

Present: All the Justices

NORFOLK SOUTHERN RAILWAY COMPANY,
SUCCESSOR IN INTEREST TO NORFOLK AND
WESTERN RAILWAY COMPANY

v. Record No. 050160 OPINION BY JUSTICE CYNTHIA D. KINSER
November 4, 2005
DALE ROGERS

FROM THE CIRCUIT COURT OF THE CITY OF PORTSMOUTH
James A. Cales, Jr., Judge

This appeal involves an action brought by Dale Rogers under the Federal Employers' Liability Act (FELA), 45 U.S.C. §§ 51-60 (2000), against Norfolk Southern Railway Company.¹ Rogers alleged that, during his employment at Norfolk Southern, he was exposed to both asbestos and silica, Norfolk Southern knew or should have known about such exposure, and despite such knowledge, Norfolk Southern failed to provide him with a reasonably safe place to work. A jury returned a verdict in favor of Rogers with regard to his silicosis claim.²

On appeal, Norfolk Southern challenges the admission of certain testimony by Richard A. Vogel, Jr., an

¹ In 1982, Southern Railway and Norfolk and Western Railway merged. They are currently known as Norfolk Southern Railway Company. See Mason Y. Cooper, Norfolk Western Historical Society, An Introduction to the Norfolk & Western Railway, http://www.nwhs.org/about_nw.html (last visited Oct. 6, 2005).

² At trial, the circuit court granted Norfolk Southern's motion to strike the evidence regarding Rogers' asbestosis claim.

industrial hygienist who testified as an expert on behalf of Rogers, as well as the sufficiency of the evidence supporting the jury verdict. We find that Vogel's challenged testimony lacks an adequate factual foundation and that, without his testimony, the evidence is insufficient as a matter of law on the issue of Norfolk Southern's negligence. Thus, we will reverse the circuit court's judgment in favor of Rogers.

I. FACTS AND PROCEEDINGS

Rogers was employed as a "maintenance of way" laborer for Norfolk Southern between 1981 and 1998.³ Maintenance of way crews are responsible for the upkeep and maintenance of the railroad track structures to ensure the safe passage of trains. Rogers worked in the maintenance of way department during his entire career with the railroad. He spent about eight years of that time working outside the Tidewater area of Virginia in locations such as West Virginia and Ohio.

Rogers' work on the railroad tracks sometimes involved rock known as "ballast," which provides a foundation and drainage for railroad tracks. Different railroads use

³ Rogers' employment with Norfolk Southern was not continuous. From 1983 until 1984, Rogers worked for Diesel Injection as a sandblaster; during 1984, he worked at Jamestown Sheet Metal as a helper; and from 1984 until 1986, he worked for Norfolk Shipbuilding and Drydock Company as a laborer. Rogers returned to the railroad in 1986.

different types of rock as ballast, and the silica content of the rock varies depending on its type. Rogers stated that, during the course of his employment with Norfolk Southern, the composition of the ballast used remained consistent and "[y]ou [could] see sparkles on most of it."

Rogers' crew dumped ballast on the railroad tracks in different ways depending on the type of railroad car containing the ballast. Some cars required workers to shovel the ballast from inside the car through an opening to other workers waiting outside the railroad car who then controlled the flow of ballast with ropes. Other cars dumped the ballast directly onto the tracks. Rogers testified that his job was dusty, and that dumping ballast on the tracks was the dustiest aspect of his duties. According to Rogers, the second dustiest job was operating a piece of equipment called a "double broom," which swept the tracks forwards and backwards after the ballast had been dumped. Other tasks performed by Rogers included repairing the tracks, welding damaged track sections, removing railroad ties, and installing switch panels. From time to time, he also operated a "ballast regulator," which was used to get a sufficient amount of ballast back in the track after a repair, and an "undercutter," a machine used

to remove old ballast from a track before new ballast was dumped.

Rogers explained that the dust associated with his various jobs on the maintenance of way crew came from under the tracks, from the dirt surrounding the tracks, and from the ballast. He related that his clothes were covered with dust and dirt after a typical shift of working on the tracks. Because Rogers worked on a "section gang," his exposure to ballast was not continuous; he might be exposed one day and not the next. By the 1990's, Rogers was not dumping ballast on a regular basis.

