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ARE FORENSIC LOCKSMITHS REALLY QUALIFIED TO
TESTIFY AS EXPERTS IN CASES OF INSURANCE FRAUD?:
AN EXAMINATION OF THE ADMISSIBILITY OF FORENSIC
LOCKSMITH OPINIONS UNDER RULE 702

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I. INTRODUCTION

In 1996, the Coalition Against Insurance Fraud estimated that \$14.2 billion in losses were attributed to fraudulent claims brought against insurance companies. An increasingly large number of these claims are known as owner “give-ups,” where the owner of an automobile abandons and burns the vehicle and then claims the damage as a theft to recover the total loss of the vehicle from the insurance company.¹

¹Mark Hansen, *Key Bit of Evidence May Not Solve Theft Claims, but Insurers Back It: Ignition lock Analysis*, A.B.A.J., Mar. 2000, at 26.

Because insurance fraud has such a direct affect on consumers, many states require insurance companies to have Special Investigation Units (SIU) to investigate fraudulent claims before the insurance companies pay the loss.² Even with SIU's actively investigating fraudulent claims, the amount of money lost each year is passed on to the public as increased insurance premium costs.³

To combat claims against insurers for bad-faith in denying claims for fraud,⁴ insurance companies often employ forensic locksmiths as expert witnesses to examine the lock of a vehicle in order to deduce whether a real thief was responsible for a theft.⁵ These examiners, through various methods, determine if an ignition has been defeated, or if a key of the proper type was last used to start the vehicle.⁶ In some instances, forensic locksmiths may be able to determine which key started the vehicle last. If the expert reaches the conclusion that the owner's key last started a vehicle, it becomes more difficult to prove that the vehicle was in fact stolen and the insured filed a legitimate claim.⁷

These findings may sound conclusive in proving that an insured filed a fraudulent claim, but many insurance companies have been found liable for bad-faith in settling claims when they have relied on these experts as the final word on whether a claim is legitimate.⁸ When an insurer is found liable for denying such a claim, it is often required to pay punitive damages far in excess of the value of the claim brought by the insured. Because a risk exists in employing such experts, insurance companies are becoming more cautious in relying on the findings of experts that claim to be

²CAL. INS. CODE § 1875.20 (West 2000); OHIO REV. CODE ANN. § 3901.21 (West 2000); N.Y. COMP. CODES R. & REGS. TIT. 11, § 86.6 (2000); ARIZ. REV. STAT. ANN. § 20-466 (West 2000); TEX. INS. CODE ANN. Art. 1.10D (West 2000); 40 PA. CONS. STAT. ANN. § 3701-502 (West 2000); FLA. STAT. ANN. § 626.9891 (West 2000). What these SIU's are finding is that fraudulent claims often have similar characteristics. Often, a "give-up" occurs when a vehicle owner has either fallen behind on payments, or when the owner has leased the vehicle and driven over the mileage limit to the point where the owner will be unable to afford to pay the mileage penalty.

³Hansen, *supra* note 1, at 26. Because of the vast amount of insurance fraud, even a legitimate claim will be handled as a fraud. Unfortunately, many honest claims will be criticized, the insured will have their financial payments looked over, and the manner in which the theft occurred would be investigated before any money is paid on the claim.

⁴*See* Commonwealth v. Chery, 628 N.E.2d 27 (Mass. App. Ct. 1994) (In *Chery*, a car owner was convicted of motor vehicle insurance fraud. The Appeals Court held that a conviction of insurance fraud could not be reversed despite an acquittal on charges of unlawful burning of a motor vehicle).

⁵Offutt v. Liberty Mut. Ins., 251 Md. 262 (1968) (picking the lock of a truck or using a master key to open a truck door did not constitute forcible entry within the policy providing that it did not cover the risk of theft from an unattended vehicle unless the theft was due to a forcible entry).

⁶*Id.*

⁷*Id.* (plaintiff's attorneys met the use of these experts with much resistance).

⁸*See* Majorowicz v. Allied Mut. Ins. Co., 569 N.W.2d 472 (Wis. Ct. App. 1997) (holding that insurer was liable for bad faith in investigating and negotiating claim, failing to settle within policy limits, and communicating with insured thereby justifying punitive damages that were awarded).

able to determine which key was last used in a lock.⁹ The question most often facing insurance companies who rely on these conclusions is whether the expert is qualified to testify at all under Rule 702.¹⁰

This Note will argue that while forensic locksmiths may be qualified as experts under Rule 702, they should not necessarily be qualified to testify as to which key started a vehicle last. Part I of this note will discuss the basic history and case law which has established the requirements necessary to qualify an expert to testify under the Rule 702. In addition, Part I will discuss the recently enacted amendments to Rule 702 and how the amended Rule 702 has expanded the admissibility of expert witnesses. Part II of this note will discuss the generally accepted procedures of forensic locksmiths, including their qualifications under Rule 702. This discussion will include a brief history of the development of forensic locksmith analysis procedures. Part III will discuss the “Key Pathway Analysis” as an example of expert testimony that may not be admissible under Rule 702. The “Key Pathway Analysis” is a variation of traditionally recognized forensic locksmith procedures that has been repeatedly challenged in court for not following the guidelines established under Rule 702. Finally, Part IV will analyze problems that exist between the admissibility of expert testimony as to which key last started the vehicle and the potential for bad faith suits in wrongfully denying insurance claims.

II. DEVELOPMENT OF RULE 702

The history of the admissibility of expert testimony in the United States courts has evolved over the last century beginning with *Frye v. United States*.¹¹ In *Frye*, the Court held that expert testimony must be based on general accepted standards in the field.¹² It was not until seventy years later, after the enactment of the Federal Rule of Evidence, 702, that controversy began to arise regarding the admissibility of scientific expert testimony.¹³ Rule 702 displaced *Frye* with an ill-defined reliability test, by allowing an expert to testify based on his knowledge, skill, experience, training, or education as to an opinion offered to a case.¹⁴ Then, in 1993, the Supreme Court in *Daubert v. Merrell Dow Pharm., Inc.*,¹⁵ expanded the admissibility of expert testimony at trial to include expert testimony that rested on a reliable foundation and was relevant to the facts of the case. The *Daubert* standard was further clarified by the Supreme Court in *Kumho Tire Co., Ltd. v. Carmichael*,¹⁶ where the Court held that a court’s “gatekeeping” responsibility extended not only to scientific testimony, but also to all expert testimony to determine if it is both relevant

⁹Meg Green, *Ignition-Key Evidence Is New Weapon in Stopping Fraud*, BESTWIRE, July 6, 1999.

¹⁰*Id.*

¹¹293 F. 1013 (D.C. Cir. 1923).

¹²*Id.*

¹³Mark Lewis & Mark Kitrick, *Kumho Tire Co. v. Carmichael: Blowout From the Overinflation of Daubert v. Merrell Dow Pharmaceuticals*, 31 U. TOL. L. REV. 79, 81 (1999).

¹⁴FED. R. EVID. 702.

¹⁵509 U.S. 579 (1993).

¹⁶526 U.S. 137 (1999).

and reliable. It is under these cases and Rule 702, as amended, that the admissibility of expert witnesses is governed today.

A. *Frye v. United States*

In a 1923 opinion, the Court of Appeals for the District of Columbia established a standard of admissibility for expert testimony.¹⁷ The appellant, James Frye, complained that the use of expert testimony regarding a blood pressure test, showing he was not lying, was excluded in error by the trial court.¹⁸ The Court of Appeals agreed with the trial court that the testing method used by Frye's expert was too new, and neither creditable nor reliable for use.¹⁹ In deciding this case, the Court of Appeals created a standard of admissibility that expert witness testimony "must be sufficiently established to have gained general acceptance in the particular field in which it belongs."²⁰ The court reasoned that the systolic blood pressure test had not gained sufficient standing and scientific recognition to justify the courts in admitting expert testimony based on the discovery and developments from this new science.²¹

The opinion in *Frye*, only three pages long, cited no authority that supported the holding reached by the court. Many federal and state courts, have adopted *Frye's* general acceptance standard in determining the admissibility of expert testimony.²² Although *Frye* was the dominant case regarding admissibility for many years, it did face several criticisms. One such criticism was that the *Frye* standard was much too stringent, and could be used to exclude novel but valid and useful expert knowledge.²³ Another criticism was that the courts were becoming inconsistent in the application of the term "general acceptance."²⁴ As a result, many courts began to reject *Frye* as being vague, manipulable, and too restrictive in excluding the fruits of cutting-edge, non-established scientific learning.²⁵

B. *The Daubert Standard*

In 1993, the United States Supreme Court decided *Daubert*, which overruled the holding of *Frye* and expanded the basis for the admissibility of expert testimony at

¹⁷*Frye v. United States*, 293 Fed. 1013 (D.C. Cir. 1923).

¹⁸*Frye*, 293 F. at 1013 (James Frye was convicted of second-degree murder. His sole complaint to the Court of Appeals was that the trial court excluded his proposed expert testimony concerning a polygraph test.).

¹⁹*Id.* at 1014.

