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RECONSTRUCTION OF AUTOMOBILE ACCIDENTS THROUGH LAY AND SCIENTIFIC TESTIMONY

Adrian P. Schoone* and
Sherin Schapiro**

I. INTRODUCTION AND SCOPE OF DISCUSSION

Perhaps the most imposing responsibility confronting the attorney participating in litigation arising out of motor vehicle collisions is that of marshaling facts. All too frequently the operators involved are dead or have no recollection of the event at the time of trial. In other cases, the parties' interest in the outcome makes their testimony incredulous. Often complicating the situation is the total absence of impartial third-party witnesses. To supply the missing evidentiary links in the chain of proof, practitioners are turning more and more to the inferences to be drawn from the physical facts left in the wake of the wreckage. The popular term applied to this investigative process is "accident reconstruction."¹

The objective of this article is to outline reported decisions in Wisconsin and other jurisdictions wherein the process has been invoked by the trial lawyer—irrespective of the ruling by the court upon the proffered testimony. Effort has been made to catalogue the fruits of the research into topical, and, hopefully, functional subdivisions, both as to subject of testimony and capacity of witness, so that the pressured practitioner may readily determine what authorities obtain upon the point of proof he seeks to present. Emphasis is on Wisconsin law because that is the arena of the writers, and not because the reconstruction process has been more utilized here. It has not. And if this writing succeeds in encouraging some few lawyers—and judges—to make more judicious use of physical facts in the determination of liability, it will have been worth the effort expended.

Earlier scribes seemed to predict an expanding use of reconstruction opportunities.² The recent decisions would accord with this; even those from Wisconsin.³

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¹ The term is used, for example, in 10 AM. JUR. PROOF OF FACTS *Reconstruction of Accident* 138 (1961).

² Reath, *Scientific Data and Expert Opinion—Its Use in Automobile Accident Cases*, 24 INS. COUNSEL J. 99 (1957); Parker, *Automobile Accident Analysis by Expert Witness*, 44 VA. L. REV. 799 (1958).

³ At the time this paper was about to go to press, the Wisconsin Supreme Court had just rendered its opinion in *Kuzel v. State Farm Mut. Auto. Ins. Co.*, 20

II. FACTS SUSCEPTIBLE OF PROOF THROUGH OBSERVATION AND RECONSTRUCTION

Lawyers attempting to cope with the limitations of proof inherent in violent collisions—where those surviving often cannot remember “how it happened”—do admittedly have one boon in Wisconsin. The expansion of the doctrine of *res ipsa loquitur*⁴ into the field of auto negligence law now assists many attorneys in making a prima facie case out of the type of factual situation once thought to give rise to nothing more than sheer speculation.⁵ But often the elements essential to the invocation of the doctrine are lacking. Or, the lawyer may wish to counter damaging testimony with what he believes to be appropriate deductions or inductions from the physical evidence discovered at the scene of the alleged tort. What use can be made of the observations of those at the scene of the impact, whether trained in reconstruction or not, is herein detailed.⁶

A. *Speed of Vehicle*

It is to state the obvious to say that the basic inquiry in any collision involving a moving vehicle concerns its speed prior to and at impact. The differences in estimates of their respective speeds by adverse parties would, in many cases, be amusing if the stakes involved were not so high. One hoary assumption which has crept into too many trials is that which immediately infers zephyr-like speed in miles per hour from extensive property damage, *without* considering the effect of the weight of the vehicle upon its momentum.⁷ The Wisconsin Supreme Court has dispelled this misconception recently.⁸

Wis. 2d 588, — N.W. 2d — (1963), wherein the court indicated, to these writers, some disposition to permit effective use of reconstructive witnesses, upon the laying of proper foundation for their testimony. More will be said in the text of this article of *Kuzel, supra*.

⁴ Fully analyzed, as most Wisconsin lawyers know, in Ghiardi, *Res. Ipsa Loquitur*, 39 MARQ. L. REV. 361 (1955).

⁵ Consider the course charted by the following: *Baars v. Benda*, 249 Wis. 65, 23 N.W. 2d 477 (1947); *Wis. Tel. Co. v. Matson*, 256 Wis. 304, 41 N.W. 2d 268 (1950); *Mayer v. Boynton Cab Co.*, 267 Wis. 486, 66 N.W. 2d 136 (1954); *Modl v. Nat. Farmers Union Prop. & Cas. Co.*, 272 Wis. 650, 76 N.W. 2d 599 (1956); *Wood v. Indemnity Ins. Co.*, 273 Wis. 93, 76 N.W. 2d 610 (1956); *Henthorn v. M.G.C. Corp.*, 1 Wis 2d 180, 83 N.W. 2d 759 (1957); *Poole v. St. Farm Mut. Auto. Ins. Co.*, 7 Wis. 2d 65, 95 N.W. 2d 799 (1959).

⁶ Authorities pertaining to the topics discussed hereunder in the text include: *Annots.*, 77 A.L.R. 2d 580, 605 (1961—point of impact and speed; 66 A.L.R. 2d 1048 (1959)—point of impact; 38 A.L.R. 2d 13 (1954)—cause of accident; 33 A.L.R. 2d 1250 (1954)—whether vehicle moving; 156 A.L.R. 382 (1945)—speed; 10 AM. JUR. PROOF OF FACTS *Reconstruction of Accident* 137 (1961); 9 C BLASHFIELD, *CYCLOPEDIA OF AUTOMOBILE LAW AND PRACTICE* §6311 *et seq.* (1954); *Reath, Scientific Data and Expert Opinion—Its Use in Automobile Accident Cases*, 24 INS. COUNSEL J. 99 (1957); 25 INS. COUNSEL J. 439 (1958); *Parker, Automobile Accident Analysis by Expert Witness*, 44 VA. L. REV. 799 (1958).

⁷ More tickling, but less likely to creep into the trial records, what with the popularity of discovery examinations, is the sincere contention of some drivers that their vehicle increased in speed upon the application of brakes on ice. The law of inertia is not universally appreciated.

⁸ *Baker v. Herman Mut. Ins. Co.*, 17 Wis. 2d 597, 601, 117 N.W. 2d 725, 728

To counter extravagant expressions of speed, the careful lawyer must be familiar with the rules of evidence applicable to such testimony. They are present in abundance in the reported cases. The succeeding discussion differentiates between witnesses viewing the collision and those not viewing it, but observing either the vehicles prior thereto or the effects of impact. As indicated in the Introduction, the dichotomy of discussion distinguishes between the testimony of the untrained layman, the law enforcement official steeped in practical experience, the scientifically tutored engineer or physicist, and other types of witnesses.

1. Lay witnesses

a. View of Collision

(1) Wisconsin

The Wisconsin Supreme Court many years ago ruled against the admissibility of vague statements to the effect that a vehicle was "going fast" or "real fast" or "was speeding" at the time of collision.⁹ The court later imposed on such indefinite description the requirement that it be coupled with a certain speed in miles per hour, made by a person experienced in driving cars.¹⁰ When the witness was able to express a miles per hour estimate, irrespective of limitations on the view, "it was receivable and for the jury to give it such weight as they saw fit."¹¹ This is true even though the vehicle passed at a right angle to the witness some six hundred to nine hundred feet away.¹² But no useful estimate can be made from a fleeting glance when the car is fifteen feet away from the witness.¹³

A guidepost in Wisconsin law has been the bar against estimates made by occupants of vehicles approaching from the opposite direction of the vehicle being gauged.¹⁴ But if the witness is in a stationary position at the time of his estimate, apparently his estimate of closure speed is admissible.¹⁵

(2) Other Jurisdictions

Most courts do insist that a witness have a reasonable length of

(1962), where Justice Currie said: ". . . We take judicial notice of the fact that just prior to the collision the truck had a momentum equal to the product of its mass and velocity . . ."; cf. the result in *Rubach v. Prah*, 190 Wis. 421, 209 N.W. 670 (1926).

⁹ *Ronning v. State*, 184 Wis. 651, 200 N.W. 394 (1924).

¹⁰ *Gerbing v. McDonald*, 201 Wis. 214, 229 N.W. 860 (1930).

¹¹ *Benedict v. Berg*, 229 Wis. 1, 6, 281 N.W. 650 (1938).

¹² *Fox v. Kaminsky*, 239 Wis. 559, 2 N.W. 2d 199 (1942).

¹³ *Culver v. Webb*, 244 Wis. 478, 12 N.W. 2d 731 (1944); but compare *Albrecht v. Tradewell*, 271 Wis. 303, 73 N.W. 2d 408 (1955).

¹⁴ *Fessler v. Northwestern Nat. Casualty Co.*, 265 Wis. 14, 60 N.W. 2d 387 (1953); *Maccaux v. Princl*, 3 Wis. 2d 44, 87 N.W. 2d 772 (1958).

¹⁵ *Millay v. Milw. Auto. Ins. Co.*, 19 Wis. 2d 330, 120 N.W. 2d 103 (1962. Cf. *Dahinden v. Milw. E. R. & L. Co.*, 169 Wis. 1, 171 N.W. 669 (1919).

time within which to make his observation as to speed before his opinion is admissible.¹⁶ But that opportunity need be but fleeting to satisfy some tribunals.¹⁷

Unlike the Wisconsin bar of vagueness, a description that a vehicle moved as a "flash of yellow," has been admitted as denoting great speed.¹⁸ And occasionally a mere "guess" is received,¹⁹ under the frustrating basis that the limitation of view goes to the weight, rather than admissibility.

A case that provides the rationale for permitting estimates of speed made within a frame of references comprised of fixed objects, is *Birnbaum v. Kirchner*.²⁰ Not every court prohibits estimates of closure speed made from moving vehicles.²¹

b. No View of Collision

This category distinguishes between estimates of speed based upon observation made prior to the collision, and those predicated upon the aftermath of the impact.

(1) Wisconsin

(a) Travel Prior to Collision

In an early case, the court said that admission of an estimate of speed of a truck when traveling on a different street prior to the collision was not prejudicial.²² But a different result was soon reached in a manslaughter case.²³ Where the physical damage to the cars was great, there was no error in permitting estimates of speed made near, but not at, the scene of the collision.²⁴

Where a defendant tried to show his reduced speed through observation of his car by a witness who apparently saw it one-fourth of a mile from the point of impact and then heard the crash, the trial court properly rejected the offer as "too remote."²⁵

An unusual offer of proof was recently made by a plaintiff who wished to prove the defendant's vehicle was traveling at a high rate of speed, through the testimony of a person reputedly *experienced* in

¹⁶ *Kristufek v. Rapp*, 154 Neb. 708, 47 N.W. 2d 923 (1951); *Peake v. Omaha Cold Storage Co.*, 158 Neb. 676, 64 N.W. 2d 470 (1954).

¹⁷ *Koutsky v. Grabowski*, 150 Neb. 508, 34 N.W. 2d 893 (1948)—driver of lead car testified as to speed based on glance in rear view mirror. Wisconsin has permitted the same thing. *Hibner v. Landauer*, 18 Wis. 2d 451, 118 N.W. 2d 873 (1962).

¹⁸ *Acker v. Columbus & Southern Ohio Elec. Co.*, 42 Ohio L. Abs. 430, 60 N.E. 2d 932 (1944).

¹⁹ *Schwenger v. Gaither*, 87 Cal. App. 2d 913, 198 P. 2d 108 (1948); *Kurn v. Counts*, 247 Ala. 129, 22 So. 2d 725 (1945). *Contra*, *Frank v. Stiegler*, 250 Minn. 447, 84 N.W. 2d 912 (1957).

²⁰ 337 Ill. App. 25, 85 N.E. 2d 191 (1949).

