

**UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS**

UNITED STATES OF AMERICA,)
)
 v.)
)
JAMES HEBSHIE,)
Defendant.)
GERTNER, D.J.)

Criminal No. 02cr10185-NG

MEMORANDUM AND ORDER RE: MOTION TO VACATE CONVICTION

November 15, 2010

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I. INTRODUCTION

Petitioner James Hebshie ("Hebshie") was convicted of arson and mail fraud in June 2006 for an April 2001 fire in a commercial building in Taunton, Massachusetts.¹ At the time of the fire, Hebshie was leasing space in the building for his convenience store, Main Street Lottery & News Store. He was sentenced to a mandatory fifteen years in prison, all the while proclaiming his innocence. After exhausting his appeals, Hebshie filed a petition for a writ of habeas corpus pursuant to 28 U.S.C. § 2255 based on the ineffective assistance of his trial counsel.² His petition raises a number of grounds³ but its principal focus is the way counsel dealt with scientific testimony on arson.⁴

¹ The indictment had four counts: arson, in violation of 18 U.S.C. § 844(I) (Count One); two counts of mail fraud (stemming from insurance claims arising from the fire), in violation of 18 U.S.C. §§ 1341-1342 (Counts Two and Three); and use of fire to commit a felony, in violation of 18 U.S.C. § 844(h)(1)-(2) (Count Four).

² "Trial counsel" refers to the two individuals representing Hebshie, John T. Spinale and his son, Jay Spinale, who was co-counsel. Unless otherwise noted, "Spinale" refers to John T. Spinale.

³ The other grounds included: Failure to challenge the sufficiency of the evidence concerning the "in furtherance" requirement of the mail fraud count; failure to object to an erroneous jury instruction on the "in furtherance" requirement; and failure to object to prejudicial and irrelevant testimony about a firefighter's heart attack. Pet. for Habeas 5-6 (document #136).

⁴ Hebshie has also filed a motion for a new trial under Rule 33 of the Federal Rules of Criminal Procedure claiming that there is "newly discovered evidence concerning the lack of accuracy and lack of reliability of the government's forensic evidence." Mot. for New Trial 1 (document #141). This motion is addressed in a separate endorsement.

The government had to prove that a crime had been committed at all -- that the fire was intentionally set, rather than accidental -- and that Hebshie was the perpetrator. To show arson, the government relied on two kinds of evidence -- first, the "cause-and-origin" forensics expert who testified about where and how the fire started, and second, the testimony of the handler of an "accelerant-detection dog" and a laboratory technician to prove that it was incendiary in nature. To show that Hebshie was the perpetrator, the government demonstrated that Hebshie leased space in the building for his convenience store, that he owed roughly \$5,000 to lottery authorities, that he was trying to sell the store, and that he sought to recover on an insurance policy. The arson evidence had substantial problems, as this decision shows; the evidence of Hebshie's motive to burn down his store was less than overwhelming.

Two Supreme Court cases help frame this decision: the very rigorous standards for determining when counsel's performance is ineffective described in Strickland v. Washington, 466 U.S. 668 (1984), and its progeny -- and the special requirements for scientific testimony under Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579 (1993) and for technical testimony under Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999). Under Strickland, Hebshie must prove (1) that his counsel's performance was deficient and (2) that he suffered prejudice as a result. 466 U.S. at 687. To be deficient, an attorney's conduct must fall below an "objective standard of reasonableness" established by "prevailing professional norms." Id. at 687-88. To demonstrate prejudice, Hebshie must show a "reasonable probability that, but for counsel's unprofessional errors, the result of the proceeding would have been different." Id. at 694. While the Strickland standards are notoriously difficult to apply to the usual strategic decisions of trial,

scientific and expert evidence raises fundamentally different questions, and impose a different set of obligations.

By 2006, when Hebshie's trial took place, a number of articles in legal journals and cases cast a critical eye on the scientific reliability of arson evidence, methodologies, and techniques. Ordinarily competent counsel would have understood that men and women had been convicted, sentenced, perhaps even executed, on the basis of flawed arson evidence and taken appropriate steps to litigate the issues using all the tools available. But the case for relief is far stronger here than in the run-of-the-mill arson case; it does not depend upon that literature, those cases or even the drumbeat of concern about arson prosecutions. Hebshie's trial counsel had been specifically warned about deficiencies *in this case* by predecessor counsel and by the experts retained by them. Even more significant, when the Court pointedly inquired during the trial, not once, *but three times*, whether there would be a challenge to the arson expert testimony, the laboratory analysis, or the canine handler's testimony, even when the Court suggested it was willing to suspend the trial in order to conduct such a hearing, counsel declined.

