UMKC LAW REVIEW

Volume 48
1979-1980

School of Law
UNIVERSITY OF MISSOURI-KANSAS CITY
Kansas City, Missouri

Scientific Evidence in Rape Prosecution

Author: William R. Rapps

Rape is America's most under-reported and least-punished felony.[1] Some authorities propose that this is because rape victims are afraid of their assailants and embarrassed by the incident;[2] others blame society's generally skeptical attitude.[3] Rape is a crime of violence,[4] and its victims are nearly always embarrassed, traumatized and often uncooperative with the state during prosecution. They inevitably face a triple ordeal of police interviews, medical examinations and court appearances. Police frequently pursue a theory that the report is false.[5] The victim's previous social or personal involvement with the defendant may exacerbate the experience.[6] Law enforcement and communities have responded to these problems admirably over the last two decades.[7] Most police agencies have special sex crime units; most large cities have rape crisis centers where victims can obtain enlightened specialized treatment; and special interest groups have sought increased prosecution of sex offenders.[8] There also has been increased research and development in many scientific fields intended to enhance the prosecution's arsenal of forensic procedures at trial.

It will be useful to both prosecution and defense to assess the available or developing forensic technologies particularly applicable to rape prosecutions and, in most instances, to sex offenses generally; however, the techniques to be discussed here may also apply to other offenses. Notwithstanding the limitations and disadvantages some of the methods may have, each has the potential to advance the goal of more conclusive and objective courtroom evidence. Attorneys for both sides should be aware of the procedures available as well as the scientific and evidentiary difficulties that may arise.

Sex offense statutes vary from state to state. Therefore, because of practical limitations, and because Missouri's sex offense statutes were recently revised,

1. During 1976 there were an estimated 56,730 forcible rapes reported in the United States, a 1% increase for the year. Fifty-two out of every 100,000 females were victims. In the same year, 69% of adults arrested for rape were prosecuted and 42% were convicted. U.S. DEP'T JUST., CRIME IN THE UNITED STATES, UNIFORM CRIME REPORTS 16 (1977).

2. *Id.* at 16-17.

3. J. CSIDA & J.B. CSIDA, RAPE: HOW TO AVOID IT AND WHAT TO DO IF YOU CAN'T 14-22 (1974) [hereinafter cited as CSIDA]; J. MACDONALD, RAPE OFFENDERS AND THEIR VICTIMS (1971).

4. Force is an essential element of rape in Missouri unless the victim is less than fourteen years of age. MO. REV. STAT. § 566.030 (1978).

5. Police investigations determined that nearly one-fifth of all reported rapes nationwide in 1976 were unfounded. U.S. DEP'T JUST., CRIME IN THE UNITED STATES, UNIFORM CRIME REPORTS 16 (1977).

6. Conviction rates tend to be significantly higher when the victim and the accused have no social or personal relationship prior to the rape. NAT'L INST. L. ENFORC. & CRIM. JUST., L. ENFORC. ASST. AD., U.S. DEP'T JUST., FORCIBLE RAPE: FINAL PROJECT REPORT 46 (1978).

7. CSIDA, *supra* note 3, at 92-109.

8. Kansas City, Missouri, has a center at St. Luke's Hospital that provides around-the-clock medical, psychiatric and religious assistance. The facility, largely due to the efforts of the Metropolitan Organization to Counter Sexual Assault (MOCSA), cooperates with the police as much as possible. *See also* Stratton, *Law Enforcement's Participation in Crises Counseling for Rape Victims*, 42 POLICE CHIEF 18 (March 1975).

this Comment will emphasize Missouri law.[9] Of course, a statutory revision is no panacea: Too often rape trials unnecessarily become "swearing matches" between the victim and the accused.[10] While the victim's testimony alone is sufficient to prove rape,[11] there is usually as much or more independent evidence available in rape cases as in any burglary or murder case.

MISSOURI'S MODERN STATUTORY APPROACH

Prior to January 1, 1979, one statute[12] covered all sex offenses in Missouri. It prescribed imprisonment for two years to life for all forcible rapes and sexual intercourse with a child under the age of sixteen (statutory rape). Thus, a seventeen-year-old boy who engaged in relations with a fifteen-year-old consenting girl committed the same crime as a thirty-year-old man who attacked his victim with a weapon.[13]

Missouri's revised code separates sex offenses involving intercourse into different crimes according to the circumstances.[14] It delineates forcible sexual intercourse (rape)[15] from acts involving consent which are punished as sexual assault[16] or sexual misconduct.[17] Severity of the crime determines punishment. Nonforcible sex with an incapacitated victim is not a forcible act.[18] The new code treats forcible sodomy much like rape, defining it as an act of deviate sexual intercourse.[19] Prior law referred to sodomy as "detestible and abominable crimes against nature" whether consensual or forced.[20] Sexual acts between humans and animals are no longer criminal in Missouri. All sex offenses in Missouri are sex neutral, either a man or a woman may be a victim.[21] Marriage is still a defense: Nonmarriage of the partners is an essential element of the statutory definition, but the statute does not consider spouses legally separated to be married.[22] The accused's reasonable belief that the victim has consented

9. S.B. 60, 1977 Mo. Laws 57 (Effective Jan. 1, 1979).

10. In California it is proper for the court to instruct the jury that rape is a class of prosecution attended with much danger of malice and vengeance and involves a charge "easily made and difficult to defend." People v. Briley, 9 Cal. App. 2d 84, 48 P.2d 734 (1935); People v. Reznick, 75 Cal. App. 2d 832, 171 P.2d 952 (1946).

11. State v. Barnes, 536 S.W.2d 932 (Mo. App. 1976).

12. H.B. 150, § A, 1975-1976 Mo. Laws 408, 410 (last codified at MO. REV. STAT. § 559.260 (Cum. Supp. 1975)).

13. Hunvald, *Criminal Law in Missouri—The Need for Revision*, 28 MO. L. REV. 521, 536-37 n.65 (1963).

14. MO. REV. STAT. ch. 566 (1978).

15. *Id.* § 566.030.

16. *Id.* §§ 566.040-.080.

17. *Id.* § 566.090.

18. *Id.* § 566.040.

19. *Id.* § 566.060.

20. S.B. 22, § 1, 1911 Mo. Laws 198 (last codified at MO. REV. STAT. § 563.230 (1969)); State v. Crawford, 478 S.W.2d 314 (Mo. 1972).

21. Interestingly, the Missouri Approved Criminal Instructions accompanying the new code still set out in their language that the victim be referred to as female and the accused as male. 1 M.A. CR. I.2d 20.02.1 (1979).

22. MO. REV. STAT. § 566.010.2 (1978).

or was of age is an affirmative defense which the defendant must raise and prove. It is no defense if the crime involves a victim under the age of fourteen.[23]

SCIENTIFIC EVIDENCE AND JUDICIAL ACCEPTANCE

The capabilities of forensic science to influence criminal juries are awesome. Courts traditionally have shown restraint in accepting new scientific tests, but in no sense have they been antagonistic. Generally, courts tend to admit scientific evidence through expert testimony that the theory and method in question have achieved general acceptance in the scientific community.[24] Much of the judicial restraint stems from a traditional and subtle fear that experts will usurp the jury.[25] Only experts can fully understand most scientific evidence; no juror or judge can effectively rely on common sense and everyday knowledge in judging the expert's conclusions. When asked to rule on admissability, courts are caught in the position of preserving the jury's role while denying use of evidence which may promote certainty and accuracy. In civil litigation, the courts have tried to strike a balance by allowing expert testimony except for opinions on the "ultimate issue."[26] Thus, even after acceptance, the courts treat scientific evidence only as facts which the jury may reject.[27]

However, in a criminal case where the ultimate issue is always guilt or innocence, scientific evidence can be devastating. Frequently, proof of an "ultimate fact," such as identity, is tantamount to proof of the ultimate issue;[28] the defense, therefore, often first attacks the state's case on search and seizure grounds, hoping to exclude the evidence completely. If this fails, the defense then may challenge the chain of evidence seeking to prevent admission of items tested. However, the state need show only that the evidence was secured, examined and transported by persons who received and relinquished custody, always in a sealed and identifiable form, and that no one tampered with it. It is not necessary for the state to affirmatively account for the bulk of the time that the evidence was in perfunctory custody.[29]

Attacks on the underlying scientific validity of forensic procedures are infrequent. To blunt this defense challenge, the prosecutor must rely on the credentials and experience of his expert. Because expert witnesses usually do not

23. *Id.* § 566.020.

24. Frye v. United States, 54 App. D.C. 46, 293 F. 1013, 1014 (1903); WIGMORE, EVIDENCE § 990 (3d ed. 1940). The particular difficulty in the forensic field is that the tests are usually introduced by those originating the procedures who are their most avid champions. *See* People v. King, 266 Cal. App. 2d 437, 72 Cal. Rptr. 478 (1968).

25. Norvell, *Invasion of the Province of the Jury*, 31 TEX. L. REV. 731 (1953).

26. *See* Stoebuck, *Opinions on Ultimate Facts: Status, Trends and a Note of Caution*, 41 DEN. L. CENTER J. 226 (1964).

27. As a result, there are such bizarre results as the early blood grouping cases where the court accepts the validity of the tests but nevertheless allows the jury to disregard their results. Berry v. Chaplin, 74 Cal. App. 2d 652, 169 P.2d 442 (1946).

28. State v. Schwartz, 266 Minn. 104, 122 N.W.2d 769 (1963) (vaginal laceration caused by sexual intercourse at a time when the victim was unwilling).

29. State v. Winters, 525 S.W.2d 417 (Mo. App. 1975).

directly investigate the validity of the methods and theories involved, the prosecutor nearly always depends on the published research of others in the field. Generally, when an expert witness in his testimony has relied on a particular work, it may be used to demonstrate the scientific acceptance of the underlying principles.[30] The defense also may use the same treatise or any other sources that the witness recognizes as authority to contradict the expert's opinion on cross-examination.[31] Prosecutors must be familiar with the basic forensic authorities in each field. Every test has its limitations, and a defense attorney who has done some homework can dwell on these to instill doubt in the minds of the jury.

SELF-INCRIMINATION AND RIGHT TO COUNSEL

Many forensic procedures analyze substances of human origin. When they are taken from the victim or the crime scene, there is seldom a substantial search and seizure issue. Missouri's search warrant statute lists a number of items which may be taken pursuant to a search warrant, but it does not give sufficient leeway to permit use of search warrants to take samples from the accused's body.[32] However, the Missouri Rules of Criminal Procedure allow, upon motion by the state and a showing of good cause, the issuance of a court order requiring the defendant to be fingerprinted;[33] give up fingernail scrapings;[34] give samples of blood, hair and other body materials;[35] and submit to reasonable medical examination.[36] The discovery rule specifically does not apply to preindictment investigation.[37] A prosecutor must be fully familiar with the use and potential of scientific evidence because the task of obtaining the order falls to him under the rule.

Rule 25.35 is subject to all constitutional limitations.[38] It became effective in 1974 after the Missouri Supreme Court in *State v. Stevens*[39] elected to follow *Schmerber v. California*,[40] which held that the taking of a blood sample without a court order, but in a medically acceptable manner, did not violate fifth amendment protections because the evidence obtained was not testimonial. *Stevens* extended *Schmerber* by ruling that notification and presence of counsel were not necessary for sample taking.[41] Rule 25.35 grants the accused a right to counsel but is silent about counsel's function once the court issues an order to take samples.[42] Constitutionality of the action, thus, turns on whether investiga-

30. For cases, *see* Annot., 60 A.L.R.2d 77, 81 (1976).
31. Brown v. United States, 419 F.2d 337 (8th Cir. 1970).
32. MO. REV. STAT. § 542.380 (1978).
33. MO. R. CRIM. P. 25.35(B)(3).
34. *Id.* 25.35(B)(7).
35. *Id.* 25.35(B)(8).
36. *Id.* 25.35(B)(9).
37. *Id.* 25.35(G).
38. *Id.* 25.35(A)(B)(F).
39. 467 S.W.2d 10 (Mo.), *cert. denied*, 404 U.S. 994 (1971).
40. 384 U.S. 757 (1966).
41. 467 S.W.2d at 16.
42. MO. R. CRIM. P. 25.35(F).

tors take the samples in a medically acceptable manner. Whether the procedures were medically acceptable must have been determined in an evidentiary hearing. This implies that the trial court has no inherent power to issue an order.[43] To meet the standard for medical acceptability, the bodily intrusion must be minor with no risk of harm or injury to the defendant.[44] The same standard applies to samples collected before the indictment or information is filed.[45]

PROOF OF FORCE AND LACK OF CONSENT

Force, or threat of force, sufficient to overcome reasonable resistance is an essential element of proof in rape and sodomy cases.[46] The old Missouri statute required that the rape victim be "forcibly ravished" but did not define force.[47] The new law defines it as physical force that overcomes reasonable resistance. This allows an incapacitated victim to prosecute because token resistance is all such persons are able to produce.[48] A victim need not resist where it would be foolish,[49] and compulsion also exists when an express or implied threat places the victim in reasonable fear of death, serious bodily injury or kidnapping of himself or another.[50] The statute also requires that the victim not have consented to sexual intercourse. The courts have interpreted this to mean that the victim may consent, but it is ineffective as a defense when it is against the victim's will due to compulsion.[51]

Psychological Condition of the Victim

What of the case where there are no physical manifestations of the attack at all? This most often occurs when the victim has delayed making a complaint. Under these circumstances, the physiological evidence that might support the victim's allegation of force has been lost. Delay in making an outcry tends to discredit the prosecuting witness, and the defense can use it to show the victim consented.[52] Unfortunately, the most severely frightened and traumatized victims of rape are the most likely to delay their complaint. They hesitate until friends or family persuade them, or other factors such as a second attack compel them to tell authorities. If the delay causes loss of the physical evidence, the prosecutor may have serious difficulty persuading the jury that any crime occurred, even if the defendant admits having sexual relations with the victim.

43. State v. Overstreet, 551 S.W.2d 621 (Mo. 1977). This case also requires interlocutory review of the order. Rule 25.35 requires an evidentiary hearing only upon request from one of the parties. Mo. R. Crim. P. 25.35(B)(8).

44. State v. Overstreet, 551 S.W.2d 621, 625 (Mo. 1977).

45. See the Missouri court's analogy to the line-up cases, particularly United States v. Wade, 388 U.S. 218 (1967). State v. Stevens, 467 S.W.2d 10, 15-16 (Mo.), *cert. denied*, 404 U.S. 994 (1971).

46. Mo. Rev. Stat. §§ 556.061(11), 566.030(1), .060(1) (1978).

47. H.B. 150, § A, 1975-1976 Mo. Laws 408, 410 (last codified at Mo. Rev. Stat. § 559.260 (Cum. Supp. 1975)).

48. Mo. Rev. Stat. § 556.061 (11) (1978); State v. Welch, 119 Mo. 179, 89 S.W. 945 (1905); State v. Stroud, 362 Mo. 124, 240 S.W.2d 111 (1951).

49. State v. Adams, 380 S.W.2d 362 (Mo. 1964).

50. State v. Catron, 317 Mo. 894, 296 S.W. 141 (1927); State v. Schuster, 282 S.W.2d 553 (Mo. 1955).

51. State v. Gray, 423 S.W.2d 776 (Mo. 1968).

52. 75 C.J.S. *Rape* § 9 (1952); *see also* State v. Cardello, 130 S.W.2d 498, 499 (Mo. 1939).

Common Stress Reactions

If in a rape trial a prosecutor has very little physical evidence available to prove force or lack of consent, psychiatric testimony about the victim's emotional symptoms can bolster the case. Psychiatrists view forcible rape as a crisis much like other external traumas that destroy an individual's emotional equilibrium. Although reactions vary according to cultural and personality differences, rape victims exhibit the same four reaction stages as victims of other stress.[53] The first response is the anticipatory or threat phase in which the victim raises emotional defenses creating an illusion of invulnerability, while maintaining enough contact with reality to handle immediate danger. The second stage is the impact period in which various degrees of hysterical reactions occur, even in previously well-adjusted individuals. It is during posttraumatic recoil that emotional expression, self-awareness, memory and behavioral control gradually reappear. Finally, during posttraumatic reconstitution, the victim typically loses self-assurance and self-esteem and suffers symptoms of disturbance. In explaining to a jury, it would be accurate to say that the victim puts most of the event out of her mind while the attack is going on, breaks down immediately thereafter, and then pulls herself together but has lingering fears for some time.[54]

Rape Trauma Syndrome

In 1974, Dr. Ann W. Burgess and Dr. Lynda L. Holmstrom of Boston College proposed that their studies had identified a two-phase emotional pattern in rape victims which they called rape trauma syndrome.[55] Symptoms commonly associated with the first phase are soreness or bruising; skeletal muscle tension; gastrointestinal irritability; genitourinary disturbance such as burning, itching or vaginal discharge; and emotional reactions including fear, anger, humiliation and self-blame.[56] In the second phase, victims entered a stage of long-term reorganization during which they experienced, in varying degrees and sequence, fear of crowds, unknown sounds, people behind them, being indoors or outdoors (usually depending on the place of the attack), and being alone. The victims also commonly changed their residence and nearly always suffered anxiety that disrupted their normal sexual patterns.[57]

53. Tyhurst, *Individual Reactions to Community Disaster: The Habitual History of Psychiatric Phenomena*, 107 Am. J. Psych. 764 (1951); Lindemann, *Symptomatology and Management of Acute Grief*, 101 Am. J. Psych. 141 (1944)

54. Notman & Nadelson, *The Rape Victim: Psychodynamic Considerations*, 133 Am. J. Psych. 408, 409 (1976); Sutherland & Scherl, *Patterns of Response Among Victims of Rape*, 40 Am. J. Orthopsych. 503 (1970).