In 2003, Rogers began experiencing some shortness of breath. He saw Dr. Richard C. Bernstein, a pulmonologist, in July 2003. Dr. Bernstein diagnosed Rogers as having "early silicosis" - "destruction of the lung[s] from silica."⁴ Dr. Bernstein based his opinion on Rogers' description of his occupational history and exposure to dust, chest x-rays, and breathing tests. He opined that Rogers' silicosis was caused by exposure to silica while working on the railroad track.

⁴ The diagnosis of silicosis was disputed at trial. Norfolk Southern introduced testimony from four medical experts who each opined that Rogers does not have silicosis. The sufficiency of the evidence regarding the diagnosis of silicosis is not an issue on appeal.

On the issue of Norfolk Southern's negligence, Rogers called Richard A. Vogel, Jr. as an expert in the field of industrial hygiene. In developing his opinions, Vogel reviewed "[a] number of depositions, answers and questions related to interrogatories, medical histories, work histories taken by a physician," and excerpts from historical documents recording various proceedings of the Association of American Railroads (AAR).⁵ Vogel also spoke with Rogers about his work history and watched a video depicting a maintenance of way crew dumping ballast.⁶

Vogel began by discussing portions of the AAR historical documents. The documents demonstrated that, as

⁵ The AAR is a professional organization of freight railroads, Amtrak, and other rail-related companies. Association of American Railroads, http://www.aar.org/About_AAR/about_aar.asp (last visited Oct. 6, 2005). The historical documents are the product of meetings held beginning in the 1930's for railroad surgeons and medical personnel to discuss medical problems known to the railroads.

⁶ Rogers introduced the video into evidence. The video depicted ballast being dumped at an undisclosed location on an unidentified railroad line and did not involve Rogers' maintenance of way crew. In the video, there was a noticeable difference between the visible dust surrounding those employees working alongside the equipment that was dumping the ballast and those working in front of it; the employees in front were working in less visible dust. Notably, Vogel testified, based on his discussions with Rogers, that the majority of the work performed by Rogers "appeared to be working at the ground level with a shovel in hand in front of the equipment."

early as 1932, the AAR was concerned about the hazards of exposure to silica dust. Reading from the documents, Vogel testified that "[p]neumoconiosis, derived from pneumo, [meaning] lung, and konis, [meaning] dust, is a condition that may be caused by any kind of dust entering the lung, but we as railroad surgeons are undoubtedly more interested in silicosis and asbestosis than any other types." He continued, "[s]ilicosis is caused by breathing free silica into the lungs." The documents also stated that silicosis is a dust disease and a person can contract it only by breathing silica dust.

Based on the information found in the AAR historical documents, Vogel opined that the railroad industry, as of 1935, had recommended standards for industrial hygiene with regard to silica exposure. Those standards included educating workers about the hazard, using methods to limit exposure to dust, providing respirators to workers, using ventilation to control dust levels, using certain handling methods to reduce the emission of dust, and taking measurements to determine the concentration of hazardous material in the air.

Continuing, Vogel testified that the applicable industrial hygiene standards in place during Rogers' employment period were the Occupational Safety & Health

Administration (OSHA) standards.⁷ 29 C.F.R. 1910.1000

(2000). OSHA regulates worker exposure to silica-

⁷ Silica exposure is not as heavily regulated as exposure to asbestos. See 29 C.F.R. § 1910.1001 (2000). In 1978, OSHA released a program directive to provide guidelines for inspecting and, where necessary, for issuing citations with regard to exposure to silica in the workplace. Occupational Safety & Health Administration, CPL 02-02-007, Program Directive #300-3, Crystalline Silica (1978), available at <http://www.osha.gov/sltc/silicacrystalline/standards.html> (follow "Crystalline Silica" hyperlink) (last visited Oct. 6, 2005) (hereinafter Directive #300-3). Pursuant to Directive #300-3, "employee exposure to airborne crystalline silica shall not exceed an 8-hour time-weighted average limit (variable) as stated in 29 CFR 1910.1000, Table Z-3 or a limit set by a state agency whenever a state-administered Occupational Safety and Health Plan is in effect." Id. Thus, an employer is not in violation unless employees are exposed to silica in excess of the permissible exposure limits.

Directive #300-3 also provides indicators as to when an employer should test for possible excessive exposure to silica:

- (i) Any information or observations which would indicate employee exposure to silica or other substances;
- (ii) Any measurement of airborne silica;
- (iii) Any employee complaints of symptoms which may be attributable to exposure to silica or other substances;
- (iv) Any production, process, or control change which may result in an increase in the airborne concentration of silica, or whenever the employer has any other reason to suspect an increase in the airborne concentrations of silica.