Trial counsel never challenged the validity or reliability of the testimony of Sergeant David Domingos ("Domingos"), the government's "cause-and-origin" arson expert; John Drugan ("Drugan"), the laboratory technician; or Sergeant Douglas Lynch ("Lynch"), the accelerant-detection dog handler, either prior to or during the trial, much less called for any limitations on their testimony even when there were substantial grounds to do so. They never objected to testimony that went far beyond the science on which it was allegedly based. Not a single pre-trial motion or proposed jury instruction was filed on expert issues at all. Nor did counsel object when the government fundamentally mischaracterized critical testimony from the canine handler

in its closing. (In fact, Hebshie's counsel legitimized the government's experts when he addressed the jury; the testimony was "impressive," he said; he did not "quarrel" with it.) While one might imagine a strategic reason for not seeking a Daubert hearing under some circumstances, or for not objecting to certain testimony, absolutely no legitimate reason was argued here. In fact, trial counsels' "explanations" (offered at the evidentiary hearing on the habeas petition) were, in a word, incoherent.

The most significant problems should have been abundantly clear -- problems with the core evidence of arson, namely, the canine evidence and the laboratory analysis. Once Billy the dog sniffed a so-called accelerant in the left side of Hebshie's store, the area to which she⁵ had been led (the very area that Domingos concluded was where the fire started), government experts never checked other areas for "accelerants." They took no control or comparison samples from anywhere else, as the scientific method and arson investigation standards suggest. That single sample was then tested and found to be "light petroleum distillate." "Light petroleum distillate," however, is a category so broad that a host of entirely benign substances fit within it, especially in this case. Hebshie's store was a convenience store, after all; light petroleum distillate could be found in a number of the goods he offered for sale (lighter fluid or lighters, for example). In addition, it was a substance generated by the heat of the fire itself, a product of pyrolysis⁶ of other materials in the store (like carpet glue). In fact, the laboratory test was only probative of arson if one area tested positive while others did not, or if the test disclosed a chemical that

⁵ The dog was a female, notwithstanding her name.

⁶ "Pyrolysis" is a chemical change brought about by the action of heat.

would not normally be present at the scene. Nevertheless, the sample was never analyzed further.

Counsel's errors in these areas -- the canine and laboratory evidence -- covered both pretrial and trial conduct. With respect to the laboratory evidence, a Daubert/Kumho Tire hearing would have allowed the trial court to screen whether minimum scientific standards were met -- not in the abstract, but in the particular context of this case. Likewise, with respect to canine evidence, which may be admitted to show how the dog assisted investigators in the selection of samples for testing, a hearing would have allowed the court to monitor how far the testimony could lawfully range, and what were its appropriate limits. To be sure, holding a hearing does not guarantee that evidence will be excluded, but as to the canine and laboratory evidence, exclusion (or in the case of the dog, strict limitation) was more than a "reasonable probability." It was likely.

Counsel's errors *pretrial* in dealing with the arson testimony, in any case, were compounded by their *trial* errors, especially with respect to Billy, the accelerant-detection dog. It is not an understatement to say that Lynch, the dog handler, was permitted to testify to an almost mystical account of Billy's powers and her unique olfactory capabilities. He presented unsubstantiated claims about the dog's accuracy. He was allowed to go on at great length about his emotional relationship with the dog and his entirely subjective ability to interpret her face, what she thought, intended, and the "strength" of the alert she gave in this case. Finally, Lynch was permitted to testify that the dog did not alert to anything else on the premises, as if the dog had been allowed to range widely on the fire scene (*she was not*), and as if the dog's failure to alert had evidential value (*it does not*).

The latter theme was repeated in the government's closing. The government argued:

Billy knew what she was smelling for. She indicated an alert on one place and *one place alone*. It was a strong alert. If it was the carpet that was setting her off, then she would have triggered everywhere else around her. . . . That was the one place where she alerted to. (Italics supplied).

Trial Tr. Vol. 6, 171: 5-13.

Counsel never objected or moved to strike the testimony or the closing. To be sure, cross-examination disclosed that Billy was only taken to one area on the fire scene, and that only one sample was taken. But the problems with Lynch's testimony and the government's closing were fundamental ones. As the Court held in Daubert, some testimony may be so problematic that the usual trial techniques are just not enough to prevent a jury from giving it far more credence than it deserves. See Daubert, 509 U.S. at 596-97. The testimony should not reach the jury at all. Here, the scientific literature cast doubt on the significance of the dog's *failure* to alert (false negatives) and even raised concerns about canine "proficiency" testing, concerns counsel never raised. Nor did counsel argue about the extent to which Lynch's testimony (regarding the strength of the alert, the dog's unique prowess, Lynch's ability to "read him") coupled with the government's closing, effectively turned Billy's alert into substantive evidence of guilt, just what the law and literature caution against. In fact, even if counsel had not moved for a pretrial Daubert hearing before trial, nothing justified standing mute during Lynch's testimony or the government's closing. Billy, like the traditional Ouija board, was simply allowed to point to Hebshie as an arsonist.