55. Burgess & Holmstrom, *Rape Trauma Syndrome*, 131 Am. J. Psych. 981 (1974).

56. *Id.* at 982-83.

57. *Id.* at 984.

Significantly, Burgess and Holmstrom pinpointed symptoms consistent with what they called a silent rape reaction. They found that persons being studied who exhibited progressive anxiety during interviews, sudden and drastic onset of phobia, paranoia and loss of self-confidence were likely to have been victims of a previous rape which they did not report.[58] Psychiatrists familiar with the syndrome can explain to jurors the symptoms and give a professional opinion that rape was the cause. Emergency room personnel, including paramedical attendants, also can describe the symptoms.[59]

There have been no appellate cases considering this evidence; however, in *State v. Mitchell*,[60] the court permitted the victim's doctor to testify that the victim had menstruated constantly since the alleged attack and to give his opinion that her condition was a result of a forcible act of intercourse. The court allowed the testimony even though two months had passed between the alleged rape and the doctor's examination. An analogous approach appears in *In re D. L. W.*,[61] a battered child case. Although the parents admitted that the child had suffered intentionally inflicted injuries, they contended that the child should remain in their custody because a babysitter had actually caused the injuries. The court admitted evidence that the parents fit a "child-abuse profile" and removed the child from the home. The Missouri Court of Appeals affirmed the decision.[62] Obviously, these two cases do not completely parallel cases seeking admission of rape trauma evidence. The instant cases both involve demonstrable physical injuries to the victim. In the battered child case, welfare of the child rather than punishment of the parents was an overriding concern. Additionally, the expert opinions in those cases were based on manifestations not commonly associated with so many other causal factors. Nevertheless, most trial courts probably would see objections to testimony about rape trauma as going only to weight and would allow the jury to consider the evidence.

Physical Condition of the Victim

Medical testimony cannot conclusively prove that a rape victim submitted under force.[63] A prosecutor most often relies on the testimony of the complaining witness corroborated by independent evidence of the victim's emotional and physical condition after the attack. Simply that the victim was injured assists the prosecution in proving that force was used. Missouri courts seem to view physical injury to the victim as the best possible inferential proof of force.[64] Missouri prosecutors seeking to introduce a victim's bloody clothing can rely on a substantial body of law allowing admission of such evidence despite objections

58. *Id.*

59. Holmstrom & Burgess, *Assessing Trauma in the Rape Victim*, 75 AM. J. NURSING 1288, 1291 (1975).

60. 339 Mo. 228, 96 S.W.2d 341 (1936).

61. 530 S.W.2d 388 (Mo. App. 1975).

62. *Id.* at 392.

63. Consent and compulsion are irrelevant if the victim is under the age of fourteen. MO. REV. STAT. §§ 566.030-.060 (1978).

64. State v. Williams, 532 S.W.2d 826 (Mo. App. 1975).

to its irrelevant and inflammatory nature. The clothing need only be relevant to any fact at issue and aid the jury in any way in arriving at a correct verdict.[65]

Testimony concerning the victim's condition after the alleged attack is unquestionably admissible in Missouri.[66] Particularly relevant are hymenial membrane lacerations and resultant bleeding which are probative of both force and penetration.[67] In *State v. Laney*,[68] a rape victim's doctor testified that his patient was bleeding from the vagina and had two broken ribs, which the prosecutrix testified were cracked by her assailant's weight. On appeal, the defense challenged the doctor's testimony as irrelevant, immaterial and highly inflammatory, arguing that the evidence was merely cumulative because there was other medical testimony tending to corroborate the rape. The Missouri Supreme Court saw no merit in the claim; it noted that even when a victim submits out of fear and offers no resistance the evidence of the victim's subsequent physical condition is still admissible because it would be admissible in a statutory rape prosecution where force is not an issue.[69] In *State v. Chandler*,[70] the defendant contended that the state failed to prove force because the prosecutrix testified that she removed her clothes voluntarily after the defendant threatened her. The defense was unable to keep out evidence that the victim had torn clothing, scratches and bruises. The Missouri Supreme Court found no error.[71]

PROOF OF PENETRATION

In Missouri, the newly revised criminal code defines sexual intercourse as "any penetration, however slight, of the female sex organ by the male sex organ, whether or not emission results."[72] Deviate sexual intercourse is "any sexual act involving the genitals of one person and the mouth, hand, tongue, or anus of another person."[73] Many Missouri cases support the majority rule that even the slightest penetration is sufficient to sustain a rape conviction. In addition, proof of penetration may be by circumstantial evidence.[74] Medical corroboration of penetration is mostly for the sake of the jury because appellate courts require very little proof of that element.

For example, in *State v. Hamilton*,[75] a statutory rape prosecution, the pro-

65. State v. Martin, 530 S.W.2d 447 (Mo. App. 1975).

66. State v. Chandler, 314 S.W.2d 897, 901 (Mo. 1958); State v. Burton, 355 Mo. 792, 198 S.W.2d 19, 21 (1946); State v. Mitchell, 339 Mo. 228, 96 S.W.2d 341, 343 (1936); State v. Parsons, 285 S.W. 412, 414 (Mo. 1926).

67. State v. Ivey, 303 S.W.2d 585 (Mo. 1957). *See* notes 72-101 *infra* and accompanying text for other forensic techniques probative of penetration.

68. 506 S.W.2d 452 (Mo. 1974).

69. *Id.* at 455, *citing* State v. Burton, 355 Mo. 792, 198 S.W.2d 19 (1946).

70. 314 S.W.2d 897 (Mo. 1958).

71. *Id.*

72. MO. REV. STAT. § 566.010(1) (1978).

73. *Id.* § 566.010(2).

74. State v. Devorss, 221 Mo. 469, 120 S.W. 75 (1909); State v. Williams, 263 Mo. 603, 173 S.W. 1051 (1915); State v. Hamilton, 304 Mo. 19, 263 S.W. 127 (1924); State v. Dayton, 535 S.W.2d 469 (Mo. App. 1976).

75. 304 Mo. 19, 263 S.W. 127 (1924).

secutrix testified only that she felt something touch her in her "private parts." The Missouri Supreme Court felt that because the defendant admitted traveling to another city with the prosecutrix, spending the night in a hotel room with her and sleeping in the same bed, the evidence was sufficient to sustain the conviction without any medical corroboration.[76] In a case involving statutory rape, an eleven-year-old prosecutrix testified on cross-examination that she could not see if it was the defendant's sex organ that touched her genitals and, in fact, could not say that there was any penetration.[77] Although medical testimony established that there was a torn hymen, a physician also testified that the tear could have been self-inflicted. Additionally, the doctor stated that the only way to conclusively determine if there had been intercourse was to detect the presence of sperm, but he found none.[78] The Missouri Supreme Court rejected defendant's argument that the testimony of the prosecutrix was insufficient in that it was totally conclusory and unsupported by medical observation.[79]

Specific Trace Evidence

Spermatozoa

Although attempts to obtain medical corroboration evidence in a rape case fail, the state can sustain a conviction on appeal in its total absence;[80] however, it is standard procedure in rape cases for the victim to undergo medical examination for the purpose of securing independent corroboration of penetration. The examination and subsequent scentific testing is directed towards identifying various substances that remain after coitus. Medical experts regard the presence of male spermatozoa as conclusive that intercourse occurred. The test is simply a visual search of smears or samples for the presence of sperm.

Passage of time can have significant effects on the spermatozoa examination. Researchers do not agree on the point after intercourse when no spermatozoa are likely to be found. Their estimates vary from three[81] to seventeen[82] days. Modern research seems to support the rule of thumb that tests conducted within twenty-four hours after intercourse are almost certain to be positive.[83] Motile (still living) and intact spermatozoa are not likely to be found after six hours.[84] Thus, within very broad limits, the results can help the prosecutor corroborate the times alleged by the victim. On the other hand, time may work against the state where there has been a delay in examination or reporting because the test

76. *Id.* at 21, 263 S.W. at 128.
77. State v. Famber, 358 Mo. 288, 291, 214 S.W.2d 40, 42 (1948).
78. *Id.* at 291, 214 S.W.2d at 41.
79. *Id.* at 294, 214 S.W.2d at 43. The court reversed and remanded on the grounds that there was error in the trial court's refusal to give an instruction on common assault.
80. State v. Baugh, 323 S.W.2d 685 (Mo. 1959).
81. Sharpe, *The Significance of Spermatozoa in Victims of Sexual Offenses*, 89 CAN. MED. A.J. 513-14 (1963).
82. Pollack, *Semen and Seminal Stains*, 35 ARCHEOLOGICAL PATHOLOGY 140 (1943).
83. *Id.* at 143.
84. Davies & Wilson, *The Persistence of Seminal Constituents in the Human Vagina*, 3 FOR. SCI. 45 (1974).

is likely to be negative more than one day later.

Because emission is not an essential element in rape, negative test results for spermatozoa are not legally fatal to the state's case. In *State v. Wynn*,[85] the victim's testimony, coupled with physical evidence tending to substantiate her account, was sufficient to sustain a conviction on appeal even though the doctor who treated the victim for her injuries performed no gynecological examination at all.[86] In a sodomy case involving prison inmates,[87] a physician who examined the victim's anal canal testified that he found no trauma or semen. However, he said this could have resulted from use of a lubricant and a later bowel movement which the victim said occurred. The doctor also testified that he found traces of a lubricant. The court affirmed the conviction.

Despite the irrelevancy of emission and the light burden in proving penetration, a negative gynecological examination for sperm often undermines the credibility of the prosecuting witness. Besides passage of time, there are other explanations. One of the most common is the presence of a vasectomized or otherwise aspermic male. That no sperm was found and that the defendant was aspermic can be a highly incriminating coincidence on the issue of identity.

Prosecutors and defense attorneys should be aware that cross contamination between the oral and anal cavities occurs rather easily.[88] When rape and anal sodomy are charged in the same case, penetration is an essential element in both acts. Where the victim is deceased or cannot testify that penetration occurred in both instances, the presence of sperm assumes greater importance. Expert testimony should include explanation of precautions taken to prevent cross contamination in taking the smears and whether or not the smears were substantially different as to the number and condition of the sperm. Otherwise, the state's prima facie case may disintegrate due to the lack of proof on which act involved penetration. Examiners can detect sperm in the mouth in oral sodomy cases, but dissipation is accelerated.[89]

Acid Phosphatase

For these reasons, most modern forensic laboratories do not totally rely on an examination for spermatozoa in substantiating penetration. Most attempt to substantiate their findings by testing for another substance called acid phosphatase. Research has demonstrated that acid phosphatase levels are 500 to 1,000 times higher in human semen than in normal body fluids or secretions.[90] This high acid phosphatase level persists in male prostatic fluid in the vaginal pool or in dried seminal stains, and most forensic experts consider it a fairly reliable

85. 357 S.W.2d 936 (Mo. 1962).
86. *Id.* at 937.
87. State v. Booker, 517 S.W.2d 937, 939 (Mo. App. 1974); *see also* State v. Nevels, 537 S.W.2d 824, 826 (Mo. App. 1976).
88. Enos & Beyer, *Spermatozoa in the Anal Canal and Rectum and in the Oral Cavity of Female Rape Victims*, 23 J. FOR. SCI. 231 (1978).
89. *Id.* at 232.
90. Gutman & Gutman, *Quantitative Relations of a Prostatic Component (Acid Phosphatase) of Human Seminal Fluid*, 28 ENDOCRINOLOGY 115, 118 (1941).

indicator of the presence of semen.[91] The test adds support to the expert's conclusions and avoids the problem of an aspermic defendant.

Testing for acid phosphatase in swabs or washings taken from the vagina of a sexual assault victim poses special interpretive problems, especially for a prosecutor needing independent corroboration to prove penetration. Research has demonstrated that low levels of acid phosphatase are normal for women who have been sexually inactive.[92] Thus, in testing for the substance, forensic personnel must take into consideration normal, endogenous levels. Most laboratories set their own thresholds according to intuition and experience.[93] Another problem is that acid phosphatase activity declines at a highly variable rate after intercourse. This makes postcoital time intervals difficult to estimate and may result in a test conclusion that the acid phosphatase presence was negative when, in fact, there has been a rapid decline after an event in which emission did occur. This false negative result is possible within as little as three hours after intercourse. The chance that a false positive test will result is less likely, but is a possibility if the victim has had consensual relations before the alleged attack and experienced a slow decline in acid phosphatase activity.[94]

It appears that Missouri's courts have accepted acid phosphatase testing without a direct challenge to its scientific validity. In a recent case, the Missouri Court of Appeals noted that an acid phosphatase test corroborated the account of an eleven-year-old oral sodomy victim.[95] The victim testified that she spit the ejaculate on the floor. Tests of the resultant stain revealed no trace of sperm but showed a high concentration of acid phosphatase. The court found this corroborative fact important because acid phosphatase is not found in saliva.[96] The defense attacked the state's sole reliance on the acid phosphatase test by suggesting that because a number of common table vegetables also contain the chemical, the saliva stain could have a false positive reaction. The state's expert admitted several times that other materials besides semen contain acid phosphatase. The defense did not use its own expert and, thus, could not challenge the empirical data.[97]

Choline

Choline is another substance found in human semen which can be a "semen marker." The test for choline is no more specific than tests for acid phosphatase, and it disappears below detectable levels much more rapidly: Negative test results are common after fourteen hours. For this reason, and

91. Davies & Wilson, *supra* note 84, at 49; Enos, Mann & Dolan, *A Laboratory Procedure for the Identification of Semen*, 39 AM. J. CLIN. PATH. 316 (1963).

92. Findley, *Quantitation of Vaginal Acid Phosphatase and the Relationship to Time of Coitus*, 68 AM. J. CLIN. PATH. 238 (1977).

93. Sensabaugh, *The Quantitative Acid Phosphatase Test: A Statistical Analysis of Endogenous and Post Coital Acid Phosphatase Levels in the Vagina*, 24 J. FOR. SCI. 346 (1979).

94. *Id.* at 346-47.

95. State v. Baughman, 565 S.W.2d 827 (Mo. App. 1978).

96. *Id.* at 828.

97. *Id.*, trial transcript at 68-86.

because the test offers no particular advantages, the procedure is not commonly used in most forensic laboratories.[98] Also, some researchers have noted wide variations in choline levels between individuals and between ejaculates from the same individuals.[99]

Semen-Specific Protein

Genetic mechanisms control synthesis, the manufacture of proteins in the human body. Thus, if examiners could identify protein in human semen, they could ascertain with more certainty the biological specificity of the substance (the difference between male and female sources). Researchers appear on the threshold of producing exactly this semen marker.[100] Proponents of this theory suggest that it promises to result in a technique of semen identification using a marker that does not dissipate in the vaginal environment as rapidly or erratically as other markers. In addition, a protein-specific semen marker may retain its detectable qualities longer in dried stains, and tests for it should be relatively simple and inexpensive.[101] The technique is not yet ready for the courtroom, however.

PROOF OF IDENTITY

Proof of the identity of the accused is essential in every criminal case. Because there may have been a previous social relationship between accused and victim, or because the defense relies on consent, the issue may never arise. More frequently, however, identity of the accused is paramount. Most of the forensic techniques used to prove identity are corroborative. Some, such as fingerprints, are highly specific. The basis of the court's acceptance of such evidence is the general premise that a criminal always leaves behind substances or impressions at the crime scene, and he always carries something away, no matter how minute that evidence might be.[102]

As to corroboration in general, the rule in Missouri is that the victim's uncorroborated testimony will sustain a rape conviction unless the testimony is contradictory or, when applied to the admitted facts, is unconvincing.[103] In some cases the victim may not be able to say for sure that the defendant was the person who raped her, but imaginative forensic techniques can compensate for this deficiency.