²¹ *Lewis v. Miller*, 119 Neb. 765, 230 N.W. 769 (1930).

²² *Thomas v. Lockwood Oil Co.*, 178 Wis. 599, 190 N.W. 559 (1922).

²³ *Ronning v. State*, 184 Wis. 651, 200 N.W. 394 (1924).

²⁴ *Rubach v. Prah*, 190 Wis. 421, 209 N.W. 670 (1926).

²⁵ *Neumann v. Evans*, 272 Wis. 579, 76 N.W. 2d 322 (1955).

listening to vehicles on the highway. Not surprisingly the court excluded such evidence as conjectural.²⁶

(b) Effects of Collision

*Thomas v. Lockwood Oil Co.*²⁷ permits proof of the distance run by a vehicle after impact. Where a defendant driver traveled twelve feet after collision with the emergency brake applied, negligence was found as a matter of law, for he stated he could have easily stopped.²⁸

Negligent speed as a matter of law, was also found, setting aside a jury verdict, where car No. 1 was driving east with a weight of 2200 pounds and car No. 2, weighing 3800 pounds and headed south, struck No. 1, deflecting No. 1 from its easterly course and moving it 74 feet south at a right angle to its original path. Car No. 2 came to a stop 25 feet south of the place of collision. The court deemed the uncontroverted physical results of the collision to be so strong and convincing as to control the case.²⁹

A comparatively recent case in which no eyewitnesses to the accident could be located, and where the results of the accident were relied upon to reconstruct the actions of the vehicle prior to impact, is *Evjen v. Packer City Transit Lines*.³⁰ There Justice Hallows stated:

When several inferences may reasonably be drawn from credible evidence and one of which will support a claim or contention of any party and the others will not, the rule is that the proper inference to be drawn is for the jury. *Dachelet v. Home Mut. Casualty Co.* (1951), 258 Wis. 413, 46 N.W. (2d) 331. While there is no evidence of the position of the motor vehicles just prior to the impact, except which may be inferred from the position of the motor vehicles, their cargoes, and the debris after the accident, and there is no direct oral testimony corroborating any inference to be drawn from the physical facts, we are of the opinion the facts here presented, if anything, a jury question. The relative positions of the two vehicles and the debris after the collision cannot conclusively support either theory because the mechanical results of an accident of this kind are sometimes very surprising and hard to explain. It seems to us that in the present case they may be explained fully as reasonably on the theory that the collision occurred in the west lane near the center line as in the east lane. In *Glatz v. Kroeger Bros. Co.* (1919), 168 Wis. 635, 639, 170 N.W. 934, this court said such a situation was peculiarly appropriate for the judgment of a jury. See also *Standard Accident Ins. Co. v. Runquist* (1932), 209 Wis. 97, 101, 244 N.W. 757.³¹

And great speed was inferred from the extensive damage to the

²⁶ Carstensen v. Faber, 17 Wis. 2d 242, 116 N.W. 2d 161 (1961).

²⁷ Thomas v. Lockwood Oil Co., *supra* note 22.

²⁸ Ortman v. A. Leath & Co., 187 Wis. 616, 205 N.W. 397 (1925).

²⁹ Rubach v. Prah, 190 Wis. 421, 209 N.W. 670 (1926).

³⁰ 9 Wis. 2d 153, 100 N.W. 2d 580 (1960).

³¹ *Id.* at 161-62, 100 N.W. 2d at 586.

vehicles and the serious injuries to the occupants in *Rodenkirch v. Johnson*,³² where it was said:

The jury could reasonably conclude that the speed of the respondent was great and in excess of 25 miles per hour from the physical facts and other testimony, especially that the appellant's car was forced backward over 65 feet, spun around in the opposite direction, and practically demolished; the respondent's car continued beyond the apparent point of impact some 35 feet in its direct line of force, was turned around, and was extensively damaged; and four people were killed outright and two seriously injured.³³

Negligence as to speed was similarly inferred as to the following car in a two car collision, in *LaVillie v. Gen. Ins. Co.*³⁴

(2) Other Jurisdictions

(a) Travel Prior to Collision

Lay witnesses can always testify as to their observations, such as the length of skidmarks, even though they may not see the impact.³⁵ But, as in Wisconsin, what the ear hears cannot be transposed into a miles per hour estimate.³⁶ Conversely, observations of a driver, killed in the crash, driving "at regular speed" on the way to the point of collision can be described on the witness stand.³⁷

A court has permitted an estimate of the speed of a bus fifteen hundred feet before the place where it struck a vehicle it was trying to pass.³⁸ Where other witnesses followed the vehicle and its speed did not vary, an estimate made two and one-half miles from the scene was competent.³⁹

Witnesses have also been permitted to state that a vehicle in collision was veering back and forth across the center line, even as far back as 27 miles before the place of impact.⁴⁰ But other judges recognize one's conduct can change.⁴¹

(b) Effects of Collision

Most courts place restrictions upon attempts of lay witnesses to gauge the speed of vehicles prior to and at collision from the effects

³² 9 Wis. 2d 245, 101 N.W. 2d 83 (1960).

³³ *Id.* at 251, 101 N.W. 2d at 86.

³⁴ 17 Wis. 2d 522, 117 N.W. 2d 703 (1962).

³⁵ *Grossnickle v. Avery*, 96 Ind. App. 479, 152 N.E. 288 (1926).

³⁶ *Challinor v. Axton*, 246 Ky. 76, 54 S.W. 2d 600 (1932); *Haight v. Nelson*, 157 Neb. 341, 59 N.W. 2d 576 (1953). Opposite result: *Hayungs v. Falk*, 238 Iowa 285, 27 N.W. 2d 15 (1947).

³⁷ *Arkmo Lumber Co. v. Luckett*, 201 Ark. 140, 143 S.W. 2d 1107 (1940).

³⁸ *Gabel v. Hanby*, 165 Kans. 116, 193 P. 2d 239 (1948); similarly, at six hundred feet, *Kohl v. Marin*, 346 Mich. 693, 78 N.W. 2d 621 (1956).

³⁹ *Clay v. Sammons*, 239 S.W. 2d 927 (Ky. App. 1951). *Reid v. Humphreys*, 210 Md. 178, 122 A. 2d 756 (1956)—two and one-half miles.

⁴⁰ *Briggs v. Burk*, 174 Kans. 440, 257 P. 2d 164 (1953). Three-fourths of a mile was too distant in *David Belgore & Co. v. Ryder*, 211 F. 2d 855 (8th Cir. 1954), however.

⁴¹ *Brower v. Quick*, 249 Ia. 569, 88 N.W. 2d 120 (1958).

of the impact. While nonexperts can describe skidmarks, they cannot base miles per hour speed on their length.⁴² Unsurprisingly, the same objection extends to opinions based on the "roar" of the crash.⁴³ Without some proof of qualification, witnesses cannot opine speed from the extent of damage to the vehicles alone.⁴⁴

The mere fact a witness, in the car from which plaintiff had alighted a split second before collision, was propelled one hundred feet by the rear end impact, did not permit that witness to testify as to the defendant's speed. The court held a person with knowledge of time and distance, and an opportunity to formulate a basis for his opinion, is competent to estimate speed. But no opportunity was presented in the case.⁴⁵

2. Law Enforcement Witnesses

Perhaps no classification of witness is more often sought as to the physical facts upon which reconstruction can be predicated than the law enforcement officer. Usually arriving at the scene of the collision within a short time after impact, he is by statute in most states, such as Wisconsin,⁴⁶ obliged to make an official written report of his observations and the results of his inquiries. No preparation for trial is truly thorough unless a copy of that report is a part of the trial lawyer's file.⁴⁷ And detailed interview with the officer may often reveal his availability and qualifications for testimony beyond mere observation. The following authorities are at least indicative of the bounds within which such testimony is admissible.

a. Wisconsin

Only one Wisconsin case has been located in which a law enforcement officer attempted to reconstruct the speed of vehicles in collision. In *Andersen v. Andersen*,⁴⁸ a two car collision occurred in the center of the highway. At trial, a traffic officer who had been on the highway squad for twenty-eight years and had participated in the investigation of over one thousand accidents, but who had never studied the subject of physics, was called to the stand. He had not visited the scene of the accident involved in litigation, but had studied photographs of the scene and a drawing of the locations of the cars after impact with skid marks noted thereon. These items had already been received in

⁴² *Everhart v. Fischer*, 75 Ore. 316, 147 Pac. 189 (1915); *Ward v. Zerzanek*, 227 Iowa 918, 289 N.W. 443 (1940).

⁴³ *Challinor v. Axton*, 246 Ky. 76, 54 S.W. 2d 600 (1932).

⁴⁴ *Williams v. Roche Undertaking Co.*, 255 Ala. 56, 49 So. 2d 902 (1950).

⁴⁵ *Kristufek v. Rapp*, 154 Neb. 708, 47 N.W. 2d 923 (1951). To the same effect: *Haight v. Nelson*, 157 Neb. 341, 59 N.W. 2d 576 (1953).

⁴⁶ WIS. STAT. §346.70 (4) (1961).

⁴⁷ 52 OPS. WIS. ATTY GEN. 242 (1963) has helped make such reports more readily available in Wisconsin, by removing them from the status of confidential records with the law enforcement agencies.

⁴⁸ 8 Wis. 2d 278, 99 N.W. 2d 190 (1959). Cf. *Luetke v. Schmidt-Gaertner Co.*, 170 Wis. 590, 176 N.W. 63 (1920).

evidence. The officer then stated, among other things, that in his opinion the defendant's car must have been going much faster than plaintiff's, based upon the location and extent of damage.

On appeal, the Wisconsin Supreme Court held the practical experience of the officer was insufficient qualification to enable him to give an opinion as to the relative speed.⁴⁹ But the admission of the testimony, while error, was not prejudicial.

b. Other Jurisdictions

Mere observation of physical damage by an officer steeped in practical experience, but short on scientific training, does not permit him to give an opinion of speed, where the hypothetical question did not embrace any of the facts occurring prior to impact.⁵⁰ But where an officer on the stand has measured the length of skidmarks at the scene, and had five and one-half years experience on the highway patrol, he was permitted to testify whether a driver "was traveling at an excessive rate of speed."⁵¹ (In Wisconsin, the established admissibility⁵² of the Table of Stopping Distances contained in the *Wisconsin's Manual for Motorists*, published by the State Motor Vehicle Department makes any oral testimony as to speed based on skidmarks alone usually superfluous.)

Some states permit an officer to testify as to the "reasonable speed in the area" where the collision occurred, and then the speed of the drivers, where the officer has spent many years of duty in that area.⁵³

Where a witness had twenty-six years experience in a traffic bureau and received training at the Northwestern University Traffic Institute, he was permitted to testify as to speed based on the surface of the roadway, the damage to the vehicles, and seventy-five feet of skidmarks.⁵⁴ And in another case, two officers had attended a four and one-half month course in traffic administration, experimented with various cars on various surfaces, conducted 6500 tests, including

⁴⁹ The court relied on 1 WIGMORE, EVIDENCE §561, at 963 (2d ed. 1923).

⁵⁰ *Stephanofsky v. Hill*, 136 Conn. 379, 71 A. 2d 560 (1950). Same result: *Ross v. Newsome*, 289 F. 2d 209 (5th Cir. 1961); *Baggett v. Allen*, 237 Ala. 164, 137 So. 2d 37 (1962); *Robert v. Koons*, 230 Iowa 92, 296 N.W. 811 (1941).

⁵¹ *Johnson v. Battles*, 255 Ala. 624, 52 So. 2d 702 (1951). The same testimony was permitted where the witness had nine years of experience in *Ruther v. Tyra*, 139 Wash. 625, 247 P. 2d 964 (1952).