Hebshie also argues counsel erred in connection with the cause-and-origin testimony. For example, petitioner claims the government experts failed to follow the scientific method in

the way the scene was preserved. A reasonable hypothesis, according to petitioner's experts, was that the fire began in the basement rather than in Hebshie's store, or that even if it had started there, that substances regularly found in a convenience store had accidentally ignited. Yet Domingos failed to preserve the scene in a way that enabled others, including defense experts -- not to mention peer reviewers -- to evaluate his conclusions. He failed to take photographs of the basement or even mention that he had been there in his investigation reports. In effect, few, if any, investigative materials involving places *other* than where Domingos concluded the fire had begun were collected before the building was razed to the ground and further investigation was impossible. And these failures were especially significant in the light of the challenges to Domingos' "interpretation" of the fire patterns raised at the habeas evidentiary hearing. Still, there was no pretrial motion for a Daubert hearing, and no motion for a voir dire during trial, even when the court invited counsel to do so.

But the cause-and-origin challenge stands on a different footing than the canine and laboratory evidence. Whether a Daubert challenge to cause-and-origin would have succeeded on these grounds is a closer question. Counsel not only cross-examined Domingos; they offered a rebuttal expert raising the basement hypothesis, and challenging the premises of the government's cause-and-origin theory. While the defense was hamstrung by limitations in the government's investigation, still, as the government notes, there was not a complete failure to raise many -- although not all -- of the salient points highlighted in the habeas hearing. Domingos' testimony was troubling, to be sure, but not nearly so troubling as the laboratory analysis or the canine evidence. Under the circumstances, I need not resolve whether there was a "reasonable probability" that I would have excluded the cause-and-origin testimony had the

issues been teed up before me because the exclusion of the canine and laboratory evidence is so clear.

Under the "prevailing professional norms," reasonably competent counsel should have moved for a Daubert/Kumho Tire hearing before trial on all of the expert testimony -- a) on the accelerant laboratory analysis based on the investigator's failure to use a comparison or control sample and not test beyond the generic finding of "light petroleum distillate"; b) on the canine evidence, highlighting problems with proficiency testing and emphasizing the limited scope of the testimony; and, c) on the expert cause-and-origin testimony, when the expert's proposed testimony was scientifically flawed. If counsel had requested such a hearing, there is more than a "reasonable probability" that it would have been granted, that the laboratory analysis and the canine evidence would have been excluded, or severely limited, at the very least. Moreover, quite apart from what counsel ought to have done before the trial began, reasonably competent counsel should have at least objected -- strenuously -- to Lynch's testimony about Billy when it ranged far, far, beyond its limited purpose, and to the government's closing argument, which dramatically overstated Billy's significance. If, during trial, counsel had done so, the objection would have been sustained.

The prejudice is clear: Without Billy's "testimony" or the laboratory analysis, there is a more than "reasonable probability" that the outcome of the trial would have been different. While the cause-and-origin testimony purports to identify where the fire began, the canine evidence and the laboratory results are essential to prove that the fire was an arson, not an accident. Without it, there is simply no crime.

In short, I find that due to counsel's failures, the very danger that Daubert and Kumho Tire sought to avoid occurred: Questionable theorizing about arson, about Billy's mystical prowess, and the generic laboratory results, were presented as "science" to the jury, and as a result, Hebshie was convicted. Hebshie's § 2255 petition is **GRANTED**.

II. FINDINGS OF FACT

I will first describe the background of events chronologically, then the evidence adduced at trial on direct and cross-examination, and finally, the evidence adduced at the evidentiary hearing on Hebshie's § 2255 petition.

A. Background

On Saturday, April 21, 2001, a fire broke out in a two-story commercial building at 32-34 Main Street in Taunton, Massachusetts. Hebshie leased space on the first floor for his convenience store, Main Street Lottery & News Store. Two other businesses, Ro An Jewelers and Downtown Sports Card Shop, were also located at 32-34 Main Street. On the day of the fire, Hebshie left his store at 1:37 p.m., setting the security alarm as he left. According to the alarm company, a motion detector alerted within the store at 1:44 p.m. At roughly the same time, a police officer noticed smoke coming from the building.

