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19-P-758

Appeals Court

COMMONWEALTH vs. DOMINIC SHINER.

No. 19-P-758.

Suffolk. September 8, 2021. - June 15, 2022.

Present: Rubin, Milkey, & Henry, JJ.

Homicide. Intimidation of Witness. Evidence, Experiment, Demonstration, Videotape, Photograph, Expert opinion, Relevancy and materiality. Witness, Expert, Intimidation. Practice, Criminal, Required finding, Argument by prosecutor.

Indictments found and returned in the Superior Court Department on September 11, 2015, and November 8, 2016.

The cases were tried before Douglas H. Wilkins, J.

Michael P. Gerace for the defendant.
Paul B. Linn, Assistant District Attorney (Julie Higgins, Assistant District Attorney, also present) for the Commonwealth.

MILKEY, J. On the evening of December 12, 2014, the victim, Sean Dwyer, was stabbed through the heart on Adams Street in the Dorchester section of Boston. Nine months later, the defendant was indicted for murder in the first degree in

connection with the victim's death. The principal issue at trial was the identity of the perpetrator. There were no eyewitnesses to the killing, and no fingerprints or other forensic evidence that directly connected the defendant to the scene of the crime. Based on the evidence that was presented, a Superior Court jury found the defendant guilty of the lesser-included offense of voluntary manslaughter. The jury also found the defendant guilty of witness intimidation. See G. L. c. 268, § 13B.

The defendant now appeals, claiming that the Commonwealth's evidence on both offenses was insufficient. He also argues that the judge improperly admitted an out-of-court demonstration designed to illustrate that clothing shown on a nighttime surveillance video may appear lighter in color than it would appear when viewed by the naked eye. Finally, the defendant claims error in the prosecutor's closing argument. We affirm.

Background. We summarize the relevant trial evidence as follows.

1. The relationship between the defendant and victim. The victim and the defendant had known each other a long time. They grew up in South Boston and had been in the same social circles. They both had used illegal drugs at various times in their lives, and the defendant, unlike the victim, still actively used heroin.

The victim operated a barber shop at 671 Adams Street, Dorchester.¹ Two days before the stabbing, the defendant went to the victim's barber shop at closing time seeking money, and the victim gave him eighty dollars. In addition, the victim's girlfriend testified that -- also two days before the stabbing -- the victim showed her the defendant's Facebook page during a conversation in which he (the victim) appeared agitated.²

2. The afternoon of the incident. The victim was working at his barber shop on the afternoon of December 12, 2014. According to eyewitnesses, he appeared "antsy" and "anxious" at the time, even going so far as to fumble the clippers he was using to cut someone's hair. Witnesses also reported that the phone at the barber shop was ringing more frequently than usual. However, other than testimony from the victim's girlfriend that she unsuccessfully called the barber shop several times that afternoon, there was no evidence identifying any of the callers. At one point late in the day, the victim retrieved his collapsible metal baton from a former roommate who had borrowed it.

¹ That location lies in the southern reaches of Dorchester, just north of Adams Village.

² The prosecutor steered the witness away from speaking about the substance of the conversation.

Based on the evidence that the victim had armed himself with a baton and that he was agitated, the Commonwealth argued that the victim had been anxious about a potential confrontation with someone and that that person stabbed him. The Commonwealth posited that the defendant was that individual.

3. The stabbing. At approximately 6:19 P.M., passing motorists found the victim lying face down in the middle of Adams Street approximately 131 feet from the barber shop. He had suffered two stab wounds, including one through the heart, and was declared dead at the scene. As noted, there were no witnesses to the stabbing. A collapsible baton was lying next to the victim's body. There was some evidence to suggest that a confrontation between the victim and his attacker might have begun inside the barber shop,³ although no blood was found there.

The Commonwealth's theory of the case was that on the day of the stabbing, the victim expected the defendant to return to the barber shop seeking additional money, that the two men got into an argument when the victim refused to give the defendant the money, and that the defendant -- enraged -- stabbed the victim twice in the chest. No murder weapon was found, but the Commonwealth argued that the defendant used the victim's own

³ For example, the wristwatch on the victim's wrist was missing its crystal, and police found a circular piece of glass that may have been the crystal inside the barber shop.

pocket knife that he regularly kept clipped to his belt and that was not found on him when his body was discovered.⁴ Over \$1,000 in cash and two cell phones were found on the victim's person.

4. Forensic evidence. The police sought deoxyribonucleic acid (DNA) evidence from some locations, including on the baton. The parties stipulated that "[n]o trace evidence or DNA was recovered from the baton suitable for analysis." With regard to other DNA sampling done at the site, including from scrapings taken from under the victim's fingernails, the parties stipulated that the defendant "was excluded from the DNA analysis." Similarly, the parties stipulated that the defendant "was not identified to any of the latent [finger]prints recovered from the items examined."

5. Surveillance video. A video surveillance system at a home located directly next to the crime scene captured black-and-white footage of someone running down the street at 6:19 P.M. The Commonwealth's theory was that the person shown in the footage, which was displayed to the jury and introduced as an exhibit, was the defendant fleeing the scene directly after the

⁴ One witness testified that the blade of the knife was about the length of his finger, which he estimated to be about two inches long. The stab wounds were about five inches deep. There was expert testimony about how stabbing someone with force can compress the body, a phenomenon that could create a wound that is deeper than the blade of the knife used.

stabbing.⁵ However, as the Commonwealth acknowledges, the resolution of the footage would not have allowed the jury to identify the defendant through his facial features.⁶ Some information about what the person was wearing can be discerned, including that the outer jacket that he was wearing appears in the video as light-colored. This presented a potential problem for the Commonwealth's theory of the case, because one witness testified that when she saw the defendant approximately two hours later, he was wearing a dark-colored "hoodie."⁷ Thus, the video footage had some potential exculpatory value.

6. Video demonstration. Several months after the incident, a police detective went to the home of the person whose video surveillance system recorded the putative assailant running away from the scene of the stabbing, and had a fellow officer walk by the video cameras at night wearing a black shirt.⁸ As illustrated by a cell phone photograph of what the

⁵ The footage was admitted in two forms: a digital video disc containing four hours of raw footage, and a "thumb drive" containing short excerpts taken from three different cameras. We retrieved both exhibits from the trial court and have examined them.

⁶ Indeed, a viewer cannot even tell the person's race.

⁷ A second witness who observed the defendant at the same time, testified that the defendant's clothing "might have been like a dark hoodie."

⁸ The detective also had his colleague do so wearing a light gray shirt. During his voir dire, the detective testified that

detective saw on the video monitor, the black shirt appeared to be light-colored on the surveillance footage. After holding a voir dire, the judge allowed the detective to testify about what he did, and the photograph of what the detective saw on the video monitor was shown to the jury.⁹ Further detail about this testimony is reserved for later discussion.

7. Cell phone data. Brief calls were placed from the defendant's cell phone at 6:19 P.M. and 6:20 P.M. There was evidence that the defendant was trying to reach a former girlfriend, Stephanie Spacco, to secure a ride from her.¹⁰ The Commonwealth theorized that he was seeking a ride in order to leave the area directly after the stabbing. Evidence was introduced that these two calls utilized a cell tower in Quincy whose coverage area included 671 Adams Street (even though there were closer towers). Thus, the cell tower evidence indicated that the defendant was in the general vicinity of Dorchester or Quincy at the time of the stabbing, and it could not be ruled

the light gray shirt presented as bright white. During his testimony before the jury, he was not asked about how the light gray shirt presented.

⁹ The photograph was not admitted as an exhibit, but the detective testified that what the photograph showed matched what he had observed on the video monitor.

¹⁰ The defendant called Spacco later that evening, and she picked him up in South Boston. She acknowledged that he had tried to contact her earlier in the evening using his cell phone.

out that he placed the two calls from the actual scene of the crime.

8. The defendant's ride to Charlestown. Later that evening, the defendant placed another call from his cell phone to Spacco and asked her for a ride home from South Boston. She met him in South Boston around 8 P.M. and drove him to Charlestown (where he was living). At one point during the ride, Spacco noticed that the defendant's hand was wrapped in a bloody makeshift bandage and that his jaw was "swollen."¹¹ She asked him what had happened, and he told her that he had been involved in "a weed robbery gone wrong in Roxbury." He stated that the botched robbery involved a Black man, and that the situation "was bad and it might be on the news." When Spacco specifically asked him about his jaw injury, which the defendant indicated "might be broke," he stated that "[i]t could have been a baton."¹² During the trip to Charlestown, a third party informed Spacco by phone that the victim -- whom Spacco also knew -- had died, and she began crying. According to Spacco,

¹¹ When the defendant first entered Spacco's car, he went into the back seat; Spacco was in the front passenger's seat and a friend of Spacco was driving. Soon thereafter, the friend left, Spacco took over driving, and the defendant got into the front passenger's seat. It was then that Spacco noticed his injuries.