²⁰*Id.*

²¹*Id.*

²²Lewis & Kitrick, *supra* note 13, at 82.

²³*Id.* Problems later began to surface when the Rule 702 was implemented. The rule did not address *Frye* nor did the rule make any reference to a general standard.

²⁴*Id.*

²⁵*United States v. Downing*, 753 F.2d 1224 (3d Cir. 1985) (The court explained that evidence must survive preliminary scrutiny in course of in limine proceeding conducted by district judge, which is essentially a balancing test centering on the reliability of scientific principles upon which expert testimony rests.).

trial.²⁶ In *Daubert*, two infants and their guardians sued a pharmaceutical company to recover for defects sustained as a result of their mother's ingestion of Benedictine while the minors were still in the womb. Merrell Dow's expert testified that, based upon his expertise and review of extensive published scientific literature on the subject, material use of the drug had not been found to be a risk factor for birth defects.²⁷ The plaintiffs then responded with eight other well-credentialed experts who testified, based on their conclusions, that ingestion of the drug did cause birth defects. The court of appeals affirmed the trial court's decision, by stating that expert opinion based on a scientific technique is inadmissible unless the technique is generally accepted as reliable in the relevant scientific community.²⁸

The Supreme Court reversed, stating that Rule 702, not *Frye*, provided the standard for admitting expert scientific testimony.²⁹ The Court determined that the legislative history of Rule 702 made no mention of *Frye*, and such "a rigid 'general acceptance' requirement would be at odds with the 'liberal thrust' of the Federal Rules and their 'general approach of relaxing the traditional barriers to opinion testimony.'"³⁰ The Court felt that since the rules made no mention of the stricter *Frye* rule, such a standard should not be applied in federal trials.³¹

The Court then stated that Rule 702 placed appropriate limits on the admissibility of purportedly scientific evidence, by assigning the trial judge the task of determining whether the proffered testimony both rests on a reliable foundation and is relevant to assisting the trier of fact.³² The *Daubert* Court stated that several matters should be considered in determining whether the testimony's underlying reasoning or methodology is scientifically valid and can be properly applied. These factors included: whether the theory or technique in question has been tested or can be tested, whether it has been subject to peer review and publication, its known or potential error rate and the existence and maintenance of standards controlling its operation, and whether it has attracted widespread acceptance within a relevant scientific community.³³

The Court cautioned that the factors enumerated in *Daubert* should not be considered a checklist for admissibility, but rather the factors are general observations that the court can consider in accomplishing the task of determining

²⁶509 U.S. at 589-93, 597 (The trial court determined that the evidence presented by the other eight witnesses was inadmissible because the testimony did not meet the "general acceptance" standard that had been established by *Frye*.)

²⁷*Id.* at 583.

²⁸*Id.* at 584. The trial court concluded that calculations that did not have a causal link between the drug and birth defects were ruled to be inadmissible because they had not been published or subject to peer review.

²⁹*Id.* at 579.

³⁰*Id.* at 588 (citing *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1988)).

³¹*Daubert*, 509 U.S. at 588-89.

³²*Id.* at 589. Generally, *Daubert* motions are heard outside the jury's presence. Here the judge will hear arguments for and against the admissibility of the expert, and whether the expert is qualified to give an opinion based on his skill or experience.

³³*Id.* at 594.

what expert opinions will be relevant and whether the expert relied on sound principles in reaching their conclusion.³⁴ The focus, according to the Court, “must be solely on principles and methodology, not on the conclusions that they generate.”³⁵

The Court stated that the abandonment of a “general acceptance” test under *Frye* would not lead to a “free-for-all” in which juries would be exposed to all manner of expert opinion regardless of reliability.³⁶ Just because a trial judge rules that the methods relied upon by the expert in forming their opinion are reliable and therefore the testimony is admissible, adverse parties are not precluded from offering contradictory evidence to demonstrate the weakness of the expert’s opinion. Parties are encouraged to vigorously cross-examine expert witnesses and to present contrary evidence in order to attack shaky but admissible evidence.³⁷ It is under this reasoning that the judge becomes the “gate keeper” in determining whether the testimony offered by the expert will be admitted before a jury.³⁸ These challenges to the admissibility of expert testimony before the witness will be allowed to testify before the jury became known as “Daubert motions” or “Daubert challenges.”³⁹

The Supreme Court in *Daubert* limited their discussion to the admissibility of scientific knowledge. The court “cautioned that it was not addressing technical, or other specialized knowledge, which are also covered under Rule 702.”⁴⁰ As a result, courts were left to determine, on their own, whether the stricter *Frye* standard or the more liberal *Daubert* standard would be applied to expert witnesses who would base their opinion on technical or specialized knowledge under Rule 702.⁴¹ As the use of experts grew, courts were faced with critical questions: including, whether *Daubert* applied outside the field of hard sciences, whether the gatekeeping function applied to the admission of all other types of expert testimony, and whether the *Daubert* factors are required in admitting testimony based on knowledge not derived from scientific methodology.⁴² Because of these many unanswered issues, the Supreme Court once again visited Rule 702 under *Kumho Tire Co. v. Carmichael*.⁴³

³⁴Bert Black, *Expert Evidence in the Wake of the Daubert-Jones-Kumho Tire Trilogy*, SE01 ALI-ABA 125, 129 (1999).

³⁵*Daubert*, 509 U.S. at 595.

³⁶*Id.* at 595 (Abandoning the stricter holding of *Frye* allowed the admission of expert testimony which may not be grounded in hard scientific disciplines, yet is more of a cutting edge area which will help the jury to better understand the facts of a case.).

³⁷*Id.* at 596.

³⁸Lewis & Kitrick, *supra* note 13, at 82.

³⁹Jack B. Weinstein, *Improving Expert Testimony*, 20 U. RICH. L. REV. 473, 474-75 (1986).

⁴⁰Black, *supra* note 34, at 129.

⁴¹Lewis & Kitrick, *supra* note 13, at 83.

⁴²*Moore v. Ashland Chem., Inc.*, 151 F.3d 269, 280 (5th Cir. 1998), *cert. denied*, 526 U.S. 1064 (1999). Here the court held that five non-exclusive and flexible factors to be considered by district courts in deciding whether to admit expert testimony include: whether the expert’s theory can be or has been tested, whether the theory has been subject to peer review and publication, the known or potential rate of error of technique or theory when applied, the

C. Kumho Tire Inflates Daubert

In 1999, the Supreme Court once again visited the admissibility of expert witness testimony under Rule 702. In *Kumho*, the Court was asked to consider whether the “gatekeeping” obligation of *Daubert*, requiring an inquiry into both relevance and reliability, applies not only to “scientific” testimony, but to all expert testimony.⁴⁴

The plaintiffs in *Kuhomo* brought a products liability action against a tire manufacturer for injuries that were sustained when the tire on their vehicle blew, leaving one passenger dead and seven others seriously injured.⁴⁵ In order to prove their claim, the plaintiffs retained an expert in tire failure analysis.⁴⁶ According to the expert’s opinion, the tire failed when the tread and belt ripped apart or separated.⁴⁷ The expert further concluded that the separation of the tire was a result of a manufacturing defect.⁴⁸ *Kumho Tire* moved to exclude the expert’s testimony on the grounds that his methodology failed to satisfy Rule 702 and *Daubert*’s reliability requirement.⁴⁹ While the trial court did not doubt the expert’s qualifications, which included a Masters degree in mechanical engineering and 10 years of work in the area, the trial court did find insufficient indications of the reliability of the expert’s methodology and granted *Kumho Tire*’s motion to exclude the expert’s testimony.⁵⁰

In *Kumho*, the Supreme Court held that the application of *Daubert* extends to all experts, but stated that the factors mentioned in *Daubert* are flexible and may or may not be appropriate given the specific facts of the case.⁵¹ According to the court, the objective of “gatekeeping” is to ensure the reliability and relevancy of expert testimony.⁵² In forming this opinion, the Court stated the purpose of a trial judge “is to make certain that an expert, whether basing testimony upon professional studies or

existence and maintenance of standards and controls, and the degree to which technique or theory has been generally accepted in the scientific community.

⁴³526 U.S. 137.

⁴⁴*Id.* at 141.

⁴⁵*Id.* at 142.

⁴⁶*Id.*

⁴⁷*Id.* at 144. The plaintiffs had bought the van with tires that already showed signs of wear and tear. The tread had been worn to where replacement was necessary, however the plaintiffs continued to drive the vehicle another 7,000 miles. None of these facts were included in the expert’s analysis and conclusion.

⁴⁸*Kumho*, 526 U.S. at 143.

⁴⁹*Id.* at 145.

⁵⁰*Id.*

⁵¹*Id.* at 150-51. It is appropriate for a trial judge to ask how often an expert’s experience, based on a methodology, has produced an erroneous result or whether such a method is generally accepted in the relevant community of his expertise. It is also appropriate for an expert, basing his expertise upon experience, to be asked if his preparation is of a kind that others in the field would recognize as acceptable.