98. Davies & Wilson, *supra* note 84, at 56.

99. Forbes, *The Scope and Fallacies of the Florence Reaction for Seminal Stains*, 13 POLICE J. 162 (1940).

100. Sensabaugh, *Isolation and Characterization of a Semen-Specific Protein from Human Seminal Plasma: A Potential New Marker for Semen Identification*, 23 J. FOR. SCI. 106 (1978).

101. *Id.*

102. *See generally* A. SVENSSON & O. WENDEL, TECHNIQUES OF CRIME SCENE INVESTIGATION (Am.Ed. 1965) [hereinafter cited as SVENSSON & WENDEL].

103. State v. Quinn, 405 S.W.2d 895, 897 (Mo. 1966). There is no absolute requirement of corroboration in statutory rape cases where the same rule applies. State v. Burton, 355 Mo. 792, 198 S.W.2d 19, 20 (1946); State v. Wood, 355 Mo. 1008, 1012, 199 S.W.2d 396, 398 (1947).

Specific Trace Substances

Blood

Although courts usually accept evidence of the presence of blood as proof of the manner in which a crime was committed, they are more reluctant to accept it when offered to corroborate the identity of the perpetrator, usually by means of blood typing. In the late 1800's, Karl Landsteiner first identified three blood groups, labeling them A, B and O. Other researchers discovered a fourth group designated AB, the rarest, soon thereafter. Blood typing, now commonly known as the Landsteiner-Berstein classification, divides the blood types of all humans into these four groups: Type A includes forty-one percent of the population; B, ten percent; AB, about four percent; and O, the remaining forty-five percent. Because blood types are inherited, the laws of heredity can exclude a given individual as a blood source but cannot affirmatively include anyone; they can only establish that the individual is a possible source.[104]

Paternity is rarely an issue in any criminal case except statutory rape and nonsupport prosecutions:[105] Modern post-attack treatment usually endeavors to prevent pregnancy from criminal attack. The general rule in paternity cases is that blood tests are admissible to disprove paternity but not to prove that a particular man is the father. Missouri follows this rule but did not accept the validity of blood grouping in paternity cases until 1972.[106]

Science is on the threshold of being able to "fingerprint" an individual by his blood.[107] This is because further serological research has added so many more identifiable blood characteristics that a group of possible sources can be narrowed to one individual. Scientists discovered the first of these additional blood characteristics in 1955 when they found two human genes which control three genotypes[108] called haptoglobins (Hp).[109] Most genotypes and their combinations are fairly common, ranging from 1.8% for the rarest Hp type to 30.9% for the most common.[110] Courts have accepted haptoglobin types in paternity proceedings in England because experts were able to show that the Hp system could exclude paternity.[111] Phosphoglucomutase (PGM) is an enzyme found in most human cells, including red blood cells. Two human genes combine to form the

104. L. SUSSMAN, BLOOD GROUPING TESTS 1-24 (1962). A system similar to the ABO classification uses human blood to produce a serum which is mixed with another serum made from animal blood. The reaction produces groups labeled M and N. *Id.* at 8. Another system, known as the Rh classification, identifies a blood factor found in 85% of the Caucasion population. *Id.* at 9.

105. Nevertheless, at least two states have specifically ruled that evidence of a subsequent pregnancy is admissible as proof in a rape prosecution. *See* People v. Schober, 204 Cal. App. 2d 459, 22 Cal. Rptr. 318 (1962); Martin v. Commonwealth, 476 S.W.2d 834 (Ky. 1972).

106. State v. Summers, 489 S.W.2d 225 (Mo. App. 1972). The tests had been earlier rejected in Rasco v. Rasco, 447 S.W.2d 10 (Mo. App. 1969). *See also* State v. Damm, 64 S.D. 309, 266 N.W. 667, (1936); 2 AM. JUR. PROOF OF FACTS *Blood Tests* 608 (1976).

107. E. BEUTHER, HEREDITARY DISORDERS OF ERYTHOCITE METABOLISM (1968).

108. Groups of individuals having the same genetic makeup or patterns.

109. Smithies, *Zone Electrophoresis in Starch Gels: Group Variations in the Serum Proteins of Normal Human Adults*, 61 BIOCHEM. J. 629 (1955).

110. Javid, *Human Serum Haptoglobins: A Brief Review*, 4 SEMINARS IN HEMATOLOGY 44 (1966).

111. Stocker v. Stocker, 1 W.L.R. 190, 2 All E.R. 147 (1966).

three PGM genotypes which have a population frequency of approximately 54.8, 38.5 and 6.8% respectively.[112]

As early as the late 1960s scientists were willing to say that because the various elements forming the genotypes occur independently of each other, individuals may possess a large number of different combinations. Thus, researchers may be able to identify a person by his potentially unique combination—if they can identify enough of the various genotypes. A listing of each person's individual and independent blood characteristics would be a genetic "fingerprint" determinable through blood (or in some cases, tissue) analysis.[113] Research is at the point where experts are urging the courts to accept procedures that combine various tissue tests with ABO and haptoglobin typing. Experts say these procedures can determine paternity with ninety-five to ninety-nine percent accuracy for any individual.[114] Not all of these tests can be applied to a simple blood stain, but prosecutors who rely heavily on serological evidence should be aware that additional blood testing can provide probative identification evidence.

Although the battle over admissibility of blood typing evidence in Missouri paternity cases lasted until 1972,[115] it was always admissible as inferential proof in criminal cases to show that the accused was connected with the crime. The state may introduce the defendant's blood-stained clothing, show that the blood is the same type as the victim's and then prove that the defendant's blood type is different.[116] The state also may show that blood found at a crime scene in the defendant's residence was the same type as the victim's.[117] Attorneys usually do not argue on appeal that a large group of the population has the same blood type;[118] apparently no one in Missouri has challenged the reliability of blood grouping evidence except in paternity actions.

Semen Typing

Blood tests are particularly relevant in sex offense cases because analysts are able to determine the blood type of eighty percent of the population because of a substance secreted in body fluids such as semen.[119] Forensic experts call the eighty percent who have this inherited trait "secretors."[120] Missouri has not accepted secretor analysis using human semen, probably because law enforcement laboratories do not routinely use it. The Regional Crime Laboratory in Independence, Missouri does not perform semen typing unless officials specifically request them to do so, although it has that capability.[121] It is possible to

112. Beckman, *Isozyme Variations in Man*, 1 MONOGRAPHS IN HUMAN GENETICS 60 (1966).

113. E. BEUTHER, *supra* note 107, at 19.

114. Terasaki, Benoco, Givertson, Mickey & Purdue, *Ninety-Five Percent Probability with HLA, ABO and Haptoglobins*, 12 FOR. SCI. INT'L 227 (1978).

115. State v. Summers, 489 S.W.2d 225 (Mo. App 1972).

116. State v. Stevens, 467 S.W.2d 10, 14 (Mo.), *cert. denied*, 404 U.S. 994 (1971).

117. State v. Dayton, 535 S.W.2d 479 (Mo. App. 1976).

118. State v. Thomas, 548 S.W.2d 574 (Mo. App. 1975).

119. L. SUSSMAN, BLOOD GROUPING TESTS: MEDICOLEGAL USES (1968).

120. *Id.*

121. Interview with Gary M. Howell, Director of the Missouri Regional Crime Laboratory, in Independence, Missouri (March 24, 1979).

perform the testing on semen samples taken from the human body as well as from recently dried stains.[122]

Texas[123] and Louisiana[124] have accepted secretor analysis. In a Texas case, an investigating officer originally thought there was only one actor in a rape-murder. The possibility of a second offender arose when the officer learned of an alleged conversation between the defendant and a cellmate. Analysts performed blood grouping tests on vaginal pool specimens taken at the autopsy, and they confirmed that at least two men, each with different blood types, had intercourse with the deceased. The postarrest statement was admitted against the defendant at trial. Challenged on appeal, the court ruled that the statement was admissible on the grounds that it led to the discovery of other evidence and therefore was incriminating and qualified as an admission against interest.[125] However, in *People v. Robinson*,[126] a New York court rejected secretor analysis on the grounds that the evidence of blood types in a criminal case was improper because the ABO classification groups are common to large segments of the general population.[127] Oddly, the court did not discuss whether blood typing could be performed using semen. In a recent Missouri case, *State v. Foster*,[128] the Missouri Court of Appeals simply assumed that blood typing was not possible from semen samples. The state used the presence of seminal stains on the defendant's underpants worn at the time of the rape as corroborative evidence. On appeal, the defense objected on the grounds that experts could not link the stains to stains on the victim's garments nor could they determine how long the stains had been on the defendant's clothing. In allowing the evidence because it tended to prove the state's case and was corroborative of other evidence given by the prosecutrix, the court noted that "blood can be identified by type and semen cannot, yet an analogy can be drawn between the two insofar as the relevancy of the evidence is concerned."[129] Although this 1973 case does not say that semen typing is scientifically valid, the obvious implication of its language is that "secretor" evidence will be admissible.

Hair

Hair is a common item of trace evidence in sex offense cases. Investigators routinely find it at crime scenes and while examining victims. Experts examine hair samples with a microscope to determine the hair's size, shape, color and the scale patterns on its surface. For many years, forensic experts have been able to testify only that a given sample falls within a range of variance for these characteristics and that the sample may have come from the defendant. A foreign hair found on a person is probative of contact with someone else, but no

122. SVENSSON & WENDEL, *supra* note 102, at 139-43.
123. McGilvery v. State, 533 S.W.2d 24 (Tex. Crim. App. 1976).
124. State v. Alexander, 339 So.2d 818 (La. 1976).
125. McGilvery v. State, 533 S.W.2d 24 (Tex. Crim App. 1976).
126. 27 N.Y.2d 864, 265 N.E.2d 543, 317 N.Y.S.2d 19 (1970).
127. *Id.*
128. 490 S.W.2d 662, 664 (Mo. App. 1973).
129. *Id.*

expert can testify on the basis of visual examination alone that the source was one individual to the exclusion of all others. Human hair is easily distinguishable from animal hair, and examiners can often identify the species of animal.[130] They also can determine the sex of the person from whom the hair came although this requires that the epithelial root sheath be intact;[131] however, some very recent research indicates that sex determination of human hair may be possible using only a small segment.[132]

Scientists have been able for some time to identify substances with great precision using neutron-activation analysis. The material to be identified is first made radioactive so that it emits gamma rays. The tester then exposes the radioactive material to a crystal, and every time a gamma ray strikes the crystal it produces a flash of light which is converted into an electrical impulse of measurable voltage. A measuring device, a multichannel differential analyzer, sorts out the electrical impulses into groups and creates a graph or chart of them. The graph portrays the kind and amounts of basic chemical elements in the tested samples.[133]

Because neutron-activation analysis is so expensive, prosecutors have not been able to turn to it in many cases. For this reason, admissibility of hair comparison evidence has followed a dual course, depending on whether the state elected to employ the more costly neutron-activation test or to rely on the simpler, but less specific, "range of variance" testimony from experts. One line of Missouri cases joins the majority of states[134] in admitting hair comparison evidence.[135] Missouri courts also have allowed neutron-activation analysis; however, there has been no challenge of the scientific validity of the underlying theory. In *State v. Stevens*,[136] an expert testified neutron-activation analysis showed that two hairs found on the defendant's gloves had two sources, the accused and the homicide victim.[137] The defense unsuccessfully attacked the expert's qualifications and proper performance of the test, but did not attempt to show that such precise identity evidence is impossible with neutron-activation analysis. Nevertheless, the court commented that there seemed to be sufficient scientific acceptance of the theory to warrant its admissibility.[138]

A Canadian study further confirms that neutron-activation identification is reliable. Canadian scientists used the technique to identify and quantify nine major components in hair samples taken within one year of each other and

130. SVENSSON & WENDEL, *supra* note 102, at 139-43.
131. Nagamori, *Sex Determination from Plucked Human Hairs Without Epithelial Root Sheath*, 12 FOR. SCI. INT'L 167 (1978).
132. *Id.*
133. *See* 15 AM. JUR. PROOF OF FACTS *Neutron Activation Analysis* § 1 (1976).
134. *See* State v. Wilson, 217 La. 470, 46 So. 2d 738, *aff'd*, 341 U.S. 901 (1951).
135. State v. Dayton, 535 S.W.2d 479, 483 (Mo. App. 1976) (victim's hair found in defendant's apartment, challenged on search and seizure grounds); State v. Yowell, 513 S.W.2d 397, 401 (Mo. 1974) (challenged on search and seizure grounds, victim's hair found in defendant's car).
136. 467 S.W.2d 10 (Mo.), *cert. denied*, 404 U.S. 994 (1971).
137. *Id.* at 22.
138. *Id.* at 23, *citing* 15 AM. JUR. PROOF OF FACTS 16 (Supp. 1970) (numerous cases admitting neutron-activation analysis collected).

concluded that only one person in 100,000,000 would have comparable amounts of the same elements. In all, scientists have identified eighteen components common to human hair; based on a comparison of eleven of them, the odds against two persons having comparable amounts rises to one in 1,140,000,000.[139] This kind of evidence is probably as conclusive as fingerprints, but unlike fingerprint identification, has not had time to compile a long history of acceptance in the courts. The procedure's great expense has slowed judicial acceptance.

Fingerprints

Fingerprints are judicially recognized as the best known means of identification.[140] They are likely to be used to prove identity in any kind of prosecution, and law enforcement is geared to recover and use them as evidence. In sex offenses, however, there is a special possibility that merits mention. Investigators find fingerprints most often on firm, nonporous surfaces. Technicians looking for latent prints, those invisible until chemically made to appear, tend to restrict themselves to these areas.[141] Every prosecutor dealing with sex offense cases should encourage his investigators to be on the lookout for fingerprints or palm prints on the victim's body.[142] The difficulty with recovering latent fingerprints from human skin is that many of the chemicals used to develop them are either toxic to the skin or react unfavorably with natural moisture on the skin's surface. However, a process called iodine-silver plate transfer seems to avoid these difficulties the most efficiently.[143] Unless prosecutors encourage police to obtain fingerprints from the victim's body, important evidence will be quickly lost through contact with clothing or washing. Homicide cases are particularly appropriate for seeking latent prints because destruction is less likely.

Bite Marks

Although probably uncommon, it is possible that a rape victim suffered a bite during the attack and her skin will bear the unmistakable imprint of the assailant's teeth.[144] Analysts can identify bite marks by comparing them to individual characteristics of the suspect-accused's teeth and mouth. Dental records or sample impressions taken from the defendant for the purpose will reveal these characteristics.[145]

139. Perkons & Jervis, *The Significance of Data from Forensic Activation Analysis*, Presented at 16th Annual Meeting of American Academy of Forensic Science, Chicago, Ill., Feb. 1964; Kerr, *The Application of Neutron Activation Analysis to Forensic Science*, 21 ROYAL CAN. MOUNTED POLICE GAZ. 13, 15 (1959).

140. Stevenson v. United States, 380 F.2d 590 (D.C. Cir.), *cert. denied*, 389 U.S. 362 (1967); *see also* State v. Hampton, 275 S.W.2d 356 (Mo. 1955); State v. Varner, 329 S.W.2d 623 (Mo. 1959).

141. SVENSSON & WENDEL, *supra* note 102, at 39.

142. Reichardt, Catt & Stone, *A Conventional Method for Lifting Fingerprints from Human Skin*, 23 J. FOR. SCI. 135 (1978).

143. Adcock, *The Development of Latent Fingerprints on Human Skin: The Iodine Silver Plate Transfer Method*, 22 J. FOR. SCI. 599 (1977).

144. Butler, *The Value of Bite Mark Evidence*, 1 INT'L J. FOR. DENT. 23 (1973).

145. Furness, *A New Method of Identification of Teethmarks in Cases of Assault and Homicide*, 24 BRIT. DENT. J. 261 (1968).

Missouri appellate courts have not ruled on the admissibility of bite mark identification. There is little authority generally on the subject; but what there is favors admissibility. In a California case, *People v. Marx*,[146] three dentists testified that they compared the unique characteristics in the defendant's mouth and teeth with a bite mark on the murder victim's nose and concluded that the bite came from the accused's teeth. The appellate court sustained the conviction. In a Texas murder prosecution admission of bite mark evidence was held to be proper in the face of a direct challenge to the evidence's scientific validity.[147] Because teeth impressions in living flesh lose detail quickly as the tissue recovers its original shape, investigators usually use bite mark identification only in homicide cases. This is also true of bite marks consisting of bruises because the bruise quickly begins to diffuse in a living victim. Officers also can recover bite evidence from food or other materials found at the crime scene.[148]

Miscellanea

Modern medical treatment of rape victims includes measures to prevent venereal disease.[149] Should either victim or assailant transmit a venereal infection during the attack, however, it can be used to corroborate the identity of the defendant. Missouri courts so hold.[150]

Given even a small sample of dried blood, forensic experts can determine the allergies of the source.[151] This can help differentiate between stains from different donors even though they have the same blood type. It also provides data on the clinical history of the suspect. In some cases, the information further distinguishes between individuals because some allergy antibodies are confined largely to certain populations.[152]

INVESTIGATIVE AIDS

Hypnosis

Police agencies are becoming more receptive to hypnosis as an investigative tool.[153] It is frequently appropriate in sex offense cases because anxiety often

146. 54 Cal. App. 3d 100, 126 Cal. Rptr. 350 (1975).

