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FOR PUBLICATION

UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

DAVID SCHUDEL, et al.,
Plaintiffs,
and
DEBORAH GUARAGNA-WILLIAMS,
Plaintiff-Appellee,
v.
GENERAL ELECTRIC CO., a foreign corporation; KAISER ALUMINUM AND CHEMICAL CORPORATION, a foreign corporation,
Defendants-Appellants.

No. 95-35092
D.C. No.
CV-92-00081-FVS

DAVID SCHUDEL; DANIEL GLASS; MERLIN E. CARLSON; TIMOTHY SCHUDEL; SANDRA SCHUDEL, husband and wife, and the marital community composed thereof; KATHRENE RAE HOWELL; CRAIG A. THOMPSON; JOHN HOPKINS; RUTH HOPKINS, husband and wife, and the marital community composed thereof,
Plaintiffs-Appellants,
v.
GENERAL ELECTRIC CO., a foreign corporation; KAISER ALUMINUM AND CHEMICAL CORPORATION, a foreign corporation,
Defendants-Appellees.

No. 95-35145
D.C. No.
CV-92-00081-FVS
OPINION

Appeals from the United States District Court
for the Eastern District of Washington
Fred Van Sickle, District Judge, Presiding

Argued and Submitted
October 8, 1996—Seattle, Washington

Filed July 23, 1997

Before: James R. Browning, Dorothy W. Nelson, and
Ferdinand F. Fernandez, Circuit Judges.

Opinion by Judge Browning

SUMMARY

Civil Litigation and Procedure/Motions

The court of appeals dismissed appeals, vacated a judgment, and reversed orders of the district court. The court held that in considering a Rule 50(b) post-verdict motion for judgment notwithstanding the verdict (JNOV), a district court should not ignore erroneously admitted evidence.

Appellees David Schudel, Deborah Williams and others sued appellants General Electric Co. and Kaiser Aluminum and Chemical Corp. for damages, alleging injuries from exposure to toxic substances and loss of consortium.

At trial, the only evidence on causation on behalf of appellants Daniel Glass, Craig Thompson, and David, Tim, and Sandra Schudel (Schudel plaintiffs) was the testimony of Dr. Paula Lantsberger. She based her expert opinions on two theories: specific condition causation and "whole person aggravation."

In addition to Dr. Lantsberger, Drs. Morton and Goldstein testified on neurological symptom causation on behalf of Williams. The district court approved their reliance on interview data relating to the plaintiffs' symptoms that was collected by Diane Nebel while she was investigating an incident of Legionnaire's disease at Kaiser's facility.

Drs. Goldstein and Lantsberger testified that the Nebel data were the kind that toxicologists consider reliable and regularly rely on. Dr. Morton testified that Williams suffered from brain damage that was "more probably than not" caused by exposure to solvents (TCA and Perc) that General Electric had used to clean up toxic substances at Kaiser's facility.

Dr. Goldstein conceded that none of the organic solvents involved in this case had been proven to be neurotoxic; that it would be improper to make inferences as to the toxicity of TCA and Perc based on the toxic nature of other solvents; and that repeated exposure to organic solvents over a long period must be documented to establish a causal relationship. Two studies cited by Dr. Goldstein (Altman and Kalifant studies) involved TCA and Perc. The Altman study found no relationship between exposure to Perc and the brain damage or loss of consciousness alleged by the plaintiffs. The Kalifant study involved long-term, repetitive exposure to TCA at high levels.

A jury returned verdicts for the plaintiffs. On defense motions for JNOV or a new trial, the district court affirmed the verdict for Williams, but granted JNOV with respect to respiratory injuries alleged by appellant Merlin Carlson, and as to neurological injuries asserted by appellant Kathrene Froese, John Hopkins, and Ruth Hopkins (Froese plaintiffs). The court vacated the verdicts for them on the ground that they were "tainted" by evidence of injuries as to which JNOV had been granted, and ordered a new trial. Lastly, the court granted JNOV on all the claims of the Schudel plaintiffs. In doing so, the court excised Dr. Lantsberger's testimony relat-

ing to the "whole person aggravation" theory, having concluded that it was inadmissible. Both sides appealed.