⁵²*Id.*

personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.”⁵³

The expert’s methodology was first based on his visual examination of the tire, including his review of the photographs.⁵⁴ Then he employed a process of elimination to rule out abuse as the cause of the blow out.⁵⁵ Specifically, the expert looked for evidence that over inflation had caused the tire’s tread to separate in the accident.⁵⁶ He testified that the absence of at least two of the four signs of abuse led him to conclude that a defect had caused a separation.⁵⁷ His analysis also depended upon acceptance of the fact that his visual inspection could determine that the tire had not been abused despite some evidence of the very signs he looked for and also two apparent punctures in the tire.⁵⁸

The expert’s own testimony also raised questions about the reliability of his opinion. For instance, he was unable to tell how far the tire had traveled based upon the wear of the tire.⁵⁹ Although his opinion was that the defect was based upon early separation of the tread, he was unable to state with any certainty how many miles the tire had driven before it separated.⁶⁰ The expert also conceded that he had only inspected the tire itself for the first time the morning of his deposition for a few hours and that most of his conclusions were based on photographs of the tire.⁶¹ In addition, he had issued a report prior to his deposition stating that the tire had not been over inflated because the rim flange impressions were normal and the tread appeared to be inconsistent around the rim.⁶²

The court then turned to the *Daubert* factors to determine whether the expert’s methodology was reliable. The court found that none of the *Daubert* factors,

⁵³*Kumho*, 526 U.S. at 152.

⁵⁴*Id.* at 154-55.

⁵⁵*Id.* at 154 (The Court here was concerned with the reasonableness of the expert’s approach in determining the cause of the tire separation. The basis for the expert’s conclusion was not a general theory, but rather a specific theory that failed to note some general signs that the tire was worn out.).

⁵⁶*Id.* at 154.

⁵⁷*Id.* at 143-44. The signs of abuse include proportionately greater tread wear on the shoulder; signs of grooves caused by the beads; discolored sidewalls; and marks on the rim flange.

⁵⁸*Kumho*, 526 U.S. at 154.

⁵⁹*Id.* at 154-55.

⁶⁰*Id.* at 155 (Specifically, the expert could not say whether the tire had traveled more than 10, 20, or even 50 thousand miles, adding that 6,000 miles was about how far he could say with any certainty. The court was concerned that the expert claimed to be able to determine that tire wear caused the blowout, yet the expert could not tell the difference between a tire that had been driven less than 10,000 miles or more than 50,000 miles).

⁶¹*Id.* at 155 (The expert was also unable to tell with a reasonable amount of certainty whether the tire had been over loaded. In addition, the expert could not even identify a tire that looked like it had been over deflated, which was the defense offered by Kumho Tire Company).

⁶²*Id.*

including that of general acceptance in the relevant expert community indicated that his testimony was reliable.⁶³ Further, the Court found that there was no mention of the potential error rate of his analysis, nor any mention of other experts in the industry that had used this expert's methodology to find similar distinctions about the cause of tire separation.⁶⁴ Even though the expert himself claimed that his method was accurate, the Court stated that neither *Daubert* nor Rule 702 require a court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert.⁶⁵

Finally, the Court concluded that Rule 702 grants a trial judge the discretionary authority to determine the reliability of an expert's testimony in light of the particular facts and circumstances of the particular case. In his concurrence, Justice Scalia, in stating that trial court's gatekeeping authority is a valid role to ensure reliable evidence is brought before a jury stated, "it is discretion to choose among *reasonable* means of excluding expertise that is *fausse* and science that is junky."⁶⁶

D. Rule 702 Catches Up With *Daubert*

As a result of the holdings in *Daubert* and *Kumho*, the Supreme Court commissioned a review of Rule 702, so that the rule would conform within the standards established by these cases.⁶⁷ The text of the amended Rule 702⁶⁸ added three new "reliability" requirements: reliable data, reliable methodology, and reliable application of methodology. Through these requirements, trial judges have been given more latitude to either include or exclude expert testimony.⁶⁹

⁶³*Kumho*, 526 U.S. at 156.

⁶⁴*Id.* at 157 (The court found that there were no articles or papers offered that could validate the expert's approach in determining the cause of the tire blowout).

⁶⁵Gen. Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997). *Daubert* did not address the standard of appellate review for evidentiary rulings. In *Joiner*, the Supreme Court resolved a disagreement among the circuits about the standard for reviewing a district court's admission or exclusion of expert testimony. *Id.* at 146. The court reasoned that the usual abuse of discretion standard that generally applied to evidentiary rulings also applied to the admission or exclusion of expert testimony. *Id.* at 140. This allows the trial court judge to maintain his role as a "gatekeeper" for purposes of admitting or excluding expert testimony. *Id.*

⁶⁶*Kumho*, 526 U.S. at 159. Expertise that is considered junky is evidence that fails to rely on any standard or methodology in arriving at a conclusion. *Id.* at 159.

⁶⁷Sofia Adroque & Alan Ratliff, *Kicking the Tires After Kumho: The Bottom Line on Admitting Financial Expert Testimony*, 37 HOUS. L. REV. 431, 446 (Summer 2000).

⁶⁸FED. R. EVID. 702 ("If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness is qualified as an expert by knowledge, skill, experience training, or education, may testify thereto in the form of an opinion or otherwise if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods of reliability to the facts of the case.").

⁶⁹*Kansas City Southern Railway Company, Inc. v. J.C. Johnson*, 2001 WL 83928 (Miss. 2001) (holding that expert testimony proffered by motorist was admissible in personal injury action where witness had qualified as an expert in over 100 cases and relied on widely

Five additional inquiries were identified by the Committee, to be considered by judges in performing their gatekeeping functions.⁷⁰ These inquiries included: “whether the expert’s testimony results from matters growing naturally and directly out of research that the expert has conducted independent of litigation or matters developed expressly for the purpose of testifying, whether the expert has extrapolated from an accepted premise to an unfounded conclusion, whether the expert has accounted for obvious alternative explanations,⁷¹ whether the expert is applying the same standard of care in the litigation as the expert would normally apply outside of litigation, and whether the expert’s field of expertise is known to reach reliable results on the subject of the proffered testimony.”⁷² Therefore, an expert does not have to demonstrate by preponderance of the evidence that their opinions are correct, but merely, that those opinions are reliable.⁷³

The Committee also discussed the reliability of nonscientific expert testimony in amending Rule 702.⁷⁴ Because some areas of expert testimony will not rely on any type of scientific method, this form of expert testimony would have to be evaluated by standard principles found within the specific area of expertise.⁷⁵ In addition, the Committee stated that the expert’s testimony must be grounded in an accepted body of learning or experience in the expert’s field, and that the expert must explain how the conclusion is grounded in that field.⁷⁶ Therefore, the new amendment to Rule 702 requires that the testimony must stem from reliable principles and methods that are reliably applied to the facts of the case.

1. Cases Discussing Admission of Expert Testimony

In *Donnelly v. Ford Motor Company*,⁷⁷ the parents of a driver who suffered burns in an automobile accident brought a product liability suit against Ford and the company that manufactured the ignition switch within the vehicle. To prove the claim, the plaintiff’s expert, if permitted, was to testify that the fire was not caused

accepted calculations in the field of forensic economics to determine an amount for loss of enjoyment of life).

⁷⁰Adroque & Ratliff, *supra* note 67, at 448.

⁷¹*Id. see generally* Report of the Advisory Committee on Evidence Rules, at <http://www.uscourts.gov/rules/submitted.htm> (last visited Sept. 25, 2001) [hereinafter Report].

⁷²*Id.*

⁷³*Id. See also* Lauzon v. Senco Products, Inc., 123 F.Supp.2d 510 (D. Minn. 2000) (The court held that an expert was not qualified to testify as to the defective design of a pneumatic nailer because he was unable to duplicate the events, the experts theory as to the cause of the accident had never been subject to peer review and his method was not accepted by a relevant scientific community).

⁷⁴Report, *supra* note 71.

⁷⁵*Id.*

⁷⁶*Id.*

⁷⁷80 F.Supp.2d 45 (E.D.N.Y. 1999) (The plaintiff’s vehicle ignited after an accident with an oncoming vehicle. Several eyewitnesses observed flames from the engine area and the plaintiff testified that he felt heat near his knees. The expert was to testify that the source of the fire was a faulty ignition in the steering column).

by a collision, but was caused by a defective ignition switch.⁷⁸ In determining whether the expert's reasoning or methodology was reliable, the court considered the *Daubert* factors.⁷⁹ Though the expert stated that his work and the work of experts within his field use theories and techniques, which can be tested and have been the subject of peer review, he failed to identify any specific technique or method that he used, and cited no industry standards or studies upon which he relied in forming his opinion.⁸⁰ The court wanted the expert to at least provide some type of statistic to support his broad conclusion that all fires originating on the driver's side of Ford vehicles are the result of ignition switch failure.⁸¹ Alternatively, if no such data is available, the court expected the expert to be able to explain how he was able to exclude all other possible explanations for the fire.⁸²

The court also found that the factual basis of the plaintiff's claim could not be properly applied to the expert's testimony.⁸³ His opinions assumed facts for which there was no evidentiary basis.⁸⁴ Specifically, the expert's testimony that the ignition switch caused the fire rests wholly on the factual premise that the fire had its origin under the driver side dash in the area of the steering column.⁸⁵ Unless there was adequate evidence to support that factual premise, the expert's testimony would be of no assistance to the jury in determining whether the ignition switch caused the fire.⁸⁶

In a similar case regarding a suit for injury sustained by the driver in an automobile accident, the court in *Wood v. Toyota Motor Corp.*,⁸⁷ held that a mechanical engineer, who worked on automotive cooling and heating systems, was not qualified to express his expert opinion that chemical burns to the plaintiff were

⁷⁸*Id.* at 47.