Lieutenant Todd Myers ("Myers"), a firefighter with the Taunton Fire Department, was the first to enter. Since visibility was poor, Myers, along with other firefighters, crawled into the smoke-filled building towards an "orange glow" at the back of the convenience store -- described as the office area, but also an area near what appeared to be the basement stairs. Trial Tr. vol. 2, 15:1-3, 19:1-14. After about ten minutes, Myers reported that the fire had been extinguished. Id. at 20:16-21:11. In short order, however, firefighters noticed smoke in the back of the

convenience store and on the second floor of the building, as well. Id. at 9:1-9. After several hours and multiple alarms, they managed to put out the fire, but the building sustained substantial damage and partially collapsed.

Domingos, who worked for the Massachusetts State Police Fire Marshal's Investigative Unit led the "cause-and-origin" investigation. He arrived at around 2:00 p.m. on the day of the fire. Trial Tr. vol. 3, 19:1-3. He directed that statements be taken from witnesses and firefighters. Id. at 21:13-22:13, 23:9-12. Around dusk, he tried to crawl into the convenience store but debris from the second floor that had fallen during fire suppression efforts blocked his entrance. Id. at 23:1-25:11. He returned the next day, April 22.

Domingos concluded very early on that the fire had started in the left-hand wall in Hebshie's store initially because he believed it was the area of greatest damage and because of his interpretation of certain "burn patterns." He took photographs, including of the area where the basement stairs were, but not any of the basement itself. While he testified that he did in fact go into the basement and discounted it as the origin of the fire, his report makes absolutely no mention of the basement's condition, his observations, or that he entered the area at all. The stairwell to the basement was not even in the government's rendering of the store's floor plan. In fact, based on the investigatory materials from Domingos, the defense would have had no way of knowing that anyone even entered the basement.

Domingos called on an "accelerant-detection" canine to assist in his determination of whether the fire was arson or an accident. "Accelerant-detection" canines are supposed to be used to help investigators narrow the search area for ignitable liquids. Once a dog alerts to an area or areas, samples are taken and tested. While the dog is described as an

"accelerant-detection" dog, in fact what the dog is trained to alert to is actually a class of chemicals, some of which can be used as an accelerant in an arson, but some of which also have entirely benign purposes and are part of the area's ambient environment. Moreover, the dog's "results" depend upon two additional factors -- how usual or unusual it is for that kind of chemical to be on the scene at all and whether the "accelerant's" location was affected by the fire suppression efforts, i.e. the fire hoses or the excavation, or whether it pre-dated the fire.

The dog's handler, Sergeant Lynch of the Massachusetts State Police, brought "Billy" the dog only to an area that was safe for her, also taking into account the area Domingos wanted to evaluate. Trial Tr. vol. 3, 178:19-23. The safe area was the left side of the store, the area that Domingos had specifically cleared and where Domingos believed that the fire had started. In fact, this was the most intact area of the convenience store; virtually everywhere else was filled with debris. Billy alerted Lynch to one spot along the wall.

Lynch took a single sample for laboratory analysis from that spot. Neither he nor Domingos directed the dog to any other areas in the building -- like the basement -- apart from the convenience store's left side to see whether she would register the same kind of "alert." Trial Tr. vol. 4, 27:8-16. Nor did Lynch bother to take a sample from other areas in the store to act as a control or a comparison sample. Taking control samples, he noted, just was not part of his routine. And in this case, he did not do so in part because of his subjective assessment of the "type" of alert that Billy gave, and because Domingos had not asked him to. (Significantly, Domingos denies directing him to take only one sample.)

The State Police Crime laboratory took that one sample and identified the general class of chemicals to which it belonged -- light petroleum distillate -- but not the specific chemical. No

further tests were requested, tests that might have narrowed the field and distinguished the sample from the usual products in the convenience store that also contained "accelerants," or the products of pyrolysis.

On Sunday night, April 22, 2001, Domingos left the scene and released it to the insurance company. The building was demolished soon thereafter.

B. Pre-Trial

On May 29, 2002, Hebshie was indicted for arson, mail fraud, and use of fire to commit a felony.⁷ Robert Muse, and then his son, Peter Muse, were appointed to represent him. In order to help prepare the defense's case, Peter Muse hired two forensic experts -- John Titus ("Titus"), a fire protection engineer, and Michael Higgins ("Higgins"), President of K-Chem Laboratories. Evid. Hr'g Tr. 215:7-12. In March 2005, Hebshie replaced Muse with retained counsel, John T. Spinale, who in turn hired his son, Jay Spinale, as co-counsel. The trial began over a year later, on June 12, 2006.