¹² When the defendant was arrested nine months later, he answered a booking question about medical conditions by relaying that he had suffered a broken cheekbone over the summer.

the defendant responded by saying that he liked the victim, who he described as "a good kid."¹³

The police eventually arrested the defendant in Danvers at the home of a friend. As he was being arrested, the defendant made various statements that the Commonwealth put forward as evidence of his consciousness of guilt. For example, the defendant told police as they were arresting him inside the apartment that they were "lucky [he] didn't go out the window," and that if he had encountered other officers while he was escaping, he "would have given someone a face mush." Other comments the defendant made directly after his arrest demonstrated that he was aware that his "name was being thrown around" with respect to the stabbing incident.

9. Mark-up of grand jury minutes. While held pretrial at the Nashua Street jail, the defendant received a copy of the grand jury minutes in which the names of some of the witnesses had been redacted. He proceeded to mark up those minutes by adding substantive comments on the witnesses' testimony and by identifying those witnesses whose identities had been withheld. He then gave the marked-up originals and letters to a jail

¹³ Another witness who knew both the victim and the defendant testified that she directly confronted the defendant about whether he had killed the victim, and that he denied it. One witness who also knew both men was called to testify about various admissions the defendant allegedly had made, but he refused to testify and was held in contempt.

caseworker and requested that she send them to a friend. Pursuant to jail policy, the mail was intercepted and opened by a Suffolk County sheriff's department investigator. As a result, excerpts from the defendant's annotations and the statements he made in cover letters to the intended recipient were introduced as evidence against him on both the murder and witness intimidation charges. With regard to the murder charge, the most important annotation that the jury saw was the defendant's comment -- in reference to a mention by one witness to the victim's pocket knife -- that "[i]t was the [k]nife."

Discussion. 1. Sufficiency of the evidence. In assessing the legal sufficiency of the evidence, we apply the familiar standards set forth in Commonwealth v. Latimore, 378 Mass. 671, 676-677 (1979). Specifically, we view the trial evidence, including all reasonable inferences that could be drawn from that evidence, in the light most favorable to the Commonwealth, and we then ask whether based on that view of the evidence, "any rational trier of fact could have found the essential elements of the crime beyond a reasonable doubt." Id. at 677, quoting Jackson v. Virginia, 443 U.S. 307, 319 (1979). "Circumstantial evidence may be sufficient to prove guilt beyond a reasonable doubt . . . and the inferences drawn from such evidence 'need not be necessary and inescapable, only reasonable and possible.'" Commonwealth v. Braune, 481 Mass. 304, 306-307

(2019), quoting Commonwealth v. Goddard, 476 Mass. 443, 449 (2017). "To the extent that conflicting inferences are possible from the evidence, 'it is for the jury to determine where the truth lies.'" Commonwealth v. Wilborne, 382 Mass. 241, 245 (1981), quoting Commonwealth v. Amazeen, 375 Mass. 73, 81 (1978). Applying these standards, we discuss each of the defendant's convictions in turn.

a. Manslaughter. The defendant argues that, as a matter of law, the evidence was insufficient to prove voluntary manslaughter beyond a reasonable doubt. He challenges only the sufficiency of the Commonwealth's proof that he was the one who stabbed the victim; he makes no argument that the elements of voluntary manslaughter otherwise were unsatisfied.

We conclude that the Commonwealth's proof as to identity, while far from overwhelming, was sufficient for the jury to find the defendant guilty. The defendant struggled with heroin use and, just two days earlier, had gone to the victim for money. Although there was no evidence that the two men had had an altercation in the past, the jury could have found that the nature of their relationship rendered it fraught with the potential for conflict.¹⁴

¹⁴ In contrast, there was evidence that the victim had altercations with two other individuals at or near the barber shop in the months before the stabbing. One was Ryan Adams, the victim's former business partner, who during his trial testimony

Spacco observed the defendant's fresh injuries less than two hours after the stabbing, and the defendant told her that the injuries had been caused by an altercation so serious that it could make the news. The defendant also told Spacco that during the altercation, he may have been hit in the jaw with a baton, and the victim had retrieved his baton shortly before the incident and was found with a baton lying next to his body. Perhaps most damning is the defendant's annotation on the grand jury minutes indicating that the victim's pocket knife "was the [k]nife." The jury readily could have inferred from that statement that the defendant meant that the victim's knife was the knife used in the stabbing, something the defendant would have had personal knowledge of only if he had been present during the stabbing.¹⁵ While the cell phone tower data could not

denied killing the victim. The other was Abdul Kabba, a Western Massachusetts resident who was the father of the victim's girlfriend's child. A police witness provided testimony that the jury could have interpreted as saying that they had investigated Kabba and had determined he was not in the area at the time of the stabbing. The Commonwealth had no burden to prove that Adams and Kabba did not kill the victim, and the evidence of potential third-party culprits therefore does not negate the sufficiency of the Commonwealth's proof. Cf. Commonwealth v. Hoose, 467 Mass. 395, 411-412 (2014) (no error in judge's refusal to instruct jury that they could not find defendant guilty unless Commonwealth proved that potential third-party culprits could not have committed murder).

¹⁵ Although the defendant asserts that his reference to the victim's pocket knife as being "the" knife is subject to other interpretations, he has not suggested what they would be, even when pressed on the issue at oral argument.

be used to pinpoint the defendant's location at the relevant times, that data nevertheless provided the jury increased confidence in the defendant's guilt. See Commonwealth v. Javier, 481 Mass. 268, 285-287 (2019) (discussing bounds of trial judge discretion to admit cell tower data).¹⁶ In the end, this is a case where none of the individual pieces of evidence was particularly strong, but -- taken together -- they reinforced each other so as to provide a basis for a rational juror to find the defendant guilty beyond a reasonable doubt. "As Justice Holmes observed long ago, '[e]vidence which would be colorless if it stood alone may get a new complexion from other facts which are proved, and in turn may corroborate the conclusion which would be drawn from the other facts.'" Commonwealth v. Norman, 87 Mass. App. Ct. 344, 347 (2015), quoting Commonwealth v. Mulrey, 170 Mass. 103, 110 (1898).

b. Witness intimidation. The defendant also challenges the sufficiency of the evidence that supported the conviction for witness intimidation. That evidence consisted of the defendant's sending a copy of the grand jury minutes with his notations to an identified third party with instructions that it be passed along to his "best friend." As noted, the identity of

¹⁶ The witness through whom the cell phone data was presented was rigorously cross-examined. We are confident that the jury were not given a false impression of what they could and could not draw from the data.

some of the grand jury witnesses had been redacted, and the defendant annotated the minutes so as to identify those witnesses. He also added annotations that characterized a witness as a "rat," and some of the testimony as "NG" (which the jury could have taken to refer to "not good"). The annotations also corrected testimony that the defendant maintained was false. Finally, the cover letter to the transcript included what could be taken as a threat of physical violence against those who were speaking out against him: "If anyone is talking shit out there, tell them to pick up a bull shit case and come to [the Nashua Street jail] because I am waiting. Ha. Ha."

We agree with the defendant insofar as he argues that the evidence of witness intimidation was not overwhelming. We further agree that any statements by the defendant that witnesses were not telling the truth does not by itself prove witness intimidation. After all, a defendant's "utterances asserting his innocence" might actually constitute "consciousness of innocence" (quotation and citation omitted). United States v. Scheffer, 523 U.S. 303, 332 & n.18 (1998). Nevertheless, we conclude that the Commonwealth's evidence, viewed in its entirety, was sufficient to support the conviction. Based on the defendant's revealing the identity of grand jury witnesses to a nonlawyer third party, his pointing to some of the grand jury testimony as particularly damaging, his

characterizing a witness as a "rat," and his threatening physical violence against those who were speaking out against him, a rational juror could have found, beyond a reasonable doubt, that the defendant had taken steps to intimidate witnesses against him with threats of physical violence in a knowing attempt to influence their testimony. Nothing more was required. See Commonwealth v. Nordstrom, 100 Mass. App. Ct. 493, 499-500 & n.8 (2021), citing Commonwealth v. Fragata, 480 Mass. 121, 126-127 (2018) (summarizing elements of witness intimidation applicable during relevant time period).¹⁷ To be sure, jail officials prevented the defendant's annotated grand jury minutes from reaching their intended targets. However, the Commonwealth need not prove that the defendant's efforts to intimidate witnesses succeeded, only that he had put such efforts in motion. See Commonwealth v. Rivera, 76 Mass. App. Ct. 530, 535 (2010).