⁵² See *Steffes v. Farmers Mut. Auto Ins. Co.*, 7 Wis. 2d 321, 96 N.W. 2d 501 (1959). See also *Baker v. Herman Mut. Ins. Co.*, 17 Wis. 2d 597, 117 N.W. 2d 725 (1962)—brake reaction time.

⁵³ *E.g.*, *Ferguson v. Hurford*, 132 Colo. 522, 290 P. 2d 229 (1955); *Beckman v. Schroeder*, 224 Minn. 370, 28 N.W. 2d 629 (1947). *Contra*, *Christ v. Wempe*, 219 Md. 627, 150 A. 2d 918 (1959).

⁵⁴ *Continental Oil Co. v. Elias*, 307 P. 2d 849 (Okla. 1957). Similarly: *Foreman v. Heinz*, 185 Kans. 715, 347 P. 2d 451; *Johnson v. Huskey*, 186 Kans. 282, 350 P. 2d 14 (1960); *Etheridge v. Hooper*, 104 Ga. App. 227, 121 S.E. 2d 323 (1961); *Central Container Corp. v. Westbrook*, 105 Ga. App. 855, 126 S.E. 2d 264 (1962). *Contra*, *Reall v. Deiriggi*, 127 W.Va. 662, 34 S.E. 2d 253 (1945); *Jowers v. Dauphin*, 237 Ala. 567, 143 So. 2d 167 (1962); *B-Line Cab Co. v. Hampton*, 247 S.W. 2d 34 (Ky. App. 1952).

some at the scene. From these tests and their other experience in determining coefficients of friction, they were permitted to state that the critical speed of the vehicle in leaving the curve was 80.52 m.p.h. On appeal, the court gave great deference to the discretion of the trial court, but indicated it would have reversed, had the testimony been the only evidence from which the jury could determine speed.⁵⁵

The observation of wreckage of the vehicles alone is not a sufficient basis for the estimate of speed, no matter how experienced the officers.⁵⁶ But where a captain of the Nebraska State Patrol had examined the paving at the scene, the kind of cars, and studied photos of the scene, and was asked a hypothetical question as to speed based on the type cars, their wheel base, their course, the grade, the condition of the intersection at the time, the position of the cars after the accident, the damage to them as reflected in the photos, and twenty-two feet of skidmarks, the estimate of speed was permitted.⁵⁷

And just when an opinion as to speed based exclusively upon the damage observed will not be permitted is indicated by *Tyndall v. Harvey G. Hines Co.*⁵⁸ There a state highway patrolman came to the scene where the plaintiff pedestrian had been injured and his sister killed by an ice cream truck. At trial the officer testified as to his observations, and then, over defendant's objection, answered a hypothetical question as to speed. His answer was derived from the distance of the bodies from the point of impact and other markings at the scene.

On defendant's appeal, the North Carolina Appellate Court acknowledged that generally a witness must concern himself with facts, and his opinions are to be confined to questions of art, science or skill. It then said:

But this rule is too narrow to meet the needs of everyday life and to protect the rights of citizens in courts of justice. It is practically impossible to give intelligible evidence as to some facts except through the medium of opinion.⁵⁹

However, the court considered that because the witness had estimated speed from readily observable conditions at the scene, the ordinary layman could readily understand and appreciate what the witness had seen. Hence, the jury was as well qualified to draw the inferences from such facts as the witness, and his testimony was prejudicial to the defendant.

⁵⁵ *Myers v. Korbly*, 103 So. 2d 215 (Fla. App. 1958).

⁵⁶ *Redding v. Independent Contracting Co.*, 333 S.W. 2d 269 (Ky. App. 1960); *Flores v. Barlow*, 354 S.W. 2d 173 (Tex. Civ. App. 1962); *Wilkinson v. Martin*, 353 P. 2d 440 (Wash. 1960). *Contra*, *Cross v. Estate of Patch*, 123 Vt. 11, 178 A. 2d 393 (1961).

⁵⁷ *Beggs v. Gottsch*, 173 Neb. 15, 112 N.W. 2d 396 (1961).

⁵⁸ 226 N.C. 620, 39 S.E. 2d 828 (1946).

⁵⁹ *Id.*, 39 S.E. 2d at 829.

3. "Scientific Expert" Witnesses

We have seen that many jurisdictions quite readily permit the investigating officer to give his opinion of speed based upon his observations at the scene of impact, particularly where identifiable skidmarks were present. Far less harmony prevails in the case of the witness trained in the laws of mechanics, dynamics, inertia, and, in short, the laws of energy and motion, who attempts to reconstruct the events prior to impact as well as thereafter from the fragmentary evidence in the record at the time he testifies. The following discussion regarding reconstruction of speed, and the succeeding matters considered in which "expert" testimony was or was not allowed in the decided cases do reflect a trend. Such opinion evidence will be admitted if the expert's qualifications are clearly established as material to the subject matter of his testimony, sufficient physical evidence is in the record upon which an opinion can be predicated, and that opinion is not in conflict with the common experience of mankind.⁶⁰

a. Wisconsin

Thirty years ago *Goetz v. Herzog*⁶¹ was decided. There the plaintiff sued for the alleged wrongful death of her husband whose car collided with a cab owned by one of the defendants. The jury found both drivers negligent, and plaintiff appealed from the judgment for the defendants. One of her bases for requesting reversal was the refusal of the trial court to permit a qualified teacher of physics to state the law of physics applicable to the imparting of force. This offer of proof was rejected on the ground the witness had no experience with colliding automobiles. The purpose of the offered testimony was to refute the inference that defendants' car could not have been traveling as fast as the deceased's because if it had been, its inertia would have carried it beyond the point of impact. The Wisconsin Supreme Court affirmed the trial court, stating:

The law [of imparted force] is doubtless as well known, as much a matter of common knowledge, as the law of inertia, the contended effect of which the proffered evidence was offered to refute. The effect of it was as much a proper subject of argument without proof as was the effect of the law of inertia of which there was no proof. If not as well understood by the jury as the law of inertia, its effect was readily subject to illustration in argument. We perceive no error in the rejection of the testimony.⁶²

In the later case of *Anderson v. Eggert*,⁶³ the court said it did not wish to imply that the trial court in *Goetz* would have committed error by admitting the testimony of the teacher of physics.

⁶⁰ See 10 AM. JUR. PROOF OF FACTS *Reconstruction of Accident* 144 (1961).

⁶¹ 210 Wis. 494, 246 N.W. 573 (1933).

⁶² *Id.* at 498, 246 N.W. at 574.

⁶³ 234 Wis. 348, 360, 291 N.W. 365 (1940)—more fully discussed at p. 358.

b. Other Jurisdictions

Mere examination of the automobiles by a professional engineer several days after the accident is not a sufficient basis upon which to determine the relative speeds of the two vehicles.⁶⁴ But where a witness with an M.A. in civil engineering was asked to assume as true the testimony of a motorman locating point of impact and the fact that at the time of collision the power of the bus was released and its brakes applied, and investigating officers had previously testified as to the place where it came to a stop, the engineer, using a "coefficient of friction" formula, was permitted to testify as to the speed of the streetcar. His opinion of 39 m.p.h. was the only testimony contradicting the 25 m.p.h. estimate of defendant's motorman. On appeal by defendant to the Minnesota Supreme Court, Justice Youngdahl, in what is now one of the leading opinions in the matter of expert testimony regarding speed, held the fact the engineer had not operated a street car, and was unfamiliar with its weight and braking apparatus, was not a bar to his expression of opinion.⁶⁵

Any person of ordinary ability and intelligence having the means or opportunity of observation is competent to testify to the rate of speed at which an automobile, locomotive, or other object was moving at a given time. Such estimate of speed is generally viewed as a matter of common observation rather than expert opinion. Because speed is generally not considered a matter of expert opinion, it does not mean that experts cannot testify to it, but merely that when they do their testimony is received not as an exception to the opinion evidence rule made in cases calling for expert evidence, but under the exception existing when it is impossible to reproduce data. 20 Am. Jur., Evidence, §805.⁶⁶

With this breakthrough, the Minnesota Supreme Court, in the later case of *Storbakken v. Soderberg*,⁶⁷ found no objection in the testimony by a civil engineer as to speed at impact using the "Law of Conservation and Momentum." The witness conducted tests at the scene, and was given all facts deemed pertinent in a hypothetical question which is included in the footnotes.⁶⁸ The court held the hypothesis need not

⁶⁴ Warren v. Hynes, 4 Wash. 2d 128, 102 P. 2d 691 (1940).

⁶⁵ Moeller v. St. Paul City Ry. Co., 218 Minn. 353, 16 N.W. 2d 289 (1944).

⁶⁶ *Id.*, 16 N.W. 2d at 295.

⁶⁷ 246 Minn. 434, 75 N.W. 2d 496 (1956).

⁶⁸ *Id.*, 75 N.W. 2d at 499:

" . . . I ask you to assume these following facts: that an automobile weighing approximately 3435 pounds, with a load of 340 pounds including the driver, is traveling northward on a hard-packed gravel surface roadway of clay and dirt; also assume that this automobile is slowing down for an intersection located approximately a hundred and fifty to a hundred and seventy-five feet north by intermittently applying the brakes until the wheels commence to slide a total of three times; assuming further that after this process the driver of this automobile totally applies his brakes so that the four wheels are sliding a distance of fifty to fifty-five feet to

include all testimony in the record, but substantially all undisputed facts relating to the subject matter of the opinion.⁶⁹

A more recent case illustrates the importance of including no facts not in evidence, such as an assumption the defendant was making a right turn at time of collision, where no prior testimony substantiated it.⁷⁰ The court relied on the following rule:

. . . no matter how skilled or experienced the witness may be, he will not be permitted to guess or to state a judgment based on mere conjecture; in other words, the factual foundation for the expert opinion must not be nebulous.⁷¹

The value of reconstructive testimony in an action for wrongful death, with no surviving eyewitnesses, is shown by *Leeper v. Thornton*.⁷² There, defendant introduced a safety engineer who began his investigation of the collision one and one-half years after it occurred. He based his opinions on what evidence was then visible at the scene and the remains of the two cars in a salvage yard. From this, he was permitted to state that the vehicle of plaintiff's deceased was traveling faster at impact, and his evidence supported a jury verdict for the defense.

But where two plaintiffs, involved in a two-car head-on collision, attempted to prove by expert testimony that defendant had the "last clear chance" to avoid the crash, but could not because of excessive speed, their efforts were thwarted.⁷³ The plaintiffs had no recollection of events prior to impact, and employed Clarence S. Bruce, a "traffic accident analyst," with thirty years experience in the automotive

a point in the northeast quarter of the intersection of these roadways where the car and the truck came into collision; assuming also that the weight of the truck with the load was 15,040 pounds and that the truck had been traveling in an easterly direction and had approached the automobile approximately at right angles; assuming also that the left front of the automobile and the right front of the truck collided; and further assuming that after the collision the automobile traveled in a northerly direction and came to rest in the ditch on the east side of the road, with the rear wheels approximately 16 feet four inches north from the north line of the township road and the front left wheels of the car approximately 12 feet three inches east from the east shoulder of the gravel road on which the car had been traveling; that the left front wheel of the automobile was damaged in the collision; and that the direction of travel of the truck was changed from an easterly direction to a northerly direction and that the truck came to rest on its right side, with the center of the truck approximately 22 feet north from the point of impact. Now, on the basis of those assumed facts which have been given to you previously, Mr. Johnson, have you been able to make, to formulate, to form an opinion as to speed of the automobile at these various times (A) when the driver of the automobile first commenced to apply the brakes intermittently? Have you formed an opinion as to the speed of the automobile at that point?"