Id. If testing is undertaken and exposure is found to be above the permissible limits, Directive #300-3 outlines the steps an employer should take to minimize exposure:

The first mandatory requirement is that employee exposure be eliminated through the implementation of feasible engineering controls. After all such controls are implemented and they do not control to the permissible exposure limit, each employer

containing materials, and the allowable silica level has been constant since 1972. Vogel explained that the level of allowable silica is "based on the percentage of silica in a compound. Ten milligrams per cubic meter divided by the percentage of silica plus two, so it's a moving target. The higher the silica content in the material, the lower the level."

To perform this calculation, the silica content of the material being tested must be known. On direct examination, Vogel was asked:

Q: Is it essential to the calculation to know what the silica content is of the material you're testing?

A: You have to know, otherwise all you're evaluating is exposure to airborne dust.

Q: And that could be from any source?

A: True.

During both his direct testimony and cross-examination, Vogel admitted that he did not know the type of rock that Rogers was exposed to during his employment with Norfolk

must rotate its employees to the extent possible in order to reduce exposure. Only when all engineering or administrative controls have been implemented, and the level of respirable silica still exceeds permissible exposure limits, may an employer rely on a respirator program

Id. (emphasis added). Engineering controls include suppressing dust by wetting down the offending substance (in this case the ballast) and proper ventilation. Id.

Southern, nor did he know its silica content.⁸ He agreed that "[i]n order . . . to state whether somebody's at risk, you need to know the volume of the substance they were exposed to" and that determination is made by taking an air sample and measuring that sample against the applicable "threshold limit value." Vogel stated that he had not conducted testing with regard to either Rogers' work or similar work performed by other maintenance of way crews. Nevertheless, Vogel testified that "[v]isible dust is an indication that there are no controls or limited control measures in effect . . . [and i]f you can see visible dust, there's likely to be a much larger percentage of dust that is not visible to the naked eye." According to Vogel, "[a] visible dust cloud is an indicator of conditions that could generate a respiratory hazard and it's something that should trigger sampling." (Emphasis added.)

⁸ During direct examination, Vogel was asked whether "Mr. Rogers worked with or around silica-containing products?" Vogel replied, "I believe he did. I've seen material safety data sheets from a number of companies supplying ballasts for railroad operations that indicated silica in their materials at varying percentages." Vogel testified that he had no "specific firsthand knowledge of the materials that Norfolk Southern purchased that Mr. Rogers would have been using during his employment." Sustaining Norfolk Southern's motion to strike this testimony, the circuit court instructed the jury to disregard it. Contrary to Rogers' argument, Vogel did not indicate that he relied on material safety data sheets in formulating his opinions in this case.

Even though he did not know the type of ballast Rogers worked with or its silica content, Vogel opined that Norfolk Southern failed to comply with industrial hygiene standards relating to exposure to silica dust because Norfolk Southern never warned Rogers about the hazards of working with ballast. Furthermore, according to Vogel, Norfolk Southern did not train Rogers in the proper handling of the silica-containing materials, provide workers with respiratory protection, or conduct air samples. Finally, Rogers asked Vogel:

Q: [B]ased on your education, training and certification as an industrial hygienist, based on your review of the existing relevant literature, based on your knowledge of railroad industry practices, based on your viewing of the videotape depicting ballast dumping that is admitted as Plaintiff's Exhibit 1, based on your discussions with Mr. Rogers concerning his work history from 1981 to 1997, based on the then existing OSHA permissible exposure limits, based on the applicable railroad industry standards in effect during the period of his employment, do you have an opinion as to a reasonable degree of industrial hygiene certainty as to whether or not Mr. Rogers was exposed to silica dust during the years of his employment with Norfolk Southern in an amount that exceeded a reasonably safe level?

A: Based on all those factors, yes, I believe he did.

Norfolk Southern objected to this question on the basis that an adequate foundation had not been established for Vogel's opinion. The circuit court

overruled the objection and allowed that question along with the following one:

Q: And, Mr. Vogel, based on all those same things . . . do you have an opinion to a reasonable degree of certainty in the field of industrial hygiene as to whether Norfolk Southern provided reasonable and sufficient safeguards to Mr. Rogers so he would have a reasonably safe place to work with regard to his exposure to silica dust?

A: No, I do not believe that they did.

At the conclusion of Rogers' case-in-chief, Norfolk Southern moved to strike Rogers' evidence. The circuit court overruled the motion. Norfolk Southern then presented testimony from its witnesses.