147. Patterson v. State, 509 S.W.2d 857 (Tex. Crim. App. 1974).

148. Butler, *supra* note 144, at 26.

149. State v. Newcomb, 220 Mo. 54, 119 S.W. 405 (1909). The treating physician should not be asked to detail all that he did in treating the rape victim since his procedures will usually include an injection to ward off venereal disease and an examination for signs of pregnancy. Mention of either factor can imply that the accused was infected or that the victim was previously unchaste; however, if the physician should mention these procedures the evidence is irrelevant and counsel can explain it away as merely routine medical procedures, thus avoiding error. State v. Yowell, 513 S.W.2d 397, 402 (Mo. 1974).

150. State v. Newcomb, 220 Mo. 54, 119 S.W.405, 409 (1909).

151. Werriett & King, *Antibody Profiling of Blood Stains*, 8 FOR. SCI. 151 (1976).

152. Werriett & King, *Application of Allergy Diagnosis in Forensic Serology*, 22 J. FOR. SCI. 763, 769 (1977).

153. Conversations with eight investigative supervisors of police agencies in the Kansas City, Missouri metropolitan area in March 1979, revealed that their detectives had been involved in cases where hypnosis was used at least once in the previous two years.

interferes with a victim's recall. The purpose of hypnosis in police investigations is to calm and relax the witness who otherwise does not have detailed recall.[154] Psychiatrists and psychologists usually perform the hypnosis,[155] but laymen and police officers can qualify in its use after training.[156]

Hypnosis places the subject in a relaxed setting and then encourages an exclusive focus of attention, usually the practitioner's verbal images; eventually, mental fatigue from the increased concentration produces a relaxed, passive state in which the hypnotist takes control. When the recall of certain events is painful, the practitioner calms and reassures the subject and sometimes shifts his perception to that of an uninvolved, unthreatened observer. The goal is enhanced recall through elimination of distractions and emotional defense mechanisms.[157]

Missouri appellate courts have not directly considered whether to accept testimony originally obtained under hypnosis; however, a case tried in the circuit court of Jackson County, Missouri, considered the issue.[158] The case involved charges of rape, sodomy, kidnapping and armed criminal action. A police psychologist placed the victims, two teen-age girls, under hypnosis and asked them to detail the events and the physical description of their attackers. During the hypnosis a police artist drew a sketch of one suspect from the girls' description. At a pretrial hearing the psychologist testified that he carefully restricted his questions to a nonsuggestive form such as "What do you see?" and "Describe what you are seeing." He also testified, however, that persons under hypnosis are more susceptible to suggestive conversation. Police officers also testified that they discussed with the girls everything they said during hypnosis. The girls testified that they were not in a "trance" and remembered completely everything that had taken place. They said that they believed their recall of details improved only slightly. The defense moved to exclude testimony about all facts the girls recalled under hypnosis, especially those facts which were later repeated to the girls, on the theory that the girls should testify only from their "natural memories." The defense also sought to suppress the artist's drawing as similarly tainted. The trial court overruled the motion[159] and the defendant relied on an alibi defense. The jury found him guilty on all counts.[160] The court denied the defendant's motion for a new trial which again raised the hypnosis issue. The defendant filed notice of appeal.[161]

154. H. Arons, Hypnosis in Criminal Investigation (1967).

155. The Kansas City, Missouri Police Department retains Dr. Marshall Saper, a practicing psychologist, for this purpose.

156. Detective William Cronley, Kansas City, Missouri Police Department, on occasion uses hypnosis himself. He is also the department artist.

157. A. Weitzenhoffer, General Techniques of Hypnotism (1957); J. Bramwell, Hypnotism, Its History, Practice and Theory (1913).

158. State v. Greer, No. CR 78-1399, Div. 18, Cir. Ct., Sixteenth Judicial District, Jackson County, Missouri, Lombardo, J., (tried June 4-7, 1979).

159. *Id.* June 4, 1979.

160. *Id.* June 7, 1979.

161. *Id.* July 13, 1979. Afterwards, the trial judge expressed some misgivings about his rulings and was particularly alarmed that persons other than the psychologist had been present during hypnosis but did not testify. He was concerned that they may have suggested some facts to the witnesses and yet were not called to explain. Conversation with Judge Louis Lombardo, Division 18, Circuit Court, Sixteenth Judicial District, Jackson County, Missouri (Aug. 10, 1979).

Generally, prosecutors should be aware that hypnosis and a closely related field, narcoanalysis (questioning while under the influence of "truth" drugs), are not well received by the courts. Hypnosis as a means of extracting truthful statements is inadmissible in at least two states.[162] Confessions are unconstitutional if drugs[163] or hypnosis[164] override the defendant's will. Some courts apparently have found statements made under hypnosis to be unreliable. In an older Missouri case involving the defendant's right to use favorable lie detector results in his own behalf, the Missouri Supreme Court commented in dicta that both lie detectors and hypnosis are likely to result in untrustworthy evidence;[165] most medical authorities would agree.[166] A hypnosis subject is not only more susceptible to suggestion, but also retains the ability to lie or misconstrue facts.[167] The existence of hypnosis as a demonstrable phenomena of the human mind is not open to much question, but its use in criminal cases must be carefully restricted and upon direct challenge is usually disfavored by the courts.

Polygraphs

Of all scientific techniques used in law enforcement, the polygraph (lie detector) has perhaps evoked the most judicial disapproval. However, police still routinely use it to extract confessions and test witnesses. The polygraph is a machine strapped to the subject to record minute changes in his pulse rate, perspiration and blood pressure. The operator, by interpreting graphs of these factors recorded as the subject responded to his questions, judges whether or not the subject attempted to deceive.[168] Champions of the procedure estimate that when interrogators use it under ideal conditions with the best-trained operators, it still will have an error probability of about five percent caused by psychological and physiological impairment of the test subjects.[169] These same proponents readily admit that many polygraph operators do not possess even the basic qualifications to function effectively, especially since the accuracy of the testing depends heavily on their experience and training.[170] Polygraph results are inad-

162. People v. Hiser, 267 Cal. App. 2d 47, 72 Cal. Rptr. 906 (1968); State v. Pusch, 77 N.D. 860, 46 N.W.2d 508 (1950).

163. Townsend v. Sain, 372 U.S. 293 (1963).

164. Leyra v. Denno, 347 U.S. 556 (1954).

165. State v. Cole, 354 Mo. 181, 188 S.W.2d 43 (1945).

166. Comment, *Hypnotism, Suggestibility and the Law*, 31 Neb. L. Rev. 575 (1972).

167. Herman, *Hypno-Induced Statements*, 25 Ohio St. L. J. 1, 26-29 (1964).

168. J. Reid & F. Inbau, Truth and Deception 3-26 (1966). Note that all the constitutional rules against involuntary self-incrimination apply to polygraph examinations. *See* Miranda v. Arizona, 383 U.S. 436 (1966); Harris v. State, 208 So. 2d 108 (Fla. App. 1968) (right to counsel at the test); United States *ex rel.* Szocki v. Cavell, 156 F. Supp. 79 (W.D. Pa. 1957) (state suppression of results); People v. Hines, 87 Ill. App. 2d 283, 232 N.E.2d 111 (1967) (comment on defendant's refusal to take the test during trial).

169. J. Reid & F. Inbau, *supra* note 168, at 234.

170. *Id.* at 235.

missible by either side in nearly every state including Missouri except by stipulation of the parties in advance.[171] The Missouri Supreme Court in 1945, in *State v. Cole*,[172] explained its reluctance to allow lie detector evidence. The court felt that the scientific theory underlying the test was not sound. It also expressed fear that an expert's explanation of his graphs might confuse a jury with irrelevant material because operators use questions unrelated to the crime as control questions.[173] It is also undoubtedly true that courts will never easily give over to science their historical function of evaluating the credibility of witnesses. Prosecutors should be aware that even a victim who "flunks the box" may still be telling the truth.

CONCLUSION

A prosecutor's job begins with the first report by the victim. Initially his role is to help the police avoid legal mistakes and to promote a thorough gathering of the evidence. Even though the lawyer knows that the uncorroborated testimony of the victim is enough to make a submissible case unless particularly weak or contradictory,[174] he should preserve and use every scrap of corroborative testimony. Statistical studies, both national and local, show a substantial relationship between the use of scientific evidence and higher conviction rates.[175] Not every procedure discussed in this Comment is ready for the courtroom, and certainly not every case is appropriate for the use of all the methods available. However, prosecutors should survey all the possibilities in each case. To do this each prosecutor must have at least a general knowledge of the potential and capabilities of forensic science in each area. Conversely, defense attorneys should be cognizant that objective means are often available to assist them in preventing injustice. An attorney's duty goes beyond merely using all that is available. It also requires that he keep abreast of research so he can present new forms of evidence to the courts in a fashion that expands the body of valid scientific evidence available while avoiding scientific chicanery. The public has the right to expect that in each and every case the legal profession will fulfill this responsibility.

William R. Rapps

---

171. *Id.* at 243 (cases collected). In Missouri, by stipulation of both parties, polygraph evidence is admissible in a criminal trial. State v. Fields, 434 S.W.2d 507 (Mo. 1968).

172. 354 Mo. 181, 188 S.W.2d 43, 47 (1945). *See also* State v. Weindorf, 361 S.W.2d 806 (Mo. 1962); State v. Jacks, 525 S.W.2d 431, 434 (Mo. App. 1975).

173. 188 S.W.2d at 48.

174. State v. Edwards, 476 S.W.2d 556 (Mo. 1972).

175. NAT'L INST. L. ENFORC. & CRIM. JUST., L. ENFORC. ASST. AD., U.S. DEP'T JUST., FORCIBLE RAPE: FINAL PROJECT REPORT 46 (1978); Weninger, *Factors Affecting the Prosecution of Rape: A Case Study of Travis County, Texas*, 64 VA. L. REV. 357, 360-62 (1978).

UMKC LAW REVIEW

Volume 48
1979-1980

School of Law
UNIVERSITY OF MISSOURI-KANSAS CITY
Kansas City, Missouri

Scientific Evidence in Rape Prosecution

Rape is America's most under-reported and least-punished felony.[1] Some authorities propose that this is because rape victims are afraid of their assailants and embarrassed by the incident;[2] others blame society's generally skeptical attitude.[3] Rape is a crime of violence,[4] and its victims are nearly always embarrassed, traumatized and often uncooperative with the state during prosecution. They inevitably face a triple ordeal of police interviews, medical examinations and court appearances. Police frequently pursue a theory that the report is false.[5] The victim's previous social or personal involvement with the defendant may exacerbate the experience.[6] Law enforcement and communities have responded to these problems admirably over the last two decades.[7] Most police agencies have special sex crime units; most large cities have rape crisis centers where victims can obtain enlightened specialized treatment; and special interest groups have sought increased prosecution of sex offenders.[8] There also has been increased research and development in many scientific fields intended to enhance the prosecution's arsenal of forensic procedures at trial.

It will be useful to both prosecution and defense to assess the available or developing forensic technologies particularly applicable to rape prosecutions and, in most instances, to sex offenses generally; however, the techniques to be discussed here may also apply to other offenses. Notwithstanding the limitations and disadvantages some of the methods may have, each has the potential to advance the goal of more conclusive and objective courtroom evidence. Attorneys for both sides should be aware of the procedures available as well as the scientific and evidentiary difficulties that may arise.

Sex offense statutes vary from state to state. Therefore, because of practical limitations, and because Missouri's sex offense statutes were recently revised, this Comment will emphasize Missouri law.[9] Of course, a statutory revision is no panacea: Too often rape trials unnecessarily become "swearing matches" between the victim and the accused.[10] While the victim's testimony alone is sufficient to prove rape,[11] there is usually as much or more independent evidence available in rape cases as in any burglary or murder case.

1. During 1976 there were an estimated 56,730 forcible rapes reported in the United States, a 1% increase for the year. Fifty-two out of every 100,000 females were victims. In the same year, 69% of adults arrested for rape were prosecuted and 42% were convicted. U.S. DEP'T JUST., CRIME IN THE UNITED STATES, UNIFORM CRIME REPORTS 16 (1977).

2. *Id.* at 16-17.

3. J. CSIDA & J.B. CSIDA, RAPE: HOW TO AVOID IT AND WHAT TO DO IF YOU CAN'T 14-22 (1974) [hereinafter cited as CSIDA]; J. MACDONALD, RAPE OFFENDERS AND THEIR VICTIMS (1971).

4. Force is an essential element of rape in Missouri unless the victim is less than fourteen years of age. MO. REV. STAT. § 566.030 (1978).

5. Police investigations determined that nearly one-fifth of all reported rapes nationwide in 1976 were unfounded. U.S. DEP'T JUST., CRIME IN THE UNITED STATES, UNIFORM CRIME REPORTS 16 (1977).

6. Conviction rates tend to be significantly higher when the victim and the accused have no social or personal relationship prior to the rape. NAT'L INST. L. ENFORC. & CRIM. JUST., L. ENFORC. ASST. AD., U.S. DEP'T JUST., FORCIBLE RAPE: FINAL PROJECT REPORT 46 (1978).

7. CSIDA, *supra* note 3, at 92-109.

8. Kansas City, Missouri, has a center at St. Luke's Hospital that provides around-the-clock medical, psychiatric and religious assistance. The facility, largely due to the efforts of the Metropolitan Organization to Counter Sexual Assault (MOCSA), cooperates with the police as much as possible. *See also* Stratton, *Law Enforcement's Participation in Crises Counseling for Rape Victims*, 42 POLICE CHIEF 18 (March 1975).

MISSOURI'S MODERN STATUTORY APPROACH

Prior to January 1, 1979, one statute[12] covered all sex offenses in Missouri. It prescribed imprisonment for two years to life for all forcible rapes and sexual intercourse with a child under the age of sixteen (statutory rape). Thus, a seventeen-year-old boy who engaged in relations with a fifteen-year-old consenting girl committed the same crime as a thirty-year-old man who attacked his victim with a weapon.[13]

Missouri's revised code separates sex offenses involving intercourse into different crimes according to the circumstances.[14] It delineates forcible sexual intercourse (rape)[15] from acts involving consent which are punished as sexual assault[16] or sexual misconduct.[17] Severity of the crime determines punishment. Nonforcible sex with an incapacitated victim is not a forcible act.[18] The new code treats forcible sodomy much like rape, defining it as an act of deviate sexual intercourse.[19] Prior law referred to sodomy as "detestible and abominable crimes against nature" whether consensual or forced.[20] Sexual acts between humans and animals are no longer criminal in Missouri. All sex offenses in Missouri are sex neutral, either a man or a woman may be a victim.[21] Marriage is still a defense: Nonmarriage of the partners is an essential element of the statutory definition, but the statute does not consider spouses legally separated to be married.[22] The accused's reasonable belief that the victim has consented

9. S.B. 60, 1977 Mo. Laws 57 (Effective Jan. 1, 1979).

10. In California it is proper for the court to instruct the jury that rape is a class of prosecution attended with much danger of malice and vengeance and involves a charge "easily made and difficult to defend." People v. Briley, 9 Cal. App. 2d 84, 48 P.2d 734 (1935); People v. Reznick, 75 Cal. App. 2d 832, 171 P.2d 952 (1946).

11. State v. Barnes, 536 S.W.2d 932 (Mo. App. 1976).

12. H.B. 150, § A, 1975-1976 Mo. Laws 408, 410 (last codified at MO. REV. STAT. § 559.260 (Cum. Supp. 1975)).

13. Hunvald, *Criminal Law in Missouri—The Need for Revision*, 28 MO. L. REV. 521, 536-37 n.65 (1963).

14. MO. REV. STAT. ch. 566 (1978).

15. *Id.* § 566.030.

16. *Id.* §§ 566.040-.080.

17. *Id.* § 566.090.

18. *Id.* § 566.040.

19. *Id.* § 566.060.

20. S.B. 22, § 1, 1911 Mo. Laws 198 (last codified at MO. REV. STAT. § 563.230 (1969)); State v. Crawford, 478 S.W.2d 314 (Mo. 1972).

21. Interestingly, the Missouri Approved Criminal Instructions accompanying the new code still set out in their language that the victim be referred to as female and the accused as male. 1 M.A. CR. 12d 20.02.1 (1979).