The Spinales kept Titus on as a consultant and expert witness but did not retain Higgins. Id. at 132:2-12. Titus (testifying at the evidentiary hearing) was adamant that he had expressly warned the Spinales about flaws in the government's cause-and-origin evidence, the canine evidence, and the laboratory analysis, over and over again, both before and during the trial. Id. at 269:12-24. The Canine evidence was especially problematic: First, a handler has to interpret the dog's reactions. Id. at 263:9-264:14. Second, simply because a dog "alerts" to accelerant does not resolve "whether or not the presence of that chemical has anything to do with incendiary intent or [is] simply part of the ambient environment for that place." Id. at

⁷ On September 24, 2003, a federal grand jury returned a superceding indictment, charging Hebshie with arson, two counts of mail fraud, and use of fire to commit a felony.

262:14-263:5. In fact, Titus reiterated that the latter -- the ambient environment of the convenience store -- would include "thousands" of materials to which the dog might alert. *Id.* at 266:16-19. Titus also flagged the prejudicial use of the term "accelerant," as in "accelerant-detection dog," which makes the conclusion of arson, rather than an accidental fire, all the more likely, even when the substances alerted to may be entirely benign. *Id.* at 265:13-266:5.

In addition to the canine evidence, Titus highlighted the problems with the testing *in this case* -- first, the fact that the laboratory identified only the general category of accelerant, light petroleum distillate, but not the specific chemical within that category, and second, that there were no comparison or control samples taken from any place other than where Domingos suspected the fire to have begun. He again warned them that the laboratory test was probative only if it identified an accelerant that was *not present elsewhere* in the store. *Id.* 268:15-269:6. Spinale's files contained a laboratory analysis from K-Chem Laboratories, an analysis that Hebshie's prior attorney had commissioned, which drew the same conclusions.⁸

Despite these warnings, the Spinales never filed *any* pretrial motions (except motions to obtain incidental relief from Hebshie's pretrial release). There were no motions in limine, no motions directed to the expert testimony whatsoever. They never requested a Daubert hearing to

⁸ The analyst wrote:

It is my understanding that the fire scene was a store that sold items that contained petroleum products such as lighter fluid. In similar incidences finding petroleum products that are natural to the scene (sold there) is expected. These products heat up normally and the containers will either melt or burst allowing the liquid petroleum product to spill. Even if these products were stored in a different location the action of the firefighters spraying hoses can move these petroleum products around allowing them to be found in a different location. This in turn can cause accelerant detecting K-9's to find false samples that will mislead investigators.

Evid. Hr'g Ex. 17, at 1-2.

challenge the bona fides of the Domingos investigation or the canine evidence, never moved in limine to exclude the laboratory analysis because of the generality of its conclusions and the lack of a control sample. They did not use the expert from K-Chem Laboratories that Muse had hired or the data from the insurance file that they had been given.⁹

Nor were there any explanations for these failures -- much less strategic ones. Spinale admitted at the habeas evidentiary hearing that he had just "assumed" that Muse had decided not to pursue a Daubert hearing concerning Domingos' investigation. Id. at 151:23-152:11. Muse in fact testified that he too had expressly highlighted problems with the government's forensic case to the Spinales and encouraged them to challenge the evidence pretrial. Id. at 217:20-219:13.

Whatever the Spinales concluded at the outset of their representation concerning scientific evidence, they never reconsidered it during the year and three months after they took over from Muse. Nor did they reconsider it, even after the Court asked them three times during the trial whether they intended to challenge the cause-and-origin evidence, the canine evidence, and Domingos testimony, and indicated that the Court was prepared to suspend the trial for a hearing.¹⁰

⁹ Daniel Cronin, the insurance investigator, had examined and taken photographs of the building prior to its complete demolition. Jay Spinale testified that he never requested the insurance file or the photographs, including one of the basement stairs. Id. at 191:9-25.

¹⁰ The three instances are:

- A) THE COURT: Let's take our morning break. . . . Actually one thing, was there any Daubert challenge to any experts? I just wanted to make sure there wasn't.
MR. SPINALE: No.

Trial Tr. vol. 3, 60:15-19.

- B) THE COURT: I wanted to make sure I didn't miss anything here, there was no challenge to the canine evidence, to the dog?

C. Trial

At trial, the government's witnesses included: Myers, the first-in firefighter; Domingos, the cause-and-origin investigator; Lynch, the canine handler; Drugan, the police laboratory technician who tested the carpet sample to which Billy the dog had alerted; and a rebuttal witness, Wayne Miller ("Miller"), a former agent of the Bureau of Alcohol, Tobacco, Firearms and Explosives ("ATF").¹¹ The defense put on Titus, the expert whom the Muses had found.

The government's theory was that Hebshie used an accelerant to burn down his store in order to collect on his \$30,000 insurance policy. The only evidence of financial exigency on the record was that Hebshie had lost his license to sell lottery tickets a few weeks before because he owed \$5,000, and that his efforts to sell the store the week before the fire had been delayed because the putative purchaser had a death in the family. The government claimed that Hebshie set the fire along the left-hand wall in his store.