⁷⁹*Id.* at 48.

⁸⁰*Id.* at 50.

⁸¹*Id.*

⁸²*Donnelly*, 80 F.Supp.2d at 51 (The expert specifically stated at trial, "My conclusion in this matter, to a reasonable degree of engineering certainty, is that the cause of the vehicle fire was not the collision, but rather the eruption of a long term over heating condition established by the breakdown of a known defective ignition switch in a Ford product.").

⁸³*Id.* at 50. *See also* *Smith v. Ford Motor Co.*, 215 F.3d 713 (7th Cir. 2000) (In *Smith*, the experts were not qualified to testify because their work had not been published in a peer-reviewed journal, which the court stated was sufficient to show that the expert's testimony was unreliable).

⁸⁴*Id.* at 50. *See also* *Berry v. Crown Equipment Corp.*, 108 F.Supp.2d 743 (E.D. Mich. 2000) (In *Berry*, the court held that a safety consultant lacked the qualifications necessary to render an expert opinion regarding the alleged defective design of a forklift because the expert had no formal education in engineering).

⁸⁵*Id.* at 51. The expert presented no information about the information that he earlier declared was necessary to make a determination as to the origin of the fire. When experts fail to follow the information that they declare is necessary to the investigation, courts feel that the opinion of the expert is unreliable. *Id.* at 51.

⁸⁶*Id.*

⁸⁷134 A.2d 315 (Md. Ct. Spec. App. 2000).

caused by a defect in the air bag.⁸⁸ Here, the expert had never been accepted as a witness in trials involving airbag design. He also had no training in medicine or in analyzing burn conditions.⁸⁹ Further, he had never worked for an automobile manufacturer or had any employment history that directly involved airbags.⁹⁰

Although an expert qualifies if he or she demonstrates a minimal amount of competence or knowledge in the area in which they claim to be an expert, this expert was unable to establish any experience in designing or in working with airbags.⁹¹ He had never designed an airbag system, designed a component for an airbag system, nor even seen a video of an airbag component being installed into a vehicle.⁹² The court also found that he held himself out as an expert because he had, on occasion, been a litigation consultant to other experts and had reviewed Toyota's airbag test results.⁹³ His opinions were merely based on general engineering principles and expert testimonies given in other airbag cases.⁹⁴ He was also unable to demonstrate through any methodology, any rationalization for why the size of vent holes had anything to do with the injuries that the motorist sustained.⁹⁵

III. THE USE OF FORENSIC LOCKSMITHS IN PROVING INSURANCE FRAUD

According to the Coalition Against Insurance Fraud, fraudulent claims accounted for an estimated \$14.2 billion in losses in 1996, the most recent year for which such figures are available.⁹⁶ Among the different types of automobile insurance fraud, owner give-ups⁹⁷ are continuing to rise. In an owner give-up situation, the insured claims that the vehicle was stolen and vandalized, in order to bring a claim against the insurer of the vehicle for the entire value of the vehicle.⁹⁸

⁸⁸*Id.* at 320-21.

⁸⁹*Id.*

⁹⁰*Id.*

⁹¹*Id.* (citing *Naughton v. Bankier*, 691 A.2d 712 (Md. Ct. Spec. App. 1997)). Here, the court held that an ophthalmologist could not testify as plaintiff's expert as to causal connection between capabilities of sling-shot toy as set forth in manufacturer's warnings and injuries sustained by plaintiff who was struck in eye when defendant used toy to propel water balloon through window. The record revealed no evidence that the ophthalmologist had ever handled or used the toy in question or that he was qualified to comment as to its design and production, although the ophthalmologist may have encountered injuries to eye caused by many types of projectiles. *Id.* at 719.

⁹²*Wood*, 134 A.2d at 323.

⁹³*Id.*

⁹⁴*Id.*

⁹⁵*Id.* at 322.

⁹⁶Hansen, *supra* note 1, at 26.

⁹⁷*Id.*

⁹⁸George A. Peters, *The Consequences of Claims Fraud*, 4 PROD. LIAB. L.J. 17 (1992). A National Insurance Crime Bureau has been formed (by the National Automobile Theft Bureau and the Insurance Crime Prevention Institute) to help law enforcement officials identify, locate and prosecute insurance fraud as well as reduce insurance fraud losses. *Id.* at 18. The cost of

Several states have laws requiring insurance companies to establish special investigation units (SIU's)⁹⁹ to investigate fraudulent claims against insurance companies. In determining whether a claim for a vehicle theft is fraudulent, these investigation units will often seek the assistance of forensic locksmiths. The forensic locksmith will generally testify in trial that the vehicle was removed from the loss location with the use of a key and that the vehicle ignition in the steering column was not defeated or tampered with in anyway. Once a forensic locksmith concludes that there is no evidence of tampering or defeating of a vehicle ignition, insurance companies often rely on this information to deny the insurance claim and prevent the insured from recovering under a fraudulent claim.¹⁰⁰

A. Generally Accepted Procedures and Findings

The examination of locks to determine if a lock was defeated is not a new area of expertise. In 1975, W.G. Plumtree¹⁰¹ published an article that has since become a controlling authority on the procedure of examining locks to determine whether any tool marks were made by objects other than the owner's keys.¹⁰² Prior to 1975, there were several means available to examine disc and pin tumbler locks for tool marks made by lock picks, but no articles had been published to illustrate both the type and to what extent was possible to examine a lock.¹⁰³ Plumtree also analyzed several lock cylinders and types of tool marks that were placed in the cylinder by both keys and lock picks to determine if the mark made by a pick could be distinguished from the marks made by a proper key passing across the tumbler.¹⁰⁴ Plumtree concluded

insurance fraud is estimated to add at least an additional \$100 to the average auto insurance premium. *Id.*

⁹⁹*See supra* note 2.

¹⁰⁰*See Walker v. Valor Ins. Co.*, 731 N.E.2d 363 (Ill. App. Ct. 2000) (holding that evidence that an ignition was not compromised on a vehicle was sufficient to determine a factual issue existed as to whether the insured breached the insurance contract by intentionally setting the vehicle on fire).

¹⁰¹W.G. Plumtree, *The Examination of Disc and Pin Tumbler Locks for Tool Marks Made by Lock Picks*, 20 JFSCAS 656 (1975). At the time of his study, Plumtree had worked as a Criminalist with the Los Angeles Sheriff's Department for over fifteen years. Although technology has changed since this study, the methods that were used in this examination are still used by forensic locksmiths today.

¹⁰²*Id.*

¹⁰³*Id.* Before any locksmith can attempt to evaluate a lock, it is important to understand how a lock works. When a lock is picked, the internal components are manipulated to simulate the action of the correct key. The plug, which contains the keyway, is rotated to activate the bolt. *Id.* at 656. Because lock picks are made of steel, while the tumblers inside the locks are made of brass or nickel, the picks often leave tool marks on the softer metal inside the lock. *Id.* It is these marks that forensic locksmiths analyze to determine whether a key made the mark or another foreign object was placed in the lock cylinder to manipulate the tumblers.

¹⁰⁴*Id.* Plumtree examined over 500 types of tumblers in his research. *Id.* at 656. Each cylinder manufacturer was noted, the cylinder was cut and each piece identified before investigation. *Plumtree, supra* note 103, at 656. He then examined marks left on the locks using a rake pick, paper clip, and Teflon coated pick. *Id.* These tool marks were all compared to the lock pick marks made by spring steel lock picks. *Id.* at 657.

that “if a lock is suspected of having been picked, an examination could reveal if an instrument other than a key had been inserted into the cylinder plug of the lock.”¹⁰⁵ Based on this examination, an examiner could state an opinion as to whether an attempt had been made to pick the lock, whether or not the attempt might have been successful, and the general type of pick used. In addition, Plumtree stated that if a suspect tool is located, “the examiner may be able to state an opinion as to whether or not the suspect tool could have been used in the given lock.”¹⁰⁶ The examiner, according to Plumtree, should then be able to determine whether the lock had been defeated by picks, operated by a key, or simply left unlocked.¹⁰⁷ Therefore, under the traditional examination, a forensic locksmith may reasonably conclude whether a key of the proper type last operated the lock cylinder.¹⁰⁸

B. Case Law Supports Findings of These Forensic Locksmiths

Several courts have qualified forensic locksmiths, employing the procedures discussed by Plumtree, as experts under Rule 702 in order to have them testify concerning the manner in which a lock was or was not defeated. In *Walker*,¹⁰⁹ the insured sued her automobile insurer after the insurer denied her claim when her car was allegedly stolen then burned. The insurance company submitted a report prepared by a forensic locksmith to the court in defending its denial of the plaintiff’s claim.¹¹⁰ The appellate court, in reversing the trial court’s judgment, noted that the plaintiff was unable to negate the forensic report that the factory-style ignition key was used to start the vehicle.¹¹¹ Whether forcible entry was used to gain access to the automobile raised a genuine issue of material fact, thus negating the trial court’s summary judgment.¹¹² Further, the report concluded that the steering wheel and ignition were not compromised and that the ignition key to the vehicle was found on the floor of the vehicle.¹¹³ This evidence was therefore properly admitted to assist the jury in determining whether the vehicle was really stolen or in fact a fraudulent claim had been brought against the insurance company.