22. MO. REV. STAT. § 566.010.2 (1978).

or was of age is an affirmative defense which the defendant must raise and prove. It is no defense if the crime involves a victim under the age of fourteen.[23]

SCIENTIFIC EVIDENCE AND JUDICIAL ACCEPTANCE

The capabilities of forensic science to influence criminal juries are awesome. Courts traditionally have shown restraint in accepting new scientific tests, but in no sense have they been antagonistic. Generally, courts tend to admit scientific evidence through expert testimony that the theory and method in question have achieved general acceptance in the scientific community.[24] Much of the judicial restraint stems from a traditional and subtle fear that experts will usurp the jury.[25] Only experts can fully understand most scientific evidence; no juror or judge can effectively rely on common sense and everyday knowledge in judging the expert's conclusions. When asked to rule on admissability, courts are caught in the position of preserving the jury's role while denying use of evidence which may promote certainty and accuracy. In civil litigation, the courts have tried to strike a balance by allowing expert testimony except for opinions on the "ultimate issue."[26] Thus, even after acceptance, the courts treat scientific evidence only as facts which the jury may reject.[27]

However, in a criminal case where the ultimate issue is always guilt or innocence, scientific evidence can be devastating. Frequently, proof of an "ultimate fact," such as identity, is tantamount to proof of the ultimate issue;[28] the defense, therefore, often first attacks the state's case on search and seizure grounds, hoping to exclude the evidence completely. If this fails, the defense then may challenge the chain of evidence seeking to prevent admission of items tested. However, the state need show only that the evidence was secured, examined and transported by persons who received and relinquished custody, always in a sealed and identifiable form, and that no one tampered with it. It is not necessary for the state to affirmatively account for the bulk of the time that the evidence was in perfunctory custody.[29]

Attacks on the underlying scientific validity of forensic procedures are infrequent. To blunt this defense challenge, the prosecutor must rely on the credentials and experience of his expert. Because expert witnesses usually do not

23. *Id.* § 566.020.

24. Frye v. United States, 54 App. D.C. 46, 293 F. 1013, 1014 (1903); WIGMORE, EVIDENCE § 990 (3d ed. 1940). The particular difficulty in the forensic field is that the tests are usually introduced by those originating the procedures who are their most avid champions. *See* People v. King, 266 Cal. App. 2d 437, 72 Cal. Rptr. 478 (1968).

25. Norvell, *Invasion of the Province of the Jury*, 31 TEX. L. REV. 731 (1953).

26. *See* Stoebuck, *Opinions on Ultimate Facts: Status, Trends and a Note of Caution*, 41 DEN. L. CENTER J. 226 (1964).

27. As a result, there are such bizarre results as the early blood grouping cases where the court accepts the validity of the tests but nevertheless allows the jury to disregard their results. Berry v. Chaplin, 74 Cal. App. 2d 652, 169 P.2d 442 (1946).

28. State v. Schwartz, 266 Minn. 104, 122 N.W.2d 769 (1963) (vaginal laceration caused by sexual intercourse at a time when the victim was unwilling).

29. State v. Winters, 525 S.W.2d 417 (Mo. App. 1975).

directly investigate the validity of the methods and theories involved, the prosecutor nearly always depends on the published research of others in the field. Generally, when an expert witness in his testimony has relied on a particular work, it may be used to demonstrate the scientific acceptance of the underlying principles.[30] The defense also may use the same treatise or any other sources that the witness recognizes as authority to contradict the expert's opinion on cross-examination.[31] Prosecutors must be familiar with the basic forensic authorities in each field. Every test has its limitations, and a defense attorney who has done some homework can dwell on these to instill doubt in the minds of the jury.

SELF-INCRIMINATION AND RIGHT TO COUNSEL

Many forensic procedures analyze substances of human origin. When they are taken from the victim or the crime scene, there is seldom a substantial search and seizure issue. Missouri's search warrant statute lists a number of items which may be taken pursuant to a search warrant, but it does not give sufficient leeway to permit use of search warrants to take samples from the accused's body.[32] However, the Missouri Rules of Criminal Procedure allow, upon motion by the state and a showing of good cause, the issuance of a court order requiring the defendant to be fingerprinted;[33] give up fingernail scrapings;[34] give samples of blood, hair and other body materials;[35] and submit to reasonable medical examination.[36] The discovery rule specifically does not apply to preindictment investigation.[37] A prosecutor must be fully familiar with the use and potential of scientific evidence because the task of obtaining the order falls to him under the rule.

Rule 25.35 is subject to all constitutional limitations.[38] It became effective in 1974 after the Missouri Supreme Court in *State v. Stevens*[39] elected to follow *Schmerber v. California*,[40] which held that the taking of a blood sample without a court order, but in a medically acceptable manner, did not violate fifth amendment protections because the evidence obtained was not testimonial. *Stevens* extended *Schmerber* by ruling that notification and presence of counsel were not necessary for sample taking.[41] Rule 25.35 grants the accused a right to counsel but is silent about counsel's function once the court issues an order to take samples.[42] Constitutionality of the action, thus, turns on whether investiga-

30. For cases, *see* Annot., 60 A.L.R.2d 77, 81 (1976).

31. Brown v. United States, 419 F.2d 337 (8th Cir. 1970).

32. MO. REV. STAT. § 542.380 (1978).

33. MO. R. CRIM. P. 25.35(B)(3).

34. *Id.* 25.35(B)(7).

35. *Id.* 25.35(B)(8).

36. *Id.* 25.35(B)(9).

37. *Id.* 25.35(G).

38. *Id.* 25.35(A)(B)(F).

39. 467 S.W.2d 10 (Mo.), *cert. denied*, 404 U.S. 994 (1971).

40. 384 U.S. 757 (1966).

41. 467 S.W.2d at 16.

42. MO. R. CRIM. P. 25.35(F).

tors take the samples in a medically acceptable manner. Whether the procedures were medically acceptable must have been determined in an evidentiary hearing. This implies that the trial court has no inherent power to issue an order.[43] To meet the standard for medical acceptability, the bodily intrusion must be minor with no risk of harm or injury to the defendant.[44] The same standard applies to samples collected before the indictment or information is filed.[45]

PROOF OF FORCE AND LACK OF CONSENT

Force, or threat of force, sufficient to overcome reasonable resistance is an essential element of proof in rape and sodomy cases.[46] The old Missouri statute required that the rape victim be "forcibly ravished" but did not define force.[47] The new law defines it as physical force that overcomes reasonable resistance. This allows an incapacitated victim to prosecute because token resistance is all such persons are able to produce.[48] A victim need not resist where it would be foolish,[49] and compulsion also exists when an express or implied threat places the victim in reasonable fear of death, serious bodily injury or kidnapping of himself or another.[50] The statute also requires that the victim not have consented to sexual intercourse. The courts have interpreted this to mean that the victim may consent, but it is ineffective as a defense when it is against the victim's will due to compulsion.[51]

Psychological Condition of the Victim

What of the case where there are no physical manifestations of the attack at all? This most often occurs when the victim has delayed making a complaint. Under these circumstances, the physiological evidence that might support the victim's allegation of force has been lost. Delay in making an outcry tends to discredit the prosecuting witness, and the defense can use it to show the victim consented.[52] Unfortunately, the most severely frightened and traumatized victims of rape are the most likely to delay their complaint. They hesitate until friends or family persuade them, or other factors such as a second attack compel them to tell authorities. If the delay causes loss of the physical evidence, the prosecutor may have serious difficulty persuading the jury that any crime occurred, even if the defendant admits having sexual relations with the victim.

43. State v. Overstreet, 551 S.W.2d 621 (Mo. 1977). This case also requires interlocutory review of the order. Rule 25.35 requires an evidentiary hearing only upon request from one of the parties. Mo. R. CRIM. P. 25.35(B)(8).

44. State v. Overstreet, 551 S.W.2d 621, 625 (Mo. 1977).

45. See the Missouri court's analogy to the line-up cases, particularly United States v. Wade, 388 U.S. 218 (1967). State v. Stevens, 467 S.W.2d 10, 15-16 (Mo.), *cert. denied*, 404 U.S. 994 (1971).

46. MO. REV. STAT. §§ 556.061(11), 566.030(1), .060(1) (1978).

47. H.B. 150, § A, 1975-1976 Mo. Laws 408, 410 (last codified at MO. REV. STAT. § 559.260 (Cum. Supp. 1975)).

48. MO. REV. STAT. § 556.061 (11) (1978); State v. Welch, 119 Mo. 179, 89 S.W. 945 (1905); State v. Stroud, 362 Mo. 124, 240 S.W.2d 111 (1951).

49. State v. Adams, 380 S.W.2d 362 (Mo. 1964).

50. State v. Catron, 317 Mo. 894, 296 S.W. 141 (1927); State v. Schuster, 282 S.W.2d 553 (Mo. 1955).

51. State v. Gray, 423 S.W.2d 776 (Mo. 1968).

52. 75 C.J.S. *Rape* § 9 (1952); *see also* State v. Cardello, 130 S.W.2d 498, 499 (Mo. 1939).

Common Stress Reactions

If in a rape trial a prosecutor has very little physical evidence available to prove force or lack of consent, psychiatric testimony about the victim's emotional symptoms can bolster the case. Psychiatrists view forcible rape as a crisis much like other external traumas that destroy an individual's emotional equilibrium. Although reactions vary according to cultural and personality differences, rape victims exhibit the same four reaction stages as victims of other stress.[53] The first response is the anticipatory or threat phase in which the victim raises emotional defenses creating an illusion of invulnerability, while maintaining enough contact with reality to handle immediate danger. The second stage is the impact period in which various degrees of hysterical reactions occur, even in previously well-adjusted individuals. It is during posttraumatic recoil that emotional expression, self-awareness, memory and behavioral control gradually reappear. Finally, during posttraumatic reconstitution, the victim typically loses self-assurance and self-esteem and suffers symptoms of disturbance. In explaining to a jury, it would be accurate to say that the victim puts most of the event out of her mind while the attack is going on, breaks down immediately thereafter, and then pulls herself together but has lingering fears for some time.[54]

Rape Trauma Syndrome

In 1974, Dr. Ann W. Burgess and Dr. Lynda L. Holmstrom of Boston College proposed that their studies had identified a two-phase emotional pattern in rape victims which they called rape trauma syndrome.[55] Symptoms commonly associated with the first phase are soreness or bruising; skeletal muscle tension; gastrointestinal irritability; genitourinary disturbance such as burning, itching or vaginal discharge; and emotional reactions including fear, anger, humiliation and self-blame.[56] In the second phase, victims entered a stage of long-term reorganization during which they experienced, in varying degrees and sequence, fear of crowds, unknown sounds, people behind them, being indoors or outdoors (usually depending on the place of the attack), and being alone. The victims also commonly changed their residence and nearly always suffered anxiety that disrupted their normal sexual patterns.[57]

53. Tyhurst, *Individual Reactions to Community Disaster: The Habitual History of Psychiatric Phenomena*, 107 AM. J. PSYCH. 764 (1951); Lindemann, *Symptomatology and Management of Acute Grief*, 101 AM. J. PSYCH. 141 (1944)

54. Notman & Nadelson, *The Rape Victim: Psychodynamic Considerations*, 133 AM. J. PSYCH. 408, 409 (1976); Sutherland & Scherl, *Patterns of Response Among Victims of Rape*, 40 AM. J. ORTHOPSYCH. 503 (1970).

55. Burgess & Holmstrom, *Rape Trauma Syndrome*, 131 AM. J. PSYCH. 981 (1974).

56. *Id.* at 982-83.

57. *Id.* at 984.

Significantly, Burgess and Holmstrom pinpointed symptoms consistent with what they called a silent rape reaction. They found that persons being studied who exhibited progressive anxiety during interviews, sudden and drastic onset of phobia, paranoia and loss of self-confidence were likely to have been victims of a previous rape which they did not report.[58] Psychiatrists familiar with the syndrome can explain to jurors the symptoms and give a professional opinion that rape was the cause. Emergency room personnel, including paramedical attendants, also can describe the symptoms.[59]

There have been no appellate cases considering this evidence; however, in *State v. Mitchell*,[60] the court permitted the victim's doctor to testify that the victim had menstruated constantly since the alleged attack and to give his opinion that her condition was a result of a forcible act of intercourse. The court allowed the testimony even though two months had passed between the alleged rape and the doctor's examination. An analogous approach appears in *In re D. L. W.*,[61] a battered child case. Although the parents admitted that the child had suffered intentionally inflicted injuries, they contended that the child should remain in their custody because a babysitter had actually caused the injuries. The court admitted evidence that the parents fit a "child-abuse profile" and removed the child from the home. The Missouri Court of Appeals affirmed the decision.[62] Obviously, these two cases do not completely parallel cases seeking admission of rape trauma evidence. The instant cases both involve demonstrable physical injuries to the victim. In the battered child case, welfare of the child rather than punishment of the parents was an overriding concern. Additionally, the expert opinions in those cases were based on manifestations not commonly associated with so many other causal factors. Nevertheless, most trial courts probably would see objections to testimony about rape trauma as going only to weight and would allow the jury to consider the evidence.

Physical Condition of the Victim

Medical testimony cannot conclusively prove that a rape victim submitted under force.[63] A prosecutor most often relies on the testimony of the complaining witness corroborated by independent evidence of the victim's emotional and physical condition after the attack. Simply that the victim was injured assists the prosecution in proving that force was used. Missouri courts seem to view physical injury to the victim as the best possible inferential proof of force.[64] Missouri prosecutors seeking to introduce a victim's bloody clothing can rely on a substantial body of law allowing admission of such evidence despite objections

58. *Id.*

59. Holmstrom & Burgess, *Assessing Trauma in the Rape Victim*, 75 AM. J. NURSING 1288, 1291 (1975).

60. 339 Mo. 228, 96 S.W.2d 341 (1936).

61. 530 S.W.2d 388 (Mo. App. 1975).

62. *Id.* at 392.

63. Consent and compulsion are irrelevant if the victim is under the age of fourteen. MO. REV. STAT. §§ 566.030-.060 (1978).

64. State v. Williams, 532 S.W.2d 826 (Mo. App. 1975).

to its irrelevant and inflammatory nature. The clothing need only be relevant to any fact at issue and aid the jury in any way in arriving at a correct verdict.[65]

Testimony concerning the victim's condition after the alleged attack is unquestionably admissible in Missouri.[66] Particularly relevant are hymenial membrane lacerations and resultant bleeding which are probative of both force and penetration.[67] In *State v. Laney*,[68] a rape victim's doctor testified that his patient was bleeding from the vagina and had two broken ribs, which the prosecutrix testified were cracked by her assailant's weight. On appeal, the defense challenged the doctor's testimony as irrelevant, immaterial and highly inflammatory, arguing that the evidence was merely cumulative because there was other medical testimony tending to corroborate the rape. The Missouri Supreme Court saw no merit in the claim; it noted that even when a victim submits out of fear and offers no resistance the evidence of the victim's subsequent physical condition is still admissible because it would be admissible in a statutory rape prosecution where force is not an issue.[69] In *State v. Chandler*,[70] the defendant contended that the state failed to prove force because the prosecutrix testified that she removed her clothes voluntarily after the defendant threatened her. The defense was unable to keep out evidence that the victim had torn clothing, scratches and bruises. The Missouri Supreme Court found no error.[71]

PROOF OF PENETRATION

In Missouri, the newly revised criminal code defines sexual intercourse as "any penetration, however slight, of the female sex organ by the male sex organ, whether or not emission results."[72] Deviate sexual intercourse is "any sexual act involving the genitals of one person and the mouth, hand, tongue, or anus of another person."[73] Many Missouri cases support the majority rule that even the slightest penetration is sufficient to sustain a rape conviction. In addition, proof of penetration may be by circumstantial evidence.[74] Medical corroboration of penetration is mostly for the sake of the jury because appellate courts require very little proof of that element.

For example, in *State v. Hamilton*,[75] a statutory rape prosecution, the pro-

65. State v. Martin, 530 S.W.2d 447 (Mo. App. 1975).

66. State v. Chandler, 314 S.W.2d 897, 901 (Mo. 1958); State v. Burton, 355 Mo. 792, 198 S.W.2d 19, 21 (1946); State v. Mitchell, 339 Mo. 228, 96 S.W.2d 341, 343 (1936); State v. Parsons, 285 S.W. 412, 414 (Mo. 1926).

67. State v. Ivey, 303 S.W.2d 585 (Mo. 1957). *See* notes 72-101 *infra* and accompanying text for other forensic techniques probative of penetration.

68. 506 S.W.2d 452 (Mo. 1974).

69. *Id.* at 455, *citing* State v. Burton, 355 Mo. 792, 198 S.W.2d 19 (1946).