⁶⁹ Quoting 2 WIGMORE, EVIDENCE §682 (b) (3d ed. 1940).

⁷⁰ *Waller v. So. Cal. Gas Co.*, 107 Cal. App. 747, 339 P. 2d 577 (1959).

⁷¹ 32 C.J.S. *Evidence* §522, at 220 (1942).

⁷² 86 Ariz. 242, 344 P. 2d 1101 (1959).

⁷³ *Kale v. Douthitt*, 274 F. 2d 476 (4th Cir. 1960).

laboratory at the National Bureau of Standards and author of *Table of Stopping Distances and Reaction Time* used in many states, Bruce studied the scene of the accident the day before trial which was eighteen months after the collision. He also examined photographs earlier introduced into evidence showing the highway, skidmarks and debris at the scene, and the damaged vehicles on opposite shoulders of the road. He was then asked to determine defendant's speed at the time he applied his brakes.⁷⁴ Objection due to the omission of material facts such as the exact weight of the drivers, the angle of incline, and the nature and condition of the tires and the road surface, was sustained. The plaintiffs thus were "out of court," for the court of appeals felt that

Experience has shown the futility of attempted demonstration in accident cases; there are too many varying factors. Among these variants we may class indefinite rate of speed, condition of the highway, judgment or lack thereof in the drivers, a direct blow or a glancing one, and the balance or equilibrium of each car at the time of impact.⁷⁵

Similar reasoning has prevented an "accidentologist," one Alvin Doyle of Baton Rouge, La., with previous experience testifying in courts of twelve states⁷⁶ from expressing opinion as to speed, in one of the latest cases on the subject.⁷⁷ The commendable feature of the decision is the dissent:

The majority opinion suggests that it would invade the province of the jury to admit expert testimony in automobile cases. But this reasoning begs the question, because there are many instances where expert opinion has been permitted to aid the jury. This would include medical questions of causation, the testimony of handwriting experts, ballistics experts, property appraisers. Nor will such evidence necessarily turn

⁷⁴ The following assumptions were included in the question:

"... (1) a highway approximately 21 feet wide with lanes about 10 feet wide, relatively level and straight, with a slight upgrade toward the north; (2) hard-surface asphalt pavement, known as F-1 black top; (3) skid marks 50 feet in length made by the Douthitt car approaching from the north; (4) the Kale car approaching from the south came into the south-bound lane of traffic at a speed between 45 and 55 miles an hour; (5) the vehicles collided at a point indicated in the photographs by the skid marks and debris; (6) the Kale car came to rest against a bank 5 feet 10 inches from the edge of the east shoulder, which is 11 feet and 10 inches wide; (7) the Douthitt car came to rest either at a point 10 inches west of the white center line, or on the west shoulder as shown in the photograph. Q. Can you, with those statements which I have given you, estimate mathematically the speed at which the Chrysler Imperial (Douthitt's car) was travelling at the time the deceleration of that vehicle began?"
"A. Yes, sir."

⁷⁵ 274 F. 2d at 483, quoting *Fishman v. Silva*, 116 Cal. App. 1, 2 P. 2d 473, 474 (1931).

⁷⁶ His testimony was admitted, for example, in *Sinclair v. Cook*, 128 So. 2d 247 (La. App. 1961); *Fendlason v. Allstate Ins. Co.*, 136 So. 2d 814 (La. App. 1961).

⁷⁷ *Hagan Storm Fence Co. v. Edwards*, 148 So. 2d 693 (Miss. 1963).

into a clash of partisan experts. *The automotive engineer is not subject to the same partisan pressures to which an attending physician may be subject. Moreover, the ability to apply the laws of motion is distinctly much more of an exact science than the art of expressing an opinion on a question of medical causation.* In the search for truth, the court should permit the use of adequately qualified experts in any area where scientific evaluation would be of assistance to the jury. Yet, unfortunately, the controlling opinion rejects the testimony of an experienced, qualified automotive engineer where there are no available eyewitnesses.

. . . it seems to us that where there are no eyewitnesses and in fact there is nothing on which the jury could reasonably base their decision, and where the physical evidence leaves the question of what happened unexplained, a jury of ordinary, everyday citizens would welcome the opinion of someone with superior knowledge and experience. We do not mean to say such testimony should be permitted in every case. It should be left to the sound discretion of the trial court. In the exercise of sound discretion, it should determine (a) that the witness is qualified by training and experience or otherwise; (b) his evidence would be of benefit to the jury, and (c) such evidence is necessary for the jury to have a better understanding of the facts presented to it.
[Emphasis supplied.]⁷⁸

Needless to say, a scientific expert is sometimes permitted to estimate speed from the length of observable skidmarks.⁷⁹

4. Other Witnesses

In isolated cases, one can find witnesses of varied backgrounds giving estimates of speeds. Decisions immediately after the advent of the automobile reveal little restrictions on such testimony.⁸⁰ Occasionally, mechanics and surgeons were permitted to opine speed based on damage to the car and its occupants.⁸¹ Much deference seems accorded to the trial court in allowing the testimony of garagemen.⁸² But mere experience in driving trucks does not qualify a witness as an expert on speed.⁸³

And no witness, irrespective of his qualifications, should predicate

⁷⁸ *Id.*, 148 So. 2d at 700.

⁷⁹ *Monday v. Millsaps*, 264 S.W. 2d 6 (Tenn. App. 1953); *In re Armstrong Estate*, 181 Kans. 171, 311 P. 2d 281 (1957).

⁸⁰ *E.g.*, *Heidner v. Germscheid*, 41 S.Dak. 430, 171 N.W. 208 (1919)—witnesses were familiar with the handling of cars and had examined scene.

⁸¹ *McCarthy v. Souther*, 83 N.H. 29, 137 Atl. 445 (1927); *contra*, as to testimony of mechanic: *Faris v. Burroughs Adding Mach. Co.*, 48 Idaho 312, 282 Pac. 72 (1929); *Johnston v. Peairs*, 117 Cal. App. 208, 3 P. 2d 617 (1931); *Roberts v. Koons*, 230 Iowa 92, 296 N.W. 811 (1941); *Oyster v. Dye*, 7 Wash. 2d 674, 110 P. 2d 863 (1941).

⁸² See *Harrington v. Travers*, 288 Mass. 156, 192 N.E. 495 (1934); *Comstock v. Smith*, 183 Wash. 94, 48 P. 2d 255 (1935); *Linde v. Emmick*, 16 Cal. App. 676, 61 P. 2d 338 (1936).

⁸³ *Wisniewski v. Weinstock*, 130 N.J. L. 58, 31 A. 2d 401 (1943).

his opinion on such facts as are beyond his acknowledged ability to comprehend and evaluate.⁸⁴

B. *Direction of Travel*

1. Lay Witnesses

As might be expected there is paucity of reported cases in which untrained persons were permitted to testify as to the direction and path of travel of vehicles before and after collision. Only observations of lay persons going to the fact of direction seem permitted.⁸⁵

2. Law Enforcement Witnesses

a. Wisconsin

We have previously discussed *Andersen v. Andersen*⁸⁶ where the experienced traffic officer testified although not present at the scene. In addition to giving opinion as to relative speeds, the witness testified to a reasonable certainty that the defendant car was sliding sideways in the south lane, with its front end facing the north lane, at time of collision. All of his opinions were inadmissible, but their reception not prejudicial error in that case.

b. Other Jurisdictions

In some of the cases, it appears that the investigating officer is permitted to testify as to the maneuvers of the vehicles under the guise of reporting the presence and nature of skidmarks.⁸⁷ Much deference is extended to the discretion of the trial court in permitting the officer to comment on direction of travel after collision.⁸⁸ But the appellate court will be zealous to void opinions based on observations coupled with what bystanders told the investigating officer.⁸⁹

A lead case permitting wide latitude in the testimony of a highway patrolman investigating the collision of two tractor-trailers is *Wells Truckways v. Cebrian*.⁹⁰ There, based on the location of the trucks after impact, tire tracks and gauge marks, and the nature and extent of damage, the witness was permitted to state that the defendant truck was "angling" at a 20° angle at collision, and that such angulation would have projected the trailer into plaintiff's lane for 23 feet prior to impact. The court on appeal emphasized the witness's qualifications—100 such investigations in 14 years of patrol work. Because the circumstantial evidence in the record was not self-explanatory to

⁸⁴ *Whittaker v. Van Fossan*, 297 F. 2d 245 (4th Cir. 1961).

⁸⁵ See, for example, *Lambert v. Corona*, 206 N.C. 616, 175 S.E. 303 (1934), where an eye witness was permitted to state that skid-marks observed were in the direction the vehicle was headed.

⁸⁶ Note 48 *supra*.

⁸⁷ For example, *Bybee Bros. v. Imes*, 288 Ky. 1, 155 S.W. 2d 492 (1941).

⁸⁸ *Ruther v. Tyra*, 207 Okla. 112, 247 P. 2d 964 (1952).

⁸⁹ *Maben v. Lee*, 260 P. 2d 1064 (Okla. 1953), citing 20 AM. JUR. EVIDENCE §817 (1939). See also *L. C. McNelley v. D-A Lubricant, Inc.*, 368 P. 2d 555 (Colo. 1962).

⁹⁰ 122 Cal. App. 666, 265 P. 2d 557 (1954).

the layman, the patrolman's opinion was considered of assistance to the jury in drawing correct inferences from the physical facts.

The Iowa Supreme Court appears to have now adopted this reasoning.⁹¹

Sometimes an investigating officer will chart the direction of travel of vehicles on the diagram which he prepares for submission to high authority. If such a drawing includes his conclusions, and no foundation is laid for its submission, the conclusions are to be deleted from the diagram before received in evidence.⁹² And questions asked the officer should not be framed in terms of "whether the collision could have occurred as plaintiff—or defendant—testified" as this invades the province of the jury.⁹³

3. "Scientific Expert" Witnesses

The latest Wisconsin case in the field of accident reconstruction is *Kuzel v. State Farm Mut. Auto. Ins. Co.*⁹⁴ There the defendant's insured driver was killed in a two car head-on collision. The testimony of the investigating officer was to the effect that the presence of dirt and debris on the highway, as well as skidmarks from the plaintiff automobile, indicated the impact occurred in defendant's lane, the south-bound lane, of traffic. There were no skidmarks from the defendant's car. The plaintiff, guest in the other car, and his driver, stated on trial that prior to impact, defendant's car had invaded their north-bound lane, forcing them to swerve to the left into the south-bound lane.

The only witness called by the defense other than the investigating officer, was Professor A. H. Easton of the University of Wisconsin. His initial acquaintance with the case was in November, 1961, three and one-half years after the collision, when he spent one and one-half hours at the scene. The only other data available to him were seven photographs taken by the officer immediately after the collision and the officer's written report of the accident. In Easton's opinion on trial, he stated that the car in which plaintiff was a passenger had been traveling in a path directly in line with its skidmarks for at least 100 feet prior to application of brakes. The skidmarks measured 57 feet and were all in the lane of defendant's driver. The professor further opined that defendant's driver had been traveling "more or less parallel to the center for approximately 50 feet prior to the impact,"

⁹¹ *Brower v. Quick*, 249 Iowa 569, 88 N.W. 2d 120 (1958); cf. *Nielsen v. Wessels*, 247 Iowa 213, 73 N.W. 2d 83 (1955).

⁹² *Grayson v. Williams*, 256 F. 2d 61 (10th Cir. 1958).