[1] The court of appeals has jurisdiction to review final judgments on entire claims, not on individual issues. An order adjudicating only one issue that is not determinative of an entire claim is not appealable. [2] Litigants who advance a single legal theory of liability applied to one set of facts allege a single claim. Carlson and Froese alleged a single claim of negligence, not separate claims for neurological injury and respiratory injury. The Hopkinses alleged claims for negligence and loss of consortium, not separate claims for neurological injury and respiratory injury as to each claim.

[3] The district court granted JNOV as to issues related to certain injuries allegedly suffered by the plaintiffs because of the defendants' negligence. The court of appeals had no jurisdiction to review the district court's rulings on those issues because the claims for negligence and the derivative claims for loss of consortium were not finally determined. The order granting a new trial was also interlocutory and not immediately appealable.

[4] When deciding a JNOV motion, a trial court may not ignore evidence erroneously admitted at trial. Excluding evidence after the verdict is unfair to a party who may have relied on the determination that the evidence was inadmissible. [5] The record should be taken as it existed when the trial closed.

[6] The district court properly concluded that Dr. Lantsberger's testimony based on the "whole person aggravation" theory should have been excluded. However, once the jury rendered its verdict based on the improperly admitted evidence, the district court erred in excising that evidence when ruling on the JNOV motion. Considering all the evidence, there was sufficient evidence to support the verdict in favor of the Schudel plaintiffs.

[7] Nonetheless, these verdicts could not stand. The district court erred in denying the defendants' motion for a new trial. A new trial should be granted when the erroneous admission of evidence affected the substantial rights of the parties. Dr. Lantsberger's testimony was the only evidence of causation; its erroneous admission was undoubtedly prejudicial.

[8] The trial judge must determine that proposed scientific expert testimony will be both reliable and relevant. [9] Scientific knowledge is reliable if it is grounded in the methods and procedures of science and connotes more than subjective belief or unsupported speculation. In determining reliability, the focus must be solely on principles and methodology, not on the conclusions that they generate.

[10] Evidence of scientific knowledge is relevant if the reasoning or methodology properly can be applied to the facts in issue. A court's determination of relevance must consider the applicable substantive standard. Under Washington tort law, a plaintiff must show that the act complained of "probably" or "more likely than not" caused the subsequent disability.

[11] The Nebel data provided the basis for much of the scientific testimony presented by Williams' experts. [12] The district court acted within its discretion in approving the use of the data by Williams' expert witnesses; Dr. Morton's testimony met the relevance requirement. However, it did not meet the requirement of reliability.

[13] Dr. Morton's conclusions were based on extrapolations from studies that involved solvents other than TCA or Perc and examined long-term exposure at relatively low concentrations, or short-term exposure at very high concentrations, rather than the short-term, moderate-level exposure sustained by Williams. Dr. Morton did not establish that it was scientifically acceptable to draw general conclusions about the neurotoxicity of TCA and Perc from studies of other chemicals.

[14] The district court erroneously reasoned that because there was evidence that acute exposure to TCA and Perc can cause toxic encephalopathy, whether Williams' exposure was sufficient to cause her symptoms was a question for the jury. Williams' exposure was neither long enough nor intense enough to fall within the ranges described in the studies Dr. Morton relied upon. Extrapolation was necessary to make the studies relevant, and there was no showing that the necessary extrapolation was scientifically acceptable.

[15] Dr. Goldstein acknowledged that the mechanism of neurotoxicity from TCA and Perc had not been demonstrated. **[16]** Dr. Lantsberger's testimony failed to meet the relevance requirement. She testified that it was only a "possibility," not a "probability," that Williams suffered from brain damage from exposure to solvents. Dr. Lantsberger admitted that she could not testify to a specific cause and effect relationship between Williams' exposure and health problems. She relied on a "whole person aggravation" theory without establishing that it had a scientific basis. **[17]** Dr. Lantsberger's testimony regarding the hazards of TCA and Perc was inadmissible. Like Dr. Goldstein, she relied on the Altman and Kalifant studies to reach her conclusions, and admitted that medical science had not determined the effects of short-term exposure to the solvents.

