 1983). The trial court, however, need not accept the testifying expert's view of what is reasonably relied upon by experts in a particular field. *See* Merit Motors, Inc. v. Chrysler Corp., 569 F.2d 666, 673 (D.C. Cir. 1977).

A second issue concerns how the jury may use the out-of-court information once it is admitted. Although Rule 703 permits an expert to base his opinion on hearsay information, it does not explicitly recognize a hearsay exception for this information. Under one view, the jury can consider the information only in evaluating the expert's opinion; it cannot use the information substantively, *i.e.,* for the truth of the assertions contained therein. *See* United States v. Sims, 514 F.2d 147, 149-50 (9th Cir.), *cert. denied,* 423 U.S. 845 (1975). *See generally* Carlson, *Collision Course in Expert Testimony: Limitations on Affirmative Introduction of Underlying Data,* 36 U. Fla. L. Rev. 234 (1984). Other authorities, however, envision the substantive use of the information, creating in effect another hearsay exception. C. McCormick, *supra,* at § 324.2. *See also* M. Graham, Handbook of Federal Evidence 631 (1981) ("For most but not all practical purposes, Rule 703 operates as the equivalent of an additional exception to the rule against hearsay. . . .").

In criminal trials, the use of hearsay evidence as a basis for expert opinion testimony raises confrontation issues. In United States v. Lawson, 653 F.2d 299 (7th Cir. 1981), *cert. denied,* 454 U.S. 1150 (1982), the defense objected to the testimony of a prosecution psychiatrist who testified that the defendant was sane. The expert had limited personal contact with the defendant and relied on hearsay information in formulating his opinion. The court ruled the testimony had been properly admitted. According to the court, reli-

ance on staff reports, interviews conducted by other psychiatrists, and background information from military and prosecutorial records was "clearly of the type that psychiatrists would rely upon in making a similar professional judgment" and thus satisfied the requirements of Rule 703. *Id.* at 302. Although the court also rejected the defendant's confrontation argument, it recognized the cogency of that argument in certain circumstances: "An expert's testimony that was based entirely on hearsay reports, while it might satisfy Rule 703, would nevertheless violate a defendant's constitutional right to confront adverse witnesses. The Government could not, for example, simply produce a witness who did nothing but summarize out-of-court statements by others." *Id.* at 302. *See also* United States v. Williams, 447 F.2d 1285 (5th Cir. 1971) (testimony of expert on the value of land, based on documents and records not admitted in evidence, did not violate the right of confrontation), *cert. denied,* 405 U.S. 954 (1972); Stae v. Henderson, 554S.W. 2d 117 (Tenn. 1977) (admission of laboratory report through the testimony of the director of the laboratory violated confrontation right).

In State v. Towne, 142 Vt. 241, 453 A.2d 1133 (1982), a prosecution expert testified that the defendant was sexually disturbed but not mentally ill. To support his opinion the expert cited a book, which had been written by a friend of his. He also testified that he had spoken by telephone with the author about the case and that the author agreed with his opinion. The Vermont Supreme Court held that the expert's references to the author did not come within the rule allowing an expert to base his opinion upon facts not admissible in evidence but reasonably relied on by experts in the field. Instead, the court found that the witness was in effect " 'acting as a conduit' for the other doctor's opinion." *Id.* at 246, 453 A.2d at 1135. According to the court, not only was the opinion hearsay, but it also violated the defendant's right of confrontation. *See* Carlson, *supra,* at 248 ("For such support to come from a nontestifying expert insulated from cross-examiation presents a difficult, almost impossible situation for the opponent of the evidence.").

A related confrontation issue arises where a supervising chemist identifies a substance based, at least in part, on tests performed by other chemists. Several courts have upheld this practice if the supervising chemist testifies that the tests were perfomed under his personal supervision. *See* State v. Reardon, 172 Conn. 593, 376 A.2d 65 (1977); State v. Ecklund, 30 Wash. App. 313, 633 P.2d 933 (1981). *See also* United States v. Posey, 647 F.2d 1048, 1051 (10th Cir. 1981); Commonwealth v. Manning, 495 Pa. 652, 660-61, 435 A.2d 1207, 1211-12 (1981) (testimony of supervising toxicologist who identified PCP based on tests performed under his direction admitted); Commonwealth v. Gilliard, 300 Pa. Super. 469, 476, 446 A.2d 951, 954 (1982) (testimony of medical examiner based on toxicologist report admitted); State v. Kreck, 86 Wash.2d 112, 542 P.2d 782 (1975).