¹⁰⁵ *Plumtree, supra*, note 103, at 662.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

¹⁰⁸ *Id.*

¹⁰⁹ 731 N.E.2d at 365.

¹¹⁰ *Id.* at 367 (The forensic locksmith found that the vehicle was removed from the loss location with the use of the key recovered in the keyway and found in the driver’s floor of the vehicle. Through examining the steering wheel lock cylinder, along with the recovery of the key, the forensic locksmith was able to determine that the vehicle was removed with the factory style ignition key and that the locking systems were not attacked or defeated.).

¹¹¹ *Id.* at 370.

¹¹² *Id.* at 365.

¹¹³ *Id.* at 366 (The act of committing fraud against the insurance company was considered a breach of the insurance contract, according to the court.).

In a similar case involving an insurance company denying a claim for an alleged vehicle theft, the court in *Kimball v. Liberty Mutual Insurance Co.*,¹¹⁴ relied on the findings of a forensic investigator in holding that the insurer was correct in denying the insured's claim. At trial, the insured testified that there was damage to the vehicle's door lock sufficient to demonstrate that the vehicle had been stolen.¹¹⁵ The insurer's investigator, however, found that the vehicle's ignition had not been defeated and that the ignition cylinder was intact, with no sign of damage.¹¹⁶ From this examination, the forensic locksmith concluded that the plaintiff's vehicle could not have been started, steered, or driven without the use of the correct key.¹¹⁷ When the plaintiff was questioned, he maintained that he had possession of both sets of keys to the vehicle.¹¹⁸ Based on these findings, the insurer properly denied plaintiff's claim for intentionally causing the theft of his vehicle.¹¹⁹

Again, using one of the key tools in lock cylinder examination, the borescope,¹²⁰ the court in *Meagher v. United States Fidelity & Guaranty Co.*,¹²¹ held that the insurer had a reasonable basis for rejecting the insured's claim for his stolen vehicle. A forensic locksmith, retained by the insurer, found that the damage to the steering column was only cosmetic damage.¹²² "The damage did not reveal the locking pins and permit release of the steering wheel so as to have enabled a thief to steer and operate the vehicle."¹²³ The expert concluded that the car could not have been driven to the location where it was found without the use of the proper key.¹²⁴ As in the previous case, the plaintiff claimed that none of his keys were missing, although the

¹¹⁴No. 9739-CV-318, 1999 WL 1260846 (Mass. App. Div. Oct. 20, 1999).

¹¹⁵*Id.* at 1.

¹¹⁶*Id.* The expert also noted that the automobile's alarm system had not been activated and the vehicle was found with the steering wheel column in the "locked" position. *Id.* at 1.

¹¹⁷*Id.*

¹¹⁸*Id.*

¹¹⁹*Kimball*, 1999 WL 1260846, at 2. *See also In re Malinowski* 249 B.R. 672 (Bankr. Md. 2000). In *Malinowski*, the court held that the intentional acts exclusion of an automobile policy applied and relieved an automobile insurer of any liability for the destruction of the insured's automobile in a fire, on grounds that the fire had been deliberately set by the insured, collaterally estopping the insured from denying the willful and malicious nature of his acts. 249 B.R. at 674.

¹²⁰E. Lee Griggs III, *Tool Mark Identification as Related to Locksmithing and Key Identification re: "Key Pathway Analysis,"* at <http://www.msegroup.com/keypathways.htm> (last visited 30, 2000). Photographic equipment can be used in conjunction with these microscopes to produce pictures for use at trial to demonstrate the forensic locksmiths findings during the examination of the lock cylinder. *Id.*

¹²¹No. 9153 CV 0310, 1994 WL 413383 (Mass. App. Div. Apr. 20, 1994).

¹²²*Id.* at *1.

¹²³*Id.* (The ignition cylinder remained intact, there was no damage to the exterior keyhole of the cylinder, and the internal examination by means of a borescope indicated the absence of any tool marks, which would have been present if the lock had been forced or picked.).

¹²⁴*Id.*

plaintiff stated in an earlier recorded conversation that he only had one set of keys, when in fact there were three sets of keys in existence.¹²⁵ Therefore, based on this examination, the insurer was justified in denying the plaintiff's vehicle theft claim as a breach of the insurance contract for intentionally causing the theft of the insured's vehicle.¹²⁶ The findings of the forensic locksmith were admissible because the expert relied on an existing methodology.¹²⁷

C. Recent Developments in Forensic Locksmith Examinations

The use of forensic locksmiths to examine locks has grown since Plumtree's article in 1975.¹²⁸ Today, forensic examiners use microscopes and other technical instruments to examine the interior components of a lock cylinder to determine whether the lock was in fact defeated.¹²⁹ While most experts in this area limit their examination to determining whether a lock cylinder was defeated by an object other than a key, other investigators now claim to be able to determine in some cases which key was last used in operating the lock. An example of one such forensic examiner is Richard Pacheco, the founder of North Eastern Technical Services, Inc.¹³⁰ Mr. Pacheco's company is has attempted to push forensic examination to the next level.¹³¹

Mr. Pacheco has several years of experience in testifying as an expert forensic locksmith.¹³² On many occasions, Mr. Pacheco's testimony has assisted insurance companies in denying fraudulent claims of theft by insureds.¹³³ Based on established principles of forensic locksmiths, Mr. Pacheco has been successful in identifying

¹²⁵*Id.* at *4.

¹²⁶*Meagher*, 1994 WL 413383 at *4.

¹²⁷*Id.* at 4.

¹²⁸*See North Eastern Technical Services, Inc.*, at <http://www.netsexam.com/Services.htm> (last visited Aug. 30, 2000). Examination Examples include: vehicle fire, and theft, home invasion. *Id.* These procedures are used in both civil and criminal trial to assist a jury to better understand the method used to operate any type of lock cylinder. *Id.*

¹²⁹*See Griggs*, *supra* note 120.

¹³⁰*See North Eastern Technical Service, Inc.*, *supra* note 128. (N.E.T.S. technicians have qualified to testify as experts in several states regarding the manner in which a vehicle ignition was last operated. As many experts in this field, these technicians are much more difficult to qualify as experts when the procedure of determining the last key used in the vehicle is unknown or the technician cannot disclose the procedure for proprietary reasons).

¹³¹*Id.* Here the website of N.E.T.S. describes to some extent the procedures that this company has developed to further the field of forensic locksmith analysis. *Id.* This company also offers a variety of services including fire examination, vehicle security analysis, underwater diver and marine recovery. *Id.*

¹³²Deposition of Richard J. Pacheco, *Anderson v. Premier Auto Insurance Co.*, (E.D. Pa 1999) (No. 98-CV-6366) [hereinafter Deposition] (Mr. Pacheco has testified at over 150 trials as an expert forensic locksmith. In each case, the trial judge must first qualify him before he is admitted to offer an opinion as to the method with which a lock was last operated).

¹³³*Id.* at 142.

when a lock cylinder has or has not been defeated by an object other than a key.¹³⁴ However, Mr. Pacheco has on several occasions, attempted to testify as an expert, stating that he can tell which key was used last to operate a vehicle through a means known as “Key Pathway Analysis.”¹³⁵ Under this theory, Mr. Pacheco enables insurance companies to defeat plaintiff insured’s that claim to have all keys in their possession when a vehicle is stolen and where no other reason for stealing the vehicle can be found. By identifying which key was last used in the lock cylinder, insurance companies can better establish that a person who possessed the keys to the vehicle last operated the vehicle. During a “Key Pathway Analysis,” the keys used to operate the lock are analyzed in addition to the lock being examined.¹³⁶

D. “Key Pathway Analysis”: Fact or Fiction?

Before one can determine whether this is a valid procedure to qualify an expert under Rule 702, it is important to understand the differences that exist between this procedure and the standard procedures employed by forensic locksmiths. The examiner begins by examining the lock to rule out lock picking by looking for signs of the use of a lock pick.¹³⁷ These signs include: scratch marks around the face of the lock, scratch marks at the bottom of the keyway, and scratch marks around the upper portion of the keyway where a pick would come in contact with the lock pins or tumblers.¹³⁸ Once the examiner determines that there is no evidence of the use of a pick, the key is then examined to determine whether it is an original key, whether it was used to make a duplicate key, or whether the key is in fact a duplicate key.¹³⁹ Here the examiner is looking for unique wear patterns on the surface of the key that may allow the examiner to determine if the key was used as an everyday key or as a backup key.¹⁴⁰ The examiner will also note the placement of ridges and unique characteristics of the key, which will later be matched with the lock itself.¹⁴¹

Once the key has been examined, the lock cylinder is then dissected and the surfaces of the tumblers are examined with the use of a microscope to determine whether any tampering has been attempted.¹⁴² When the same key is frequently used in a lock cylinder, wear marks develop on the tumblers where the key passes over them.¹⁴³ When worn keys have only operated a lock, then the markings on the

¹³⁴*Id.* (This finding is usually consistent with the established methodology within the field of forensic locksmiths).