[18] Only one of the expert witnesses whose testimony was not challenged provided causation testimony, and it related only to Williams' respiratory injury. **[19]** Considering all the evidence admitted at trial, the district court properly denied the defendants' JNOV motion with respect to Williams. However, admission of the challenged testimony was prejudicial because it was the sole causation evidence with respect to Williams' neurological symptoms.

COUNSEL

Donald W. Fowler and Joe G. Hollingsworth, Spriggs & Hollingsworth, Washington, D.C., and James B. King, Keefe, King & Bowman, Spokane, Washington, for the defendants-appellants-cross-appellees.

Craig F. Schauermann, Schauermann & Thayer, Vancouver, Washington, and Marcia M. Meade, Dawson & Meade, Spokane, Washington, for plaintiffs-cross-appellants David Schudel, Timothy Schudel, Daniel Glass, Sandra Schudel, Merlin Carlson, Kathrene Howell, and Craig Thompson.

Thomas C. Phelan, Vancouver, Washington, for plaintiffs-cross-appellants John and Ruth Hopkins.

Craig F. Schauermann, William K. Thayer, and David I. Gedrose, Schauermann & Thayer, Vancouver, Washington, for plaintiff-appellee Deborah Guaragna-Williams.

Kit A. Pierson, Jenner & Block, Washington, D.C., for the amicus curiae.

OPINION

BROWNING, Circuit Judge:

This diversity case involves claims for damages from negligence and loss of consortium against defendants General Electric Company and Kaiser Aluminum and Chemical Corporation. Kaiser contracted with General Electric to clean up polychlorinated biphenyls (PCBs) at Kaiser's Trentwood facility in Spokane, Washington. Nine of the ten plaintiffs were employed by General Electric on the cleanup.[1] These plaintiffs alleged they developed various neurological and respiratory problems from exposure to two cleaning solvents, trichloroethane (TCA) and perchloroethylene (Perc).

[1]The tenth plaintiff, Sandra Schudel, did not work at the site, but asserted a loss of consortium claim as the wife of plaintiff Tim Schudel.

A jury returned verdicts for the plaintiffs. The defendants moved for JNOV or new trial. The district court affirmed the verdict in favor of one plaintiff, Deborah Williams. The court granted JNOV with respect to respiratory injuries[2] asserted by Merlin Carlson ("Carlson") and with respect to neurological injuries[3] asserted by Kathrene Froese, John Hopkins, and Ruth Hopkins ("the Froese plaintiffs"). The court ordered a new trial with respect to injuries of Carlson and the Froese plaintiffs as to which JNOV had not been granted. Finally, the court granted JNOV on all claims asserted by the five remaining plaintiffs ("the Schudel plaintiffs"[4]).

Defendants appeal the verdict in favor of plaintiff Williams. The other plaintiffs appeal the granting of motions for JNOV or new trial. We address four issues: (1) whether the district court had jurisdiction over the defendants' motions for JNOV or new trial; (2) whether we have jurisdiction to review the district court's order for JNOV and new trial as to Carlson and the Froese plaintiffs; (3) whether the district court erred by granting JNOV against the Schudel plaintiffs without considering expert testimony the court concluded after trial had been erroneously admitted; and (4) whether the district court properly admitted expert testimony on behalf of plaintiff Williams.

I. District Court Jurisdiction Over the Defendants' Motions for JNOV or New Trial

Plaintiffs argue the district court lacked jurisdiction to consider defendants' motions for JNOV or new trial because the motions were not properly served.[5] When the motions were filed, Federal Rules of Civil Procedure 50 and 59 required the defendants to both file and serve such motions within ten days after entry of judgment.[6] Defendants filed the motions and delivered them to Federal Express for service on the tenth day after judgment. While personal delivery or delivery to the U.S. Postal Service would have satisfied the service requirement, delivery to Federal Express did not. *Magnuson v. Video Yesteryear*, 85 F.3d 1424, 1431 (9th Cir. 1996).