The issue, however, remains controversial. One federal district court has held that his practice violates the right of confrontation, but that case was subsequently reversed on other grounds. Readon v. Manson, 491 F. Supp. 982 (D. Conn. 1980), *rev'd on procedural grounds,* 644 F.2d 122 (2d Cir. 1981). *See also* United States v. Coleman, 631 F.2d 908, 914-15 (D.C. Cir. 1980) (court declines to decide this "difficult" question); 3 J. Weinstein & M. Berger, *supra,* at 703-24 ("in a criminal case, even though Rule 703 does not prohibit the use of hearsay as a basis for an opinion, the constitutional right of confrontation may require that the defendant have the opportunity to cross examine the persons who prepared the underlying data on which the expert relies."). *But see* Ardoin v. State, 582 S.W.2d 595 (Tex. App. 1984) (statute authorizes custodian to testify about procedures used in test even though he did not conduct the test).

DEGREE OF CERTITUDE

Some jurisdicitons require an expert to express an opinion in terms of reasonable scientific probability or certainty. *See generally* 7 J. Wigmore, Evidence § 1976 (Chadbourn rev. 1978); Joseph, *Less Than Certain Medical Testimony,* 14 Trial 51 (Jan. 1978); McElhaney, *Expert Witnesses and the Federal Rules of Evidence,* 28 Mercer L. Rev. 463, 477 (1977). For example, in State v. Holt, 17 Ohio St.2d 81, 246 N.E.2d 365 (1969), an expert, based on neutron activation analysis, testified that two hair samples were "similar *and. . . likely* to be from the same source." *Id.* at 85, 246 N.E.2d at 368. According to the Ohio Supreme Court, this testimony did not satisfy the reasonable certainty or *probability* standard and thus was inadmissible. *Id.* at 86, 246 N.E.2d at 368.

The *Holt* case is wrong. Frequently, experts testify that two samples "could have come from the same source" or "were likely to be from the same source." Such testimony meets the relevancy standard adopted by Federal Rule 401, and there is no requirement in the Federal Rules that an expert's opinion be expressed in terms of "probabilities." For example, in United States v. Cyphers, 553 F.2d 1064 (7th Cir.), *cert. denied,* 434 U.S. 843 (1977), the expert testified that hair samples found on items used in a robbery "could have come from the defendants." *Id.* at 1072. The defendants argued that the testimony was inadmissible because the expert did not express his opinion in terms of reasonable scientific certainty. The court wrote: "There is no such requirement. To the extent State v. Holt. . .expresses a contrary view, we find it unpersuasive." *Id.*

See also United States v. Oaxaca, 569 F.2d 518, 526 (9th Cir.), *cert denied,* 439 U.S. 926 (1978) (expert's opinion regarding hair comparison admissible even though expert was less than certain); United States v. Spencer, 439 F.2d 1047, 1049 (2d Cir. 1971) (expert's opinion regarding handwriting comparison admissible even though expert did not make a positive identification); United State v. Longfellow, 406 F.2d 415, 416 (4th Cir.), *cert. denied,* 394 U.S. 998 (1969) (expert's opinion regarding paint comparison admissible, even though expert did not make a positive identification); State v. Boyer, 406 So.2d 143, 148 (La. 1981) (reasonable scientific certainty not required where expert testifies concerning the presence of gunshot residue based on neutron activation analysis).

ULTIMATE ISSUE RULE

At one time both lay and expert witnesses were prohibited from expressing opinions on the ultimate issues in a case. This rule was sometimes justified on the grounds that such opinions "invade the province of the jury" or "usurp the function of the jury."

There are several problems with the ultimate issue rule. First, difficult questions of application are involved in distinguishing "ultimate facts" from other facts. C. McCormick, *supra,* § 12. Second, a witness cannot usurp the function of the jury because the jury is not bound to accept a witness' opinion, including the opinion of an expert. 7 J. Wigmore, Evidence § 1920 (Chadbourn rev. 1978) (ultimate issue rule criticized as "a mere bit of empty rhetoric"). Finally, the ultimate issue rule provides an improper standard for determining the admissibility of expert testimony. The standard should be whether the opinion assists the trier of fact, not whether it relates to an ultimate issue. For example, in a forgery case the only contested issue may be whether the defendant forged a check. A questioned document expert, because of his training and experience, may be able to answer that question. In such a case, an opinion on the "ultimate issue" is both desirable and necessary. The expert, however, would not be permitted to testify that the defendant was "guilty"; he may testify, however, that based on his examination the known exemplars and the check were written by the same person.

