of the trial, or that the defendant's exception to his refusal to grant the request was then allowed.

Judgment on the verdict.

SNOW, J., did not sit: the others concurred.

[redacted]

Rockingham,
March 6, 1928.

HERBERT RUSSELL *v.* BOSTON & MAINE RAILROAD.

[redacted]

Chester T. Woodbury and *William H. Sleeper* (*Mr. Sleeper* orally), for the plaintiff.

Hughes & Burns (*Mr. Hughes* orally), for the defendant.

BRANCH, J. The essential facts which the plaintiff undertook to prove as a part of his case were (1) that the fire was discovered within a short time after the passage of defendant's locomotives, (2) that it started upon the side of the barn roof nearest to the tracks, (3) that the wind was blowing from the track toward the buildings, and (4) that the engines which passed might have emitted sparks. It was apparently conceived by the plaintiff that proof of these facts would justify a finding that the fire was caused by a spark from a locomotive. The defendant not only took issue with the plaintiff upon all the foregoing questions of fact, but contested the plaintiff's whole theory upon the fundamental ground that the conclusion which the plaintiff sought to draw from these facts, if established, was invalid. It was the contention of the defendant throughout the trial that it was physically impossible for a spark, discharged from the stack of a light engine operated under the conditions disclosed by the evidence, to reach the necessary height and travel the necessary lateral distance to land on the roof of the barn.

It was the position of the plaintiff that the fire was most probably caused by a spark from the last locomotive to pass his premises, which was of the "mogul" type, and the engineer of this locomotive was called as a witness by the plaintiff. From his testimony it ap-

peared that this engine stopped at Windham, which was a junction point, at a "positive stop post," which was located according to other evidence in the case at about 1500 feet from the plaintiff's buildings; that in starting from this position he probably "hooked up" his engine, *i. e.* shortened the cut-off so as to admit only a small quantity of steam to the cylinders, within 20 or 25 feet; that he didn't believe he was going over 15 or 20 miles per hour when he passed the Russell place; that he did not think the engine could throw sparks, because "this engine was light, there was very little steam passing through the stack at the time, and exhaust on the fire would be very light." None of the plaintiff's evidence contradicted the testimony of this witness as to the manner in which the engine was operated.

In support of its contention that it was impossible for a spark from this engine to reach the roof of the plaintiff's barn, the defendant drew from plaintiff's witnesses the information that the buildings in question stood upon higher ground than the track, the foundation of the barn being approximately 14 or 15 feet above the rails; that the posts of the barn were 16 feet high, so that the eaves must have been at least 30 feet above the rails, and that the stack of a locomotive of the type in question rises 14 feet above the rails. From the plaintiff's expert, a former locomotive engineer of many years' experience, defendant also elicited testimony that the longest distance from the track to which sparks had ever been carried, within his personal knowledge, was 70 feet, in the case of an unusually large spark discharged by a freight locomotive laboring under a heavy load on a steep grade; that the greatest height to which sparks were ever thrown was 25 to 30 feet above the stack, and that this happened when a locomotive was starting or hauling a heavy load; that any sparks which might be thrown from a light engine traveling at a speed of 15 to 20 miles per hour would not rise more than 5 or 6 feet above the stack.

In order to reach the roof of the barn it is plain that a spark would have to attain an elevation of at least 16 feet above the stack and maintain that elevation during a lateral flight of at least 90 feet, since the plaintiff's barn stood 88 feet from the nearest rail at its nearest point. The testimony of the plaintiff's expert supported the defendant's contention that it was impossible for a spark from a light engine to reach the height necessary to accomplish this journey, and indicated that a lateral flight of 90 feet would be unprecedented in his experience. The plaintiff produced no evidence

that such an occurrence was possible under the conditions which existed at the time of the fire, and it must therefore be determined whether such evidence was essential to his case.