Rules 50 and 59 were amended in 1995, however, to require only that such motions be filed, not served, no later than 10 days after entry of judgment. *See* Fed. R. Civ. P. 50(b), 59(b). The amendments took effect December 1, 1995, and "govern all proceedings in civil cases thereafter commenced and, insofar as just and practicable, all proceedings in civil cases then pending." S. Ct. Order, Amendments to the Federal Rules of Civil Procedure (Apr. 27, 1995).

This proceeding was pending on December 1, 1995, and no prejudice will result from application of the amendments. All parties have briefed the substantive, non-jurisdictional arguments in detail. No additional action on the part of the court or the parties is required to proceed. We have applied amended federal rules of appellate procedure retroactively in similar circumstances, *see Schroeder v. McDonald*, 55 F.3d 454, 459-60 (9th Cir. 1995); *Wallis v. J.R. Simplot Co.*, 26 F.3d 885, 888 (9th Cir. 1994), and do so here.

[2]With respect to Carlson, the term "respiratory injuries" applies to respiratory injuries, fatigue, overall body pain, and all other alleged injuries that do not fall within the term "neurological injuries."

[3]With respect to these plaintiffs, the term "neurological injuries" applies to neurological injuries, headaches, rashes, and all other alleged injuries that do not fall within the term "respiratory injuries."

[4]David Schudel, Tim Schudel, Sandra Schudel, Daniel Glass, and Craig Thompson.

[5]Plaintiff Carlson does not raise this issue: his attorney was timely served.

[6]*See* former Fed. R. Civ. P. 50(b) ("Such a motion [for judgment as a matter of law] may be renewed by service and filing not later than 10 days after entry of judgment."); former Fed. R. Civ. P. 59(b) ("A motion for a new trial shall be served not later than 10 days after the entry of judgment.").

motion to exclude Dr. Lantsberger's causation testimony prior to trial and a motion to strike the testimony during trial. The district court did not rule on these motions.

After the jury returned verdicts in favor of plaintiffs and defendants moved for JNOV, the court held that Dr. Lantsberger's causation testimony based on the "whole body aggravation" theory had been admitted erroneously. The court then considered the sufficiency of the remaining evidence to support the jury verdicts and granted the motion for JNOV. The court denied defendants' alternative request for a new trial.

[4] Four circuits have held that, when deciding a motion for JNOV, a trial court may not ignore evidence erroneously admitted at trial, reasoning that excluding evidence after the verdict is unfair to a party who may have relied on the determination that the evidence was admissible.[10] "If evidence is ruled inadmissible during the course of the trial, the plaintiff has the opportunity to introduce new evidence. However, when that evidence is ruled inadmissible in the context of deciding a motion for JNOV, the plaintiff, having relied on the evidence already introduced, is unable to remedy the situation." *Jackson v. Pleasant Grove Health Care Ctr.*, 980 F.2d 692, 696 (11th Cir. 1993).

[5] We recently indicated we would abide by the same rule. *See Central Office Tel., Inc. v. American Tel. & Tel. Co.*, 108 F.3d 981, 993 (9th Cir. 1997). We now hold that when ruling on a Rule 50(b) motion, a district court should not exclude evidence erroneously admitted at trial. The record should be taken as it existed when the trial closed. This rule promotes certainty: litigants need not supplement conditionally admitted evidence, perhaps unnecessarily; and district courts need not speculate as to what other evidence might have been offered if the evidence had been excluded at trial. The rule promotes fairness: punishing a litigant for the court's erroneous admission of evidence is unfair; and the remedy of a new trial is available to put both sides on an equal footing. *Jackson*, 980 F.2d at 696 n.4.

[6] The district court properly concluded that Dr. Lantsberger's testimony based on the "whole person aggravation" theory of causation did not meet the standard of *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993) (*Daubert I*), (outlined in Part IV of this opinion), and should have been excluded. Once the jury rendered its verdict based on the improperly admitted evidence, however, the district court erred in excising that evidence when ruling on the motion for JNOV. Considering all the evidence admitted at trial, including Dr. Lantsberger's "whole person aggravation" theory testimony, we conclude there was sufficient evidence to support the jury verdicts in favor of the Schudel plaintiffs.

[7] Nonetheless, these verdicts may not stand. The district court erred in denying defendants' motion for new trial. A new trial should be granted when the erroneous admission of evidence affected the substantial rights of the parties. Fed. R. Civ. P. 61. Dr. Lantsberger's testimony was the only evidence of causation; its erroneous admission was undoubtedly prejudicial.