¹³⁵*Id.* at 143.

¹³⁶Hansen, *supra* note 1, at 26.

¹³⁷Defendant’s Response to Plaintiff’s Motion to Exclude Testimony of Richard Pacheco and/or Peter Hammond, *Bespalov v. Progressive Specialty Insurance Co.*, (Wash. 2000) (No. 99-2-00902-5) [hereinafter Defendant’s Response].

¹³⁸*Id.* at 3.

¹³⁹*Id.* at 4-5.

¹⁴⁰*Id.*

¹⁴¹*Id.* at 5.

¹⁴²Defendant’s Response, *supra* note 137, at 6.

¹⁴³*Id.* at 5.

tumblers should generally correspond with the markings found on the keys.¹⁴⁴ A newly made key possesses different surface features than those keys used everyday, so that when a new key is inserted, new markings will appear on the tumblers. These newer abrasions may wear out over time when use of the regular key is resumed.¹⁴⁵ Often the examiner may observe multiple key pathways within the wear zone from the random and alternating use of multiple keys overtime.¹⁴⁶

The final step in the examination is to compare the most recently created tool marks on the tumblers with the keys that were examined earlier.¹⁴⁷ The examiner will likely be able to draw one of several conclusions from the completed examination.¹⁴⁸ If the “Key Pathway Analysis” is successful, the examiner may conclude that the tool marks on the tumblers correspond with striations on the tested keys, which enables the identification of that key as having been the last one used to operate the lock.¹⁴⁹

IV. ADMISSIBILITY OF ALTERNATIVE FORENSIC LOCKSMITH TECHNIQUES

As stated earlier, under Rule 702, an expert must first qualify himself before he can offer an opinion to assist the jury in determining a fact in issue or in understanding the evidence.¹⁵⁰ Generally, a witness qualifies as an expert through their knowledge, skill, experience, training, or education.¹⁵¹ These expert witnesses will be permitted to testify if the testimony is based upon sufficient facts or data, if the testimony is the product of reliable principles and methods, and if the witness has applied the principles and methods reliably to the facts of the case.¹⁵²

Courts have long held that scientific evidence need not satisfy all of the *Daubert* factors in order to be admissible.¹⁵³ As the Court in *Kumho* held, the *Daubert* factors are simply intended to offer guidance as to relevant considerations involved in

¹⁴⁴*Id.* at 6.

¹⁴⁵*Id.*

¹⁴⁶*Id.*

¹⁴⁷Defendant’s Response, *supra* note 137, at 7.

¹⁴⁸*Id.* First, the examiner may conclude that the level of fire or mechanical damage to the lock cylinder prevents him from determining the last key used, but he may be able to determine that no other means was used except a key of the proper type. Second, the examiner may conclude that lock picks or other foreign objects did not defeat the lock cylinder. Another conclusion that might be reached is that the examiner observed markings on the tumblers that did not correspond to any of the keys submitted for examination, thereby indicating the existence of another key that was not submitted for examination.

¹⁴⁹*Id.*

¹⁵⁰Adroque & Ratliff, *supra* note 67, at 431.

¹⁵¹*United States v. Harris*, 28 F.3d 1487 (8th Cir. 1994) (holding that the prosecution’s witness, who was a gang member, was qualified to testify on drug trafficking based on his six years experience setting up drug distribution centers in different cities).

¹⁵²FED. R. EVID. 702.

¹⁵³*Kumho*, 526 U.S. at 157.

determining whether scientific evidence is admissible.¹⁵⁴ Measuring the admissibility of expert testimony will vary depending on whether the subject matter of the testimony is rooted in science or some technical or other specialized area of knowledge.¹⁵⁵ However, for purposes of this note, the “Key Pathway Analysis” will be scrutinized under all of the *Daubert* factors and Rule 702 to determine whether courts are correct in allowing the admission of this type of expert testimony.

A. *Has the Theory or Technique Been the Subject of Peer Review?*

Under examination, Mr. Pacheco was questioned as to whether the methodology of the “Key Pathway Analysis” has ever withstood the scrutiny of peer review from any scientific or forensic body.¹⁵⁶ Mr. Pacheco claimed that his work and procedures are constantly reviewed when people attend his seminars on the “Key Pathway Analysis.” Many people who have attended seminars on “Key Pathway Analysis” have taken the knowledge that they have gained and have been successful in perfecting the process and selling themselves as experts in identifying which key was last used in a lock cylinder.¹⁵⁷

However, no publication of the procedure exists for review. The process has never been submitted to scientists or anyone else for peer review or an independent review of the procedures.¹⁵⁸ Yet, because several other companies have taken the “Key Pathway Analysis” and used it in their own business, Mr. Pacheco contends that this is sufficient to satisfy a peer review requirement.¹⁵⁹ Much of the procedure has been unavailable for publication because Mr. Pacheco has kept the information proprietary, this is because the process took so long to create that he needed to recover his costs.¹⁶⁰ In fact, no employees of Mr. Pacheco’s company are able to identify any article, journal, publication, text, or scientific body that ever conducted any review or analysis, in which someone attempted to determine which, of a set of keys, was the last key to be used in a particular lock.¹⁶¹

However, many forensic locksmiths, including Mr. Pacheco, associate the “Key Pathway Analysis” with the same forensic science of tool mark identification. Tool mark identification is a process of determining whether a tool may have made a mark

¹⁵⁴*Id.* at 155.

¹⁵⁵*Id.* at 156.

¹⁵⁶Deposition, *supra* note 133, at 246.

¹⁵⁷*Id.* at 245. Other known forensic locksmiths using similar approaches in last key analysis are Shannon Engineering of Dallas, Texas, and a company also known as North Atlantic Technical Services. This practice, according to the deposition of Mr. Pacheco, is a standard practice in Europe on lock room crimes. *Id.* at 244. Some of Mr. Pacheco’s training came from a forensic locksmith in Amsterdam that had been practicing last key analysis in Europe. *Id.* at 245. However, the practice of conducting last key analysis by each of these companies is not standardized, as many different standards exist between the companies to determine whether a key was last used in a vehicle. *Id.* at 246.

¹⁵⁸*Id.*

¹⁵⁹*Id.* at 247.

¹⁶⁰*Id.* at 124.

¹⁶¹Deposition, *supra* note 133, at 247.

on an object, or more common, matching a bullet to a gun.¹⁶² It is these same procedures that allow those that use the “Key Pathway Analysis” to determine which key was last used in a vehicle.¹⁶³ Because tool mark identification has been the subject of numerous scientific articles and has become well accepted for much of the 20th century, proponents of the “Key Pathway Analysis” claim that this is sufficient to show the scientific review of the process.¹⁶⁴

B. Can the Procedure be Tested?

In *Daubert*, the court stated that one of the factors to be considered is whether the theory can be (and has been) tested.¹⁶⁵ In addition, consideration should also be given to the known potential rate of error.¹⁶⁶ While a procedure should be available for peer review, as well as guidance, it appears that there is no known procedure or standard to guide those who employ the “Key Pathway Analysis.”¹⁶⁷

At a recent trial hearing, Mr. Pacheco admitted that, as far as he knew, there were no uniform standards among different companies that are to be followed in performing the analysis.¹⁶⁸ Yet, according to Mr. Pacheco, an evaluation procedure was developed to gauge the effectiveness of the technicians performing the analysis, to ensure accuracy of the examination and to ensure the accuracy of the procedures being performed by the technician.¹⁶⁹

The internal evaluation involves a two-step process. First, the technician is given a blind case, which is numbered and handled in the same manner as any other case, except that the last key in the ignition is made known to the examiner prior to the technician’s receiving the blind case.¹⁷⁰ The second step is the examiner’s review and grading of the technician’s result. This grade is composed of several criteria including: whether proper procedures were followed in handling the evidence,

¹⁶²Defendant’s Response, *supra* note 137, at 9. For a history of the development of toolmark identification as it has been used in forensic science, see James E. Hamby, *The History of Firearm and Toolmark Identification*, at http://www.firearmsid.com/A_historyoffirearmsID.htm (last modified Aug. 23, 2001). For review of the procedures and criteria used in toolmark identification by forensic scientists, see Ronald G. Nichols, *Firearm and Toolmark Identification Criteria: A Review of the Literature*, 42 JFSCAS 466 (1997).

¹⁶³Defendant’s Response, *supra* note 137, at 9.

¹⁶⁴*Id.* However, claiming that the last key used in a vehicle can be attributed to the same technology used by criminologists to identify a bullet with a gun appears to be a commingling of two distinct areas of forensic science.