As part of Norfolk Southern's evidence, David M. Tucker testified as an expert in the field of industrial hygiene. Tucker was employed for Norfolk Southern as an industrial hygienist from 1989 through 2001. During his tenure with Norfolk Southern, he was not aware of any railroad worker who had a confirmed diagnosis of silicosis.

Tucker testified that in order for silica dust to be harmful, it must be respirable dust. This means that it must be microscopic; any dust particle larger than that is harmless. Therefore, Tucker opined that not every exposure to silica represents a health hazard.

Tucker further explained that Norfolk Southern uses various types of rock as ballast, including granite and limestone. He stated that Rogers mainly worked on Norfolk Southern's railroad tracks where limestone ballast was used. Limestone rock has a lower silica content than granite. Tucker also considered significant the fact that Rogers worked in what was called a "section gang." Unlike a "system gang" that was exposed to silica dust on a daily basis, a section gang did not have exposure to silica dust everyday.

In 1990, Norfolk Southern learned that a former track maintenance worker had possibly been diagnosed with silicosis. After some initial testing, Norfolk Southern decided, in 1992, to conduct extensive air monitoring and medical work-ups on employees. The testing revealed that a few workers were exposed to levels of silica dust that exceeded the threshold limit values (TLV) while working on railroad tracks where granite ballast was used.⁹ According

⁹ Tucker explained:

The TLV is designed as an established safe limit. Nobody exposed at or below the TLV for eight hours a day, 40 hours a week over a 35 year working lifetime and that's constant at that level should ever get sick except for somebody predisposed genetically [who is] very sensitive to this disease.

to Tucker, the air monitoring and medical testing showed that the "track maintenance workers [were] at no increased risk of contracting silicosis over any other occupation."

At the close of all the evidence, Norfolk Southern again renewed its motion to strike. Similarly, after the jury returned a verdict in favor of Rogers, Norfolk Southern moved to set aside the jury verdict. The circuit court denied both motions and entered judgment for Rogers.

On appeal, Norfolk Southern challenges, among other things, the admission of Vogel's testimony that Rogers was exposed to excessive levels of silica dust during his employment with Norfolk Southern and the sufficiency of the evidence regarding the issue of negligence.¹⁰ We will address the issues in that order.

II. ANALYSIS

A. Standard of Review

Armed with a jury verdict in his favor, Rogers is entitled to have the evidence, and all inferences that may reasonably be drawn from it, viewed in the light most favorable to him. Norfolk & W. Ry. Co. v. Keeling, 265 Va.

¹⁰ On brief, Rogers claims that Norfolk Southern failed to file the August 9, 2004 trial transcript and therefore is barred from relying on it in this appeal. That transcript was, however, filed when Norfolk Southern attached it to its motion to set aside the verdict. Therefore, the transcript is part of the record and may be considered on appeal.

228, 232, 576 S.E.2d 452, 456 (2003); Evaluation Research Corp. v. Alequin, 247 Va. 143, 147, 439 S.E.2d 387, 390 (1994). The judgment of the trial court will not be set aside unless it is "plainly wrong or without evidence to support it." Code § 8.01-680. This standard of review is applicable to Norfolk Southern's assignments of error challenging the sufficiency of the evidence. Keeling, 265 Va. at 282, 576 S.E.2d at 456. The question whether Vogel's expert opinion was supported by an adequate factual foundation concerns the admissibility of evidence. CSX Transp., Inc. v. Casale, 250 Va. 359, 367, 463 S.E.2d 445, 450 (1995). On appeal, we will reverse a trial court's decision to admit expert testimony if the court abused its discretion in doing so. Tarmac Mid-Atl., Inc. v. Smiley Block Co., 250 Va. 161, 166, 458 S.E.2d 462, 465 (1995).

B. Admissibility of Expert Testimony

In FELA cases, Virginia law governs the admissibility of expert testimony. Keeling, 265 Va. at 235, 576 S.E.2d at 457. Expert testimony is allowed where it "will assist the trier of fact to understand the evidence or to determine a fact in issue." Code § 8.01-401.3. An expert's opinion may be based on "facts, circumstances or data made known to or perceived by such witness." Code § 8.01-401.1.