IV. The Defendants' Appeal

Defendants argue the neurological symptom causation testimony of Dr. William Morton, Dr. Daniel Goldstein, and Dr.

[10] *See Jackson v. Pleasant Grove Health Care Ctr.*, 980 F.2d 692, 695-96 (11th Cir. 1993); *Douglass v. Eaton Corp.*, 956 F.2d 1339, 1343-44 (6th Cir. 1992); *Sumitomo Bank v. Product Promotions, Inc.*, 717 F.2d 215, 218 (5th Cir. 1983); *Midcontinent Broadcasting Co. v. North Cent. Airlines, Inc.*, 471 F.2d 357, 358-59 (8th Cir. 1973). The Third Circuit has held that such exclusion is proper as long as other evidence relating to the same issue was not barred during trial as cumulative, reasoning that the moving party has a competing interest in litigating a case only once and expressing doubt that litigants would hold back significant evidence at trial. *Lightning Lube, Inc. v. Witco Corp.*, 4 F.3d 1153, 1199-1200 (3d Cir. 1993).

Lantsberger underlying the jury verdict for Deborah Williams was not admissible under Federal Rule of Evidence 702.[11]

A.

[8] The Supreme Court held in *Daubert I*, 509 U.S. at 590-91, that Rule 702 requires the trial judge to determine that proposed scientific expert testimony will be both reliable and relevant. *See also Daubert v. Merrell Dow Pharm.*, 43 F.3d 1311, 1313 (9th Cir. 1995) (*Daubert II*).

[9] Scientific knowledge is reliable if it is "ground[ed] in the methods and procedures of science" and "connotes more than subjective belief or unsupported speculation." *Daubert I*, 509 U.S. at 590. In determining reliability, "[t]he focus . . . must be solely on principles and methodology, not on the conclusions that they generate." *Id.* at 595.

[10] Evidence of scientific knowledge is relevant if the "reasoning or methodology properly can be applied to the facts in issue." *Id.* at 593; *see also Daubert II*, 43 F.3d at 1315 (evidence of scientific knowledge must "logically advance[ ] a material aspect of the proposing party's case"). A court's determination of relevance must consider the applicable substantive standard. *See id.* at 1320. Under Washington tort law, a plaintiff must show that the "the act complained of 'probably' or 'more likely than not' caused the subsequent disability." *O'Donoghue v. Riggs*, 440 P.2d 823, 830 (Wash. 1968). This is virtually the same as the standard under California tort law applied in *Daubert II*. *See* 43 F.3d at 1320. Under this standard, we held in *Daubert II* that expert testimony offered to prove causation did not satisfy the relevance requirement because the evidence suggested only that use of the drug at issue "could *possibly* have caused plaintiffs' injuries," rather than "more likely than not" caused the injuries, i.e., that use of the drug more than doubled the likelihood the injuries would occur. 43 F.3d at 1320-22.

[11]Defendants also argue the trial court should have held a pretrial hearing on the admissibility of the testimony of Williams' experts. Because we conclude the expert testimony should have been excluded, we do not decide whether a pretrial hearing should have been held.

B.

[11] The district court approved reliance by Williams' experts on interview data collected by Diane Nebel. Nebel contacted many of the workers at the Kaiser facility after one of the project supervisors fell ill with Legionnaire's disease. Nebel found no evidence of a Legionnaire's outbreak, but did discover that some of the workers, including the plaintiffs, suffered from various medical symptoms. The data collected in Nebel's Legionnaire's disease investigation provided the basis for much of the scientific testimony presented by Williams' experts at trial.

[12] The district court acted within its discretion in approving the use of this data by Williams' expert witnesses. Dr. Goldstein and Dr. Lantsberger both testified the data was of the type toxicologists consider reliable and regularly rely upon. *See* Fed. R. Evid. 703.

Dr. Morton testified that plaintiff Williams suffered from solvent-induced toxic encephalopathy which "more probably than not" was caused by exposure to Perc and TCA. Dr. Morton's testimony met *Daubert*'s relevance requirement. However, it did not meet *Daubert*'s requirement of reliability.