⁹³ *Tidwell v. Davidson*, 54 Wash. 2d 75, 338 P. 2d 326 (1959), citing 9 C BLASHFIELD, *CYCLOPEDIA OF AUTOMOBILE LAW AND PRACTICE* §6312, at 508 (1954): "Expert testimony is not admissible to prove that cars involved in a collision could not, if struck in the manner and under the circumstances testified to by other witnesses, have moved or come to rest in the manner testified to."

⁹⁴ Note 3 *supra*.

and thus had not invaded plaintiff's lane immediately prior to collision. These opinions were based upon the absence of any "little scuff marks," which Easton stated would be left on the highway by any violent maneuvering of an automobile. The jury apportioned the negligence of the drivers, with 90% allocated to the driver of the plaintiff, and 10% to the defendant's driver. The trial court held a joint enterprise obtained between plaintiff and his driver, and the latter's negligence was imputed to the former. Plaintiff appealed to the Wisconsin Supreme Court.

Because the expert admitted that the photographs he used in formulating his opinions might have failed to reveal such "scuff marks," and because the investigating officer had not been asked whether there were such marks on the pavement, the supreme court felt compelled to grant a new trial in the interest of justice.

This was done although the plaintiff had not objected to the expert's testimony in his motion for new trial in the lower court.⁹⁵ The court stated:

Easton based his opinion on the fact that the report of the investigating officer did not mention any scuff marks. However, during the course of the trial the defense had two separate occasions to question the police officer as to whether or not there were any scuff marks on the highway, and no such questions were propounded by counsel for the defense.

Since there was no proof of the absence of scuff marks, the expert's opinion was not found in fact and must fall. This leaves the jury's finding that Dewey was 90 per cent negligent entirely unsupported by any credible evidence . . .⁹⁶

The importance of laying adequate foundation for the expert opinion cannot be overemphasized in the light of this decision. More will be said about the manner of developing expert opinion in a succeeding portion of this article. It should be noted that *Kuzel* appears to be one of the few reported decisions in the country in which an individual schooled in scientific reconstruction, as opposed to those experienced in towing away the wreckage, attempted to determine the course of vehicle *prior* to impact.

4. Other Witnesses

In several cases, mechanics and garagemen have attempted to chart the course of vehicles in collision.

A garageman has been permitted to state the course likely to have been taken by a vehicle sustaining a bent axle in initial impact.⁹⁷ But, in frequently cited *Fishman v. Silva*,⁹⁸ a mechanic who had towed or repaired an average of 20 wrecked cars per week for nine years,

⁹⁵ *Cf. Wells v. Dairyland Mut. Ins. Co.*, 274 Wis. 505, 80 N.W. 2d 380 (1957).

⁹⁶ *Per Justice Dieterich*, 20 Wis. 2d 558, 573-74, —N.W. 2d— (1963).

⁹⁷ *Crampton v. Diame*, 224 Ky. 507, 6 S.W. 2d 686 (1928).

⁹⁸ 116 Cal. App. 1, 2 P. 2d 473 (1931).

could not testify as to the probable course taken by the cars after impact.

A repairman was able to express his opinion that a car was struck in the center of the right side and then rolled over, in *Earhart v. Tretbar*.⁹⁹ And in *Woyak v. Komieske*,¹⁰⁰ a man in the business of selling and servicing cars for 38 years examined photographs of defendant's car and then testified the collision was a "sideswipe." The Minnesota Supreme Court held the admission of this testimony was discretionary with the trial court.

Cases involving opinions as to the speed of colliding automobiles, based on an examination of the wrecked automobiles or photographs thereof, involve an element of speculation and conjecture not present in determining whether a car hit almost broadside by the front end of another car was standing still or moving. A person experienced in repairing damaged automobiles may conceivably be able to determine from an examination of an automobile, whether there was any movement sideways under such circumstances. . . . The explanation of the witness . . . was thoroughly explored on cross examination.¹⁰¹

C. Point of Impact

1. Lay Witnesses

Expectedly, the untrained witness is infrequently called upon to ascertain the location of collision with reference to the roadway. Such a witness is even less frequently successful over objection to questions propounded to him.¹⁰²

If, however, the lay witness is able to give measurements of the width of the highway and its several lanes, the width of the vehicles and distance from curbing, the fact that the result amounts to fixation of the point of impact is not objectionable.¹⁰³

2. Law Enforcement Witnesses

a. Wisconsin

We have earlier mentioned *Andersen v. Andersen*,¹⁰⁴ where the testimony of the location of the cars with respect to the concrete based solely upon examination of photographs and a drawing made by another officer was erroneously, but not prejudicially, admitted.

The more recent case of *Milwaukee v. Bub*¹⁰⁵ will impede the willingness of many investigating policemen to pinpoint the location of impact, particularly in prosecution for traffic violations. There the court made it clear that a qualified expert could opine the position

⁹⁹ 148 Kans. 42, 80 P. 2d 4 (1938).

¹⁰⁰ 237 Minn. 213, 54 N.W. 2d 649 (1952).

¹⁰¹ *Id.*, 54 N.W. 2d at 654.

¹⁰² Floeck v. Hoover, 52 N.Mex. 193, 195 P. 2d 86 (1948); Cheek v. Barnwell Warehouse & Brokerage Co., 209 N.C. 569, 183 S.E. 729 (1936).

¹⁰³ Gzetowski v. Hall Motor Exp., 25 N.J.S. 192, 95 A. 2d 759 (1953).

¹⁰⁴ Note 48 *supra*.

¹⁰⁵ 18 Wis. 2d 216, 118 N.W. 2d 123 (1962).

of two vehicles at time of impact based upon damage to them, their position after collision, and marks or absence of marks on the pavement and shoulders.¹⁰⁶ Justice Dieterich then said:

It takes a high degree of training, plus experience, to become an expert on the complex problem of where an impact occurs in an automobile accident. The testimony of police officer Walters certainly does not qualify him as an expert witness. Although the record discloses that Walters is an experienced police officer, that in itself does not qualify him as a physicist or engineer and without such knowledge his testimony can be given no weight as to the point of impact. . . .

b. Other Jurisdictions

Other states agree with Wisconsin in barring the conclusions of officers as to the point of impact.¹⁰⁷ Sometimes this is because the officer's preferred testimony is not based on his own conclusions, but on hearsay statements of others.¹⁰⁸ In other cases, the admission, while considered erroneous, is not prejudicial.¹⁰⁹

More recent decisions indicate a willingness on the part of courts to permit the experienced officers to testify, where the jurors are not able to easily infer the point of collision.¹¹⁰ Where the testimony is

¹⁰⁶ Making reference to *Henthorn v. M.G.C. Corp.*, 1 Wis. 2d 180, 83 N.W. 2d 759 (1957).

¹⁰⁷ *Wolf v. State for Use of Brown*, 173 Md. 103, 194 Atl. 832 (1937); *State v. Blazard*, 103 Utah 113, 133 P. 2d 1000 (1943); *Hadley v. Ross*, 195 Okla. 89, 154 P. 2d 939 (1944); *Standard Oil Co. v. Crane*, 199 Miss. 69, 23 So. 2d 297 (1945); *Kohler v. Stephens*, 74 N.D. 655, 24 N.W. 2d 64 (1946); *Beckman v. Schroeder*, 224 Minn. 370, 28 N.W. 2d 629 (1947); *Hamre v. Conger*, 209 S.W. 2d 242 (Mo. 1948); *Delta Chevrolet Co. v. Waid*, 51 So. 2d 443 (Miss. 1951); *Danner v. Waters*, 154 Neb. 506, 48 N.W. 2d 635 (1951); *Gordon v. Robinson*, 210 F. 2d 192 (3d Cir. 1953); *Giffen v. Ensign*, 234 F. 2d 307 (3d Cir. 1955); *Ryan v. Campbell "66" Express, Inc.*, 304 S.W. 2d 825 (Mo. 1957); *Applegate v. Wilson*, 156 Cal. App. 2d 330, 319 P. 2d 401 (1957); *Chester v. Schockley*, 304 S.W. 2d 831 (Mo. 1957); *Satterland v. Fieber*, 91 N.W. 2d 623 (N.Dak. 1958); *Padgett v. Buxton-Smith*, 262 F. 2d 39 (10th Cir. 1958); *Grayson v. Williams Mercantile Company*, 256 F. 2d 61 (10th Cir. 1958); *Lee v. Terminal Transport Co.*, 269 F. 2d 97 (7th Cir. 1959); *Biggs v. Gottsch*, 173 Neb. 15, 112 N.W. 2d 396 (1961); *Gilbert v. Quinet*, 91 Ariz. 29, 369 P. 2d 267 (1962); *Presser v. Shull*, 133 Ind. App. 553, 181 N.E. 2d 247 (1962).

¹⁰⁸ *Ribble v. Cook*, 111 Cal. App. 2d 103, 245 P. 2d 593 (1952); *Kalfus v. Fraze*, 136 Cal. App. 415, 288 P. 2d 967 (1955); *Johnson v. People's Cab Co.*, 386 Pa. 513, 126 A. 2d 720 (1956); *Gray v. Woods*, 84 Ariz. 87, 324 P. 2d 220 (1958).

¹⁰⁹ *Hazelrigg Trucking Co. v. Duvall*, 261 P. 2d 204 (Okla. 1953).

¹¹⁰ *E.g.*, *Een v. Consolidated Freightways*, 120 F. Supp. 289 (D.N.D. 1954); *Lynch v. Bissell*, 99 N.H. 473, 116 A. 2d 121 (1955); *Grant v. Clark*, 78 Idaho 412, 305 P. 2d 752 (1956); *Tuck v. Buller*, 311 P. 2d 212 (Okla. 1957); *Brower v. Quick*, 249 Iowa 569, 88 N.W. 2d 120 (1958); *Gerberg v. Crosby*, 52 Wash. 792, 329 P. 2d 184 (1958); *Zelayta v. Pac. Greyhound Lines, Inc.*, 104 Cal. App. 2d 716, 232 P. 2d 572 (1951); *Kelso v. Independent Tank Co.*, 348 P. 2d 855 (Okla. 1960); *Ross v. Newsome*, 289 F. 2d 209 (5th Cir. 1961); *Hermansen v. Anderson Equipment Co.*, 174 Neb. 325, 117 N.W. 2d 791 (1962); *L. C. McNelley, D-A Lubricant, Inc. v. Smith*, 368 P. 2d 555 (Colo. 1962); *Wells Truckways v. Cebrian*, 122 Cal. App. 2d 666, 265 P. 2d 557 (1954). Other cases in which officers testified as to point of impact are: *Spotswood v. Dalious*, 180 A. 2d 465 (1962); *Flores v. Barlow*, 354 S.W. 2d 173 (Tex. Civ. App. 1962); *Pulse v. Jones*, 218 S.W. 2d 553

based on debris on the pavement, it has been held admissible, irrespective of the officer's qualifications.¹¹¹ But it is improper to ask the officer to determine the point of impact, where the question relies exclusively on past experience without specifying the facts obtaining at the collision in issue.¹¹²

3. "Scientific Expert" Witnesses

a. Wisconsin

The Wisconsin Supreme Court was careful to emphasize in *Anderson v. Eggert*,¹¹³ that the physics professors did not attempt to state where the impact occurred.