An expert opinion, however, must have an adequate factual foundation, and an expert's testimony will be found to be inadmissible if it is speculative in nature. John v. Im, 263 Va. 315, 319-20, 559 S.E.2d 694, 696 (2002); Tarmac Mid-Atl., 250 Va. at 166, 458 S.E.2d at 465-66. It is the trial court's responsibility " 'to ensure that only properly admitted evidence is considered by the jury.' " Casale, 250 Va. at 367, 463 S.E.2d at 450 (quoting Tyger Constr. Co. v. Pensacola Constr. Co., 29 F.3d 137, 143 (4th Cir. 1994)). "Expert testimony founded upon assumptions that have no basis in fact is not merely subject to refutation by cross-examination or by counter-experts; it is inadmissible. Failure of the trial court to strike such testimony upon a motion timely made is error subject to reversal on appeal." Vasquez v. Mabini, 269 Va. 155, 160, 606 S.E.2d 809, 811 (2005) (citations omitted).

In the present case, Vogel's challenged testimony was not based on an adequate factual foundation and was therefore inadmissible. See Tittsworth v. Robinson, 252 Va. 151, 155, 475 S.E.2d 261, 263 (1996) (excluding expert testimony because it "is speculative, is founded upon assumptions lacking a sufficient factual basis, relies upon dissimilar tests, and contains too many disregarded variables"); Stover v. Norfolk & W. Ry. Co., 249 Va. 192,

197, 201, 455 S.E.2d 238, 241, 243 (1995) (expert witness, who relied solely on depositions and color photographs, drew an impermissible inference because the opinion was not based on facts in the case or within the expert's knowledge). Vogel acknowledged that, in order to determine the allowable silica level, it is necessary to know the silica content of the material being tested. Otherwise, the test is merely evaluating exposure to airborne dust that could come from any source. Vogel did not know the kind of ballast used by Rogers during his employment with Norfolk Southern nor did he know its silica content. Furthermore, Vogel admitted that, in order to know if a worker is at risk, it is necessary to know the volume of substance to which the worker was exposed.

Despite the admitted lack of necessary underlying data, Vogel opined that Rogers had been exposed to excessive levels of silica while working for Norfolk Southern. He reached that conclusion by relying primarily on AAR historical documents, his discussions with Rogers concerning his work environment, and the video depicting ballast dumping. Not one of those sources of information, however, contained any evidence about the kind of ballast used in Rogers' work or its silica content. Consequently, Vogel's opinion that Rogers was exposed to silica dust in

an amount that exceeded a reasonably safe level was "founded upon assumptions that [had] no basis in fact." Vasquez, 269 Va. at 160, 606 S.E.2d at 811. The testimony was therefore inadmissible.

C. Sufficiency of Evidence

Under the provisions of FELA, railroads are liable for "injury or death resulting in whole or in part from the negligence of any of the officers, agents, or employees of such carrier, or by reason of any defect or insufficiency, due to its negligence, in its cars, engines, appliances, machinery, track, roadbed, works, boats, wharves, or other equipment." 45 U.S.C. § 51 (2000). "[A] railroad has a nondelegable duty, which is continuing, to exercise reasonable care in furnishing its employees a safe place to work." Norfolk & W. Ry. Co. v. Johnson, 251 Va. 37, 44, 465 S.E.2d 800, 805 (1996). FELA does not, however, hold employers to be the insurers of their employees. Inman v. Baltimore & Ohio R.R. Co., 361 U.S. 138, 140 (1959); Brown v. CSX Transp., Inc., 18 F.3d 245, 249 (4th Cir. 1994); Norfolk S. Ry. Co. v. Trimiew, 253 Va. 22, 27, 480 S.E.2d 104, 108 (1997).

The question whether an employer was negligent under FELA is a question of federal law. Trimiew, 253 Va. at 24, 480 S.E.2d at 106. "Drawing on federal law, we have noted

that a plaintiff's proof must justify with reason the conclusion that an employer's negligence played any part, even the slightest, in producing the injury for which damages are sought." Id.; accord Rogers v. Missouri Pac. R.R., 352 U.S. 500, 506 (1957). "Reasonable foreseeability of harm is an essential ingredient of FELA negligence." Stover, 249 Va. at 201, 455 S.E.2d at 244.