The defense's theory was that the fire had started accidentally in the basement. But because of the limited scope of the Domingos investigation, Titus had little proof -- no

MR. SPINALE, JR.: No.

Id. at 121:15-18.

C) THE COURT: So there's a single sample taken from where this witness said the dog had identified the accelerant?
PROSECUTOR: Yes
THE COURT: That's stipulated to, so you don't have a counter on that?

Id. at 181: 17-20.

¹¹ Also testifying, in addition to the above witnesses, were Charles A. Brown, a Taunton police officer; Ronald Nasti, Deputy Chief, Taunton Fire Department; Benjamin Barker, of National Security and Telephone (who had installed the alarm in Hebshie's store and identified Hebshie as the last person in the convenience store on April 21, before the fire started, based on Hebshie's alarm code, setting the alarm); Ernest Heledies, the owner of the property that Hebshie leased; Heather deAndrade, the fiancée of the owner of the card shop in the building; Elaine Pigeon, who worked in Ro An Jewelers; Dave Lampert, the owner of Ro An Jewelers; and Walter Bevis, an employee of Hebshie's.

photographs of the basement itself or comparison samples from elsewhere in the convenience store (and no opportunity to do an independent evaluation of the scene). Indeed, the government seized on the limitations of Titus' testimony in its closing, limitations for which it was entirely responsible: "Mr. Titus, ladies and gentlemen, came to no conclusion about what the cause of the fire was. . . . [A]t no point did he say this is where the fire started." Trial Tr. vol. 6, 172:10-15.

The government's case on cause-and-origin and arson was based on four areas of evidence: (1) building construction and Domingos' interpretation of burn patterns; (2) the canine evidence; (3) the laboratory testing of the accelerant sample; and, (4) Myers, the first-in firefighter's account.

1. Domingos' Testimony: Building Construction and Burn Patterns

Domingos' job was to interpret what would have looked like a "pile of rubble" to the "untrained eye" the day after the fire had been extinguished. Trial Tr. vol. 3, 82: 4-7. He concluded almost immediately that the fire had started along the left-hand wall in Hebshie's store, moved several feet to the pipe through the wall and through that to the second floor. *Id.* at 40:13-41:16. He discounted the fact that, in between the extinguishing of the fire on Saturday and his return on Sunday, part of the building had collapsed, leaving the site different than the night before. *Id.* at 31: 15-19. That change, he concluded, did not matter because the collapsed area "was not specifically related to *our first noticed area of origin from the first-in fire department.*" *Id.* at 32:6-13 (italics supplied).

Domingos began by examining the exterior of the building. *Id.* at 32:14-20. Then, he walked through the sports memorabilia store and the jewelry store and ruled them out as possible

areas of origin. Id. at 33:8-36:25. He next entered the convenience store, directing the excavator operator to clear out some of the "roof material and timber material" that had dropped into the scene, clearing the rest with hand tools. Id. at 37:25-39:22.¹² Domingos' observations confirmed his theory of the fire's origin. He pointed to the "heavy damage and charring," id. at 40:13, a "low burn or area that was damaged close to the bottom of the floor level," id. at 41:5-11, and a "V" pattern on the wall above the hypothesized origin of the fire, id. at 41:14-20.¹³ Domingos ruled out the basement as the origin of the fire (although as noted above, nothing in any of his reports reflected that he had even been there).¹⁴

Spinale cross-examined Domingos. Domingos agreed that the area he had identified as the most damaged was in fact an area where sections of the wall were most intact, id. at 65:19-66:3, where even the flimsy paneling had not been burned through, id. at 94:6-95:5, nor had a stack of papers, id. at 95:6-15, or nearby plastic bags, id. at 96:3-97:2. He also acknowledged

¹² Domingos described this as removing "dropdown," namely "anything that might have been damaged from the fire that wasn't originally in that location but fell through into that location," Trial Tr. vol 3, 39:13-15, and "overhauling," namely, the removal of debris that does not have a direct impact on the investigation, id. at 39:20-22.

¹³ He noted:

A V-pattern is a pattern that is made from a fire as the smoke and soot impact the adjacent or surrounding surface area. . . . As it dissipates into the air and moves off into the air, it spreads out through osmosis . . . it spreads out and that smoke and soot stains the wall directionally towards the heaviest soot area which is the closest to the fire . . . [a V-Pattern found in the area that was the most damaged] might signify that that is your area of origin.

Id. at 30:17-31:26. See Evid. Hr'g Ex. 4.

¹⁴ He concluded at the trial that his observation of a heating grate connecting Hebshie's first-floor store to the basement indicated that the basement did not play any significant role in the fire. He testified:

I would expect to see discoloration when metal is exposed to heat more intense than has developed to with stain, it will get like a shiny, multi-color look to it, and when it's hit with water, you usually will get like a rusted pattern. You may get melting of the rivots [sic] in some of the joints, some of the duct tape that's used to hold the vent together. . . . I did not [see that here].