2. Admission of the demonstration. As noted, video surveillance cameras at a private residence captured the apparent perpetrator fleeing the scene, and the jury heard testimony that six months after the incident, a detective had a colleague walk by that residence at night wearing a black shirt

¹⁷ We apply the version of the statute applicable at the time of the offense in December 2014. See G. L. c. 268, § 13B (1), as amended through St. 2010, c. 256, § 120.

to see how that shirt would appear on surveillance footage. As the detective explained during his voir dire, the purpose of this undertaking was "[t]o test the camera system in relation to colorization and the infrared cameras at night and what the system captured."¹⁸ He acknowledged that he had no expertise in videography, or experience conducting similar exercises. The defendant objected to the admission of the testimony on the ground that such testimony required an expert witness. He additionally argued that the Commonwealth had not shown that the conditions under which the demonstration was conducted were sufficiently similar to those in place when the surveillance video was recorded to make the detective's testimony of value to the jury.

The judge initially stated that he was "really skeptical" about the admissibility of the evidence and that he was "troubled by some aspects of this." He pointed out that the exercise that the detective performed raised a number of questions, such as how similar the color and fabric of the black shirt that was used during the exercise was to those of the dark hoodie the defendant reportedly was wearing that night.

¹⁸ This testimony established that the system being tested utilized infrared cameras. While this point came out during the detective's voir dire and not during his subsequent testimony to the jury, it was the voir dire testimony that served as the basis on which the judge decided to admit the evidence regarding the demonstration.

However, the judge deferred ruling on the issue, and on the following day, he explained that he had had a change of heart. He concluded that the Commonwealth should be allowed to introduce the detective's testimony about the observations that he had made during his exercise in order to illustrate "the limitations of the technology." He explained his view that the jurors "shouldn't assume that because [something recorded in such a video] appears light, it was light" and "the Commonwealth is entitled to disabuse the jury of that assumption." The judge emphasized that the Commonwealth would not be allowed to try to use the detective's testimony as affirmative proof of how dark the outer garment worn by the person seen fleeing the scene otherwise would appear.

When the detective took the stand, the judge instructed the jury at length about the limited use they could make of the upcoming testimony. He characterized what the jury was about to hear as "a demonstration that may help you understand some of the features of the issues that we're talking about." The judge told the jury that the demonstration was not "proof of anything" and that they should decide the case based on "actual evidence." In addition, he directed the jury to "keep in mind that when the Commonwealth shows you what they're about to show you, we're not going to be able to duplicate the conditions that were present on the night in question for a number of reasons." As examples,

the judge pointed out that the individual shown leaving the scene was not wearing the shirt used in the exercise, and that "[t]here is no evidence that the equipment itself was in fact the same or that it was in the same setting."¹⁹

Following these instructions, the detective testified as anticipated. Later that day, the judge sua sponte again raised the issue whether the conditions under which the exercise was conducted were similar to those that were present when the surveillance recording was made. Perhaps concerned that he earlier had overemphasized the dissimilarities, the judge -- this time outside the jury's presence -- made a statement about the degree of similarities "[j]ust for the record." Specifically, the judge noted that the following similarities were present: "the darkness, the time of night -- not the time, but the degree of light, given that it was nighttime -- the angle of the camera and the substantial similarity of the equipment, even though the detective couldn't say it was exactly the same equipment, it did appear to be similar." He then concluded by stating that in his view, "the conditions were

¹⁹ In fact, in his voir dire testimony, the detective testified without objection that the homeowner had confirmed to him that the surveillance system used for the demonstration "was the same system from" the night of the stabbing incident. Again, the judge determined the admissibility of the demonstration evidence based on the voir dire testimony.

sufficiently similar to make the demonstration of value to the jury."

The issue whether video surveillance systems employing infrared technology accurately record how an object would appear to the naked eye has arisen in various criminal prosecutions around the country. Given the technical nature of the subject matter, such cases typically involve the use of expert witnesses to explain to jurors how infrared cameras work, and what they do and do not show. See, e.g., Commonwealth v. Williams, 255 A.3d 565, 574-576 (Pa. Super. Ct. 2021) (upholding use of expert who explained how clothing can appear different using regular and infrared-influenced cameras). What makes the current case different -- and more challenging -- is that the Commonwealth did not use an expert to inform the jury about how an object seen using a night-vision camera might look different than how that object would appear to the naked eye. Instead, the Commonwealth sought to communicate that concept by introducing the results of a simple demonstration conducted by a lay person.²⁰ The question is whether the judge abused his

²⁰ We are aware of one reported case in which such testimony was provided by a lay witness, and the defendant on appeal argued that an expert witness was necessary. See State vs. Myles, Tenn. Crim. App. No. E2016-01478-CCA-R3-CD (July 11, 2017). However, that case is not helpful to us, because the defendant there failed to preserve the issue and the case was resolved on grounds of waiver.

discretion in allowing the jury to hear such testimony. See Commonwealth v. Rintala, 488 Mass. 421, 425 (2021) (whether judge properly admitted expert's testimony regarding experiment he had conducted subject to abuse of discretion standard). See also Commonwealth v. Makarewicz, 333 Mass. 575, 592-93 (1956) (applying abuse of discretion standard to ruling that lay witness could testify to experiment he conducted).

The Commonwealth introduced the detective's testimony about the actions he had conducted for a limited purpose. It was not seeking to persuade the jury that the outer garment worn by the person fleeing the scene in fact was any particular color or shade of darkness. To the contrary, the Commonwealth was attempting to undermine any conclusions about the clothing's color that could be drawn from how it appeared in the original surveillance footage. The judge allowed the testimony for this purpose and, as noted, repeatedly cautioned the jury about what inferences could be drawn from such testimony, even going so far as to suggest it was not "actual evidence" or "proof of anything."²¹

²¹ We respectfully disagree with such characterizations. The relevant testimony was not in the nature of a "chalk" that simply collected admitted evidence and displayed it to the jury in a useful way. Nor was it in the nature of a "view," which the cases insist is not evidence -- at least in the "strict and narrow sense" -- even though jurors are told they may rely on it. See Commonwealth v. Gomes, 459 Mass. 194, 199 (2011), quoting Commonwealth v. Curry, 368 Mass. 195, 198 (1975).

The detective did not testify about generalized scientific principles, nor did he offer any opinion testimony (expert or lay). Rather, the detective merely recounted actions that he personally took and observations that he personally made using ordinary perception (e.g., what color his colleague's shirt was). The detective's observations did not rely on any technical expertise or scientific understanding, and he made no claim that he had any. Accordingly, there was no danger that the jury would be unduly swayed by the detective's purported expertise.

It does not follow that the testimony about the demonstration necessarily was proper. We still must examine whether the judge properly executed his gatekeeping role. In assessing whether an experiment or other demonstration should be admitted as evidence, the key question is whether "it 'sufficiently resembles the actual event so as to be fair and informative.'" Commonwealth v. Perryman, 55 Mass. App. Ct. 187, 193-194 (2002), quoting Terrio v. McDonough, 16 Mass. App. Ct. 163, 173 (1983). See Commonwealth v. Javier, 481 Mass. 268, 287

Rather, the Commonwealth was seeking to have the jury rely on the detective's testimony as proof of the limitations of what they could draw from the surveillance footage. If the testimony about the exercise was not evidence, it should not have been admitted. However, any misstatement about the relevant testimony not constituting "evidence" or "proof" inured to the defendant's benefit.

(2019). In other words, would the admission of the evidence further the jury's truth-seeking role, or serve instead to "confuse or mislead" them? Id., quoting *Commonwealth v. Chukwuezi*, 475 Mass. 597, 603 (2016).

In our view, whether the evidence about the demonstration supplied the jury with aid or confusion is a close and difficult question. Because that evidence was unaccompanied by any explanation for why a dark-colored object could appear light-colored, it would not be surprising if the jury were left with lingering questions regarding what lessons properly could be drawn from the evidence. In the first instance, however, "[w]hether the conditions were sufficiently similar to make the observation [offered by the demonstration] of any value in aiding the jury to pass upon the issue submitted to them [is] primarily for the trial judge to determine as matter of discretion" (emphasis omitted). Perryman, 55 Mass. App. Ct. at 194, quoting Commonwealth v. Chipman, 418 Mass. 262, 270-271 (1994). We are to reverse that exercise of discretion only where it is "plainly wrong." Perryman, supra, quoting Chipman, supra at 271. Moreover, the case law reflects the considerable degree of discretion afforded to trial judges in deciding whether to admit demonstrations. For example, in Commonwealth v. Corliss, 470 Mass. 443, 456 (2015), the Supreme Judicial Court upheld the decision by a trial judge to exclude expert

testimony proffered by the defendant (which involved superimposing a height chart onto video footage), while pointedly adding that the judge would not have abused her discretion had she allowed such evidence.