But in *Henthorn v. M.G.C. Corp.*,¹¹⁴ any impression that a properly qualified expert could not testify as to the point of impact was dispelled. There the court stated:

The defendants produced one Vik as a witness who is a graduate civil engineer with much experience in the field of traffic matters, including reconstructing accidents from the physical facts. Objections to most of the questions asked of this expert witness were sustained by the trial court on the ground that they invaded the province of the jury. This is a field in which trial courts are permitted to exercise fairly wide discretion. *Anderson v. Eggert* (1940), 234 Wis. 348, 359, 291 N.W. 365. We do not consider it would be error to permit a qualified expert, such as Vik, to state his opinion as to the position of the two units at the time of impact based upon such facts as damage to the vehicles, position of the units after the accident, and marks, or absence of marks, on the pavement and shoulders.¹¹⁵

As previously noted, *Milwaukee v. Bub*,¹¹⁶ reaffirmed the stringent qualifications that must be established before the expert witness can testify as to the point of impact.

b. Other Jurisdictions

Despite the continued misgivings of many courts,¹¹⁷ some recent decisions indicate a willingness to readily admit expert testimony on

(Mo. 1949); *Briggs v. Burk*, 174 Kans. 440, 257 P. 2d 164 (1953); *People v. Haeussler*, 260 P. 2d 8 (Cal. 1953)—this case is also of interest because it permits mechanic to explode myth that speedometer needle will always stop at speed at impact.

¹¹¹ *Nielsen v. Wessels*, 247 Ia. 213, 73 N.W. 2d 83 (1955). Compare *Reid v. Humphreys*, 210 Md. 178, 122 A. 2d 756 (1956).

¹¹² *Fisher v. Suko*, 98 N.W. 2d 895 (N.D. 1959); *contra*, *Robinson v. Morrison*, 133 So. 2d 230 (Ala. 1961).

¹¹³ Note 63 *supra*.

¹¹⁴ 1 Wis. 2d 180, 83 N.W. 2d 759 (1956).

¹¹⁵ *Id.* at 190, 83 N.W. 2d at 765.

¹¹⁶ Note 105 *supra*.

¹¹⁷ *E.g.*, *Moniz v. Bettencourt*, 24 Cal. App. 2d 718, 76 P. 2d 535 (1938); *Ross v. Stricker*, 85 Ohio App. 56, 88 N.E. 2d 80 (1949); *Carmody v. Alto*, 251 Minn. 19, 86 N.W. 2d 692 (1957); *Dickman v. Struble*, 104 Ohio App. 44, 146 N.E. 2d 636 (1957); *Venable v. Stockner*, 200 Va. 900, 108 S.E. 2d 380 (1959); *Waller v. So. Cal. Gas Co.*, 170 Cal. App. 2d 747, 339 P. 2d 577 (1959).

the point of impact where the witness's qualifications are clearly established. *Lofton v. Agee*¹¹⁸ is illustrative.

4. Other Witnesses

Mechanics are sometimes permitted to state where a vehicle receives the brunt of an impact.¹¹⁹ Others testify as to the *place* of impact on the pavement.¹²⁰ In *Ison v. Stewart*,¹²¹ the Colorado Supreme Court said:

In an endeavor to ascertain the cause of, and circumstances attending an accident such as is here involved, it would seem to be logical and reasonable—where a proper foundation therefore has been laid, to allow men who have years of experience in repairing wrecked automobiles, who have had full opportunity to make inspection, and who are acquainted with the conditions resulting from an auto accident, to give in evidence their opinions of what occurred at the time of collision.¹²²

Some cases include the testimony of witnesses as to point of impact without indicating the nature of their qualifications.¹²³ Others involve opinion evidence on the subject predicated on mere observation on markings on the pavement.¹²⁴

D. Other Facets of Accident Reconstruction

1. Lay Witnesses

One need have no special qualifications, other than the sense of sight, in order to testify as to observations, such as the length of skidmarks.¹²⁵ Sometimes observation of the actions of the cars during collision and the marks on the highway therefrom permit a witness to tell of their respective positions at impact.¹²⁶

But *Schoen v. Plaza Express Co.*¹²⁷ is a vivid illustration of the principle that mere circumstantial evidence in the form of lay observations of the wreckage, unaided by any expert interpretation of

¹¹⁸ 303 F. 2d 287 (8th Cir. 1962). See also *Leeper v. Thornton*, 86 Ariz. 242, 344 P. 2d 1101 (1959).

¹¹⁹ *Finch v. Weiner*, 109 Conn. 616, 145 Atl. 31 (1929); *Allen v. Zickos*, 37 Ala. App. 361, 68 So. 2d 841 (1953).

¹²⁰ *Arkmo Lumber Co. v. Luckett*, 201 Ark. 140, 143 S.W. 2d 1107 (1940)—no qualifications stated. Compare *Abbott v. Hayes*, 92 N.H. 126, 26 A. 2d 842 (1942).

¹²¹ 105 Colo. 55, 94 P. 2d 701 (1939).

¹²² *Id.*, 94 P. 2d at 702.

¹²³ *Sikes v. Wilson*, 74 Ga. App. 415, 39 S.E. 2d 902 (1946); *Royal Crown Bottling Co. v. Stiles*, 82 Ga. App. 254, 60 S.E. 2d 815 (1950); *Kohl v. Marin*, 346 Mich. 693, 78 N.W. 2d 621 (1956); *Union Transports, Inc. v. Braun*, 318 S.W. 2d 927 (Tex. Civ. App. 1958).

¹²⁴ *Hann v. Brooks*, 331 Ill. App. 535, 73 N.E. 2d 624 (1947).

¹²⁵ *Grossnickle v. Avery*, 96 Ind. App. 479, 152 N.E. 288 (1926); *Bowker v. Ill. Elec. Co.*, 297 Pac. 615 (Cal. App. 1931); *McWhorter Transfer Co. v. Peck*, 232 Ala. 143, 167 So. 291 (1936).

¹²⁶ *Lange v. Affleck*, 160 Md. 695, 155 Atl. 150 (1931); *Johnston v. Peairs*, 117 Cal. App. 208, 3 P. 2d 617 (1931); *Lambert v. Caronna*, 206 N.C. 616, 175 S.E. 303 (1934).

¹²⁷ 206 S.W. 2d 536 (Mo. 1947).

such observations, will not permit the issue to go to the jury. In this case there was no witness to the collision, and the circumstantial evidence was held insufficient to support a verdict of negligence in the action for wrongful death.

2. Law Enforcement Witnesses

a. Wisconsin

In *Jacobson v. Bryan*,¹²⁸ the Wisconsin Supreme Court held that the receipt in evidence over objection of an investigating officer's report would be error. On such report in that case, was an item designated "Manner of Collision." The category under this heading included "Sideswipe" which bore the officer's check mark. The court said:

The officer was no better qualified to draw conclusions from what he saw after the collision than any person of ordinary intelligence, and therefore was not an expert. And if he were an expert and qualified to give an opinion as to whether the collision was a "sideswipe" or an "angle collision" his report would not be admissible in evidence, but to make his opinion admissible he would have to give it on the witness stand under oath. . . .¹²⁹

The court then ruled that the receipt of the report in the *Bryan* case was not error because the defendant's objection to the report was general and did not specify the particular portion that was objectionable.¹³⁰

Without citing *Bryan*, the supreme court adhered to its reasoning in *Cushing v. Meehan*.¹³¹ There a police investigative report was offered and received into evidence without objection, was held to be part of the record as evidence of the facts therein stated and was not limited to the function of impeachment.

b. Other Jurisdictions

Occasionally a police officer is enabled to state his conclusion, such as the cause of a mark on one of the vehicles involved in a collision, because the objection is improperly directed to the competency of the witness, and not to the inadmissibility of the conclusion.¹³² If the objection is properly worded, it will bar testimony as to whether the officer determined one driver had violated the other's right of way.¹³³

¹²⁸ 244 Wis. 359, 12 N.W. 2d 789 (1944).

¹²⁹ *Id.* at 362, 12 N.W. 2d at 790.

¹³⁰ The court relied on 1 WIGMORE, EVIDENCE §18, at 332 (3d ed. 1940), and *Maxcy v. Peavey Publishing Co.*, 178 Wis. 401, 190 N.W. 84 (1922). It also said that under the Wisconsin Statutes (presently Wis. STAT. §327.18 (1) (1961)), such report was inadmissible in so far as it was a mere memorandum of measurements and the physical facts observable by the officer.

¹³¹ 7 Wis. 2d 30, 95 N.W. 2d 796 (1958).

¹³² *Cornwell v. Highway Motor Freight Line, Inc.*, 152 S.W. 2d 10 (Mo. 1941).

¹³³ *Williams v. Gurwitz*, 99 Cal. App. 2d 801, 222 P. 2d 673 (1950). But compare *MacGregor v. Bradshaw*, 193 Va. 787, 71 S.E. 2d 361 (1952), where officer permitted to state skidmarks indicated car was "out of control."

When an officer testifies to the observation of skidmarks, there must be at least a reasonable inference that they were made by one of the vehicles involved in collision.¹³⁴ But where the cars have already been removed from the scene, some cases yet hold the officer may state what physical markings were on the highway.¹³⁵

In *Coker v. Mitchell*¹³⁶ a sheriff in Texas was permitted to testify whether the speed of the defendant "was safe under the circumstances."

But a trained state police officer was not permitted to establish the order in which two automobiles struck a truck.¹³⁷ Such an officer was allowed to state that the damage done to a vehicle resulted from a collision with another car rather than hitting a tree.¹³⁸ But a deputy sheriff could not state from his observation of a skid mark whether he thought the plaintiff's brakes were defective.¹³⁹

3. "Scientific Expert" Witnesses

a. Wisconsin

In *Nolup v. Skemp*,¹⁴⁰ a civil engineer was asked, as an expert witness, to testify from photographs where the center of the road was located. The trial court was held to have correctly ruled that the jury could see and understand as much from the photograph as could the engineer, and so the subject was not a matter for expert testimony.

*Wojciuk v. U. S. Rubber Co.*¹⁴¹ appears to represent the extreme to which the Wisconsin Supreme Court will abide by the ruling of the trial court in excluding testimony of schooled, expert witnesses. There the one-car collision resulted from a blowout of a tire. At trial plaintiffs offered opinion testimony of a mechanical engineer tending to show that the sudden decrease in air pressure in the tire resulted from breaks in its sidewall, which in turn arose from a defect in the manufacturing process. The Circuit Court of Milwaukee County excluded such testimony because it did not deem the witness qualified, although the latter had worked for several companies where he examined defects in tires, as well as studied adhesives, including rubber. The supreme court affirmed the trial court's ruling:

Although *the decision* was based upon Dr. Schmidt's lack of experience with automobile tires, it was *not based upon a supposed rule that practical experience is always an essential qualification of an expert witness. Such a rule would be erroneous.*
[Emphasis supplied.]

¹³⁴ *Williams v. Graff*, 194 Md. 516, 71 A. 2d 450 (1950). See also *Thomas v. Meyer*, 150 Kans. 587, 95 P. 2d 267 (1939); *Padgett v. Buxton-Smith Mercantile Company*, 262 F. 2d 39 (10th Cir. 1958).

¹³⁵ *Massicot v. Nolan*, 65 So. 2d 648 (La. App. 1953). Compare *Turcotta v. De Witt*, 332 Mass. 160, 124 N.E. 2d 241 (1954).

¹³⁶ 269 S.W. 2d 950 (Tex. Civ. App. 1954).

¹³⁷ *Conway v. Hudspeth*, 229 Ark. 735, 318 S.W. 2d 137 (1958).

¹³⁸ *Conn v. Young*, 267 F. 2d 725 (2d Cir. 1959).

¹³⁹ *Van v. Union Pac. R. R. Co.*, 83 Idaho 539, 366 P. 2d 837 (1962).

¹⁴⁰ 7 Wis. 2d 462, 96 N.W. 2d 826 (1959).

¹⁴¹ 19 Wis. 2d 224, 120 N.W. 2d 47 (1962).