Federal Rule of Evidence 704, as originally enacted, abolished the ultimate issue prohibition. Federal Rule 704(a) provides: "Except as provided in subdivision (b), testimony in the form of an opinion or inference otherwise admissible is not objectionable because it embraces an ultimate issue to be decided by the trier of fact." *See generally* 3 D. Louisell & C. Mueller, *supra,* §§ 394-95; 3 J. Weinstein & M. Berger, *supra,* ¶ 704 [01]. As the drafters point out, however, Rule 704 does not open the door to all opinions on ultimate issues:

> The abolition of the ultimate issue rule does not lower the bars so as to admit all opinions. Under Rule 701 [lay opinions] and 702 [expert opinions], opinions must be helpful to the trier of fact, and Rule 403 provides for exclusion of evidence which wastes time. These provisions afford ample assurance against the admission of opinions which would merely tell the jury what result to reach. . . . They also stand ready to exclude opinions phrased in terms of inadequately explored legal criteria. Advisory Committee's Note, Fed. R. Evid. 704.

Accordingly, the federal courts have admitted expert opinion testimony regarding matters that could be considered "ultimate issues." *See* United States v. Fleishman, 684 F.2d 1329, 1335 (9th Cir.), *cert. denied,* 459 U.S. 1044 (1982) (undercover agent permitted to testify that a person was acting as a "lookout"); United States v. Johnson, 637 F.2d 1224, 1246-47 (9th Cir. 1980) (treating physician permitted to testify that a person suffered serious bodily injury). *See also* United States v. Gutierrez, 576 F.2d 269, 275 (10th Cir.), *cert. denied,* 439 U.S. 954 (1978) (caution should be exercised before admitting opinions on ultimate issues in criminal cases).

In 1984 Congress amended Rule 704 by adding a new subdivision (b) to Rule 704:

> No expert witness testifying with respect to the mental state or condition of a defendant in a criminal case may state an opinion or inference as to whether the defendant did or did not have the mental state or condition constituting an element of the crime charged or of a defense thereto. Such ultimate issues are matters for the trier of fact alone.

Thus, while Rule 704 generally abrogates the ultimate issue rule, a special exception applies in cases in which a defendant's mental condition is in issue — for example, where insanity is raised as a defense.

EXPERIMENTS

Expert testimony is often based on experiments, typically out-of-court experiments. Generally, testimony based on an out-of-court experiment is admissible if the experiment is conducted under the same or substantially similar circumstances as those involved in the case. *See* Robbins v. Whelan, 653 F.2d 47, 49-50 (1st Cir.), *cert. denied,* 454 U.S. 1123 (1981); Jackson v. Fletcher, 647 F.2d 1020, 1026-27 (10th Cir. 1981); Hall v. General Motors Corp., 647 F.2d 175, 180-81 (D.C. Cir. 1980).

For example, the results of tests conducted to determine muzzle-to-target distance have been admitted in cases involving rifles and handguns as well as shotguns. *E.g.,* State v. Castagna, 170 Conn. 80, 90-91, 364 A.2d 200, 206 (1976); People v. Carbona, 27 Ill. App.3d 988, 1004, 327 N.E.2d 546, 561 (1975), *cert. denied,* 424 U.S. 914 (1976); State v. Kahan, 268 S.C. 240, 245-46, 233 S.E.2d 293, 294 (1977); State v. Brooks, 16 Wash. App. 535, 540, 557 P.2d 362, 366 (1976); State v. Tourville, 295 S.W.2d 1, 6-7 (Mo. 1956), *cert. denied,* 352 U.S. 1018 (1957); State v. Bates, 48 Ohio St.2d 315, 321-22, 358 N.E.2d 584, 588-89 (1976), *vacated on other grounds,* 438 U.S. 910 (1978); Andrews v. State, 555 P.2d 1079, 1083-84 (Okla. Crim. App. 1976). As one court has noted, the "results of tests to determine the distance from which a weapon had been fired are admissible into evidence provided the test was conducted under conditions sufficiently similar to the actual conditions involved in the case that they can be fairly said to have probative value and will enlighten, not confuse the jury." Andrews v. State, 555 P.2d 1079, 1083 (Okla. Crim. App. 1976).