70. 314 S.W.2d 897 (Mo. 1958).

71. *Id.*

72. MO. REV. STAT. § 566.010(1) (1978).

73. *Id.* § 566.010(2).

74. State v. Devorss, 221 Mo. 469, 120 S.W. 75 (1909); State v. Williams, 263 Mo. 693, 173 S.W. 1051 (1915); State v. Hamilton, 304 Mo. 19, 263 S.W. 127 (1924); State v. Dayton, 535 S.W.2d 469 (Mo. App. 1976).

75. 304 Mo. 19, 263 S.W. 127 (1924).

secutrix testified only that she felt something touch her in her "private parts." The Missouri Supreme Court felt that because the defendant admitted traveling to another city with the prosecutrix, spending the night in a hotel room with her and sleeping in the same bed, the evidence was sufficient to sustain the conviction without any medical corroboration.[76] In a case involving statutory rape, an eleven-year-old prosecutrix testified on cross-examination that she could not see if it was the defendant's sex organ that touched her genitals and, in fact, could not say that there was any penetration.[77] Although medical testimony established that there was a torn hymen, a physician also testified that the tear could have been self-inflicted. Additionally, the doctor stated that the only way to conclusively determine if there had been intercourse was to detect the presence of sperm, but he found none.[78] The Missouri Supreme Court rejected defendant's argument that the testimony of the prosecutrix was insufficient in that it was totally conclusory and unsupported by medical observation.[79]

Specific Trace Evidence

Spermatozoa

Although attempts to obtain medical corroboration evidence in a rape case fail, the state can sustain a conviction on appeal in its total absence;[80] however, it is standard procedure in rape cases for the victim to undergo medical examination for the purpose of securing independent corroboration of penetration. The examination and subsequent scentific testing is directed towards identifying various substances that remain after coitus. Medical experts regard the presence of male spermatozoa as conclusive that intercourse occurred. The test is simply a visual search of smears or samples for the presence of sperm.

Passage of time can have significant effects on the spermatozoa examination. Researchers do not agree on the point after intercourse when no spermatozoa are likely to be found. Their estimates vary from three[81] to seventeen[82] days. Modern research seems to support the rule of thumb that tests conducted within twenty-four hours after intercourse are almost certain to be positive.[83] Motile (still living) and intact spermatozoa are not likely to be found after six hours.[84] Thus, within very broad limits, the results can help the prosecutor corroborate the times alleged by the victim. On the other hand, time may work against the state where there has been a delay in examination or reporting because the test

76. *Id.* at 21, 263 S.W. at 128.
77. State v. Famber, 358 Mo. 288, 291, 214 S.W.2d 40, 42 (1948).
78. *Id.* at 291, 214 S.W.2d at 41.
79. *Id.* at 294, 214 S.W.2d at 43. The court reversed and remanded on the grounds that there was error in the trial court's refusal to give an instruction on common assault.
80. State v. Baugh, 323 S.W.2d 685 (Mo. 1959).
81. Sharpe, *The Significance of Spermatozoa in Victims of Sexual Offenses*, 89 CAN. MED. A.J. 513-14 (1963).
82. Pollack, *Semen and Seminal Stains*, 35 ARCHEOLOGICAL PATHOLOGY 140 (1943).
83. *Id.* at 143.
84. Davies & Wilson, *The Persistence of Seminal Constituents in the Human Vagina*, 3 FOR. SCI. 45 (1974).

is likely to be negative more than one day later.

Because emission is not an essential element in rape, negative test results for spermatozoa are not legally fatal to the state's case. In *State v. Wynn*,[85] the victim's testimony, coupled with physical evidence tending to substantiate her account, was sufficient to sustain a conviction on appeal even though the doctor who treated the victim for her injuries performed no gynecological examination at all.[86] In a sodomy case involving prison inmates,[87] a physician who examined the victim's anal canal testified that he found no trauma or semen. However, he said this could have resulted from use of a lubricant and a later bowel movement which the victim said occurred. The doctor also testified that he found traces of a lubricant. The court affirmed the conviction.

Despite the irrelevancy of emission and the light burden in proving penetration, a negative gynecological examination for sperm often undermines the credibility of the prosecuting witness. Besides passage of time, there are other explanations. One of the most common is the presence of a vasectomized or otherwise aspermic male. That no sperm was found and that the defendant was aspermic can be a highly incriminating coincidence on the issue of identity.

Prosecutors and defense attorneys should be aware that cross contamination between the oral and anal cavities occurs rather easily.[88] When rape and anal sodomy are charged in the same case, penetration is an essential element in both acts. Where the victim is deceased or cannot testify that penetration occurred in both instances, the presence of sperm assumes greater importance. Expert testimony should include explanation of precautions taken to prevent cross contamination in taking the smears and whether or not the smears were substantially different as to the number and condition of the sperm. Otherwise, the state's prima facie case may disintegrate due to the lack of proof on which act involved penetration. Examiners can detect sperm in the mouth in oral sodomy cases, but dissipation is accelerated.[89]

Acid Phosphatase

For these reasons, most modern forensic laboratories do not totally rely on an examination for spermatozoa in substantiating penetration. Most attempt to substantiate their findings by testing for another substance called acid phosphatase. Research has demonstrated that acid phosphatase levels are 500 to 1,000 times higher in human semen than in normal body fluids or secretions.[90] This high acid phosphatase level persists in male prostatic fluid in the vaginal pool or in dried seminal stains, and most forensic experts consider it a fairly reliable

85. 357 S.W.2d 936 (Mo. 1962).
86. *Id.* at 937.
87. State v. Booker, 517 S.W.2d 937, 939 (Mo. App. 1974); *see also* State v. Nevels, 537 S.W.2d 824, 826 (Mo. App. 1976).
88. Enos & Beyer, *Spermatozoa in the Anal Canal and Rectum and in the Oral Cavity of Female Rape Victims*, 23 J. FOR. SCI. 231 (1978).
89. *Id.* at 232.
90. Gutman & Gutman, *Quantitative Relations of a Prostatic Component (Acid Phosphatase) of Human Seminal Fluid*, 28 ENDOCRINOLOGY 115, 118 (1941).

indicator of the presence of semen.[91] The test adds support to the expert's conclusions and avoids the problem of an aspermic defendant.

Testing for acid phosphatase in swabs or washings taken from the vagina of a sexual assault victim poses special interpretive problems, especially for a prosecutor needing independent corroboration to prove penetration. Research has demonstrated that low levels of acid phosphatase are normal for women who have been sexually inactive.[92] Thus, in testing for the substance, forensic personnel must take into consideration normal, endogenous levels. Most laboratories set their own thresholds according to intuition and experience.[93] Another problem is that acid phosphatase activity declines at a highly variable rate after intercourse. This makes postcoital time intervals difficult to estimate and may result in a test conclusion that the acid phosphatase presence was negative when, in fact, there has been a rapid decline after an event in which emission did occur. This false negative result is possible within as little as three hours after intercourse. The chance that a false positive test will result is less likely, but is a possibility if the victim has had consensual relations before the alleged attack and experienced a slow decline in acid phosphatase activity.[94]

It appears that Missouri's courts have accepted acid phosphatase testing without a direct challenge to its scientific validity. In a recent case, the Missouri Court of Appeals noted that an acid phosphatase test corroborated the account of an eleven-year-old oral sodomy victim.[95] The victim testified that she spit the ejaculate on the floor. Tests of the resultant stain revealed no trace of sperm but showed a high concentration of acid phosphatase. The court found this corroborative fact important because acid phosphatase is not found in saliva.[96] The defense attacked the state's sole reliance on the acid phosphatase test by suggesting that because a number of common table vegetables also contain the chemical, the saliva stain could have a false positive reaction. The state's expert admitted several times that other materials besides semen contain acid phosphatase. The defense did not use its own expert and, thus, could not challenge the empirical data.[97]

Choline

Choline is another substance found in human semen which can be a "semen marker." The test for choline is no more specific than tests for acid phosphatase, and it disappears below detectable levels much more rapidly: Negative test results are common after fourteen hours. For this reason, and

91. Davies & Wilson, *supra* note 84, at 49; Enos, Mann & Dolan, *A Laboratory Procedure for the Identification of Semen*, 39 AM. J. CLIN. PATH. 316 (1963).

92. Findley, *Quantitation of Vaginal Acid Phosphatase and the Relationship to Time of Coitus*, 68 AM. J. CLIN. PATH. 238 (1977).

93. Sensabaugh, *The Quantitative Acid Phosphatase Test: A Statistical Analysis of Endogenous and Post Coital Acid Phosphatase Levels in the Vagina*, 24 J. FOR. SCI. 346 (1979).

94. *Id.* at 346-47.

95. State v. Baughman, 565 S.W.2d 827 (Mo. App. 1978).

96. *Id.* at 828.

97. *Id.*, trial transcript at 68-86.

because the test offers no particular advantages, the procedure is not commonly used in most forensic laboratories.[98] Also, some researchers have noted wide variations in choline levels between individuals and between ejaculates from the same individuals.[99]

Semen-Specific Protein

Genetic mechanisms control synthesis, the manufacture of proteins in the human body. Thus, if examiners could identify protein in human semen, they could ascertain with more certainty the biological specificity of the substance (the difference between male and female sources). Researchers appear on the threshold of producing exactly this semen marker.[100] Proponents of this theory suggest that it promises to result in a technique of semen identification using a marker that does not dissipate in the vaginal environment as rapidly or erratically as other markers. In addition, a protein-specific semen marker may retain its detectable qualities longer in dried stains, and tests for it should be relatively simple and inexpensive.[101] The technique is not yet ready for the courtroom, however.

PROOF OF IDENTITY

Proof of the identity of the accused is essential in every criminal case. Because there may have been a previous social relationship between accused and victim, or because the defense relies on consent, the issue may never arise. More frequently, however, identity of the accused is paramount. Most of the forensic techniques used to prove identity are corroborative. Some, such as fingerprints, are highly specific. The basis of the court's acceptance of such evidence is the general premise that a criminal always leaves behind substances or impressions at the crime scene, and he always carries something away, no matter how minute that evidence might be.[102]

As to corroboration in general, the rule in Missouri is that the victim's uncorroborated testimony will sustain a rape conviction unless the testimony is contradictory or, when applied to the admitted facts, is unconvincing.[103] In some cases the victim may not be able to say for sure that the defendant was the person who raped her, but imaginative forensic techniques can compensate for this deficiency.

98. Davies & Wilson, *supra* note 84, at 56.

99. Forbes, *The Scope and Fallacies of the Florence Reaction for Seminal Stains*, 13 POLICE J. 162 (1940).

100. Sensabaugh, *Isolation and Characterization of a Semen-Specific Protein from Human Seminal Plasma: A Potential New Marker for Semen Identification*, 23 J. FOR. SCI. 106 (1978).

101. *Id.*

102. *See generally* A. SVENSSON & O. WENDEL, TECHNIQUES OF CRIME SCENE INVESTIGATION (Am.Ed. 1965) [hereinafter cited as SVENSSON & WENDEL].

103. State v. Quinn, 405 S.W.2d 895, 897 (Mo. 1966). There is no absolute requirement of corroboration in statutory rape cases where the same rule applies. State v. Burton, 355 Mo. 792, 198 S.W.2d 19, 20 (1946); State v. Wood, 355 Mo. 1008, 1012, 199 S.W.2d 396, 398 (1947).

Specific Trace Substances

Blood

Although courts usually accept evidence of the presence of blood as proof of the manner in which a crime was committed, they are more reluctant to accept it when offered to corroborate the identity of the perpetrator, usually by means of blood typing. In the late 1800's, Karl Landsteiner first identified three blood groups, labeling them A, B and O. Other researchers discovered a fourth group designated AB, the rarest, soon thereafter. Blood typing, now commonly known as the Landsteiner-Berstein classification, divides the blood types of all humans into these four groups: Type A includes forty-one percent of the population; B, ten percent; AB, about four percent; and O, the remaining forty-five percent. Because blood types are inherited, the laws of heredity can exclude a given individual as a blood source but cannot affirmatively include anyone; they can only establish that the individual is a possible source.[104]

Paternity is rarely an issue in any criminal case except statutory rape and nonsupport prosecutions:[105] Modern post-attack treatment usually endeavors to prevent pregnancy from criminal attack. The general rule in paternity cases is that blood tests are admissible to disprove paternity but not to prove that a particular man is the father. Missouri follows this rule but did not accept the validity of blood grouping in paternity cases until 1972.[106]

Science is on the threshold of being able to "fingerprint" an individual by his blood.[107] This is because further serological research has added so many more identifiable blood characteristics that a group of possible sources can be narrowed to one individual. Scientists discovered the first of these additional blood characteristics in 1955 when they found two human genes which control three genotypes[108] called haptoglobins (Hp).[109] Most genotypes and their combinations are fairly common, ranging from 1.8% for the rarest Hp type to 30.9% for the most common.[110] Courts have accepted haptoglobin types in paternity proceedings in England because experts were able to show that the Hp system could exclude paternity.[111] Phosphoglucomutase (PGM) is an enzyme found in most human cells, including red blood cells. Two human genes combine to form the

104. L. Sussman, Blood Grouping Tests 1-24 (1962). A system similar to the ABO classification uses human blood to produce a serum which is mixed with another serum made from animal blood. The reaction produces groups labeled M and N. *Id.* at 8. Another system, known as the Rh classification, identifies a blood factor found in 85% of the Caucasion population. *Id.* at 9.

105. Nevertheless, at least two states have specifically ruled that evidence of a subsequent pregnancy is admissible as proof in a rape prosecution. *See* People v. Schober, 204 Cal. App. 2d 459, 22 Cal. Rptr. 318 (1962); Martin v. Commonwealth, 476 S.W.2d 834 (Ky. 1972).

106. State v. Summers, 489 S.W.2d 225 (Mo. App. 1972). The tests had been earlier rejected in Rasco v. Rasco, 447 S.W.2d 10 (Mo. App. 1969). *See also* State v. Damm, 64 S.D. 309, 266 N.W. 667, (1936); 2 Am. Jur. Proof of Facts *Blood Tests* 608 (1976).

107. E. Beuther, Hereditary Disorders of Erythocite Metabolism (1968).

108. Groups of individuals having the same genetic makeup or patterns.

109. Smithies, *Zone Electrophoresis in Starch Gels: Group Variations in the Serum Proteins of Normal Human Adults*, 61 Biochem. J. 629 (1955).

110. Javid, *Human Serum Haptoglobins: A Brief Review*, 4 Seminars in Hematology 44 (1966).

111. Stocker v. Stocker, 1 W.L.R. 190, 2 All E.R. 147 (1966).

three PGM genotypes which have a population frequency of approximately 54.8, 38.5 and 6.8% respectively.[112]

As early as the late 1960s scientists were willing to say that because the various elements forming the genotypes occur independently of each other, individuals may possess a large number of different combinations. Thus, researchers may be able to identify a person by his potentially unique combination—if they can identify enough of the various genotypes. A listing of each person's individual and independent blood characteristics would be a genetic "fingerprint" determinable through blood (or in some cases, tissue) analysis.[113] Research is at the point where experts are urging the courts to accept procedures that combine various tissue tests with ABO and haptoglobin typing. Experts say these procedures can determine paternity with ninety-five to ninety-nine percent accuracy for any individual.[114] Not all of these tests can be applied to a simple blood stain, but prosecutors who rely heavily on serological evidence should be aware that additional blood testing can provide probative identification evidence.

Although the battle over admissibility of blood typing evidence in Missouri paternity cases lasted until 1972,[115] it was always admissible as inferential proof in criminal cases to show that the accused was connected with the crime. The state may introduce the defendant's blood-stained clothing, show that the blood is the same type as the victim's and then prove that the defendant's blood type is different.[116] The state also may show that blood found at a crime scene in the defendant's residence was the same type as the victim's.[117] Attorneys usually do not argue on appeal that a large group of the population has the same blood type;[118] apparently no one in Missouri has challenged the reliability of blood grouping evidence except in paternity actions.

Semen Typing

Blood tests are particularly relevant in sex offense cases because analysts are able to determine the blood type of eighty percent of the population because of a substance secreted in body fluids such as semen.[119] Forensic experts call the eighty percent who have this inherited trait "secretors."[120] Missouri has not accepted secretor analysis using human semen, probably because law enforcement laboratories do not routinely use it. The Regional Crime Laboratory in Independence, Missouri does not perform semen typing unless officials specifically request them to do so, although it has that capability.[121] It is possible to

112. Beckman, *Isozyme Variations in Man*, 1 Monographs in Human Genetics 60 (1966).

113. E. Beuther, *supra* note 107, at 19.

114. Terasaki, Benoco, Givertson, Mickey & Purdue, *Ninety-Five Percent Probability with HLA, ABO and Haptoglobins*, 12 For. Sci. Int'l 227 (1978).