Trial Tr. vol. 3, 53:21 -54:4.

that the most damaged area may not be the area where the fire started because the burn pattern may be affected by other factors, id. at 84:19-85:12, which could also lead to false identification of cause-and-origin. For example, "V" patterns can be caused by factors having nothing to do with the fire's origins -- ventilation or the fact that some materials burn more easily. In fact, he agreed that there was no real "V" in the picture at all. Id. at 89:9 -91:4.¹⁵ He conceded that there was significant burning in the stairwell area leading to the basement, id. at 102:16-25.¹⁶ And as to Billy, he agreed the dog was permitted to go only where her handler deemed it safe for her. Id. at 82:4-83:9.

Domingos discounted the theory that the fire was an electrical fire starting in the basement, even though, as noted, his written report did not mention the basement at all. Id. at 107:22-108:19. He agreed that there was a "V" pattern on the electrical outlet on the wall created by the fire coming in through the outlet, id. at 92:20-24, but concluded that the pattern meant only that the fire had gotten into the wall, not that the source of the fire was an electrical malfunction, id. at 93:6-14. He noted that the "burnt toast" smell that several witnesses reported an hour before the fire could have been an electrical problem, id. at 107:15-21.

Most important, Domingos acknowledged that control samples were not taken, id. at 98:14-16, even though he conceded they were "advisable," and that their purpose is to make

¹⁵ He noted that inferences about where things were found were affected by the fire suppression tactics, id. at 76:11-77:5. He acknowledged that there were other contaminants in the convenience store because of the collapse of the second floor onto the first and the presence of the equipment, like the excavator, which was gas driven, that could also pollute the scene. Id. at 79:25-80:3. He also noted that since some of the plastic from the plastic bags had dripped down to the floor, that could have been mistaken for an accelerant by the dog. Id. at 97:3-9.

¹⁶ On the building construction issue, Domingos denied that the building was balloon construction, id. at 73:19-23, insisting that it was platform construction, id. at 73:24-74:6, which contradicted the testimony of Deputy Chief Nastri. Trial Tr. vol. 1, 94:11-13. The former framework would have made it easier for the fire to travel from the basement through the walls of the building. Platform construction acts as a fire stopper.

certain whatever "accelerant" is found is not part of the ambient environment, id. at 98:23-99:1, 119:15-20. He agreed that many household products have accelerants. Id. at 97:14-17. He admitted that he taught his students to take control samples, id. at 99:3-10, and that he had done so in the past, id. at 99:25-100:3.

In fact, he acknowledged he did not know why samples were not taken *in this case*. Id. at 120:5-7. When Domingos was asked why he took no control samples, he said only, "You'll have to ask Trooper Lynch that question." Id. at 120:7. Trooper Lynch, as described below, points the finger at Domingos.

2. Canine Evidence

Lynch testified at great length about Billy, the accelerant-detection dog. He emphasized both the dog's unique powers and his singular ability to read her reactions, moods, and sounds. Before he described Billy's prowess, in particular, he went on about his experiences with other dogs, including dogs that were not involved in arson investigations, like a narcotics-sniffing dog and explosive-sniffing dogs.¹⁷ He talked about Amor, his first dog, a narcotics-sniffing dog, imported from Germany because Germany "had a very solid, proven product." Trial Tr. vol. 3, 143:8-16. He worked with Amor until the dog "died on me in 1995." Id. at 114:19. In fact, he described the special olfactory qualities of all of the dogs used for these investigations.¹⁸

Then he focused on Billy, and made his emotional attachment to her abundantly clear. (She had died before the trial.¹⁹ He lived with her day and night.) Id. at 146:17-25. He

¹⁷ Narcotics-sniffing dogs and explosive-sniffing dogs do not raise the same issues as do accelerant-detection dogs. Billy, he acknowledged, alerted to a class of products, namely petroleum products, which included common household products. See Gov't Trial Ex. 6, NFPA 921 § 14.5.3.5.

¹⁸ "It can sense things that we can't even imagine that they smell." Trial Tr. vol. 3, 142:19-25.

¹⁹ As Lynch put it, "Billy passed away in April '05 on me." Id. at 148:14.

underscored his ability to communicate with her. Trial Tr. vol. 4, 12:2-8.²⁰ He could "read her face," Trial Tr. vol. 3, 150:14-16; he knew "her personality," "the way her eyes shifted," "the way her ears shifted when she located stuff." Id. at 150:20-22. He could interpret her mood even in a dark room, just from the sounds she made. Id. at 151:17-22.²¹ And there were times when she was "visibly more confident in her alerting on something than on other occasions," id. at 151:5-25, when she gave particularly strong alerts.