In many simple cases common knowledge may render unnecessary the production of evidence. When a fire starts on the ground close to a railroad track soon after the passage of a train, it may be a legitimate inference that the fire was set by the locomotive. In such a case, common knowledge of "the fact that locomotives frequently emit sparks which fall near the track causing fires" (*Staples* v. *Railroad*, 74 N. H. 499, 500) furnishes a sufficient, logical and legal basis for the conclusion. But the height to which sparks can be thrown and the distance to which they can be carried by the wind under a given set of conditions are obviously limited by natural laws, and it cannot be assumed that the limits thus fixed by natural laws are matters of common knowledge. Consequently in a case like the present one which calls for a determination of those limits, common knowledge furnishes no criterion for judgment and evidence becomes indispensable, for it has been held repeatedly in this state that "the law does not permit the jury to find a verdict upon surmises and conjectures, but it must be founded upon some substantial evidence." *Nadeau* v. *Stevens*, 79 N. H. 502, 504, and cases cited. The law "requires an open, visible connection between the principal and evidentiary facts and the deductions from them, and does not permit a decision to be made on remote inferences." *United States* v. *Ross*, 92 U. S. 281, 283, 284; *Deschenes* v. *Railroad*, 69 N. H. 285, 290; *Clark* v. *Sharpe*, 76 N. H. 446, 447, and cases cited. Proof of a bare possibility that an injury may be due to a given cause does not justify a finding that it was so caused. The evidence must furnish some logical basis for a finding that the result was probably due to the alleged cause. *Reynolds* v. *Company*, 73 N. H. 126; *Dame* v. *Car Works*, 71 N. H. 407; *Deschenes* v. *Railroad*, *supra*. Some evidence tending to establish not only the possibility but also the probability that a spark from one of the defendant's engines was carried to the roof of the plaintiff's barn was, therefore, a necessary component of the plaintiff's case, and in the absence of such evidence he was not entitled to go to the jury.

It is true that the plaintiff testified that upon a prior occasion he observed a spark from a passing freight train which struck the side of his barn, fell down in front of him and "sizzled in the snow," but in describing the occurrence he stated that this spark came from a heavy freight train which was laboring very hard and that

"there was quite a wind that carried it through there." The circumstances thus described were so different from those which prevailed upon the day of the fire that this testimony furnished no basis for a finding that a spark from a light engine probably was or could have been carried to the roof of the barn. It follows that the plaintiff's case was fatally defective and the motion for a nonsuit should have been granted. Unless the defendant's evidence supplied the defect it is now entitled to judgment.

The defendant's evidence contributed nothing to the plaintiff's case in regard to the point under consideration, but tended strongly to sustain the defendant's contention. A large amount of evidence was introduced tending to show that the wind was blowing from the west and northwest instead of from the south and southwest as claimed by the plaintiff. Previous estimates of the height of the barn above the track were corroborated by an actual survey. The improbability that a light engine would emit any sparks was stressed by several witnesses. Testimony in regard to the construction and operation of the spark arresters with which the defendant's locomotives are equipped, indicated that they are so designed as to prevent the escape of all except very small sparks and cinders, and the records of inspections of the locomotives in question, made four days after the fire, were produced, stating that all spark arresters were found to be in good condition. A competent expert testified that in his opinion it was impossible for a spark to have reached the plaintiff's barn under the circumstances disclosed by the evidence because "the spark with the engine operating under that condition at no time would be at a height greater than we will say 20 feet above the ground. In order to reach the roof of the barn in question it would have to take an upward path. Sparks never do that. They fall from the minute that they reach their maximum height, depending on the velocity of the wind as to how far they will travel." He also gave it as his opinion that the maximum distance to which sparks capable of setting a fire will carry, even in a strong wind, is 40 or 50 feet.

One of the defendant's witnesses was a crossing tender who worked at a crossing on another line of defendant's railroad near Windham station. For the apparent purpose of contradicting the testimony of the engineer as to the way in which the mogul locomotive was operated upon the day of the fire, plaintiff's counsel cross-examined this witness with reference to the operation of engines over the crossing near the plaintiff's house as follows: "Q. Well, now, did

you ever notice as the engines came right up there, Mr. Boyce, that they came along up over the crossing here and then they wouldn't, when they didn't have a load, I mean, they wouldn't go fast until they got over this highway here; that is they would approach the crossing slowly? A. Sure. Q. And cross the highway slowly? A. Naturally. Q. And then, as you might say, 'step on it' after they got across there to get up over the hill? A. (Nods assent.)" Upon redirect examination the witness stated that he could not see the crossing near the Russell house from his shanty so that he did not know what engineers did after they got west of the crossing or what they did east of it. Upon re-cross examination he testified as follows: "Q. That is, when they were not loaded did they come up and approach this highway slowly and then pick up after they get across the highway? A. Naturally would. Q. Naturally would? A. Going towards Nashua." It seems clear from the foregoing testimony that the witness was giving his idea of what an engineer would naturally do rather than the results of his observation as to what they actually did, but if this testimony could be construed to mean that engineers customarily approached the crossing near the plaintiff's house slowly and speeded up after they passed it, and if from this testimony it could be inferred that the engineer in question operated his locomotive in that way, in spite of his testimony to the contrary, there was nothing in the testimony to indicate that the speeding up of a light engine under these circumstances would cause sparks to be thrown higher than the maximum of 5 or 6 feet fixed by the plaintiff's expert. It is, therefore, plain that the testimony of this witness did not supply the missing link in the plaintiff's chain of proof.