Under the Federal Rules of Evidence, the admissibility of experimental evidence is governed by Rules 401 to 403, namely, whether the probative value of the evidence is substantially outweighed by the danger of misleading the jury. *See generally* 1 D. Louisell & C. Mueller, *supra,* § 103; C. McCormick, *supra,* §§ 202 & 215; 2 J. Wigmore, Evidence §§ 445-60 (Chadbourn rev. 1979).

LEARNED TREATISES

Learned treatises are frequently used in conjunction with expert testimony. *See generally* C. McCormick, *supra,* § 321; 6 J. Wigmore, Evidence §§ 1690-1700 (Chadbourn rev. 1976). In all jurisdictions an expert

may be impeached with a learned treatise. There is, however, disagreement as to the conditions under which a treatise may be used for this purpose. Some jurisdictions allow this method of impeachment only when the expert *relies* on the treatise in reaching his opinion. Other jurisdictions permit impeachment if the expert *recognizes* the treatise as an authoritative work. Still other jurisdictions permit impeachment if the treatise is established as a recognized authority *by any means,* including the testimony of other experts or by judicial notice. *See* Advisory Committee's Note, R. Evid. 803(18).

Under the traditional view, a learned treatise is admissible only for impeachment. Accordingly, the jury's use of a treatise as substantive evidence violates the hearsay rule. In contrast, Federal Rule of Evidence 803(18) recognizes a hearsay exception for learned treatises, thus permitting their substantive use. Fed. R. 803(18) provides:

> To the extent called to the attention of an expert witness upon cross-examination or relied upon by him in direct examination, statements contained in published treatises, periodicals, or pamphlets on a subject of history, medicine, or other science or art, established as a reliable authority by the testimony or admission of the witness or by other expert testimony or by judicial notice. If admitted, the statements may be read into evidence but may not be received as exhibits.

See generally 4 D. Louisell & C. Mueller, *supra,* § 466; 4 J. Weinstein & M. Berger, *supra,* ¶ 803(18)[01]. According to the federal drafters, the "hearsay objection must be regarded as unimpressive when directed against treatises since a high standard of accuracy is engendered by various factors: the treatise is written primarily and impartially for professionals, subject to scrutiny and exposure for inaccuracy, with the reputation of the writer at stake." Advisory Committee's Note, Fed. R. Evid. 803(18).

There are two limitations recognized by the federal rule. First, a treatise may be used substantively only when an expert is on the stand. This requirement provides an important safeguard because it ensures that a knowledgeable person is available "to explain and assist in the application of the treatise. . . ." *Id.* Second, the treatise may be read to the jury but not received as an exhibit, thus precluding its misuse in the jury room.

ATTORNEY-CLIENT PRIVILEGE

The attorney-client privilege is designed to protect confidential communications between a client and his attorney. *See generally* C. McCormick, *supra,* §§ 87-97; 2 D. Louisell & C. Mueller, *supra,* §§ 207-13; 2 J. Weinstein & M. Berger, *supra,* ¶ 503 [01]; 8 J. Wigmore, Evidence §§ 2290-2329 (McNaughton rev. 1961). As the Supreme Court has noted: "Its purpose is to encourage full and frank communication between attorneys and their clients and thereby promote broader public interests in the observance of law and administration of justice. The privilege recognizes that sound legal advice or advocacy serves public ends and that such advice or advocacy depends upon the lawyer being fully informed by the client." Upjohn Co. v. United States, 449 U.S. 383, 389 (1981). *See also* Fisher v. United States, 425 U.S. 391, 403 (1976) ("The purpose of the privilege is to encourage clients to make full disclosure to their attorneys.").