The standard of proof in a FELA action "is more lenient than in a common law action[; however,] the plaintiff nevertheless is still required to establish some act of negligence in order to prevail." Norfolk & W. Ry. Co. v. Hughes, 247 Va. 113, 116, 439 S.E.2d 411, 413 (1994). The weight of the evidence must be more than a scintilla before a case may be properly left to the discretion of a jury. Brady v. Southern Ry. Co., 320 U.S. 476, 479 (1943); Stover, 249 Va. at 200, 455 S.E.2d 243; see also Keeling, 265 Va. at 232, 576 S.E.2d at 456 ("[B]oth foreseeability and negligence must be shown by more than a scintilla of evidence"). "[I]n rare cases 'where fair-minded persons cannot differ on whether the employer was at fault and whether that fault played any part in the employee's injury or death, the question becomes one for the court.'" Stover, 249 Va. at 199, 455

S.E.2d at 242 (quoting Norfolk & W. Ry. v. Hodges, 248 Va. 254, 260, 448 S.E.2d 592, 595 (1994)).

At the close of Rogers' evidence, at the close of all of the evidence, and after the jury returned its verdict, Norfolk Southern challenged the sufficiency of the evidence with regards to the issues of negligence and foreseeability. On appeal, Norfolk Southern asserts that the circuit court erred in each instance. Because Norfolk Southern introduced evidence on its behalf after the circuit court denied its motion to strike Rogers' evidence, it has waived the right to rely on the first motion. Taylor v. Flair Prop. Assocs., 248 Va. 410, 414, 448 S.E.2d 413, 416 (1994). Thus, in deciding whether there was sufficient evidence to support the jury verdict, we consider all the evidence and not just the evidence presented in Rogers' case-in-chief. Id. We do not, however, consider the portion of Vogel's expert testimony that we have determined was inadmissible. See Grasty v. Tanner, 206 Va. 723, 727-28, 146 S.E.2d 252, 255 (1966).

The principal contention between the parties on the sufficiency of the evidence regarding Norfolk Southern's negligence is whether Rogers was required to introduce "specific dose evidence" of his exposure to silica dust. Norfolk Southern argues that Rogers "failed to present any

evidence of the amount of silica to which he was exposed, that this amount exceeded permissible threshold levels, that Norfolk Southern knew or should have known this was occurring, or that his injury was reasonably foreseeable." Rogers claims that specific dose evidence is not required to establish a railroad's liability.¹¹ To resolve whether there was sufficient evidence in this case, we turn to some of the cases cited by the parties.

In Young v. Clinchfield Railroad Co., 288 F.2d 499 (4th Cir. 1961), the court concluded that the plaintiff presented sufficient evidence to create a jury issue as to whether the railroad had failed to provide the plaintiff with a safe workplace. Id. at 501. The plaintiff worked "behind a cribbing machine which removed ballast from between the ties and an adzing machine which smoothed the ties." Id. The plaintiff presented evidence that he was exposed to heavy dust while performing this work on the defendant's railroad tracks and that the ballast used contained rock with silica content ranging from 34 percent to 100 percent. Id. A physician testified that this type

¹¹ On this point, Rogers draws a distinction between the issue of liability and the issue of medical causation. He correctly points out that Norfolk Southern has not challenged the sufficiency of the evidence on the latter issue.

of exposure, to this amount of silica, could have caused the plaintiff's silicosis. Id.

In a decision citing Young, the court in Wooden v. Missouri Pacific Railroad Co., 862 F.2d 560 (5th Cir. 1989), found sufficient evidence from which a jury could infer that the railroad knew, or should have known, of the risk to its employee of exposure to silica dust in the workplace. Id. at 562. The plaintiff alleged that his work on the railroad caused him to contract silicosis. Id. at 560. The plaintiff introduced evidence showing that he operated a tamping machine for the railroad, id. at 561, and that the machine produced enough dust that "[y]ou barely could see what you was [sic] doing." Id. at 562. An industrial hygienist testified that the rocks on the trackbed with which the plaintiff worked contained 100 percent silica. Id.

In both Young and Wooden, there was evidence as to the amount of silica present in the substance causing the dust. While neither case contained evidence of actual exposure levels, i.e., dose evidence, both cases did include expert witness testimony that the rocks in question contained significant levels of silica. Therefore, the jury in each case could reasonably infer that the dust to which the

plaintiff was exposed contained a large amount of silica. No such evidence was presented in the case before us.

In contrast to Young and Wooden, the court in Mitchell v. Gencorp Inc., 165 F.3d 778 (10th Cir. 1999), affirmed the trial court's award of summary judgment to the defendant because the plaintiff failed to prove the level of chemicals to which he was exposed. Id. at 781. The plaintiff was a warehouseman and truck driver, whose position "required him to stock, organize and fill orders from the company's 'flammable room.' " Id. at 779. The flammable room was a small room without ventilation and housed various products manufactured by the defendant that contained certain chemicals. Id. Evidence suggested that some barrels in the room had leaked. Id. The plaintiff was diagnosed with chronic myelogenous leukemia and alleged that his exposure to the chemicals in the flammable room caused his illness. Id.