¹⁶⁵*Daubert*, 509 U.S. at 593.

¹⁶⁶*Id.*

¹⁶⁷Deposition, *supra* note 133, at 121-22.

¹⁶⁸*Id.*

¹⁶⁹Defendant’s Response, *supra* note 137, at 17. These protocols to review the technician’s work are internal company policies. There are no known protocols governing the key pathway analysis or the evaluation of technicians that perform the examination.

¹⁷⁰*Id.*

whether the technician properly examined the keys, and whether the technician's analysis resulted in the correct conclusion.¹⁷¹

Several experts in the field of forensics have attempted to replicate the findings of Mr. Pacheco according to the known procedures available, combined with standard procedures in tool mark and lock cylinder identification. Jim Cadigan, the chief of the FBI's firearms and toolmark unit, concluded that while it is possible to determine if a key of the proper type has been used in a particular lock, it is not possible to tell whether it was the last key used.¹⁷² This conclusion, by one of the FBI's top experts, in the use of toolmark identification is powerful evidence of the gap that exists between toolmark identification and key pathway analysis.

In addition, other auto theft experts have attempted to replicate the findings of a "Key Pathway Analysis," but have been unable to achieve the same results. One expert, through a variety of procedures, was only able to conclude that it is possible to tell if a key has, on occasion been used, if it has a major anomaly, such as a raised burr.¹⁷³ Controlling for the last key used, this expert was unable to determine with certainty which key was last used in a vehicle. A number of factors may affect how markings appear on lock tumblers: including, the mood the driver was in when he placed the key in the ignition.¹⁷⁴ Experts cite this situation as one of many that makes it impossible to determine with any reasonable certainty, which key last operated a lock.¹⁷⁵

C. Has the Forensic Locksmith Employed a Generally Accepted Methodology?

The examination of the components of a lock includes the use of a microscope known as a borescope.¹⁷⁶ With the use of a borescope, a forensic examiner is generally able to determine if a foreign object was used to defeat a lock based on the markings placed within the lock cylinder. The use of a borescope is a standard procedure in the field of forensic examinations and tool mark examinations.¹⁷⁷ Generally, examiners will take photographs of the results of their borescope examination to demonstrate their findings to a jury.¹⁷⁸

In one particular trial where the admission of the "Key Pathway Analysis" was at issue, the examiners concluded that a particular key was used last in a lock based on

¹⁷¹*Id.* at 18.

¹⁷²Hansen, *supra* note 1, at 26. Mr. Cadigan even went so far as to refer to this type of forensic examination as "something akin to the Psychic Friends Network" because of the lack of procedure or discipline in this type of analysis. *Id.*

¹⁷³*See supra* note 120 (Mr. Griggs is a Certified Forensic Locksmith and is frequently hired as a plaintiff's witness to refute the testimony of Mr. Pacheco).

¹⁷⁴*Id.*

¹⁷⁵*Id.*

¹⁷⁶Defendant's Response, *supra* note 137, at 5.

¹⁷⁷Griggs, *supra* note 120.

¹⁷⁸*Standards for Professional Qualification of Forensic Locksmith*, at <http://www.msegroup.com/standards.htm> (last visited Aug. 30, 2000). Here the qualifications for certification as a forensic locksmith are published to ensure the reliability of the examination of the expert at trial.

marks they viewed under a microscope.¹⁷⁹ However, no photographs were taken of the microscopic examination, as is customary within the field.¹⁸⁰ In other examinations of locks where the examiners have taken photos, these photos are often unclear and do not give an actual accounting of what the examiner observed under the microscope.¹⁸¹ It is, therefore, difficult to determine the last key used without any substantial proof supporting their conclusions.¹⁸² Again, the proponents of the “Key Pathway Analysis” often hide their lack of methodology behind a shield of a protected trade secret.¹⁸³

V. PROBLEMS IN THE ADMISSIBILITY AND THE POTENTIAL FOR BAD FAITH CLAIMS

Although forensic locksmith evidence is generally admissible in cases of insurance vehicle theft claims to determine whether fraud exists, problems arise when the testimony is about the last key used in the ignition.¹⁸⁴ Mr. Pacheco and his associates have qualified as expert witnesses numerous times, giving their opinions substantial weight and credibility.¹⁸⁵ However, other circumstances can arise that lead the expert to an incorrect conclusion in determining how the vehicle was last started.¹⁸⁶ These findings can often result in a bad faith claim being brought by the insured against the insurance company who has errantly denied a vehicle theft claim. Because of the potential for bad faith suits and the additional cost, insurance

¹⁷⁹Plaintiff’s Motion to Exclude Testimony of Richard Pacheco and/or Peter Hammonds, *Bespalov v. Progressive Specialty Insurance Co.*, (Wa. Super. 2000) (No. 99-2-00902-5 at 14) [hereinafter Plaintiff’s Motion].

¹⁸⁰*Id.*

¹⁸¹*Id.* For an example of photographs with poor quality, see http://www.msegroup.com/poor_photographs.htm (last visited Aug. 30, 2000).

¹⁸²*Id.* at 16, citing *Robinson v. United States*, 805 F. Supp. 514 (E.D. Tenn. 1991) (the court held that without more than credentials and a subjective opinion, an expert’s testimony that “it is so” is not admissible).

¹⁸³*Id.* at 18 (Mr. Pacheco also claimed that the procedure would be made available once he recouped the costs of developing the procedure through its use in trial as an expert witness).

¹⁸⁴See *Gurien v. Allstate Insurance Company*, 1997 WL 431185 (Tenn. Ct. App. 1997) (Plaintiff’s car, which had been burned, was left totally intact. Allstate’s forensic locksmith determined that neither the vehicles lock or ignition system had been defeated in any way. The insured then brought a claim against Allstate for a bad faith refusal to pay the claim. The court held that Allstate acted in accordance with the terms of the insurance contract, thereby negating a claim by the insured that the denial of the claim was in bad faith. Accordingly, the use of a forensic locksmith, while proper, led Allstate to participate in additional litigation.).

¹⁸⁵Declaration of Richard Pacheco, *Bespalov v. Progressive Specialty Insurance Co.*, (Wash. 2000) No. 99-2-00902-5.

¹⁸⁶Plaintiff’s Motion, *supra* note 179, at 20 (The plaintiff here argues that there are numerous ways a vehicle can be stolen apart from an owner destroying their own vehicle. These include towing a vehicle, the use of a “jiggle key” (a key that is common among car thieves to start any vehicle). When an examination is limited to the ignition of a vehicle, the rest of the vehicle is not present to also investigate and determine if a vehicle was towed from its last known location. The forensic locksmith’s conclusion that the last known means of operating the vehicle may therefore be incorrect.).

companies should be cautious in relying on opinions that conclude which key last started a vehicle.¹⁸⁷

Forensic locksmiths that attempt to testify as to which key last started a vehicle, are not always qualified as an expert witness by the court.¹⁸⁸ Just because an expert is qualified by one court to testify, he is not guaranteed to be qualified as an expert in every other court where he attempts to testify. Under the amended Rule 702, an expert with technical or non-scientific knowledge may provide testimony if his opinions and conclusions are based in the knowledge and experience of the relevant discipline.¹⁸⁹ The judge in each case, as a matter of law, must make certain that an expert, whether basing his testimony upon professional studies or personal experiences, employs, in the courtroom, the same level of intellectual rigor that characterizes the practice of an expert in the relevant field.¹⁹⁰ In addition, the proffered testimony must be able to assist the jury in reaching a conclusion.¹⁹¹

One example of a court excluding the testimony of a forensic locksmith was the case of *Anderson v. Premier Auto Insurance Company*.¹⁹² In this case, the insurer denied a claim by it's insured for a vehicle theft. The company hired two forensic locksmiths to examine the vehicle after it was recovered some three weeks later.¹⁹³ The vehicle had been stripped of its parts when it was discovered.¹⁹⁴ After examining the ignition cylinder, these forensic locksmiths concluded, in their opinion, that the vehicle was last started by the insured's own valet key. However, this valet key was never located by anyone to be included in the investigation.¹⁹⁵ As a result of these findings, the insurance company denied the claim and accused the insured of fraudulent conduct in connection with the theft of her vehicle. The insured then filed a bad faith suit against her insurance company for denying her claim.¹⁹⁶

The court, in deciding that these forensic locksmiths were not qualified to testify as experts, based their findings on generally applicable factors of a *Daubert* test,

¹⁸⁷*See, e.g., State Farm Mutual Auto. Ins. Co. v. Grimes*, 722 So.2d 637 (Miss. 1998) (In this case, the insured sued State Farm for a bad faith denial of a theft claim. The court held that evidence failed to establish that the insured removed parts from a car and that the insurer had any arguable basis for denying a claim.).

¹⁸⁸Plaintiff's Motion, *supra* note 179, at 4.

¹⁸⁹FED. R. EVID. 702.

¹⁹⁰*Kumho*, 526 U.S. at 152.

¹⁹¹*Id.*

¹⁹²Case No. 98-CV-6366 (E.D. P.A. 1999) (order excluding from evidence the testimony of Mr. Pacheco and Mr. Hammond).