The argument that no cause other than a spark from a locomotive could be assigned for the fire was met by the defendant's evidence of another possible cause for the destruction of the plaintiff's buildings, *i. e.* a fire in the plaintiff's kitchen chimney situated in the ell between the house and the barn. The plaintiff's wife had been getting dinner on the kitchen stove before the fire was discovered and the stove was still hot when it was removed during the fire. There was evidence that the fire was first discovered on the north side of the barn roof which was next to the ell; that the plaintiff upon several occasions stated that it started there and gave as its cause a chimney fire. The proof of loss which he signed six days after the fire in order to collect his fire insurance, stated that the origin of the fire "so far as known to the assured" was "probably

chimney." One witness testified that on the day of the fire he asked Mr. Russell what the cause of the fire was and he answered that it "was a chimney fire and that he had neglected to clean it out." Plaintiff admitted upon cross-examination that the chimney was "pretty sooty" and a witness who examined it after the fire found it "awfully sooty so far as you could see."

Just before the close of the evidence, in cross-examination of the defendant's expert, plaintiff's counsel suggested a new theory in regard to the origin of the fire, *i. e.* that a spark from a locomotive might have ignited "something like dry grass" back of the barn, from which point the fire might have been communicated to the roof of the barn, and at the oral argument in this court it was urged that this was perhaps the most probable explanation of the event. This constituted a radical departure from the theory upon which the whole trial had proceeded up to that time, and it may be thought that in putting forward this suggestion, counsel indicated some loss of faith in their original position. But plaintiff's case stands no better upon the new theory than upon the old, because there was a total lack of evidence to sustain it. There is nowhere in the testimony a suggestion that there was any fire on the ground prior to its discovery upon the roof of the barn, and what testimony there is on the question is to the effect that there was none. A witness who approached the barn from the south and saw the smoke coming from the roof, testified that there was no fire anywhere in sight outside the buildings, and the plaintiff's daughter, who was one of the early observers of the fire, testified definitely that she saw no fire anywhere on the ground. Furthermore the evidence of the defendant tended strongly to prove that the fire burned from the barn toward the track. In this state of the proof, the plaintiff was not entitled to go to the jury upon his alternative theory of causation.

Since "the sufficiency of the evidence on any issue must from the nature of the question be determined by general principles of reason and logic in application to the evidence" (*Collette* v. *Railroad*, *ante*, 210), the citation of authorities in support of the conclusion which we have reached is perhaps unnecessary, but reference may be made to the following cases as representative of a large number of decisions which rest upon considerations similar to those set forth herein. *Miller-Brent Lumber Co.* v. *Douglas*, 167 Ala. 286; *Alden* v. *Railroad*, 112 Me. 515; *Midland &c. R. Co.* v. *Rupe*, 87 Okla. 286; *Cincinnati &c. Ry Co.* v. *Sadieville &c. Co.*, 137 Ky. 568; *Dudley* v. *Railway*, 133 La. 80; *Finkelston* v. *Railway*, 94 Wis. 270; *Lares* v.

Railroad, 144 Minn. 170; *Dickerson* v. *Railroad,* 190 N. C. 292; *Hines* v. *Venable,* 81 Fla. 754; *Weber* v. *Davis,* 198 Ia. 785; *Beach* v. *Railroad,* 190 Mich. 592; *Gainesville &c. R. Co.* v. *Edmondson,* 101 Ga. 747; *Metz* v. *Railway,* 125 S. C. 1; *Atlantic &c. R. Co.* v. *Watkins,* 104 Va. 154; *Kalbach* v. *Railway,* 277 Pa. St. 307; *Bates Co. Bank* v. *Railway,* 98 Mo. App. 333; *Atchison &c. R.R. Co.* v. *Hutchison,* 8 Kan. App. 605; *Lake Erie &c. R. Co.* v. *Naron,* 18 Ind. App. 193.

The foregoing discussion indicates the proper disposition of the case and makes it unnecessary to consider the defendant's other exceptions.

Judgment for the defendant.

All concurred.

Hillsborough, March 6, 1928.

EMMA SUNDEEN *v.* JAMES A. ROGERS *& a.*