Here, the evidence regarding the demonstration was admitted for a very limited purpose, and the jury were expressly cautioned not to make too much of it. Boiled down to its evidentiary essence, the demonstration at most served to establish nothing more than that it was possible that a black article of clothing could appear light-colored when viewed at night using the type of surveillance system at issue. In light of the judge's understandable concern that without the jury hearing such testimony, they might well have applied a skewed view of the strength of the exculpatory value of the surveillance video, we conclude that the judge did not abuse his discretion in admitting it.

In reaching this conclusion, we are cognizant of a recent case in which the Supreme Judicial Court reversed a murder conviction based on the improper admission of evidence of experiments that had been conducted. See Rintala, 488 Mass. at 437-445. The case before us bears little resemblance to Rintala. There, the court concluded that a trial judge abused her discretion in allowing a purported expert witness to testify to his opinions that wet paint found at the murder scene had

been poured, not spilled, and that this had been done shortly before the police were called to the scene. See id. In that case, the expert based his opinion about timing on a series of detailed experiments he had conducted with respect to how the appearance of paint changed as it dried. See id. at 436-437. The court held that the judge erred in allowing such testimony in part because the specific "experiments here were not based on sufficiently reliable methods." Id. at 437. In this manner, the Commonwealth's expert was allowed to present powerful detailed evidence central to the Commonwealth's case that ultimately rested on unfounded conclusions.²² See id. at 442-

²² In explaining the centrality of the expert's testimony, the court noted that the witness

"testified that the paint was intentionally poured by someone approximately thirty minutes before the first responders arrived. Considering the testimony from the various medical examiners that the victim had likely died earlier in the day, the testimony that someone had intentionally poured the paint just before first responders arrived was very strong evidence of the defendant's guilt. Indeed, the Commonwealth heavily emphasized the significance of [the expert's] testimony in its closing argument, arguing that 'there can be no question that paint was intentionally poured, deliberately poured on the body' and that 'there's no way that if that body had been killed at the same time the paint had been poured, that paint would be fresh and wet and liquidy when first responders got there.' The Commonwealth then tied this testimony to the defendant's efforts to cover up the murder, arguing that 'nobody but the defendant would have a reason to pour that paint.' Indeed, if the jury credited [the expert's] testimony about the timing of the intentional pouring of the paint, the evidence showed that the defendant was

445. In addition, the court emphasized that a higher degree of judicial scrutiny was appropriate where the subject matter fell in a "novel or developing area of science." Id. at 438, quoting Commonwealth v. Weaver, 474 Mass. 787, 811 (2016), *aff'd*, 137 S. Ct. 1899 (2017).

Unlike Rintala, this case does not involve a challenge to the reliability of experimental methods that a purported expert witness had employed in order to draw particular conclusions. In fact, the detective offered no opinion whatsoever and disclaimed any expertise. Moreover, the methods he used were as basic as they come, and they were used merely to illustrate the possibility that surveillance cameras used at night might depict the colors of objects differently than they would appear to the naked eye. To be sure, the detective's lack of expertise and the facile nature of his demonstration provided fodder for cross-examination, and defense counsel did not miss the opportunity to take advantage of such opportunities.

In addition, we note that this is not an area that involves a "novel and developing area of science." To the contrary, the scientific principles that underlay the demonstration are

likely the only person who could have poured the paint on the victim."

Rintala, 488 Mass. at 444-445.

indisputable.²³ In fact, in light of the ubiquity of such technology, the phenomenon that surveillance systems may not show an object's true colors may well have lain within the common knowledge possessed by the jury, even if individual jurors may not have been able to articulate what explained that phenomenon. Cf. Commonwealth v. Junta, 62 Mass. App. Ct. 120, 127-128 (2004) (no medical testimony needed to support argument to jury "that bruises are not immediately visible but may take a day or two to appear").

Our dissenting colleague labels the exercise that the detective conducted an "experiment." Then, based on Rintala, he reasons that no testimony about the results of such an experiment could be admitted without both an expert and a full Daubert-Lanigan²⁴ hearing establishing the reliability of the

²³ Humans see objects by processing the visible light that the objects reflect to our eyes, with the particular colors that we perceive determined by the wavelengths of that reflected light. See E.B. Goldstein, *Sensation and Perception*, at 56 (8th ed. 2010). The wavelengths of infrared light indisputably lie outside the range of visible light. See K.L. Lerner & B.W. Lerner, *World of Forensic Science, Night Vision Devices*, at 485-486 (2006). It follows that cameras that rely on infrared light do not record how the objects shown appear to the naked eye; they instead -- by definition -- record how well such objects reflect frequencies of light that we cannot see. It therefore is unsurprising that there may be no correlation between how an object appears when viewed in visible light and how that object is depicted when shades of gray (or artificially assigned colors) are used to depict the object's ability to reflect infrared light. See id.

experimental design. We acknowledge that it is not wholly inaccurate to call what the detective did here an "experiment."²⁵ Nevertheless, in the form that it was presented to the jury, the testimony that the jury heard is more accurately described as a demonstration, specifically, a demonstration that dark objects might appear lighter when captured by a surveillance system of the type used here. Moreover, even to the extent that the exercise that the detective performed accurately could be labeled an experiment, we do not interpret Rintala as establishing that the full panoply of Daubert-Lanigan procedural requirements therefore automatically applies, at least where, as here, the underlying scientific principles are well-established and, in any event, the issue was what factually was possible, not the scientific explanation for the phenomenon. And this puts aside the fact that while the defendant asserted that an expert was required to make the points that the Commonwealth was seeking to make, defense counsel never once -- during the lengthy sidebar debates over two days of trial with respect to the admissibility of the evidence -- raised an argument that a Daubert-Lanigan hearing was required to establish the

²⁴ See Daubert v. Merrell Dow Pharms., Inc., 509 U.S. 579, 585-595 (1993); Commonwealth v. Lanigan, 419 Mass. 15, 25-26 (1994).

²⁵ The detective himself at one point referred to what he did as an "experiment."

reliability of any scientific methods used here. Even on appeal, the defendant cites Daubert only in passing and makes no argument that a Daubert-Lanigan hearing was required. The failure to request such a hearing "constitutes waiver of the issue." Esteraz, petitioner, 90 Mass. App. Ct. 330, 335 (2016), citing Commonwealth v. Cole, 473 Mass. 317, 328 (2015); Commonwealth v. Fritz, 472 Mass. 341, 349 (2015). More substantively, the defendant's failure to press the Daubert-Lanigan issue is not a sign of his counsel's ineffectiveness; it signifies instead that the underlying scientific principles are not in doubt. See note 23, supra.²⁶

²⁶ The distinctions we are drawing can be illustrated by analogy. Consider a case, like the one before us, in which a photograph or video captured an indistinct image of the apparent perpetrator of a crime, but where the issue was not how dark the perpetrator's clothing was, but his height. One side or the other might try to demonstrate that the defendant definitively could be ruled in, or out, based on how his height compared to the perpetrator's height, as derived from the captured image. See Commonwealth v. Caruso, 85 Mass. App. Ct. 24, 28-29 (2014) (involving just such scenario). In making such an argument, a party might seek to establish the perpetrator's height using the process known as photogrammetry or related techniques employing computer-aided design. See id. at 31 & n.9. Such proof presumably would require the use of an expert, and -- if the reliability of such methods were challenged and had not been sufficiently established -- proof of their reliability pursuant to a Daubert-Lanigan hearing. This does not mean, however, that any testimony that touched on how tall the perpetrator appeared in such a photograph would require such trappings. Say, for example, that instead of trying to supply formal photogrammetric proof that the perpetrator was of a particular height, the party simply wanted to make the point that it might be wrong to assume that two people who appear in a photograph to have the same height in fact were the same height, because people appear

We add a word of caution. While we uphold the use of the demonstration here, we emphasize that we do so only because of the confluence of circumstances presented. We therefore caution future litigants against seeking to rely on lay demonstrations in place of duly qualified expert testimony.

Because we conclude that the judge did not err in allowing the testimony about the demonstration, we need not decide whether had this been error, it would have sufficiently undercut the potential exculpatory value of the video as to require reversal. However, we do note that, at a minimum, any exculpatory value that the video otherwise provided is far less than our dissenting colleague maintains. There were approximately two hours between the stabbing and when Spacco testified that she saw the defendant wearing a dark hoodie. It is self-evident that upper-body garments quickly can be shed (or, for that matter, covered up by an additional garment). In addition, the nature of the particular crime here -- fatally

smaller if they are further away from the camera. A party might seek to illustrate that point by a simple demonstration that photographed two people of the same height standing at different distances from the camera. Depending on the judge's assessment of whether it would aid the jury, such a demonstration might or might not be ruled admissible. However, such a demonstration would not likely require an expert or a Daubert-Lanigan hearing given the limited purpose for which it was being offered and the indisputable nature of the underlying science or math. The fact that such a demonstration could be described as an "experiment" does not change the analysis.

stabbing someone in the chest -- may have provided the perpetrator special reasons to want to discard whatever outer garment he was wearing as soon as possible.²⁷ Even if the video had definitively established that the defendant was wearing a different outer garment than the one the perpetrator had been wearing two hours earlier, this would have provided little, if any, exculpatory value.