¹⁹³*Id.* at 1.

¹⁹⁴*Id.*

¹⁹⁵*Id.* at 2 (The failure to locate a key that is determined by the technician to be the key that last started the vehicle defeats the core requirement of the analysis even by the limited standards set forth by Mr. Pacheco.).

¹⁹⁶*Id.*

which have been included in the amended Rule 702.¹⁹⁷ As was argued above, possessing the qualifications of a forensic locksmith and also being qualified as an expert in other courts is not sufficient to automatically qualify an expert in every case. Merely stating that a forensic locksmith knows which key last started the vehicle without any more data is inadmissible.¹⁹⁸ In fact, the procedure by which the forensic locksmith in *Anderson* based his conclusion on is not published and has never been subjected to review by his peers.¹⁹⁹ This finding was even more suspicious because the conclusion was based on a key that was never found or examined.²⁰⁰ The testimony would have probably been admissible had the forensic locksmith based his opinion on well established principles in their field of expertise and limited his conclusion as to whether the vehicle ignition had been defeated or been last operated by a proper key.²⁰¹ Instead, the insurance company was forced into costly and unnecessary litigation that ultimately resulted in an undisclosed settlement, which was most likely worth more than the original claim by the insured.²⁰²

Forensic locksmiths that refrain from attempting to determine which key last started a stolen vehicle, by merely concluding that the ignition was either defeated or a key of the proper type last operated the vehicle, experience a greater success in qualifying as an expert witness.²⁰³ These conclusions are based on methodology that has been subjected to peer review.²⁰⁴ In addition, a forensic locksmith can be certified in this methodology, which increases his credibility in court as an expert witness.²⁰⁵ While these procedures are much less susceptible to scrutiny, the exposure to a bad faith lawsuit exists when a claim is improperly denied as a fraudulent claim.²⁰⁶ Therefore, it is important that an insurance company, relying on the opinion of a forensic locksmith, determines whether this expert and his

¹⁹⁷See Adroque & Ratliff, *supra* note 67.

¹⁹⁸Plaintiff's Motion, *supra* note 179, at 15 (The expert must be held to the scrutiny of the court in determining whether his opinion is relevant and based on reliable data and principles.).

¹⁹⁹Deposition, *supra* note 133, at 248 (where the examiner admits that he is unable to point to any group where at the procedure has been accepted.).

²⁰⁰*Anderson*, *supra* note 194, at 1.

²⁰¹*Id.*

²⁰²Hansen, *supra* note 1, at 26.

²⁰³Deposition, *supra* note 133, at 253.

²⁰⁴*Id.*

²⁰⁵See *International Association of Investigative Locksmiths*, at <http://www.iail.org/certify.htm> (last visited Feb. 9, 2001).

²⁰⁶*Trimper v. Nationwide Ins. Co.*, 540 F.Supp 1188 (D.C. S.C. 1982) (the court held that an insured had a cause of action under the law of South Carolina for will or reckless failure on part of the insurer to settle or investigate his claim under an insurance policy). The court held that the award of punitive damages against the insurer was valid because of the insurer's failure to adequately investigate the merits of the claim. *Id.* at 1195. The insurance company merely relied on a report by an investigative company without also investigating the merits of the claim. *Id.* at 1194.

conclusion will be admissible under Rule 702. An insurance company should not base the denial of a claim on an opinion that cannot be admitted in court, otherwise the insurance company will be limited in whatever defense it might raise against a bad faith suit.²⁰⁷ Forensic locksmiths, therefore, should be limited in their conclusions to established principles and methodology of their field so as to prevent an insurance company from denying an otherwise legitimate vehicle theft claim.

In 1999, the court in *St. Elizabeth's Employee Federal Credit Union v. Jarman*²⁰⁸ allowed a forensic locksmith to testify as to the method that was used to start a stolen vehicle. In this case, the plaintiffs filed a claim stating that their vehicle was stolen. At the time of the theft, the plaintiffs were behind on the loan and were in the process of trying to sell the car.²⁰⁹ The insurance company employed the services of the forensic locksmith to determine whether the vehicle's ignition system had been defeated, which would be consistent with plaintiff's claim. A jury found for the insurer both the breach of contract and bad-faith claims.²¹⁰

Upon appeal, the plaintiffs maintained that all keys to their vehicle were in their possession all along, despite the forensic locksmith's conclusion that the vehicle ignition had not been defeated.²¹¹ The forensic locksmith admitted that the vehicle's ignition could be picked, but not easily. Plaintiffs appealed that their expert should have been allowed to testify to rebut the findings of the forensic locksmith.²¹² Here, the court correctly allowed the forensic locksmith to testify as an expert based on his experience, that the ignition had most likely been operated with a key of the proper type.²¹³ The final verdict of whether the vehicle in fact was last operated with a key of the proper type is a question of fact for the jury. However, the forensic locksmith did not testify as to which key last started the vehicle.

In an even more recent case, the Louisiana Court of Appeals held that the "Key Pathway Analysis" was properly admitted to determine that the key in the insured's possession was the last key to operate the ignition.²¹⁴ The Court of Appeals held that the trial court erred in its analysis of the defendant's expert witness testimony regarding the condition of the key found in the plaintiff's house.²¹⁵ The trial court determined that the North Eastern Technical Services report was inconclusive as to

²⁰⁷*Id.* at 1194.

²⁰⁸1999 WL 162138 (Ohio App. 1 Dist. 1999).

²⁰⁹*Id.* at 1. During the investigation of the claim, the insurance company asked its insured to provide all payment receipts and financial statements as proof that there was not a financial necessity to intentionally destroy the vehicle.

²¹⁰*Id.*

²¹¹*Id.* at 2.

²¹²*Id.* The court determined that the rebuttal expert would not assist the jury because Mr. Pacheco had already stated that the vehicle could be picked; the conclusion that the plaintiff's witness wanted to offer. *Id.* at 3. Therefore the testimony of this witness would have been consistent with the opinion and findings of Mr. Pacheco. *Id.*

²¹³*Id.* at 2.

²¹⁴*Tabchouri v. Progressive Insurance Co.*, 775 So.2d 1127 (La. Ct. App. 2000).

²¹⁵*Id.* at 1130.

which key was used to last operate the vehicle.²¹⁶ The Court of Appeals stated that the expert witness clearly established the key in the plaintiff's possession was the last key to operate the ignition lock assembly.²¹⁷

The trial court specifically stated that the marks left on the key, which the uncontroverted evidence showed were made by the key being forcibly removed from the ignition, were explained by the plaintiff and his wife.²¹⁸ However, the Court of Appeals determined that the plaintiff's statement was not made on record to support the trial judge's finding. The only explanation presented to the court as to the marks on the keys, was the explanation presented by the expert witness for the insurer.²¹⁹ In addition, the plaintiff-insured's were unable to offer any contradictory opinion as to the findings of the expert regarding the marks on the key or whether that particular key was in fact the last key to operate the vehicle.²²⁰ Therefore, the Court of Appeals concluded that the testimony of the examiner was admissible and reliable in assisting the jury to determine whether the insured had committed insurance fraud.²²¹

VI. CONCLUSION

The history of the development of Rule 702 demonstrates the wide range of admissibility of expert testimony that is not necessarily grounded in scientific evidence. Forensic locksmiths are a group of experts that have been qualified to testify generally under Rule 702 regarding the manner in which any type of lock has been operated. Forensic locksmiths that are properly qualified to testify in a court of law can be valuable in assisting the jury to better understand the facts of a case.

More specifically, the use of forensic locksmiths by insurance companies can be a valuable asset in combating fraudulent insurance claims. However, caution must be taken when relying on the opinions of forensic locksmiths whose findings may be speculative or based on methodology that is not commonly used within the field. When an insurance company uses a forensic locksmith, the company should determine if the theory or technique of the forensic locksmith has been or can be tested. In addition, the insurance company should determine if the theories advanced by the forensic locksmith have been subjected to peer review and publication. The insurance company should determine whether the theory and technique relied upon by the forensic locksmith have attracted widespread acceptance within the relevant community of forensic locksmiths. The risk for bad faith claims against insurance

²¹⁶*Id.* (The trial court held that the report was inconclusive due to the fact that the expert was unable to explain the existence of alternative possibilities for the marks on the ignition components.).

²¹⁷*Id.* at 1130.

²¹⁸*Id.* at 1130. Because the plaintiff claimed he was upset when he went to attempt to start the car at the salvage yard, and it did not start, the plaintiff removed the key from the ignition rather forcibly. *Id.* at 1130. This testimony led the trial court to believe that the expert's opinion was inconclusive with regards to which key was used to operate the vehicle last. *Id.*

²¹⁹*St. Elizabeth's*, 1999 WL 162138 at 2. Through examining the markings on the key with the markings found on the lock, the expert properly concluded that the key in question was the last key to operate the ignition lock assembly.

²²⁰*Id.*

²²¹*Id.* at 3.

companies for denying a claim is too great for an insurance company to rely on expert testimony that cannot be qualified according to Rule 702.

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