In this case plaintiffs were attempting to establish, from expert examination of the tire, that it had been defectively manufactured and that its failure resulted from such defect or at least had occurred in a manner which was a breach of alleged warranties. The ground which Dr. Schmidt's opinion was to cover was peculiar to the manufacture, structure, and behavior of rubber tires. We cannot say that it was an abuse of discretion to decide that Dr. Schmidt's knowledge of general scientific and mechanical engineering principles and his practical experience with materials and products other than tires did not qualify him to express opinions which would aid the jury in determining the facts of this case.¹⁴²

b. Other Jurisdictions

A professor of mechanical engineering has been permitted to testify as to the type of force needed to break a drawbar connecting two freight vans together, which was broken when a truck struck the rear of the second trailer.¹⁴³ There was also no error in admitting the testimony of an engineer⁴ to the effect that debris from a car would, under the laws of inertia and centrifugal force, travel forward of the point of impact.¹⁴⁴

Experts cannot testify as to the reasonable speed of operating a truck-trailer under icy conditions.¹⁴⁵

Where the manufacturer of the vehicle is sued on a breach of warranty—products liability theory, as a result of the failure of a hydraulic brake system on a truck, experts may properly testify as to the cause of the collision, based on their findings in inspecting the brake system.¹⁴⁶

4. Other Witnesses

A salesman of cars cannot testify that one is defective where he admits he knows nothing of their mechanical construction.¹⁴⁷ A garageman can state that in his opinion the damage done to the front axle of one car could not have been occasioned by its rear axle colliding with another car.¹⁴⁸ Similarly, a service manager could state that the damage done to a vehicle could only be caused by the steel bracket on the other party's fender.¹⁴⁹ And a garageman could state that loose spokes caused the collapse of a truck wheel.¹⁵⁰

But a state automobile inspector could not testify from a table he developed from his own experiments conducted on a level, paved road.¹⁵¹

A witness has been permitted to testify as to equipment necessary for safe operation of a truck, and that in his opinion it was overloaded

¹⁴² *Id.* at 231-32, 120 N.W. 2d at 51.

¹⁴³ *Burch v. Valley Motor Lines*, 78 Cal. App. 2d 834, 179 P. 2d 47 (1947).

¹⁴⁴ *Hazelrigg Trucking Co. v. Duvall*, 261 P. 2d 204 (Okla. 1953).

¹⁴⁵ *Hoover Motor Express Co. v. Edwards*, 277 S.W. 2d 475 (Ky. App. 1955).

¹⁴⁶ *Swillie v. General Motors Corp.*, 133 So. 2d 813 (La. App. 1961).

¹⁴⁷ *White Automobile Co. v. Dorsey*, 119 Md. 251, 86 Atl. 617 (1913).

¹⁴⁸ *Crampton v. Diame*, 6 S.W. 2d 686 (Ky. App. 1928).

¹⁴⁹ *Mann's Executor. Leyman Motor Co.*, 224 Ky. 507, 28 S.W. 2d 956 (1930).

¹⁵⁰ *DeMorais v. Johnson*, 90 Mont. 366, 3 P. 2d 283 (1931).

¹⁵¹ *Caperton v. Tuttle*, 100 Utah 476, 116 P. 2d 402 (1941). *Cf. Welch v. McNeely*, 269 S.W. 2d 871 (Mo. 1954).

at the time of collision.¹⁵² Another was permitted to state the direction the metal on a vehicle was moved as the result of a collision.¹⁵³

An experienced automobile mechanic could state that from his examination of damage to the two vehicles, "the blow would have had to have been at an angle of 20-30°, or approximately the same angle the car was in when I picked it up."¹⁵⁴

But a mechanic could not testify as to the effect of "tight" brakes, where his opinion was repudiated by an engineer employed by the automobile manufacturer.¹⁵⁵

In the widely-publicized case of *Henningsen v. Bloomfield Motors, Inc.*,¹⁵⁶ a mechanic was allowed to answer in response to a hypothetical question, that the unusual action of the steering wheel and front wheels "must have been due to a mechanical defect or failure of something from the steering wheel down to the front wheels, that something down there had to drop off or break loose to cause the car to act in the manner it did. . . ." ¹⁵⁷

III. PROPER QUESTIONING OF WITNESSES

A. Establishing Qualifications

In a comprehensive discussion on the subject of opinion evidence, Justice Wilkie of the Wisconsin Supreme Court in *Kreyer v. Farmers' Co-operative Lumber Co.*,¹⁵⁸ recently said:

Trial courts have wide discretion as to admitting opinion evidence of expert witnesses. *Anderson v. Eggert* (1940), 234 Wis. 348, 291 N.W. 365; *Henthorn v. M.G.C. Corp.* (1957), 1 Wis. (2d) 180, 83 N.W. (2d) 759.

The principal rule on whether or not expert opinion evidence should be received is stated in the *Anderson Case*, supra, where the Court held, at page 361:

'Whether the testimony was properly received in this case depends upon whether members of the jury having that knowledge and general experience common to every member of the community would be aided in a consideration of the issues by the testimony offered and received.'

Despite the liberal tenor of this test for the admission of opinion testimony, trial lawyers are yet faced with the reluctance of some trial courts to permit reconstructive testimony—and the deference accorded their decisions by the supreme court. *Wojcwik*¹⁵⁹ is a classic illustration, and shows that while practical experience is not, theoretically, the

¹⁵² *Abbott v. Hayes*, 92 N.H. 126, 26 A. 2d 842 (1942).

¹⁵³ *Pasero v. Tacoma Transit Co.*, 35 Wash. 2d 97, 211 P. 2d 160 (1949).

¹⁵⁴ *Debert v. Ross Pattern & Foundry Development Co., Inc.*, 105 Ohio App. 264, 152 N.E. 2d 369 (1957).

¹⁵⁵ *Ford Motor Co. v. Fish*, 335 S.W. 2d 712 (Ark. 1960).

¹⁵⁶ 32 N.J. 358, 161 A. 2d 69 (1960).

¹⁵⁷ *Id.*, 161 A. 2d at 98.

¹⁵⁸ 18 Wis. 2d 67, 75, 117 N.W. 2d 646, 650 (1962).

¹⁵⁹ Note 141 *supra*.

sine qua non for the admission of opinion evidence, in reality, it is quite essential.

But with the showing of some practical experience, albeit limited, in the field of accident reconstruction, coupled with substantiation of the witness's academic training, the *Henthorn*¹⁶⁰ and *Kuzel*¹⁶¹ cases portend well for the reconstructive witness. *Storbakken v. Soderborg*¹⁶² and *Leeper v. Thornton*¹⁶³ manifest the results obtainable, upon proof of qualifications and the making of a record through the testimony of preceding witnesses upon which the opinion can be predicated.

B. Framing of Inquiry

Despite the popularity of the objection with veteran trial strategists, the fact a witness is asked for opinion on an ultimate fact to be determined by the jury, does not make it objectionable. The *Kreyer*¹⁶⁴ case makes it patently clear that an expert may give an opinion on an issue of ultimate fact but only in response to a hypothetical question. Justice Wilkie there said that ". . . the key point in a hypothetical question is the facts that are assumed and form the premises. If these facts fail in any important particular then necessarily the answer or conclusion that assumes the facts must fail."¹⁶⁵

We may properly ask then, what facts must be included in the hypothetical question. Justice Wilkie feels that "A hypothetical question need not assume as proved all facts which the evidence in the case tends to prove, but only those which tend to be proved and on the basis of which a correct answer is sought. . . ."¹⁶⁶ In a more recent case dealing with medical opinion, *Kreyer* was relied on to justify the omission from a question relating symptoms to employment, rather than the accident, the undisputed fact that the plaintiff had no symptoms prior to accident.¹⁶⁷ Justice Currie indicated that only such facts as amounts to a verity, not necessarily an undisputed fact, need be included in the hypothetical question. The *Sharp*¹⁶⁸ case seems to be somewhat of a departure from the more stringent rule of the 1891 case of *Vosburg v. Putney*.¹⁶⁹ But even before *Vosburg*, the Wisconsin Supreme Court, through Justice Taylor had occasion to state in *Quinn v. Higgins*:¹⁷⁰

¹⁶⁰ Note 114 *supra*.

¹⁶¹ Note 3 *supra*.

¹⁶² Note 67 *supra*.

¹⁶³ Note 72 *supra*.

¹⁶⁴ Note 158 *supra* at 76, 117 N.W. 2d at 651; quoting Justice Marshall in *Maitland v. Gilbert Paper Co.*, 97 Wis. 476, 484, 72 N.W. 1124, 1127 (1897).

¹⁶⁵ *Id.* at 77, 117 N.W. 2d at 652.

¹⁶⁶ *Id.* at 77-78, 117 N.W. 2d at 652; citing *Sullivan v. Minneapolis, St. P. & S. S. M. R. Co.*, 167 Wis. 518, 167 N.W. 311 (1918).

¹⁶⁷ *Sharp v. Milw. & S. T. Corp.*, 18 Wis. 2d 467, 118 N.W. 2d 905 (1963).

¹⁶⁸ *Ibid.*

¹⁶⁹ 80 Wis. 523, 50 N.W. 403 (1891).

¹⁷⁰ 63 Wis. 664, 670, 24 N.W. 482, 484-485 (1885), cited in the *Kreyer* case, *supra* note 158.

It may be true that the court ought not to allow hypothetical questions to be propounded to an expert witness which are plainly outside of the case and based upon a statement of facts as to which there is no pretense that they are proved by the evidence in the case. The rule in that respect must be that, in propounding a hypothetical question to the expert, the party may assume as proved all facts which the evidence in the case tends to prove, and the court ought not to reject the question on the ground that, in his opinion, such facts are not established by the preponderance of the evidence. What facts are proved in the case, when there is evidence tending to prove them, is a question for the jury and not for the court. *The party has the right to the opinion of the expert witness on the facts which he claims to be the facts of the case, if there be evidence in the case tending to establish such claimed facts, and the trial judge ought not to reject the question because he may think such facts are not sufficiently established.* [Emphasis supplied.]

What then are such facts that the evidence tends to prove and which must be included in the question in order "to allow the expert to provide a correct answer on the theory advocated by the questioner's side of the case"?¹⁷¹ Certainly the late *Kuzel*¹⁷² decision teaches the importance of establishing in the record through prior testimony the existence, or non-existence, of a fact so important that the expert opinion, and more, the entire case, hinges upon it. And when the supreme court speaks of the necessity for establishing vital facts, *McGaw v. Wassman*¹⁷³ tells us they will not permit those facts to be established through the opinion of a preceding witness. In other words, a witness cannot predicate his opinion, as to causation, for example, upon a previous opinion.¹⁷⁴ But the witness who has first-hand knowledge of the facts included in the question may yet express his opinion in the form of hypothesis.¹⁷⁵

The experience of other jurisdictions indicates that a hypothetical question can be asked a witness going to the reconstruction of the accident, which will withstand the standard "assumption of facts not in evidence or omission of material facts" objections. In some cases the appellate court will assume the witness had critical facts in mind, although they were not included in the question put to him.¹⁷⁶ In others, such as the well-written *Storbakken*¹⁷⁷ decision, the court, following Wigmore¹⁷⁸ will permit the expert witness some latitude in determining

¹⁷¹ *Sharp v. Milw. & S. T. Corp.*, *supra* note 167, at 477, 118 N.W. 2d at 910,

¹⁷² Note 3 *supra*.

¹⁷³ 263 Wis. 486, 57 N.W. 2d 920 (1953). See also *Briggs v. Minn. St. Ry. Co.*, 52 Minn. 36, 53 N.W. 1019 (1892).