[13] Dr. Morton's conclusions were based on extrapolation from studies that: (1) involved organic solvents other than TCA or Perc; and (2) examined long-term exposure at relatively low chemical concentrations or short-term exposure at very high concentrations, rather than the short-term, moderate-level exposure sustained by Williams. Dr. Morton did not establish it was scientifically acceptable to draw general conclusions about the neurotoxicity of TCA and Perc

from studies of other chemicals; indeed, the testimony indicated small differences in molecular structure often have significant consequences.

[14] As to differences in length and intensity of exposure, the district court erroneously reasoned that because there was evidence that acute exposure to TCA and Perc can cause toxic encephalopathy, whether Williams' exposure was sufficient to cause her symptoms was a question for the jury. Williams' exposure was neither long enough nor intense enough to fall within the ranges described in the studies Dr. Morton relied upon. Extrapolation was necessary to make the studies relevant, and there was no showing that the necessary extrapolation was scientifically acceptable.[12]

Dr. Goldstein's testimony suffered from similar deficiencies. Dr. Goldstein conceded that only five organic solvents, none of which were involved in this case, had been proven to be neurotoxic. He also testified that it would be improper to infer conclusions as to the toxicity of TCA and Perc based on the toxicity of other solvents, and that repeated exposure to nonpersistent toxins such as organic solvents over a long period must be documented to establish a causal relationship.

[15] Dr. Goldstein acknowledged that the biochemical mechanism of neurotoxicity from TCA and Perc has not been demonstrated. Only two studies cited by Dr. Goldstein involved TCA and Perc, and neither met *Daubert* standards. The Altman study found no relationship between exposure to Perc and the toxic encephalopathy or loss of consciousness alleged by the plaintiffs. The Kalifant study involved long-term (7-15 years), repetitive exposures to TCA at high levels.

[12]Given our analysis of the admissibility of Dr. Morton's testimony, we need not consider defendants' contention that his testimony should have been excluded because testimony based on case reports is not admissible under *Daubert*.

[16] Dr. Lantsberger's testimony failed to meet *Daubert*'s relevance requirement. She testified it was only a "possibility," not a "probability," that Williams suffered organic brain damage from exposure to solvents at the facility. Dr. Lantsberger admitted she could not testify to a specific cause and effect relationship between Williams' exposure and health problems. She relied instead on a "whole person aggravation" theory without establishing that the theory had a scientific basis.

[17] Dr. Lantsberger's testimony regarding the hazards of TCA and Perc was inadmissible under *Daubert*. Dr. Lantsberger, like Dr. Goldstein, relied on the Altman and Kalifant articles to reach her neurotoxicity conclusions, and like Dr. Goldstein, admitted that medical science has not determined the effects of short-term exposure to the solvents involved.

[18] Plaintiff Williams points to other expert witnesses whose testimony was not challenged by defendants. Only one of these experts provided causation testimony, and his testimony related only to Williams' respiratory injury.

[19] Considering all the evidence admitted at trial, including the erroneously admitted evidence, we hold the district court properly denied defendants' motion for JNOV with respect to Williams. Admission of the challenged expert testimony was prejudicial, however, because it was the sole causation evidence with respect to Williams' neurological symptoms. Accordingly, we vacate the judgment entered on the jury verdict, reverse the district court's denial of defendants' motion for a new trial, and remand.

CONCLUSION

We lack jurisdiction to review the district court's grant of JNOV and new trial as to plaintiffs Merlin Carlson, Kathrene Froese, John Hopkins, and Ruth Hopkins, and DISMISS their appeals.

We REVERSE the grant of JNOV and the denial of the motions for new trial as to plaintiffs David Schudel, Tim Schudel, Sandra Schudel, Daniel Glass, and Craig Thompson, and REMAND.

We find plaintiff Deborah Williams' neurological expert testimony on causation inadmissible, VACATE the judgment entered on the jury verdict in her favor, REVERSE the denial of the motion for new trial, and REMAND.

DISMISSED in part, and VACATED, REVERSED, and REMANDED in part. No costs allowed.