3. Closing argument. "In closing argument, '[p]rosecutors are entitled to marshal the evidence and suggest inferences that the jury may draw from it.'" Commonwealth v. Holbrook, 482 Mass. 596, 604 (2019), quoting Commonwealth v. Roy, 464 Mass. 818, 829 (2013). Against that backdrop, the defendant argues that the prosecutor's closing argument was problematic in various respects. For example, he maintains that there was no evidence to support the prosecutor's statement that he was unemployed at the time of the stabbing incident. That particular contention fails because the statement that the defendant had no job was an inference that reasonably could be drawn from the admitted evidence.²⁸ In addition, we fail to see

²⁷ We also note that Spacco described the defendant as having a bloody makeshift bandage on his hand. Neither side explored with her what that bandage was.

²⁸ There was direct testimony that the defendant was unemployed shortly after the incident. In addition, there was testimony that at the time of the incident he actively was using

how the defendant's employment status had any significant bearing on his guilt or innocence, especially where there was evidence of the defendant's soliciting eighty dollars from the victim two days before the stabbing. Accordingly, the defendant has not shown how the prosecutor's comment that he was unemployed, even if unsupported by the evidence, would work such prejudice to warrant reversal.²⁹ This is especially true where, as here, the judge instructed the jury that they had to decide the case based on the evidence, that closing arguments are not evidence, and that their recollection of the evidence was what mattered. See Commonwealth v. Copeland, 481 Mass. 255, 264 (2019) (Commonwealth's error in closing argument did not prejudice defendant where judge instructed jury that closing arguments are not evidence).

The defendant's other claims of error regarding the closing argument generally fail for similar reasons.³⁰ Two such claims

heroin, and that he had accepted eighty dollars from the victim two days earlier.

²⁹ The defendant objected to the statement about his employment status, but only based on the specific argument that the comment was on an improper subject matter, not that it was unsupported by the evidence. Our review of this claimed error therefore is limited to whether the comment caused a substantial risk of a miscarriage of justice. See Commonwealth v. Hobbs, 482 Mass. 538, 554-555 (2019).

³⁰ For example, the prosecutor's suggestion that one witness arrived at the barber shop on the night of the incident in response to the victim's urgent request that he come there was a

warrant further discussion. The first involves overhead slides that the prosecutor displayed to the jury during her closing. The slides included written versions of statements that the defendant allegedly orally had made to various witnesses. For example, one slide stated, "I would have given someone a face mush," a reference back to what the defendant reportedly had told one of the officers who arrested him. The defendant argues that in making the slide, the prosecutor effectively created a document that was not in evidence and that by then interspersing such documents with some items in evidence and reading the quoted statements verbatim, she "convey[ed] an erroneous impression that the statements were exactly what was said." We find this argument wholly unpersuasive in the circumstances of this case. While it would have been better practice for the prosecutor to explain to the jury what the slides were, we do not think the jury would have viewed the putative quotes as having been taken from some admitted exhibit. In addition, the statements implicitly attributed to the defendant were close paraphrases of the actual testimony, and the defendant has not shown that any minor differences could have caused any

reasonable inference from the evidence. While the prosecutor's statement that "[t]hat request had never been made by [the victim] before" does not appear to be supported by the evidence, that statement is of no appreciable significance.

prejudice. Finally, the points to which the quotes related had only tangential relevance to the case.³¹

The defendant's remaining claim has to do with the Commonwealth's theory that the defendant came to see the victim on the evening of the stabbing seeking more money and then became enraged after the victim refused his requests. During her closing argument, the prosecutor underscored this theme three separate times, each time stating that the evidence supported the conclusion that in response to the defendant's seeking more money, the victim "said no," and the defendant became enraged. In this manner, the prosecutor came close to suggesting -- inaccurately -- that there had been direct evidence that the defendant and victim had had a specific conversation or interaction. Put differently, by asking the jury to draw inferences at that degree of particularity, the prosecutor arguably was calling on the jury to speculate.

As the Commonwealth highlights, the case law expressly recognizes that closing arguments may suggest an "imaginary dialogue" for dramatic effect, so long as the suggestions "remain 'grounded in the evidence.'" Commonwealth v. Rakes, 478 Mass. 22, 46 (2017), quoting Commonwealth v. Pope, 406 Mass.

³¹ For example, the "face mush" quote went, at most, to the defendant's consciousness of guilt, and it was hardly potent evidence of that.

581, 587 (1990). Although the prosecutor's repeatedly stating that the victim "said no" gives us some pause, we do not view it as crossing the boundaries of propriety drawn by the cases. Viewing the prosecutor's statements in context and in light of the evidence as a whole, we think the jury would have understood the prosecutor merely as asking them to draw a reasonable inference that the defendant had returned to the barber shop seeking additional money from the victim, that the victim had refused, and that the defendant therefore may have become angry. We do not believe that the jury would have taken the prosecutor's statements as suggesting that there had been direct evidence that the defendant and victim had been conversing, or that any such specific conversation had been overheard.³²

Conclusion. We affirm the judgments of conviction.

So ordered.

³² It bears noting that although defense counsel did object to the prosecutor's use of the conceit of an imaginary conversation, he did not suggest any particular remedy to address this issue.

RUBIN, J. (dissenting). The reason the Supreme Judicial Court reminded us just eight months ago in Commonwealth v. Rintala, 488 Mass. 421, 437-442 (2021), that evidence of experiments cannot be introduced at trial unless the experimental methods comply with the requirements set out in Daubert v. Merrell Dow Pharms., Inc. 509 U.S. 579, 585-595 (1993), and Commonwealth v. Lanigan, 419 Mass. 15, 25-26 (1994), was to prevent the denial to criminal defendants of a fair trial through introduction of evidence the meaning of which is not and cannot be known. Because the judge improperly allowed the admission in this case of evidence of an unscientific experiment that did not meet those requirements, the defendant in this case was denied a fair trial in exactly that way.

A surveillance video of the perpetrator in this case was powerful exculpatory evidence. It showed the perpetrator wearing a light-colored "hoodie." The Commonwealth's most important witness testified that the defendant was wearing a dark-colored hoodie that night; a second witness who saw him that night also thought he was wearing a dark hoodie.

The judge allowed the introduction of the results of what the officer who undertook it described as a "controlled experiment," although it was actually a very rudimentary one -- the majority in an attempt to avoid settled law describes it as a "facile . . . demonstration," ante at , but the

characterization changes nothing. The results of the experiment were offered by the Commonwealth to undermine that exculpatory evidence, showing a photo taken with a cell phone of a screen of a monitor on a security system in which a black T-shirt worn by a police officer appears light grey. This experiment suggested to the jury that the perpetrator could in fact have been wearing a dark-colored top despite how his clothing appeared in the surveillance video.

The officer's rudimentary experiment appears to have been excellent police work. It warranted careful follow-up to determine whether it could lead to admissible evidence that might validly undermine the apparently exculpatory surveillance video. The Commonwealth, however, never bothered to do any. Instead, it sought to admit evidence of the rudimentary experiment itself.

This evidence was inadmissible under Daubert and Lanigan. It is not known whether the video system was the same or different than the one used on the night of the crime, or how. It is not known whether the lighting or atmospheric conditions were the same or different, or how. It is not known whether the change in appearance might be an artifact of the monitor being used, which was not used for viewing the surveillance video. It is not known whether the fabric of the T-shirt used in the experiment was the same or different than that of the

defendant's hoodie, or how, or whether or how that might have played a role in the change of appearance. Perhaps most important, it is not known why, despite it being a single image, some dark fabrics shown in the photo appeared to be light, while others appeared to be dark. Indeed, it is not known what about any particular factor necessary to the image -- camera, monitor, other electronic equipment, lighting, fabric, weather, or other ones that are less obvious -- might even be relevant to producing such a change in appearance, so that neither the judge nor the jury had any way of determining whether the experiment was or was not relevant to the surveillance video, or the murder case, before the court.

Indeed, presumably for this reason, the judge while admitting the evidence, actually told the jury what all three members of this panel agree was wrong, that the experiment was not "actual evidence" or "proof of anything." The photo, though, was taken at the very location of the crime, creating an impression that it was an image from the very system that produced the surveillance video.