In Mitchell, an industrial hygienist was offered to testify that the plaintiff's exposure to these chemicals caused his leukemia. Id. The expert, however, studied only photographs of the flammable room showing some chemical spillage and material safety data sheets listing various chemicals contained in the defendant's products. Id. The expert never visited the room, nor did he conduct

any tests to determine the plaintiff's level of exposure to the chemicals. Id. The plaintiff relied on the proffered expert testimony, along with his own testimony as to the number and length of his visits to the flammable room, to prove exposure. Id. at 781.

In excluding the expert's testimony for lack of an adequate foundation and finding the remaining evidence insufficient, the court stated:

[W]hile [the plaintiff's] testimony could be relevant to proving that the "flammable room" contained chemicals, it does not clarify the level of chemicals to which [the plaintiff] was exposed. Similarly, the materials relied upon by [the expert] are not relevant in determining [the] level of exposure. It makes little sense to argue that a scientist can look at pictures and a list of chemicals contained in a room and arrive at a level of exposure.

Id.; see also Moore v. Ashland Chem. Inc., 151 F.3d 269, 278 (5th Cir. 1998) ("[b]ecause he had no accurate information on the level of [the plaintiff's] exposure to the fumes, [the expert] necessarily had no support for the theory that the level of chemicals to which [the plaintiff] was exposed caused [his illness]"); Savage v. Union Pacific R.R. Co., 67 F.Supp.2d 1021, 1031 (E.D.Ark. 1999) ("plaintiff must demonstrate 'the levels of exposure that are hazardous to human beings generally as well as the plaintiff's actual level of exposure' " (quoting Wright v.

Willamette Indus., Inc., 91 F.3d 1105, 1106 (8th Cir. 1996)). But cf. Westberry v. Gislaved Gummi AB, 178 F.3d 257, 264 (4th Cir. 1999) ("although [the expert] did not point to [the plaintiff's] exposure to a specific level of airborne talc, there was evidence of a substantial exposure").

Rogers correctly points out that the evidence in Young and Wooden did not include specific dose evidence and relies on Harbin v. Burlington Northern Railroad Co., 921 F.2d 129 (7th Cir. 1990), in support of his position. In Harbin, the plaintiff was employed as a boilerman, and once a year he was required to clean out three boilers located in an enclosed building. Id. at 129. This cleaning forced large amounts of soot and debris into the air. Id. at 130. While the soot and debris were being released into the air, locomotives in the building were running and emitting exhaust fumes. Id. The plaintiff was provided a breathing cup, but it only covered his mouth and had to be changed three or four times a day because the soot was so dense. Id. The railroad was aware of the problem but did nothing to improve the ventilation system. Id. It did, however, allow other employees (those not cleaning the boilers) to leave during the cleaning process. Id. On the third day of cleaning, the plaintiff experienced left arm and chest

pain, shortness of breath, and heavy perspiration. Id. He was later diagnosed as having suffered a heart attack. Id.

The plaintiff subsequently brought a FELA action against the railroad. The trial court granted summary judgment for the railroad on the issue of negligence, holding that "[w]ithout knowledge of the precise quantity or composition of soot present in the air, . . . a jury would be unable to assess the reasonableness of the Railroad's conduct." Id.

On appeal, the United States Court of Appeals for the Seventh Circuit reversed the trial court's judgment. The appellate court was persuaded by the evidence showing that the cleaning process took place in a room without adequate ventilation, while locomotives were running and emitting exhaust fumes, and that cleaning the boilers produced so much soot and debris the breathing cups had to be changed multiple times each day. Id. at 131. Based on this evidence, the court held that "a jury could reasonably conclude that the Railroad's failure to employ a different boiler cleaning method or take additional precautions to ensure the safety of its employees was negligent." Id. at 132. While the court concluded that the plaintiff did not need to "identify the specific composition and density of soot present," id., it compared the "general risk of harm

to employees forced to labor without ventilation in a sooty environment" to the risk of injury "from a rusty wire left lying about or a stagnant pool of water, or the lifting of a heavy weight." Id.