Application of the attorney-client privilege to expert witnesses sometimes arises in scientific evidence cases. Two different uses of experts must be distinguished. First, an expert may be retained for the purpose of testifying at trial. In this situation, the privilege is waived. *See* United States v. Alvarez, 519 F.2d 1036, 1046-47 (3d Cir. 1975); Pouncy v. State, 353 So.2d 640, 642 (Fla. Dist. Ct. App. 1977); State v. Mingo, 77 N.J. 576, 584, 392 A.2d 590, 595 (1978). *See also* United States v. Nobles, 422 U.S. 225, 239 (1975) ("Respondent, by electing to present the investigator as a witness, waived the [work product] privilege with respect to matters covered in his testimony."). A "party ought not be permitted to thwart effective cross-examination of a material witness whom he will call at trial merely by invoking the attorney-client privilege to prohibit pretrial discovery." Friedenthal, *Discovery and Use of an Adverse Party's Expert Information,* 14 Stan. L. Rev. 455, 464-65 (1962).

Second, an expert may be retained for the purpose of consultation; that is, to provide the attorney with information needed to determine whether a scientific defense is feasible. If such an expert provides an adverse opinion and the defendant nevertheless desires to proceed with the defense, typically through the use of other experts, the question arises whether the attorney-client privilege precludes the prosecution from calling the defense-retained expert as a government witness. *See generally* Saltzburg, *Privileges and Professionals: Lawyers and Psychiatrists,* 66 Va. L. Rev. 597 (1980); Note, *Protecting the Confidentiality of Pretrial Psychiatric Disclosures: A Survey of Standards,* 51 N.Y.U. L. Rev. 409 (1976). If the expert is a physician or psychotherapist, a separate privilege may be applicable. Many jurisdictions recognize a physician-patient privilege and some recognize a psychotherapist-patient privilege. *See generally* 2 D. Louisell & C. Mueller, *supra,* §§ 215-16; C. McCormick, *supra,* §§ 98-105; 2 J. Weinstein & M. Berger, *supra* ¶ 504[01].

A number of courts have held that the attorney-client privilege covers communications made to an attorney by an expert retained for the purpose of providing information necessary for proper representation. *See* United States v. Alvarerz, 519 F.2d 1036, 1046-47 (3d Cir. 1975) (psychiatrist); United States v. Kovel, 296 F.2d 918, 921-22 (2d Cir. 1961) (accountant); United States v. Layton, 90 F.R.D. 520, 525 (N.D. Cal. 1981); Bailey v. Meister Brau, Inc., 57 F.R.D. 11, 13 (N.D. Ill. 1972) (financial expert); Houston v. State, 602 P.2d 784, 791 (Alaska 1979) (psychiatrist); People v. Lines, 13 Cal. 3d 500, 514-15, 531 P.2d 793, 802-03, 119 Cal. Rptr. 225, 234-35 (1975); Pouncy v. State, 353 So.2d 640, 642 (Fla. App. 1977); People v. Knippenberg, 66 Ill. 2d 276, 283-84, 362 N.E.2d 681, 684 (1977) (investigator); State v. Pratt, 284 Md. 516, 520-22, 398 A.2d 421, 423-24 (1979) (psychiatrist); People v. Hilliker, 29 Mich. App. 543, 546-47, 185 N.W.2d 831, 833-34 (1971); State v. Kociolek, 23 N.J. 400, 129 A.2d 417 (1957); State v. Hitopoulus, 299 S.C. 549, 309 S.E.2d 747

(1983). *See generally* Annot., 14 A.L.R.4th 594 (1982).

Proposed Federal Rule of Evidence 503 also extends the privilege to nontestifying experts. Subdivision (4) defines a representative of an attorney as "one employed to assist the lawyer in the rendition of professional legal services." The Advisory Committee's Note states that this "definition includes an expert employed to assist in rendering legal advice." Advisory Committee's Note, Proposed Fed. R. Evid. 503, *reprinted in* 51 F.R.D. 315, 363 (1975). The ABA Criminal Justice Mental Health Standards (1984) adopt the same position. Standard 7-3.3(b). The Standards restricts prosecutorial access to the results of defense-initiated mental health evaluations of the defendant whenever the defendant does not intend to call the expert as a witness.