From what was admitted, it cannot be known whether the change-in-appearance phenomenon apparently shown in the cell phone photo played any role in the images shown on the facially exculpatory surveillance video. But the introduction of the photo reduced the exculpatory value of the surveillance video

literally to zero. It told the jury the surveillance video might be depicting a dark hoodie or a light hoodie -- indeed, that is why the majority says the judge was allowed to let it in -- but with no guidance as to how to determine which. Because they were provided with no expert testimony to explain the evidence, and because the method used to produce it did not utilize the reliable methods reliably applied that our law requires, there was nothing from which the jury could determine the likelihood that the surveillance video created a misimpression about the color of the perpetrator's hoodie, nor was there anything from which they could determine what facts and circumstances might have been relevant to whether the video surveillance images could be trusted.

The only rational response to such evidence, even though it does not warrant it, is to discount the light coloration shown on the surveillance video, that is, its exculpatory character, entirely. The jury were given something that may have had little or no likelihood of bearing relevance to the apparently exculpatory video surveillance before them. But, informed bluntly by the wrongly admitted evidence that the video might show someone in a light hoodie or someone in a dark hoodie, any rational juror would have concluded that the security video was of no value at all.

The characterization of the undertaking here, as an experiment, an "exercise," ante at , or a "demonstration," ante at , of course does not alter what all agree was actually undertaken -- something the officer who undertook it referred to as an "experiment" because that is what it was -- nor does it render the principles articulated by the Supreme Judicial Court inapplicable. There is no category of "demonstration" evidence that is not subject to the rules that ensure the admission only of evidence generated by reliable methods reliably applied. Indeed, the Supreme Judicial Court has used the terms experiment and demonstration interchangeably. See, e.g., Crivello v. All-Pak Mach. Sys., Inc., 446 Mass. 729, 736 (2006). The evidence admitted here of the officer's "facile" experiment, whatever its actual value, did exactly what the requirements of Daubert and Lanigan, with which it failed to comply, are designed to prevent. It deprived the defendant of a fair trial. With respect, I therefore dissent.

Background. 1. The exculpatory security camera video. As the majority describes, at the trial for murder in the first degree committed outside the victim's barber shop in the Dorchester area of Boston, the defendant faced a weak case. There was no evidence linking the defendant to the crime scene, neither eyewitnesses who identified him, nor, despite a substantial police investigation, any forensic evidence placing

him at the scene, including an absence of his DNA from scrapings taken from underneath the fingernails of the victim. The Commonwealth did introduce evidence that the defendant made two calls on his cell phone around the time of the murder and that the signals from those calls were picked up by a cell phone tower in Quincy. But the most this tells us is that if he had his phone, he, like tens or maybe hundreds of thousands of other people, was in Dorchester or Quincy.

There was also no evidence of any motive for the crime. The victim had known the defendant since childhood, and the prosecutor urged the jury to speculate that the defendant, a heroin addict, had come to borrow money from the victim, had been refused, had become enraged, and had attacked and killed the victim. But there was no evidence of any of that. It really was just speculation. Two days prior to the murder, the defendant had, indeed, borrowed eighty dollars from the victim at his barber shop located on Adams Street. But there was no indication that this was part of any ongoing pattern of the defendant seeking money from the victim, or that he had returned two days later seeking more. And as described there was no circumstantial evidence placing the defendant at the scene of the crime.

The defendant's conviction rests almost entirely on the testimony of Stephanie Spacco, a friend who picked him up in

South Boston two hours after the stabbing in Dorchester. The defendant was bleeding and his face was swollen, apparently due to being hit in the jaw. He said that he had been involved in a marijuana robbery gone wrong in Roxbury, a different neighborhood of Boston, that it "was bad," and that she might hear about it on the news.

Certainly this might be taken as evidence of his involvement in a serious crime, indeed even murder. She also testified that he said that the weapon with which he had been hit in the face might have been a baton, and it appeared that the victim in this case attempted to defend himself with a baton that was found on the ground near the location where he had been stabbed. This, too, is evidence, although not the strongest, that the defendant might have been involved in the crime.

Beyond that, the Commonwealth's case rested on some notations made by the defendant on grand jury minutes, none of which are particularly illuminating. Most of the notations appear to correct what the defendant apparently thought were errors in the grand jury testimony. For example, he wrote on the minutes from the testimony of Randy Crehan, a patron of the victim's barber shop who had observed the defendant enter the barbershop and borrow money from the victim two days prior to the stabbing, that he had borrowed eighty dollars from the victim, not twenty dollars. At another point, Crehan testified

that the defendant came into the victim's barber shop and asked to use the bathroom, and the defendant wrote a note on the minutes indicating that he asked for a haircut as well. On the minutes from Spacco's testimony, the defendant contradicted the assertion that they had dated "for about a year or so," writing that it was "only a few months" and indicated that Spacco had picked him up that night at a CVS store, not The Family Dollar store. The only arguably inculpatory notation in the grand jury minutes is found where Crehan testified that the victim carried a pocket knife and the defendant underlined "pocket knife" and wrote above it, "It was the nife [sic]," but this is ambiguous. Although I agree with the majority that the evidence taken together was sufficient to support the defendant's conviction for manslaughter, that notation alone certainly would not provide proof beyond a reasonable doubt that he committed the offense.

On the other side of the scale was some powerfully exculpatory evidence: A surveillance video taken on the night of the stabbing by a security camera that was part of a nearby homeowner's security system. Introduced in evidence by the Commonwealth, it showed that the perpetrator of the crime in this case, who was not identifiable from the video, was wearing a light-colored hoodie. Spacco, who saw the defendant that night, testified that he was wearing a dark hoodie. Another

witness, Peter Romikitis, a friend of Spacco who accompanied her when she picked the defendant up the night of the stabbing, also testified that the defendant might have been wearing "a dark hoodie."

While one cannot be sure, in the absence of anything to undermine that video, there is a substantial chance that because of it the jury would have concluded that the defendant had not been proven beyond a reasonable doubt to have committed the stabbing in this case.

2. Sergeant Detective Daley's experiment. The Commonwealth, as may have been necessary for conviction, sought to undermine the reliability of the video by showing that the video images were unreliable, and that, although the perpetrator appeared in the video to be wearing a light hoodie, it actually was or might have been a black hoodie. Clever police work on the part of Sergeant Detective Richard Daley, an unscientific test in which a video monitor had produced a light-colored image of a dark shirt, apparently led the prosecutor to conclude that the video system that recorded the perpetrator might have inaccurately depicted the shade of his shirt. But, rather than following up by using methods consistent with Daubert and Lanigan to determine whether that was the case, or even what might have made it the case, and to produce admissible evidence,

the prosecutor chose to attempt to introduce Sergeant Detective Daley's unscientific, rudimentary experiment.

Sergeant Detective Daley testified on voir dire that the crime occurred at 6:15 P.M. on December 12, 2014, and that he returned to the scene at 9:15 P.M. on June 24, 2015, over six months later, to perform what was called at trial a "color distortion test." Daley testified that he had no expertise in photography or surveillance systems, and that this was the first time he had performed such a test. Thus he could not explain how and why the purported distortion may occur. He testified that he did not know whether the security system had been maintained over the prior six months in any way, or if there had been any repairs or improvements to it.

He testified that on June 24, 2015, while he watched on a monitor in the homeowner's house that was not used to produce the video surveillance images of the night of the crime, he had an officer, Detective Todd Herron, walk by a camera attached to the system wearing a black T-shirt Daley had brought which, he testified, appeared light grey on the monitor in the home. He then had Detective Herron wear a light grey T-shirt Daley had also brought which, he testified, appeared bright white on the monitor.

Daley acknowledged that the officer's dark pants, however, appeared dark on the monitor in each case. Although this

implied that some dark fabric appeared dark and other dark fabric appeared light, Daley could not explain why, providing no basis for a determination when the color-change phenomenon he observed might occur.

Defense counsel objected that there was "no scientific basis for" the evidence, that the experiment was not undertaken under the same conditions as the night of the crime, that there was no information about the video system at all, that there was no evidence the video system was the same one in use in the same condition it had been on the night of the crime, and that this was the first time Daley had ever undertaken such an experiment. This preserved the defendant's claim that the Commonwealth, as the proponent of the evidence about the experiment, had not borne its burden of showing that it was "sufficiently reliable" to be admitted. Rintala, 488 Mass. at 437. Counsel also objected that an expert was required if the testimony was to be admitted.

The judge nonetheless allowed Daley to testify about this "experiment," which is how it was described in the testimony. In introduction, the judge told the jury, "First of all, quite obviously, the individual who is shown on the video at that time was not wearing the shirt that you're now seeing on the screen, so, there's a difference in the clothing. There is no evidence that the equipment itself was in fact the same or that it was in

the same setting."¹ The judge then told them vaguely, "So, that's one of the reasons this is not evidence. It's just a demonstration that may help you understand some of the features of the issues that we're talking about. . . . It's not proof of anything."