¹⁷⁴ *Bucher v. Wis. Cent. R. Co.*, 139 Wis. 597, 120 N.W. 518 (1909).

¹⁷⁵ *Feldstein v. Harrington*, 4 Wis. 2d 380, 90 N.W. 2d 566 (1958). Cf. *Crozier v. Minn. St. Ry. Co.*, 106 Minn. 77, 118 N.W. 256 (1908).

¹⁷⁶ *Coker v. Mitchell*, 269 S.W. 2d 950 (Tex. Civ. App. 1954).

¹⁷⁷ Note 67 *supra*.

¹⁷⁸ Note 69 *supra*.

whether the facts incorporated in the hypothetical question are sufficient to permit him to express his opinion thereon. Other courts, such as the court of appeals in *Kale v. Douthitt*,¹⁷⁹ are so stringent regarding the quality and quantum of evidence to be included in the opinion, that reconstruction testimony is for all practical purposes barred from use therein.

But why should not the standards developed for guidance in the formulation of hypothetical questions generally apply to reconstructive testimony? If the question meets with objection of opposing counsel because it and the evidence then in the record upon which it is predicated lack certain facts deemed essential by the objector, the trial court has ample precedent upon which to rule that the missing facts can be supplied to the expert on cross-examination,¹⁸⁰ and that the witness should be permitted to answer the question. This proposition assumes such facts as are embraced in the question tend to be established by the evidence as *Kreyer*¹⁸¹ requires. (It should be noted that under a logical, though perhaps exaggerated, extension of *Engstrom v. Dewitz*,¹⁸² the objector may be obliged to assist the propounder in the formulation of the question.)

C. Forms of Hypothetical Questions

Personal experience teaches us that the practicing lawyer places great store in that which has already endured judicial scrutiny. The best reported form of hypothetical question in the reconstruction of accident field seems to be that in *Storbakken*,¹⁸³ which we have previously quoted.¹⁸⁴ But there are others worth perusing.¹⁸⁵ And for the attorney arming himself to bar the propounding of a reconstructive question, the *Kale*¹⁸⁶ case is most helpful.

With no small degree of trepidation, the following outline is submitted to the readers. It, in substantially this form, withstood examination in personal use¹⁸⁷ in questioning a Marquette University Professor of Physics. His testimony was calculated to prove that a blow at the left rear of the plaintiff's automobile would not have a tendency to throw him to the right of his driver's seat, under the laws of inertia.

1. (After name, address and date of birth given)
What is your profession?

¹⁷⁹ Note 73 *supra*.

¹⁸⁰ Compare *Smalley v. City of Appleton*, 75 Wis. 18, 43 N.W. 826 (1889), with *Delap v. Liebenson*, 190 Wis. 73, 208 N.W. (1926).

¹⁸¹ Note 158 *supra* at 81, 117 N.W. 2d at 650.

¹⁸² 18 Wis. 2d 421, 428, 118 N.W. 2d (1963).

¹⁸³ Note 67 *supra*.

¹⁸⁴ Note 68 *supra*.

¹⁸⁵ See *Jackson v. Vaughn*, 204 Ala. 543, 86 So. 469 (1920); *Brower v. Quick*, 249 Iowa 569, 88 N.W. 2d 120 (1958); *In re Armstrong Estate*, 181 Kan. 171, 311 P. 2d 281 (1957).

¹⁸⁶ Note 73 *supra*.

¹⁸⁷ *Zabit v. Guffey*, Racine County, Wisconsin, Circuit Court, case no. 60-123 (1961).

2. Where are you employed?
3. For how long have you been so employed?
4. Where were you educated?
5. What degrees, if any, do you hold?
6. Have you had any professional experience other than that received in your present capacity?
7. What does the study of physics embrace?
8. What does mechanics embrace?
9. What are the basic principles on which mechanics rests?
10. Can you explain the law of force? (at this stage the witness was furnished a blackboard.)
11. What is the scope of this law?
12. Do you drive an automobile—for how long?
13. Would the laws of force and momentum apply to a body such as a moving automobile?
14. Would they apply to an object in a moving automobile, including a human being?
15. Can you describe the application of the laws of force and momentum to the body of a person driving an automobile from the time such person enters his car, activates the ignition, and travels forward to the time he halts the forward motion of his automobile?
16. Assume the following facts to be true in one hypothetical question—

Assume a forty-year old male in good health and athletic is driving alone in a 1952 Ford station wagon automobile, in excellent mechanical condition, in a southerly direction on a dry, paved, 22 feet wide concrete public highway which inclines slightly in a southerly direction, at a speed of 45 miles per hour, or $67\frac{1}{2}$ feet per second, on the 21st day of April, 1959, a clear, sunny day, at 6:05 P.M.; further assume that such a person observes a 1959 Rambler Ambassador automobile positioned in the south-bound lane of such a highway at a distance of at least 100 feet from his 1952 Ford station wagon automobile, that such person thereby attempts to engage the brake pedal of his automobile in an effort to decelerate but fails to do so much as activate the brake lights of the car, although they are in good operating order, and fails to change the direction of travel of his automobile, with the result that his automobile collides virtually head-on with the 1959 Rambler Ambassador automobile, causing the 1952 Ford station wagon automobile to be propelled backwards, or in a northerly direction and sustaining damage to the front ends of both automobiles of such nature as I show you in these photographs marked "Defendant, _____, Exhibits _____ and _____"; are all of these assumptions clear to you?

Now, keeping all of these assumptions in your mind and based on your study and research, your experience and your general knowledge of the principles of mechanics, do you have an opinion, based on reasonable scientific certainty of the nature of the motion relative to his automobile, the driver of the 1952 automobile had during the assumed events I have just described?

What is your opinion? You may use the blackboard to illustrate, if you wish.

What factors did you use in reaching your opinion; will you explain the application of each of these factors in arriving at your opinion?

Further questions were then asked the witness regarding the effect of a glancing blow to the left corner of the rear bumper of the '52 Ford, and whether its occupant would be thrown to the right side of the car when struck such a glancing blow.

IV. OTHER AREAS OF EXPERT TESTIMONY IN WISCONSIN NEGLIGENCE LAW

A cursory examination of the digests¹⁸⁸ and cumulative supplements reveals that opinion evidence bearing upon the issues of negligence is permitted in a variety of fact situations. For example, *Potter v. Schleck*¹⁸⁹ permitted a mechanical engineer to testify as to climatology and that the amount of precipitation on the day of a fall could not have reached the sidewalk through a downspout in liquid form. In *Drott Tractor Co. v. Kehrein*,¹⁹⁰ an engineer was permitted to testify as to the proper method of shoring a trench. *Kreyer*¹⁹¹ featured the testimony of a "fire expert."

In fact the Wisconsin Supreme Court said at an early date:

The scope of expert evidence is not restricted to matters of science, art, or skill, but extends to any subject in respect to which one may derive by experience special and peculiar knowledge. . . .¹⁹²

The scope of that evidence permitted is shown by the cases cited in the footnote.¹⁹³

¹⁸⁸ 8 CALLAGHAN'S WISCONSIN DIGEST, *Evidence* §§1142-1263 (1950); 7 WISCONSIN DIGEST, *Evidence* §§470-574 (1941).

¹⁸⁹ 9 Wis. 2d 12, 100 N.W. 2d 559 (1959). Cf. *Frion v. Coren*, 13 Wis. 2d 300, 108 N.W. 2d 563 (1960).

¹⁹⁰ 275 Wis. 320, 18 N.W. 2d 500 (1956).

¹⁹¹ Note 158 *supra*.

¹⁹² *Zarnik v. C. Reiss Coal Co.*, 133 Wis. 290, 301, 113 N.W. 752, (1907); citing *Hamann v. Milw. B. Co.*, 127 Wis. 550, 106 N.W. 1081 (1906); *Maitland v. Gilbert P. Co.*, 97 Wis. 476, 72 N.W. 1124 (1897); *Lyon v. Grand Rapids*, 121 Wis. 609, 99 N.W. 311 (1904).

¹⁹³ *Suess v. J. S. Stearns Lumber Co.*, 143 Wis. 609, 128 N.W. 443 (1910)—cause of breaking of steam pipe; *Karlen v. Hadinger*, 147 Wis. 78, 132 N.W. 591 (1911)—effect of fodder on quality of milk; *Vater v. Cornelius*, 59 Wis. 615, 18 N.W. 474 (1884)—whether horse is foundered; *Brabbits v. Chi. & N.W. Ry. Co.*, 38 Wis. 289 (1875)—effect of leaky throttle on operation; *Fitts v. Cream City R. Co.*, 59 Wis. 323, 18 N.W. 186 (1884)—approved use of streetcar; *Griffen & Shelly Co. v. Joannes*, 80 Wis. 601, 50 N.W. 785 (1891)—condition of oranges; *Whitney v. Chi. & N.W. Ry. Co.*, 27 Wis. 327 (1870)—susceptibility of wool to spontaneous combustion; *E. L. Chester Co. v. Wis. Power & Light Co.*, 211 Wis. 158, 247 N.W. 861 (1933)—cause of gas explosion; *Schweiker v. John R. Davis Lbr. Co.*, 145 Wis. 632, 130 N.W. 508 (1911)—whether sprocket should have been guarded; *Smith v. Atco Co.*, 6 Wis. 2d 371, 94 N.W. 2d 697 (1959)—cause of death of mink; *Scaramelli & Co., Inc. v. Courteen Seed Co.*, 194 Wis. 520, 217 N.W. 298 (1928)—value

V. CONCLUSION

If, as we know from *Anderson v. Eggert*,¹⁹⁴ expert opinion evidence is to be permitted whenever it would assist the jury, its use should become more prevalent in automobile litigation. When courts frankly admit that contrary inferences can be drawn from the physical facts,¹⁹⁵ the testimony of a person schooled and experienced in the analysis of those facts seems a welcome supplement to the present practice of casting the puzzle to the jury without assistance. And there have been and will be instances where the courts will not permit even the jury to speculate as to cause and liability solely upon circumstantial evidence.¹⁹⁶

It therefore appears that despite past expressions of skepticism directed towards reconstructive testimony,¹⁹⁷ there is no difference in kind between the testimony of the professionally educated witness in the fields of physics and engineering, and that of the medical witness. Anyone experiencing the spectacle of the disparity in opinion constantly developing between men of medicine representing different parties in a lawsuit should agree with the dissent of Justice Jones from Mississippi.¹⁹⁸

The trial judge has been accorded the discretion for necessary control of the subject of reconstructive evidence. That control should not amount to a blanket prohibition.

of clover seed; *Carle v. Nelson*, 145 Wis. 593, 130 N.W. 467 (1911)—value of tobacco; *Jackson v. Wis. Tel. Co.*, 88 Wis. 243, 60 N.W. 430 (1894)—conducting of lighting.

¹⁹⁴ Note 63 *supra*.

¹⁹⁵ See opinion of Justice Hallows in the *Evjen* case, *supra* note 30; and *Richards v. Eaves*, 273 Ala. 120, 135 So. 2d 384 (1961).

¹⁹⁶ The writers submit *Schoen v. Plaza Express Co.*, 206 S.W. 2d 536 (Mo. 1947) as a prime example of a situation where reconstructive testimony might have been advisable.

¹⁹⁷ *E.g.*, *Fishman v. Silva*, 166 Cal. App. 1, 2 P. 2d 473 (1931); *Moniz v. Betten-court*, 24 Cal. App. 2d 718, 76 P. 2d 535 (1938); *Hagan Storm Fence Co. v. Edwards*, 148 So. 2d 693 (Miss. 1933).

¹⁹⁸ Notes 77 and 78 *supra*.