Rogers also relies on Fulmore v. CSX Transportation, Inc., 557 S.E.2d 64 (Ga. Ct. App. 2001), an asbestos case, to support his argument that specific dose evidence is not needed. There, the court stated:

First, a plaintiff must offer proof of general causation: whether exposure to a substance is capable of causing a particular injury or disease. In addition, a plaintiff must also produce evidence of specific causation: whether exposure to a substance under the circumstances of the case caused a particular plaintiff's illness or disease. While both analyses involve a question of the concentration levels of the toxin to which plaintiffs were exposed, it does not necessarily follow that plaintiffs must show specific air measurement readings, or that they have not otherwise established causation.

Id. at 72. The court in Fulmore acknowledged the need to know the level of exposure to the offending substance. It held, however, that because the plaintiffs had contracted asbestosis, "which by definition, results only from an overexposure to asbestos, the proof of asbestosis conclusively establishe[d] such overexposure." Id. at 72.

As in Young and Wooden, the offending substance in Harbin and Fulmore was known and there was evidence from which a jury could infer that the respective plaintiff had

been exposed to a hazardous level of the substance. In Harbin, the plaintiff proved that he was exposed to such amounts of soot and debris as to require breathing cups to be changed frequently during a workday. Harbin, 921 F.2d at 130. The plaintiff also showed that the ventilation system was poor and that the railroad was aware of it - in fact, the railroad allowed those employees not involved in cleaning the boilers to leave. Id. at 130. In Fulmore, the offending substance was asbestos, and excessive exposure was proven by the fact that the plaintiff had asbestosis. 557 S.E.2d at 72.

In contrast, the evidence in the case before us, viewed in the light most favorable to Rogers, established that beginning in 1932 railroads were aware of silica dust. Testing in the 1990's, however, did not show exposure to unsafe levels of silica dust except for some railroad employees who worked in areas where granite ballast was used. Rogers did not prove that he worked with granite ballast. The only evidence on this subject showed that he predominantly worked on railroad tracks in areas where limestone ballast was used.¹²

¹² On brief, Rogers argues that testimony from one of Norfolk Southern's witnesses that he observed Rogers wearing a respirator at times, establishes that Rogers was exposed to unsafe levels of silica dust. We do not agree.

Even knowing that Rogers worked with limestone ballast, which is information Vogel did not have, the record is void of evidence as to the silica content of such rock. See Young, 288 F.2d at 501 (silica content of ballast rock ranged from 34 percent to 100 percent); Wooden, 862 F.2d at 562 (rocks on railroad trackbed contained 100 percent silica). At best, the evidence showed that Rogers, while working with limestone ballast, was exposed to a visible dust cloud. But, Rogers' own expert, Vogel, admitted that, unless the silica content of the material is known, any testing just measures exposure to airborne dust that could come from any source. Vogel further admitted that, to determine the allowable silica level, it is essential to know the silica content of the tested substance. Furthermore, Rogers testified that dust to which he was exposed came not only from ballast but also from under the railroad tracks and from dirt surrounding the tracks.

Thus, we conclude that the evidence was insufficient, as a matter of law on the issue of Norfolk Southern's negligence, to sustain the jury verdict. In reaching this

Moreover, Rogers testified that he never wore a respirator. See Massie v. Firmstone, 134 Va. 450, 462, 114 S.E. 652, 656 (1922) ("No litigant can successfully ask a court or jury to believe that he has not told the truth.").

conclusion, we agree with Rogers that "specific dose evidence" is not required. Nevertheless, a plaintiff with silicosis seeking damages under FELA must present some type of evidence, such as silica content of the offending substance, from which a jury can reasonably infer that the plaintiff was exposed to levels of silica dust that exceeded reasonably safe levels, i.e., that exceeded the TLV. See supra note 9.

III. Conclusion

Vogel's challenged testimony was inadmissible under the rules for admission of expert testimony in Virginia. His testimony that Rogers was exposed to amounts of silica dust that exceeded reasonably safe levels lacked an adequate factual foundation. The remainder of the evidence presented was insufficient as a matter of law on the issue of Norfolk Southern's negligence. Norfolk Southern cannot be held liable on a theory of exposure to excessive amounts of silica dust when there was no evidence of exposure to silica dust beyond exposure to a dust cloud of unknown content. Rogers failed to prove "some act of negligence" by Norfolk Southern. Hughes, 247 Va. at 116, 439 S.E.2d at 413. Therefore, we will reverse the judgment of the

circuit court and enter final judgment for Norfolk
Southern.¹³

Reversed and final judgment.

¹³ In light of our decision, it is not necessary to address Norfolk Southern's remaining assignments of error.