The Commonwealth did not present images it had printed from video taken at the time of the test. Rather, it introduced a single photograph of the homeowner's monitor on the night of Daley's experiment, taken by Daley with his cell phone camera. Daley testified that the image was of Detective Herron, taken while Detective Herron wore a black T-shirt. The prosecutor noted that the image of the black shirt appeared "shiny." She asked Daley, "was there any shine on the tee shirt that you had Detective Todd Herron wearing?" Daley testified that there was not.

¹ The majority relies on inadmissible hearsay from Sergeant Detective Daley during voir dire that the homeowner confirmed that it was the same system "in place back on December 12th of 2014" to imply the system may have been the same one, in the same condition, operated in the same way on the dates of the killing and the experiment. Given the fact that Sergeant Detective Daley could not testify about its maintenance or any repairs or improvements to the system, and given that he provided no testimony about the operation or settings of the system, even if this had been admissible, it would not have been sufficient to support a finding that the system was the same as it had been on the night of the killing. In any event, the judge clearly made a finding that it had not been shown either to be the same system, or to have been used in the same way, on the two relevant dates.

On cross-examination, Sergeant Detective Daley testified that he did not know the make or model of the camera, or whether the video system had been altered or repaired in the six months between the day of the stabbing and the day of his test. He said, "I was making my opinion on the view of the video camera, of the monitor, was a similar view of the video that was captured the night of the stabbing." He testified that he no longer had possession of the T-shirt shown in the demonstration.

Discussion. As the majority correctly concludes, contrary to the judge's statement to the jury, this was obviously evidence. That's all it could have been, and, of course, the reason the Commonwealth presented it was so that the jury could see it and consider it in evaluating the surveillance video and the defendant's guilt. As the majority states at one point, its purpose was "to undermine any conclusions about the clothing's color that could be drawn from how it appeared in the original surveillance footage." Ante at . It certainly established that a black article of clothing could appear light on some security camera systems under some circumstances. The majority goes further and says it "served to establish . . . that it was possible that a black article of clothing could appear light-colored when viewed at night using the type of surveillance system at issue," ante at , although in fact we do not know that the same type of system was used in the

experiment and on the night of the killing. Thus, far from having "a limited purpose," ante at , or "a very limited purpose," ante at , it rendered what might have been powerful exculpatory evidence valueless.

1. The applicable law. The Supreme Judicial Court has recently made clear that a party seeking to put in evidence of an experiment designed to prove something at trial bears the burden of showing the evidence is "sufficiently reliable to reach the jury" under Lanigan, 419 Mass. at 25-26, and the United States Supreme Court case on which it relied, Daubert, 509 U.S. at 585-595. Rintala, 488 Mass. at 426. To begin with, of course, evidence like this, about an experiment that purports to demonstrate something about the accuracy of images produced by a particular security system video recorder, is not a proper topic for lay testimony, but requires the testimony of a properly qualified expert. See Commonwealth v. Gerhardt, 477 Mass. 775, 785 (2017). Then, "[t]he conditions in the experiments must . . . be 'substantially similar' to those at the crime scene for the experiments to be of any value." Rintala, 488 Mass. at 438. The methodology may not be designed, even by an expert, "on his own without any guidance." Id. at 439. There must be a "basis in existing scientific literature or research for [the] methodology or experiments," and they must be "performed consistently with basic scientific principles."

Id. Even beyond that, where a "novel[]" experimental method is used, a failure to "validate" its results will be "significant."
Id. at 440.

Because none of these requirements was met, the significance of the result of the rudimentary "experiment" in this case, in which a dark shirt, but not dark pants, appeared light (on a monitor that was not used for viewing the original video at trial), was neither known to the officer (who was not qualified as an expert), nor was it known to the judge. Yet in overruling the objection to its introduction, the judge allowed it to be used to obliterate the jury's ability to rely on the strongest piece of exculpatory evidence available to the defendant.

2. The rudimentary experiment cannot meet the Supreme Judicial Court's test for reliability. a. Daley lacked the requisite qualifications. Sergeant Detective Daley undertook an experiment designed to determine whether the video system in use the night of the crime might have produced a light-colored image of a dark-colored hoodie, in order to generate an opinion about the matter. As in Rintala, that opinion therefore required expert testimony.² Daley obviously was not qualified as an

² An opinion "based on scientific, technical, or other specialized knowledge," is not a proper topic for lay testimony, which is permitted only where the opinion instead "lies within the realm of common experience." Gerhardt, 477 Mass. at 785.

expert, and neither the Commonwealth nor the majority contends otherwise.

The majority seeks to avoid this obvious problem by asserting that Daley did not "offer any opinion testimony (expert or lay). Rather, the detective merely recounted actions that he personally took and observations that he personally made using ordinary perception (e.g., what color his colleague's shirt was)." Ante at . See id. at ("the detective offered no opinion whatsoever").

To begin with, the substance of Daley's testimony was obviously an opinion: that based on his experiment he concluded that the security camera system at issue could have made the black hoodie look light. That was its only relevance. Further, even if it were appropriate to say the testimony itself did not contain an "opinion," Daubert and Lanigan do not allow a party to provide the jury through a lay witness with raw data from an experiment, observed by a layperson who cannot explain it, and which the jury has no means of assessing, and ask them to draw their own conclusions. Matters not within the competence of laypersons, like whether the actual camera and recording system used on the night of the stabbing could produce images in which the defendant's black hoodie might have appeared to be light, and whether this experiment actually demonstrates that, require expert testimony. Cf. Haggerty v. McCarthy, 344 Mass. 136, 139

(1962) (expert opinion required to demonstrate standard of care in medical malpractice).

The majority asserts, as though this might render Daley's lay testimony on the matter admissible, "the detective . . . disclaimed any expertise," ante at , and observes that his testimony did not include "any explanation for why a dark-colored object could appear light-colored." Ante at .

These are not characteristics that render lay testimony admissible. They are precisely why an expert was needed. It is not because without one, "individual jurors may not have been able to articulate what explained" the "phenomenon that surveillance systems may not show an object's true colors." Ante at . An expert was needed not to explain principles in the abstract, but to explain whether the circumstances that caused this apparent color-change phenomenon, circumstances that would be known to an expert, were present when the particular system in use on the night of the killing captured the footage in the surveillance video, and whether they would have affected the appearance of the perpetrator's hoodie, when Daley's own rudimentary experiment showed that, at least in some circumstances where this phenomenon occurs, some dark fabrics may appear dark at the very same time others appear light.

Explaining that, so that the jurors could understand the relevance, if any, of the evidence presented, and not merely use

it without support to completely discount the surveillance video, required expert knowledge possessed neither by Daley, the jurors, nor this panel of the court.

b. The experiment was not reliable. In any event, putting to one side the expertise of the witness, the "facile" experiment itself fails in myriad ways to meet the requirements for reliability under Daubert and Lanigan that were articulated with respect to experiments just eight months ago by the Supreme Judicial Court in Rintala.

First, for evidence in an experiment to be admissible, "[t]he conditions in the experiments must . . . be 'substantially similar' to those at the crime scene for the experiments to be of any value." Rintala, 488 Mass. at 438.

Most obviously, as the jury were told, "[t]here is no evidence that the equipment itself was in fact the same or that it was in the same setting." The equipment might have been different, altered, or repaired. The lighting may not have been the same. The atmospheric conditions may not have been the same. The fabric of the various shirts may not have been the same. The fabric of the defendant's hoodie may have been in relevant respect more like Detective Herron's pants, which appeared dark in the photo, than the dark T-shirt, which appeared grey. The view obtained by Daley may have been an

artifact of the monitor, which was not used to display the original surveillance camera images.

Without an expert who could testify as to what, exactly, might cause the change in appearance noted by Daley, we do not even know what similarities are the relevant ones. Might temperature play a role? Humidity? Moonlight? I have no idea and neither does anyone else involved with this case, from Sergeant Detective Daley to my colleagues on this panel. As I've described, this is one of the reasons only an expert qualified to provide an opinion about the operation of the relevant equipment in the circumstances present on the evening of the stabbing could properly have been permitted to testify about it. But, more to the point here, because there is no evidence from which we can even determine whether the conditions were "substantially similar" to those present on the night of the crime, the results of Sergeant Detective Daley's "simple" experiment, ante at , were inadmissible.

Next, the Commonwealth has provided no "basis in existing scientific literature or research for [Daley's] methodology or experiments. Instead, it appears that [Daley] designed these experiments on his own without any guidance." Rintala, 488 Mass. at 439. If this was fatal to the admissibility of experiments conducted by an actual expert in Rintala, it certainly prohibits the admission of the rudimentary experiment

here. Further, as in Rintala, the "experiments also do not appear to have been performed consistently with basic scientific principles." Id. at 439. Finally, and importantly, "given the novelty of his experiments, that [Daley] did not repeat or validate any of his . . . experiments is also significant." Id. at 440.