115. State v. Summers, 489 S.W.2d 225 (Mo. App 1972).

116. State v. Stevens, 467 S.W.2d 10, 14 (Mo.), *cert. denied*, 404 U.S. 994 (1971).

117. State v. Dayton, 535 S.W.2d 479 (Mo. App. 1976).

118. State v. Thomas, 548 S.W.2d 574 (Mo. App. 1975).

119. L. Sussman, Blood Grouping Tests: Medicolegal Uses (1968).

120. *Id.*

121. Interview with Gary M. Howell, Director of the Missouri Regional Crime Laboratory, in Independence, Missouri (March 24, 1979).

perform the testing on semen samples taken from the human body as well as from recently dried stains.[122]

Texas[123] and Louisiana[124] have accepted secretor analysis. In a Texas case, an investigating officer originally thought there was only one actor in a rape-murder. The possibility of a second offender arose when the officer learned of an alleged conversation between the defendant and a cellmate. Analysts performed blood grouping tests on vaginal pool specimens taken at the autopsy, and they confirmed that at least two men, each with different blood types, had intercourse with the deceased. The postarrest statement was admitted against the defendant at trial. Challenged on appeal, the court ruled that the statement was admissible on the grounds that it led to the discovery of other evidence and therefore was incriminating and qualified as an admission against interest.[125] However, in *People v. Robinson*,[126] a New York court rejected secretor analysis on the grounds that the evidence of blood types in a criminal case was improper because the ABO classification groups are common to large segments of the general population.[127] Oddly, the court did not discuss whether blood typing could be performed using semen. In a recent Missouri case, *State v. Foster*,[128] the Missouri Court of Appeals simply assumed that blood typing was not possible from semen samples. The state used the presence of seminal stains on the defendant's underpants worn at the time of the rape as corroborative evidence. On appeal, the defense objected on the grounds that experts could not link the stains to stains on the victim's garments nor could they determine how long the stains had been on the defendant's clothing. In allowing the evidence because it tended to prove the state's case and was corroborative of other evidence given by the prosecutrix, the court noted that "blood can be identified by type and semen cannot, yet an analogy can be drawn between the two insofar as the relevancy of the evidence is concerned."[129] Although this 1973 case does not say that semen typing is scientifically valid, the obvious implication of its language is that "secretor" evidence will be admissible.

Hair

Hair is a common item of trace evidence in sex offense cases. Investigators routinely find it at crime scenes and while examining victims. Experts examine hair samples with a microscope to determine the hair's size, shape, color and the scale patterns on its surface. For many years, forensic experts have been able to testify only that a given sample falls within a range of variance for these characteristics and that the sample may have come from the defendant. A foreign hair found on a person is probative of contact with someone else, but no

122. SVENSSON & WENDEL, *supra* note 102, at 139-43.
123. McGilvery v. State, 533 S.W.2d 24 (Tex. Crim. App. 1976).
124. State v. Alexander, 339 So.2d 818 (La. 1976).
125. McGilvery v. State, 533 S.W.2d 24 (Tex. Crim App. 1976).
126. 27 N.Y.2d 864, 265 N.E.2d 543, 317 N.Y.S.2d 19 (1970).
127. *Id.*
128. 490 S.W.2d 662, 664 (Mo. App. 1973).
129. *Id.*

expert can testify on the basis of visual examination alone that the source was one individual to the exclusion of all others. Human hair is easily distinguishable from animal hair, and examiners can often identify the species of animal.[130] They also can determine the sex of the person from whom the hair came although this requires that the epithelial root sheath be intact;[131] however, some very recent research indicates that sex determination of human hair may be possible using only a small segment.[132]

Scientists have been able for some time to identify substances with great precision using neutron-activation analysis. The material to be identified is first made radioactive so that it emits gamma rays. The tester then exposes the radioactive material to a crystal, and every time a gamma ray strikes the crystal it produces a flash of light which is converted into an electrical impulse of measurable voltage. A measuring device, a multichannel differential analyzer, sorts out the electrical impulses into groups and creates a graph or chart of them. The graph portrays the kind and amounts of basic chemical elements in the tested samples.[133]

Because neutron-activation analysis is so expensive, prosecutors have not been able to turn to it in many cases. For this reason, admissibility of hair comparison evidence has followed a dual course, depending on whether the state elected to employ the more costly neutron-activation test or to rely on the simpler, but less specific, "range of variance" testimony from experts. One line of Missouri cases joins the majority of states[134] in admitting hair comparison evidence.[135] Missouri courts also have allowed neutron-activation analysis; however, there has been no challenge of the scientific validity of the underlying theory. In *State v. Stevens*,[136] an expert testified neutron-activation analysis showed that two hairs found on the defendant's gloves had two sources, the accused and the homicide victim.[137] The defense unsuccessfully attacked the expert's qualifications and proper performance of the test, but did not attempt to show that such precise identity evidence is impossible with neutron-activation analysis. Nevertheless, the court commented that there seemed to be sufficient scientific acceptance of the theory to warrant its admissibility.[138]

A Canadian study further confirms that neutron-activation identification is reliable. Canadian scientists used the technique to identify and quantify nine major components in hair samples taken within one year of each other and

130. SVENSSON & WENDEL, *supra* note 102, at 139-43.
131. Nagamori, *Sex Determination from Plucked Human Hairs Without Epithelial Root Sheath*, 12 FOR. SCI. INT'L 167 (1978).
132. *Id.*
133. *See* 15 AM. JUR. PROOF OF FACTS *Neutron Activation Analysis* § 1 (1976).
134. *See* State v. Wilson, 217 La. 470, 46 So. 2d 738, *aff'd*, 341 U.S. 901 (1951).
135. State v. Dayton, 535 S.W.2d 479, 483 (Mo. App. 1976) (victim's hair found in defendant's apartment, challenged on search and seizure grounds); State v. Yowell, 513 S.W.2d 397, 401 (Mo. 1974) (challenged on search and seizure grounds, victim's hair found in defendant's car).
136. 467 S.W.2d 10 (Mo.), *cert. denied*, 404 U.S. 994 (1971).
137. *Id.* at 22.
138. *Id.* at 23, *citing* 15 AM. JUR. PROOF OF FACTS 16 (Supp. 1970) (numerous cases admitting neutron-activation analysis collected).

concluded that only one person in 100,000,000 would have comparable amounts of the same elements. In all, scientists have identified eighteen components common to human hair; based on a comparison of eleven of them, the odds against two persons having comparable amounts rises to one in 1,140,000,000.[139] This kind of evidence is probably as conclusive as fingerprints, but unlike fingerprint identification, has not had time to compile a long history of acceptance in the courts. The procedure's great expense has slowed judicial acceptance.

Fingerprints

Fingerprints are judicially recognized as the best known means of identification.[140] They are likely to be used to prove identity in any kind of prosecution, and law enforcement is geared to recover and use them as evidence. In sex offenses, however, there is a special possibility that merits mention. Investigators find fingerprints most often on firm, nonporous surfaces. Technicians looking for latent prints, those invisible until chemically made to appear, tend to restrict themselves to these areas.[141] Every prosecutor dealing with sex offense cases should encourage his investigators to be on the lookout for fingerprints or palm prints on the victim's body.[142] The difficulty with recovering latent fingerprints from human skin is that many of the chemicals used to develop them are either toxic to the skin or react unfavorably with natural moisture on the skin's surface. However, a process called iodine-silver plate transfer seems to avoid these difficulties the most efficiently.[143] Unless prosecutors encourage police to obtain fingerprints from the victim's body, important evidence will be quickly lost through contact with clothing or washing. Homicide cases are particularly appropriate for seeking latent prints because destruction is less likely.

Bite Marks

Although probably uncommon, it is possible that a rape victim suffered a bite during the attack and her skin will bear the unmistakable imprint of the assailant's teeth.[144] Analysts can identify bite marks by comparing them to individual characteristics of the suspect-accused's teeth and mouth. Dental records or sample impressions taken from the defendant for the purpose will reveal these characteristics.[145]

139. Perkons & Jervis, *The Significance of Data from Forensic Activation Analysis*, Presented at 16th Annual Meeting of American Academy of Forensic Science, Chicago, Ill., Feb. 1964; Kerr, *The Application of Neutron Activation Analysis to Forensic Science*, 21 ROYAL CAN. MOUNTED POLICE GAZ. 13, 15 (1959).

140. Stevenson v. United States, 380 F.2d 590 (D.C. Cir.), *cert. denied*, 389 U.S. 362 (1967); *see also* State v. Hampton, 275 S.W.2d 356 (Mo. 1955); State v. Varner, 329 S.W.2d 623 (Mo. 1959).

141. SVENSSON & WENDEL, *supra* note 102, at 39.

142. Reichardt, Catt & Stone, *A Conventional Method for Lifting Fingerprints from Human Skin*, 23 J. FOR. SCI. 135 (1978).

143. Adcock, *The Development of Latent Fingerprints on Human Skin: The Iodine Silver Plate Transfer Method*, 22 J. FOR. SCI. 599 (1977).

144. Butler, *The Value of Bite Mark Evidence*, 1 INT'L J. FOR. DENT. 23 (1973).

145. Furness, *A New Method of Identification of Teethmarks in Cases of Assault and Homicide*, 24 BRIT. DENT. J. 261 (1968).

Missouri appellate courts have not ruled on the admissibility of bite mark identification. There is little authority generally on the subject; but what there is favors admissibility. In a California case, *People v. Marx*,[146] three dentists testified that they compared the unique characteristics in the defendant's mouth and teeth with a bite mark on the murder victim's nose and concluded that the bite came from the accused's teeth. The appellate court sustained the conviction. In a Texas murder prosecution admission of bite mark evidence was held to be proper in the face of a direct challenge to the evidence's scientific validity.[147] Because teeth impressions in living flesh lose detail quickly as the tissue recovers its original shape, investigators usually use bite mark identification only in homicide cases. This is also true of bite marks consisting of bruises because the bruise quickly begins to diffuse in a living victim. Officers also can recover bite evidence from food or other materials found at the crime scene.[148]

Miscellanea

Modern medical treatment of rape victims includes measures to prevent venereal disease.[149] Should either victim or assailant transmit a venereal infection during the attack, however, it can be used to corroborate the identity of the defendant. Missouri courts so hold.[150]

Given even a small sample of dried blood, forensic experts can determine the allergies of the source.[151] This can help differentiate between stains from different donors even though they have the same blood type. It also provides data on the clinical history of the suspect. In some cases, the information further distinguishes between individuals because some allergy antibodies are confined largely to certain populations.[152]

INVESTIGATIVE AIDS

Hypnosis

Police agencies are becoming more receptive to hypnosis as an investigative tool.[153] It is frequently appropriate in sex offense cases because anxiety often

146. 54 Cal. App. 3d 100, 126 Cal. Rptr. 350 (1975).

147. Patterson v. State, 509 S.W.2d 857 (Tex. Crim. App. 1974).

148. Butler, *supra* note 144, at 26.

149. State v. Newcomb, 220 Mo. 54, 119 S.W. 405 (1909). The treating physician should not be asked to detail all that he did in treating the rape victim since his procedures will usually include an injection to ward off venereal disease and an examination for signs of pregnancy. Mention of either factor can imply that the accused was infected or that the victim was previously unchaste; however, if the physician should mention these procedures the evidence is irrelevant and counsel can explain it away as merely routine medical procedures, thus avoiding error. State v. Yowell, 513 S.W.2d 397, 402 (Mo. 1974).

150. State v. Newcomb, 220 Mo. 54, 119 S.W.405, 409 (1909).

151. Werriett & King, *Antibody Profiling of Blood Stains*, 8 FOR. SCI. 151 (1976).

152. Werriett & King, *Application of Allergy Diagnosis in Forensic Serology*, 22 J. FOR. SCI. 763, 769 (1977).

153. Conversations with eight investigative supervisors of police agencies in the Kansas City, Missouri metropolitan area in March 1979, revealed that their detectives had been involved in cases where hypnosis was used at least once in the previous two years.

interferes with a victim's recall. The purpose of hypnosis in police investigations is to calm and relax the witness who otherwise does not have detailed recall.[154] Psychiatrists and psychologists usually perform the hypnosis,[155] but laymen and police officers can qualify in its use after training.[156]

Hypnosis places the subject in a relaxed setting and then encourages an exclusive focus of attention, usually the practitioner's verbal images; eventually, mental fatigue from the increased concentration produces a relaxed, passive state in which the hypnotist takes control. When the recall of certain events is painful, the practitioner calms and reassures the subject and sometimes shifts his perception to that of an uninvolved, unthreatened observer. The goal is enhanced recall through elimination of distractions and emotional defense mechanisms.[157]

Missouri appellate courts have not directly considered whether to accept testimony originally obtained under hypnosis; however, a case tried in the circuit court of Jackson County, Missouri, considered the issue.[158] The case involved charges of rape, sodomy, kidnapping and armed criminal action. A police psychologist placed the victims, two teen-age girls, under hypnosis and asked them to detail the events and the physical description of their attackers. During the hypnosis a police artist drew a sketch of one suspect from the girls' description. At a pretrial hearing the psychologist testified that he carefully restricted his questions to a nonsuggestive form such as "What do you see?" and "Describe what you are seeing." He also testified, however, that persons under hypnosis are more susceptible to suggestive conversation. Police officers also testified that they discussed with the girls everything they said during hypnosis. The girls testified that they were not in a "trance" and remembered completely everything that had taken place. They said that they believed their recall of details improved only slightly. The defense moved to exclude testimony about all facts the girls recalled under hypnosis, especially those facts which were later repeated to the girls, on the theory that the girls should testify only from their "natural memories." The defense also sought to suppress the artist's drawing as similarly tainted. The trial court overruled the motion[159] and the defendant relied on an alibi defense. The jury found him guilty on all counts.[160] The court denied the defendant's motion for a new trial which again raised the hypnosis issue. The defendant filed notice of appeal.[161]

154. H. ARONS, HYPNOSIS IN CRIMINAL INVESTIGATION (1967).

155. The Kansas City, Missouri Police Department retains Dr. Marshall Saper, a practicing psychologist, for this purpose.

156. Detective William Cronley, Kansas City, Missouri Police Department, on occasion uses hypnosis himself. He is also the department artist.

157. A. WEITZENHOFFER, GENERAL TECHNIQUES OF HYPNOTISM (1957); J. BRAMWELL, HYPNOTISM, ITS HISTORY, PRACTICE AND THEORY (1913).

158. State v. Greer, No. CR 78-1399, Div. 18, Cir. Ct., Sixteenth Judicial District, Jackson County, Missouri, Lombardo, J., (tried June 4-7, 1979).

159. *Id.* June 4, 1979.

160. *Id.* June 7, 1979.

161. *Id.* July 13, 1979. Afterwards, the trial judge expressed some misgivings about his ruling and was particularly alarmed that persons other than the psychologist had been present during hypnosis but did not testify. He was concerned that they may have suggested some facts to the witnesses and yet were not called to explain. Conversation with Judge Louis Lombardo, Division 18, Circuit Court, Sixteenth Judicial District, Jackson County, Missouri (Aug. 10, 1979).

Generally, prosecutors should be aware that hypnosis and a closely related field, narcoanalysis (questioning while under the influence of "truth" drugs), are not well received by the courts. Hypnosis as a means of extracting truthful statements is inadmissible in at least two states.[162] Confessions are unconstitutional if drugs[163] or hypnosis[164] override the defendant's will. Some courts apparently have found statements made under hypnosis to be unreliable. In an older Missouri case involving the defendant's right to use favorable lie detector results in his own behalf, the Missouri Supreme Court commented in dicta that both lie detectors and hypnosis are likely to result in untrustworthy evidence;[165] most medical authorities would agree.[166] A hypnosis subject is not only more susceptible to suggestion, but also retains the ability to lie or misconstrue facts.[167] The existence of hypnosis as a demonstrable phenomena of the human mind is not open to much question, but its use in criminal cases must be carefully restricted and upon direct challenge is usually disfavored by the courts.