The argument supporting this rule rests on the attorney's need to obtain expert advice. As one court has noted: "Only a foolhardy lawyer would determine tactical and evidentiary strategy in a case with psychiatric issues without the guidance and interpretation of psychiatrists and others skilled in this field." United States *ex rel.* Edney v. Smith, 425 F. Supp. 1038, 1047 (E.D.N.Y. 1976), *aff'd* 556 F.2d 556 (2d Cir.), *cert. denied,* 431 U.S. 958 (1977). An attorney, however, might not seek such assistance if an expert's adverse opinion could be introduced by the prosecution: "Breaching the attorney-client privilege. . .would have the effect of inhibiting the free exercise of a defense attorney's informed judgment by confronting him with the likelihood that, in taking a step obviously crucial to his client's defense, he is creating a potential government witness who theretofore did not exist." State v. Pratt, 284 Md. 516, 524, 398 A.2d 421, 426 (1979).

Other courts have rejected the extension of the attorney-client privilege in this context, although their reasons vary. First, some courts limit the privilege to communications between the attorney and client. Under this view, experts and other agents are not covered by the privilege. *E.g.,* State v. Carter, 641 S.W.2d 54, 57 (Mo. 1982), *cert. denied,* 461 U.S. 932 (1983). Second, some courts have held that the privilege extends only to confidential communications and thus does not apply to experts who do not rely on the client's confidential communications in reaching their opinions. Under this view, a psychiatrist may be protected by the privilege but not a fingerprint or questioned document expert. *See* United States v. Pipkins, 528 F.2d 559, 563-64 (5th Cir.), *cert. denied,* 426 U.S. 952 (1976) (handwriting exemplars given to expert by attorney not within privilege); People v. Speck, 41 Ill.2d 177, 200-01, 242 N.E.2d 208, 221 (1968). Third, some courts hold that the privilege is waived when the defense introduces scientific evidence. Accordingly, a defendent who raises an insanity defense waives the privilege with respect to all psychiatrists who have examined the defendant. *See* State v. Carter, 641 S.W.2d 54, 57 (Mo. 1982), *cert. denied,* 461 U.S. 932 (1983); People v. Edney, 39 N.Y.2d 620, 624-25, 350 N.E.2d 400, 402-03, 385 N.Y.S.2d 23, 25-26 (1976). *But see* United States v. Alvarez, 519 F.2d 1036, 1046 (3d Cir. 1975); Houston v. State, 602 P.2d 784, 791 (Alaska 1979); State v. Pratt, 284 Md. 516, 522, 398 A.2d 421, 424 (1979).

In addition to the attorney-client privilege, defendants have argued that the Sixth Amendment right to effective assistance of counsel precludes the use of defense-retained experts by the prosecution. Several courts have accepted this argument:

> A defense attorney should be completely free and unfettered in making a decision as fundamental as that concerning the retention of an expert to assist him. Reliance upon the confidentiality of an expert's advice itself is a crucial aspect of a defense attorney's ability to consult with and advise his client. If the confidentiality of that advice cannot be anticipated, the attorney might well forgo seeking such assistance, to the consequent detriment of his client's cause. State v. Mingo, 77 N.J. 576, 587, 392 A.2d 590, 595 (1978) (handwriting expert).

See also United States v. Alvarez, 519 F.2d 1036, 1046 (3d Cir. 1975); People v. Knippenberg, 66 Ill.2d 276, 283-85, 362 N.E.2d 681, 684-85 (1977).

Notwithstanding the persuasiveness of this argument, other courts have rejected it. *See* Noggle v. Marshall, 706 F.2d 1408, 1414-15 (6th Cir. 1983); Granviel v. Estelle, 655 F.2d 673, 683 (5th Cir. 1981), *cert. denied,* 455 U.S. 1003 (1982); United States *ex rel.* Edney v. Smith, 425 F. Supp. 1038, 1054-55 (E.D.N.Y. 1976), *aff'd,* 556 F.2d 556 (2d Cir.), *cert. denied,* 431 U.S. 958 (1977); State v. Craney, 347 N.W.2d 668, 676-77 (Iowa), *cert. denied,* 105 S. Ct. 255 (1984); State v. Dodis, 314 N.W.2d 233, 240-41 (Minn. 1982); State v. Carter, 641 S.W.2d 54, 59 (Mo. 1982), *cert. denied,* 461 U.S. 932 (1983).

REFERENCES

3 D. Louisell & C. Mueller, Federal Evidence §§ 375-409 (1979)

C. McCormick, Evidence §§ 12-18 (3d ed. 1984)

3 J. Weinstein & M. Berger, Weinstein's Evidence ¶ 702 [01] et seq. (1982)