This point about validation, about figuring out the meaning of what Sergeant Detective Daley discovered, is critical. To be clear, I am not saying that in running his experiment, Detective Sergeant Daley did anything wrong. On the contrary, his police work appears to have been creative and excellent. The failure here is on the part of the Commonwealth, which failed to follow up on Daley's excellent police work to determine whether it could lead to admissible evidence that might validly undermine the apparently exculpatory surveillance video. The Commonwealth's failure was in its decision to introduce the crude results of Daley's police work rather than seeking to determine whether, in fact, the surveillance video could be shown to be misleading.

The majority suggests that these rules, indeed, that Daubert and Lanigan, are inapplicable where "the issue was what factually was possible, not the scientific explanation for the phenomenon." Ante at . But evidence of the result of an experiment is never admissible unless it is produced by reliable

methods reliably applied; this is obviously true not only where a scientific explanation is at issue. Imagine, for example, a case in which there was a question about what some key witnesses perceived. It may be factually possible that a "mirage effect" may make something appear in a position it is not. See, e.g., The Belfast, 226 F. 362, 367 (D. Mass. 1914) ("To the men above it, in the Belfast's pilot house and on her bridge, the top of this layer of vapor, owing to a mirage effect, looked like the top of the water, and was by them mistaken for the surface of the sea. The lights of the Wayne and of other barges at anchor near her, projecting above the vapor, were clearly visible, and appeared as if they were close to the water; they were judged by the Belfast's officers to be a long way off" when they were not). But we would not allow evidence of an experiment showing that mirage effect to be introduced in order to show that the witnesses misperceived reality in the absence of evidence that the conditions under which the experiment were undertaken were sufficiently similar along all pertinent dimensions to those at the time and place at issue that the experiment was relevant to the case, and that the experiment was properly designed, performed, and validated, to ensure its relevance. Even though the scientific explanation for the phenomenon would not be the issue before the court, we would not tell the jury without such supporting evidence of reliability, "here's a demonstration of

the mirage effect, it may explain what the eyewitnesses say they saw."

3. Rintala, Daubert, and Lanigan apply to this case. To be clear, the basis of my dissent is not, as the majority opinion suggests, "that the full panoply of Daubert-Lanigan procedural requirements," whatever those are supposed to be, were not employed here. The majority's related observation that the defendant did not argue in the trial court "that a Daubert-Lanigan hearing was required" is beside the point. The problem here was not procedural. Prior to ruling on admissibility, the judge did in fact hear the evidence about the reliability of the experiment the Commonwealth chose to put before the court. The Commonwealth called Sergeant Detective Daley to testify about his experiment before the judge ruled on the admissibility of the photo and Daley's testimony; that was all the evidence of reliability the Commonwealth had to submit. The burden, however, was on the Commonwealth as proponent of the evidence to put in sufficient evidence to demonstrate reliability in compliance with Daubert and Lanigan. As the defendant objected below, and as he argues here, that is what it failed to do.

The majority does not apply Rintala, Daubert, or Lanigan at all, asserting only that what applies is an abuse of discretion standard, without acknowledging that Rintala holds that "it [is] an abuse of discretion to permit the Commonwealth to introduce"

evidence that does not comply with Daubert and Lanigan. Rintala, 488 Mass. at 442. The majority does assert that Rintala does not apply because "this case does not involve a challenge to the reliability of experimental methods that a purported expert witness had employed in order to draw particular conclusions." Ante at . But that is precisely what it involves. Indeed, the majority repeatedly articulates the conclusion the jury were asked to draw on the basis of Sergeant Detective Daley's experiment: "that it was possible that a black article of clothing could appear light-colored when viewed at night using the type of surveillance system at issue." Ante at . It calls it "a demonstration that dark objects might appear lighter when captured by a surveillance system of the type used here." Ante at .

The majority also seems to suggest that "a simple demonstration" need not comply with the Daubert-Lanigan requirements of the use of reliable methods reliably applied. But demonstrations are obviously not exempt from the ordinary rules of evidence that permit only reliable evidence to be presented to the jury, and, as I described at the outset, the

Supreme Judicial Court has used the terms experiment and demonstration interchangeably.³

The majority finally suggests that Daubert, Lanigan, and Rintala have no bearing on this case because "this is not an area that involves a 'novel and developing area of science.'" Ante at . But the need for reliability in scientific evidence does not disappear when the relevant field of science matures, and nothing in the case law suggests it does.

And indeed, in its attempt to demonstrate that the science involved here is so straightforward we need not apply Rintala, the majority shows just the opposite. It asserts that "the scientific principles that underlay the demonstration are indisputable," then drops a footnote that cites what appear to be two scientific textbooks that are not in the record and were not provided to the jury, explaining among other things that

³ Although Commonwealth v. Caruso, 85 Mass. App. Ct. 24, 28-29 (2014), discussed by the majority in a lengthy footnote, involved the use of "'computer aided design' (CAD) software, as well as . . . data gleaned from a survey the defendant had done of the [relevant] area [that] . . . produced an analysis . . . purporting to show that [a] person seen in [a] video must have been at least five feet, ten inches tall," the majority, taking that case as a point of departure, gives the example of an experiment designed to show the operation of perspective in videography in which two people of the same height standing at different distances from a camera are photographed. Although the requirements of Daubert and Lanigan that reliable methods be used reliably before evidence of a scientific experiment is admitted might easily be met in the case of any such experiment, they would of course apply to it.

"[t]he wavelengths of infrared light indisputably lie outside the range of visible light," and that "[i]t follows that cameras that rely on infrared light do not record how the objects shown appear to the naked eye; they instead -- by definition -- record how well such objects reflect frequencies of light that we cannot see." Ante at n.23.

The idea that this is within the common knowledge of lay jurors is absurd, and even if it were, it does not explain why or when one might expect a particular "infrared" camera system to produce images that accurately or inaccurately reproduce the darkness of particular items.

More fundamentally, there is nothing in the record that supports the very premise of this and so much of the majority's opinion, that "the type of surveillance system at issue" utilized an "infrared" camera -- or, if it is even the same thing, what the majority sometimes calls a "night-vision camera." Ante at . There is no evidence in the record about the camera or system utilized by the homeowner at all, except that Daley did not know its make or model.⁴

⁴ Given Daley's specific testimony about his lack of knowledge of the system in use by the homeowner, the majority is clearly incorrect that Daley's prefatory testimony at voir dire that the idea behind his experiment was "[t]o test the camera system in relation to colorization and infrared cameras and night and what the system captured," "established that the system being tested utilized infrared cameras." Ante at & n.18.

The majority seeks in two distinct ways to minimize the importance of the evidence from the experiment. First, it says that it was "used merely to illustrate the possibility that surveillance cameras used at night might depict the colors of objects differently than they would appear to the naked eye," ante at , and that, "[i]n light of the judge's understandable concern that without the jury hearing such testimony, they might well have applied a skewed view of the strength of the exculpatory value of the surveillance video, we conclude that the judge did not abuse his discretion in admitting it." Ante at .

But there is nothing "mere" about the evidence of the rudimentary experiment put before the jury. As described above, it effectively rendered the otherwise-exculpatory surveillance video valueless to the defendant. And to say that without it the jury would have gotten a skewed picture puts the cart before the horse. Among the very reasons reliable scientific evidence is required if the Commonwealth wants to use experimental evidence challenging the reliability of the security video system used the night of the stabbing is so that the judge can determine accurately whether the defendant's view of the exculpatory strength of the video would indeed be "skewed" without its admission, and so that the jury can accurately assess the value of that apparently exculpatory evidence.

Second, although the majority does not and could not claim that any error was not prejudicial, in order to make it seem that the surveillance video had "little, if any, exculpatory value," ante at , it also concocts the fanciful and utterly speculative idea that the defendant might between the time of the killing and the time he was picked up by Spacco in South Boston have disposed of a light-colored hoodie, as clearly appears in the surveillance video, only to reveal a dark-colored one, to which Spacco testified, previously hidden beneath. Maybe, they even suggest, he was using the first hoodie as a "bloody makeshift bandage on his hand." Ante at n.27.

Perhaps the members of the majority know people who wear two hoodies, one over the other. But I have yet to meet one.

The Commonwealth is entitled to show that the surveillance video was not what it appeared. It was required, however, to introduce reliable evidence if it wished to do so. The judge's job was to ensure the admissibility of evidence, not to put inadmissible and unreliable evidence before the jury when that was all the Commonwealth provided.

Because that is what happened here, the defendant was denied his right to a fair trial. Consequently, I respectfully dissent.