Polygraphs

Of all scientific techniques used in law enforcement, the polygraph (lie detector) has perhaps evoked the most judicial disapproval. However, police still routinely use it to extract confessions and test witnesses. The polygraph is a machine strapped to the subject to record minute changes in his pulse rate, perspiration and blood pressure. The operator, by interpreting graphs of these factors recorded as the subject responded to his questions, judges whether or not the subject attempted to deceive.[168] Champions of the procedure estimate that when interrogators use it under ideal conditions with the best-trained operators, it still will have an error probability of about five percent caused by psychological and physiological impairment of the test subjects.[169] These same proponents readily admit that many polygraph operators do not possess even the basic qualifications to function effectively, especially since the accuracy of the testing depends heavily on their experience and training.[170] Polygraph results are inad-

162. People v. Hiser, 267 Cal. App. 2d 47, 72 Cal. Rptr. 906 (1968); State v. Pusch, 77 N.D. 860, 46 N.W.2d 508 (1950).

163. Townsend v. Sain, 372 U.S. 293 (1963).

164. Leyra v. Denno, 347 U.S. 556 (1954).

165. State v. Cole, 354 Mo. 181, 188 S.W.2d 43 (1945).

166. Comment, *Hypnotism, Suggestibility and the Law*, 31 NEB. L. REV. 575 (1972).

167. Herman, *Hypno-Induced Statements*, 25 OHIO ST. L. J. 1, 26-29 (1964).

168. J. REID & F. INBAU, TRUTH AND DECEPTION 3-26 (1966). Note that all the constitutional rules against involuntary self-incrimination apply to polygraph examinations. *See* Miranda v. Arizona, 383 U.S. 436 (1966); Harris v. State, 208 So. 2d 108 (Fla. App. 1968) (right to counsel at the test); United States *ex rel.* Szocki v. Cavell, 156 F. Supp. 79 (W.D. Pa. 1957) (state suppression of results); People v. Hines, 87 Ill. App. 2d 283, 232 N.E.2d 111 (1967) (comment on defendant's refusal to take the test during trial).

169. J. REID & F. INBAU, *supra* note 168, at 234.

170. *Id.* at 235.

missible by either side in nearly every state including Missouri except by stipulation of the parties in advance.[171] The Missouri Supreme Court in 1945, in *State v. Cole*,[172] explained its reluctance to allow lie detector evidence. The court felt that the scientific theory underlying the test was not sound. It also expressed fear that an expert's explanation of his graphs might confuse a jury with irrelevant material because operators use questions unrelated to the crime as control questions.[173] It is also undoubtedly true that courts will never easily give over to science their historical function of evaluating the credibility of witnesses. Prosecutors should be aware that even a victim who "flunks the box" may still be telling the truth.

CONCLUSION

A prosecutor's job begins with the first report by the victim. Initially his role is to help the police avoid legal mistakes and to promote a thorough gathering of the evidence. Even though the lawyer knows that the uncorroborated testimony of the victim is enough to make a submissible case unless particularly weak or contradictory,[174] he should preserve and use every scrap of corroborative testimony. Statistical studies, both national and local, show a substantial relationship between the use of scientific evidence and higher conviction rates.[175] Not every procedure discussed in this Comment is ready for the courtroom, and certainly not every case is appropriate for the use of all the methods available. However, prosecutors should survey all the possibilities in each case. To do this each prosecutor must have at least a general knowledge of the potential and capabilities of forensic science in each area. Conversely, defense attorneys should be cognizant that objective means are often available to assist them in preventing injustice. An attorney's duty goes beyond merely using all that is available. It also requires that he keep abreast of research so he can present new forms of evidence to the courts in a fashion that expands the body of valid scientific evidence available while avoiding scientific chicanery. The public has the right to expect that in each and every case the legal profession will fulfill this responsibility.

William R. Rapps

---

171. *Id.* at 243 (cases collected). In Missouri, by stipulation of both parties, polygraph evidence is admissible in a criminal trial. State v. Fields, 434 S.W.2d 507 (Mo. 1968).

172. 354 Mo. 181, 188 S.W.2d 43, 47 (1945). *See also* State v. Weindorf, 361 S.W.2d 806 (Mo. 1962); State v. Jacks, 525 S.W.2d 431, 434 (Mo. App. 1975).

173. 188 S.W.2d at 48.

174. State v. Edwards, 476 S.W.2d 556 (Mo. 1972).

175. NAT'L INST. L. ENFORC. & CRIM. JUST., L. ENFORC. ASST. AD., U.S. DEP'T JUST., FORCIBLE RAPE: FINAL PROJECT REPORT 46 (1978); Weninger, *Factors Affecting the Prosecution of Rape: A Case Study of Travis County, Texas*, 64 VA. L. REV. 357, 360-62 (1978).

uidation under these circumstances simply would mark the end of corporate existence but cannot be undertaken without the filing of untrue articles of liquidation under the existing Missouri statutes. While it is unlikely that a court would impose liability on officers, directors or shareholders in such circumstances, consideration should be given to amending the liquidation statutes to require certification either that (i) all debts have been paid or (ii) no assets remain for the payment of debts, and no assets will be distributed to shareholders in connection with the liquidation.[280] Unless such a change is made, insolvent Missouri corporations should not attempt voluntary dissolution but should allow the state to wield the death blow by forfeiture of the charter for failure to file an annual registration report or franchise tax return.[281]

CONCLUSION

The recent cases show continuing problems in the area of corporate formation and existence, apparently due in large part to the gap between the practicalities of day-to-day business operations and the frequently artificial formalities attending ownership of the business in the corporate mold. For this reason, continued litigation involving issues of corporate formation and existence can be anticipated.

Significant cases dealing with the traditional problems of duty of care and duty of loyalty of directors are noticeably absent from the recent Missouri developments. The well-entrenched business judgment rule may account for fewer duty-of-care disputes. Questions of duty of loyalty of directors frequently could be raised in litigation between minority and majority shareholders, but the tendency, at least with respect to closely held corporations, is to address such disputes in terms of the majority's fiduciary duty to the minority. Litigation involving shareholder disputes can be expected to predominate in the corporate area until clearer guidelines as to the obligations of majority shareholders to their corporation and minority owners have evolved.

280. The Delaware statutes apparently allow voluntary liquidation of insolvent corporations because the dissolution procedures make no mention of paying or making provision for liabilities prior to dissolution, and the certificate of consent filed with the secretary of state need not include any statements regarding payment of liabilities. DEL. CODE ANN. tit. 8, § 275 (1975). The Model Act, like Missouri, requires that liabilities be paid or provided for. ABA-ALI MODEL BUS. CORP. ACT §§ 87, 92 (1969).

281. A second, but obviously more expensive, alternative would be liquidation by a court of equity under MO. REV. STAT. § 351.485 (1978). In such a proceeding, the court may enter a decree of dissolution even though corporate assets are insufficient to satisfy all liabilities. MO. REV. STAT. § 351.510 (1978).

Recent Developments in Missouri: Criminal Law (The Sixth Amendment)*

Robert Popper**

INTRODUCTION

My original intent was to offer a panoramic presentation of last year's developments in Missouri criminal procedure. However, it became apparent that with that scope even selective treatment of issues and decisions would result in an inappropriate bulk for one article.[1] To allow for suitable analysis rather

* The author wishes to express his appreciation for the research assistance provided by Steve Nichols, a third-year student at the University of Missouri-Kansas City.

** Professor of Law, University of Missouri-Kansas City, member of the New York and Missouri Bars. B.S. 1953, LL.B. 1956, Harvard University; LL.M. (in Criminal Law and Jurisprudence) 1962, New York University.

1. Significant recent decisions include those relating to:

A. The fourth amendment: United States v. Bloomfield, 594 F.2d 1200 (8th Cir. 1979) (search of closed knapsack in car); State v. Valentine, 584 S.W.2d 92 (Mo. 1979) (search of car, inventory); State v. Epperson, 571 S.W.2d 260 (Mo. 1978) (emergency justifying warrantless entry and search); State v. Olds, 569 S.W.2d 745 (Mo. 1978) (statement not tainted with illegal arrest, waiver of right to silence); State v. Branstuder, 583 S.W.2d 187 (Mo. App., W.D. 1979) (statement not fruit of illegal arrest); State v. Pinegar, 583 S.W.2d 217 (Mo. App., W.D. 1979) (search of footlocker, consent); State v. Peterson, 583 S.W.2d 277 (Mo. App., W.D. 1979) (search of car, inventory); State v. Conti, 573 S.W.2d 95 (Mo. App., D.K.C. 1978) (search of canvas bag incident to arrest); State v. Rogers, 573 S.W.2d 710 (Mo. App., D.K.C. 1978) (emergency justifying warrantless entry and search, standing); State v. Abbott, 571 S.W.2d 809 (Mo. App., D. Spr. 1978) (consent to search, probable cause to arrest); State v. Csolak, 571 S.W.2d 118 (Mo. App., D. St. L. 1978) (consent to search, standing).

B. The fifth amendment: Sours v. State, 593 S.W.2d 208 (Mo. 1980), *vacated*, 48 U.S.L.W. 3761 (U.S. May 27, 1980) (No. 79-1565) (double jeopardy prohibits conviction for armed criminal action and for the felony [robbery first degree by means of a dangerous and deadly weapon] in which the armed action occurred); State v. Morgan, 592 S.W.2d 796 (Mo. 1980) (double jeopardy prohibits conviction for felony murder and for the underlying felony); State v. Ford, 585 S.W.2d 472 (Mo. 1979) (videotaped confession admissible); State v. Wright, 582 S.W.2d 275 (Mo. 1979) (error when witness called by prosecutor claimed right to remain silent as witness had done at previous trial); State v. Lindsey, 578 S.W.2d 903 (Mo. 1979) (prosecutor's reference to defendant's failure to testify); State v. Basham, 568 S.W.2d 518 (Mo. 1978) (double jeopardy—retrial precluded after appellate reversal for insufficient evidence) (*accord*, State v. Inman, 578 S.W.2d 336 (Mo. App. W.D. 1979); State v. Dittman, 569 S.W.2d 363 (Mo. App., D. Spr. 1978)); State v. Reed, 583 S.W.2d 531 (Mo. App., E.D. 1979) (prosecutor's reference to defendant's failure to testify); State v. Terry, 582 S.W.2d 337 (Mo. App., W.D. 1979) (mistrial not required by prosecutor's comments on defendant's failure to testify); State v. Blevins, 581 S.W.2d 449 (Mo. App., E.D. 1979) (waiver of right to remain silent and right to counsel); State v. Norris, 577 S.W.2d 941 (Mo. App., S.D. 1979) (defendant entitled to try on shoe at trial without being sworn); State v. Jones, 575 S.W.2d 899 (Mo. App., D.K.C. 1978) (witness claiming right to remain silent need not explain reason for relying on right); State v. Davis, 573 S.W.2d 114 (Mo. App., D.K.C. 1978) (reference to defendant's failure to testify); State v. Givan, 573 S.W.2d 104 (Mo. App., D.K.C. 1978) (testimony

than a mere listing of significant holdings, this discussion is restricted to matters relevant to one important, multifaceted amendment—the sixth.[2] This article, therefore, will focus on recent Missouri case law pertaining to rights guaranteed under the sixth amendment of the United States Constitution and on applicable decisions of the United States Supreme Court and the United States Court of Appeals for the Eighth Circuit.

Despite my choice of this more limited scope, some other extraordinary recent developments must be noted. The event having the greatest impact on Missouri criminal procedure during 1979 occurred on January 1 when the new criminal code became effective.[3] Although the code is largely substantive in nature, it touches so intimately on procedural aspects that it warrants this initial recognition.[4] In addition, its adoption spawned subsidiary changes such as new Missouri Approved Instructions in criminal cases[5] and Missouri Approved Charges—Criminal.[6] Preliminary mention also should be made that the Supreme Court of Missouri ordered a large scale revision of its rules pertaining to criminal matters.[7]

INEFFECTIVE ASSISTANCE OF COUNSEL

The claim that a conviction was obtained in violation of the accused's

as to defendant's post-arrest silence requires reversal); State v. Bronaugh, 571 S.W.2d 788 (Mo. App., D. St. L. 1978) (prosecutor's statements were not a reference to defendant's failure to testify); State v. Ward, 571 S.W.2d 773 (Mo. App., D. St. L. 1978) (trial comment on defendant's silence after arrest requires reversal); State v. Lawrence, 569 S.W.2d 263 (Mo. App., D. St. L. 1978) (comment on defendant's silence); State v. Peebles, 569 S.W.2d 1 (Mo. App., D. St. L. 1978) (defendant's silence testified to—no error as defendant not in custody for that charge).

C. Fourteenth amendment due process: (i) eye-witness identification: State v. Carter, 571 S.W.2d 779 (Mo. App., D. St. L. 1978); State v. Dickerson, 568 S.W.2d 559 (Mo. App., D. St. L. 1978); Simms v. State, 568 S.W.2d 801 (Mo. App., D. St. L. 1978); (ii) entry of plea and plea bargaining: McMahon v. State, 569 S.W.2d 753 (Mo. 1978); Schellert v. State, 569 S.W.2d 735 (Mo. 1978); (iii) probation revocation: Abel v. Wyrick, 574 S.W.2d 411 (Mo. 1978).

2. The sixth amendment provides:

> In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the assistance of counsel for his defence.

U.S. CONST. amend. VI.

3. MO. REV. STAT. §§ 556-578 (1978) (amended 1979).

4. *See, e.g.*, MO. REV. STAT. §§ 556.051-.056 (rules governing burden of proof); 557.011-558.031, 560.011-561.026, 565.006-.016 (sentencing and punishment); 559.012-.036 (probation); 562.066 (entrapment) (1978) (amended 1979). For a discussion of the new criminal code, see *Symposium—Proposed Missouri Criminal Code*, 38 Mo. L. REV. 361 (1973); Legislative Note, *Criminal Law—Sentencing Provisions in the New Missouri Code*, 43 Mo. L. REV. 549 (1978); Comment, *Accomplice Liability Under the 1979 Missouri Criminal Code*, 44 Mo. L. REV. 233 (1979).

5. *See* MO. SUP. CT. R. 28.01-.03.

6. *See id.* 23.01(e).

7. 580 S.W.2d xxi-cxxxiv (Mo. 1979) (Mo. cases ed.).

right to the effective assistance of counsel, and therefore in violation of the sixth amendment of the United States Constitution, has been of increasing importance to both criminal defendants and their attorneys. The visibility and difficulty of the criminal defense counsel's work, combined with the desperate strait of the convicted client, make the lawyer an attractive target. Moreover, the claim is a way of federalizing the defects in the state proceeding so that barriers to the availability of federal habeas corpus are overcome.[8] It is not surprising then that the pressing of this type of claim is not unusual. As one court recently lamented: "It has become almost commonplace in post conviction proceedings to attack the conduct of defense attorneys . . . ."[9]

The examination of the theory underlying the issue of ineffective counsel provides only limited understanding of the problems involved. The precedential value of a particular decision is likely to rest heavily upon the factual underpinning for the case. But while each case only can be appreciated after careful study of its factual context, there are basic concepts which have become so essential to the ineffectiveness claim that they are worth exploring. Like the federal courts,[10] Missouri has struggled with the issue for years. As late as 1970, the Missouri Supreme Court stated that the standard used to measure the effectiveness of counsel was "whether . . . [the lawyer's] actions or lack thereof made the trial a farce or a mockery of justice."[11] Less than one year later, the court approved a supplement to the farce-mockery standard when it examined whether " 'circumstances must demonstrate that which amounts to a lawyer's deliberate abdication of his ethical duty to his client.' "[12] Neither test breathed life into the sixth amendment requirement that an accused is entitled to the effective assistance of counsel. Conceivably, a trial might be unfair and yet not be farcical and not contain a deliberate dereliction by defense counsel. This prompted one judge to write that the standard "is itself a mockery of the sixth amendment."[13]

Missouri recognized the limitation of its rule, shifting to a type of "fairness" standard in an effort to ameliorate the undue narrowness of the pure farce-mockery test. As stated in *Thomas v. State*:

> There has been a gradual erosion of this harsh rule, however, in both Missouri and in this federal circuit, so that the better rule seems presently to be that if the action (or inaction) of counsel were of such a character as to result in a substantial deprivation of defendant's constitutional right to a fair trial, relief should be granted.[14]

8. *See, e.g.*, Collins v. Auger, 577 F.2d 1107, 1110 (8th Cir. 1978); Sincox v. United States, 571 F.2d 876 (5th Cir. 1978); Rinehart v. Brewer, 561 F.2d 126, 130 (8th Cir. 1977). *See generally* R. POPPER, POST-CONVICTION REMEDIES IN A NUTSHELL 160-67, 239-57 (1978).

9. Amrine v. State, 579 S.W.2d 844, 845 (Mo. App., W.D. 1979).

10. *See, e.g.*, Garton v. Swenson, 417 F. Supp. 697 (W.D. Mo. 1976).

11. State v. Schaffer, 454 S.W.2d 60, 65 (Mo. 1970).

12. Smith v. State, 473 S.W.2d 719, 722 (Mo. 1971).

13. Bazelon, *The Defective Assistance of Counsel*, 42 U. CIN. L. REV. 1, 28 (1973).

14. 516 S.W.2d 761, 765 (Mo. App., D.K.C. 1974); *see* Sims v. State, 496 S.W.2d 815, 817 (Mo.