Then he vouched for Billy's accuracy. She had been "certified," although the basis of the certification was not clear. Id. at 158:5-20, 159:13-15. And when counsel asked, "Over the course of your working with Billy, do you know how accurate she was," he categorically stated that she was 97 % accurate. Id. at 156:7-9. In fact, he noted that if Billy were wrong it was the handler's error not hers. Id. at 156:16-20.²² He based the latter conclusion on the fact that he had "spoken to lab techs . . . in both Connecticut and Mass." Trial Tr. vol. 3, 156: 13-14. No reports or tests were introduced.

Lynch would only take Billy to areas that were safe.²³ Significantly, the area to which Billy was directed was an area that Domingos directed the excavator to clear (aided by the hand shovels of Domingos and others) and precisely where Domingos concluded the fire had started.

²⁰ "I'd go into a room, I almost knew immediately if the room was hot by listening to her nose. . . . Even if I couldn't visibly see her until my eyes adjusted, I audibly heard the deep nose working and the blow-out. I didn't have to see her to know that she had found something." Id. at 163:6-16.

²¹ "I was with her 365 days a year. It was the first thing I did every morning, it was the last thing I did every night for the entire time that I had that dog." Id. at 150:10-19.

²² The Assistant United States Attorney asked: "[H]ow would you know that she got it right?" Id. at 155:2. He answered that he would send it to the crime lab and it would turn out to be a petroleum-based product. "There were many times in a million years I couldn't smell what she had shown me," but it came back as a petroleum-based product. Id. at 155:10-21.

²³ Lynch testified that he only "deploy[s] the dog where [he] feel[s] it's safe for [him] to deploy the dogs." Id. at 178:19-20.

Billy was employed just "in the cleared area on the left side of the store," indeed the more "intact portion" of the store. Trial Tr. vol. 4, 26:21-22, 27:8-16.²⁴

Lynch stated that when Billy passed the spot near where Domingos had identified a "V-pattern," the dog reacted in a way that Lynch interpreted to be an "alert" that accelerants were present. He characterized this as a "strong alert." Trial Tr. vol. 3, 152:5-8. The spot was the same place that Domingos observed "plastic appeared to have dripped down to the floor," *id.* at 97:3-5, which he later acknowledged could be mistaken for an accelerant. (See *supra* n. 15.) He testified - without objection -- that the dog did not alert to anything else on the premises. Trial Tr. vol. 4, 13:7.

Lynch cut a single sample from the carpet in the area where Billy alerted. *Id.* at 18:2-3. He did not take any other samples from nearby spots to act as control or comparison samples. He did not do it in this case because of the type of alert the dog gave and because the principal fire investigator had not requested comparison samples. Trial Tr. vol. 3, 169:23-170:13, 20.

Although counsel cross-examined Lynch, challenging the fact that only one sample was taken, and that Billy was limited to certain areas, he never objected to the breadth of the testimony, its emotional quality, or the irrelevant references to other dogs. He never challenged the 97% accuracy figure or addressed the scientific literature on false negatives -- when the dog failed to alert.²⁵ Indeed, Spinale did not object, even after the Court asked:

²⁴ While Lynch testified that he continued with Billy along the left side of the store to the back and then the front door and she did not alert again, his testimony has to be viewed in the context of his acknowledgment that they remained "in the cleared area on the left side of the store." Trial Tr. vol. 4, 12:9-13:9.

²⁵ Indeed, the government's questions highlighted the significance of Billy's failure to alert -- without objection:

- Q. So if there are several different locations in a room, for example . . . does she react that way for each of those?

THE COURT: I wanted to make sure I didn't miss anything here, there was no challenge to the canine evidence, to the dog?

MR. SPINALE, JR.: No.

Id. at 121:15-18.²⁶

After Lynch's testimony, the Court inquired again as to whether there would be a challenge to the fact that only one sample had been taken:

THE COURT: So there's a single sample taken from where this witness said the dog had identified the accelerant?

PROSECUTOR: Yes.

THE COURT: That's stipulated to, so you don't have a counter on that?

Id. at 181:17-22.²⁷

3. Drugan: Accelerant Sample

The single carpet sample from the convenience store was sent to the Massachusetts State Police Crime Laboratory on April 23. Drugan, a police laboratory technician and supervisor,

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- A. For each one of those. Each spot that she can locate properly and bring it back to odor is a reward for her, so I could have multiple marks in the same room.

Id. at 163:17-25.

²⁶ Domingos had earlier made the same observations of Billy's alert in his testimony -- where Billy alerted, the strength of the alert -- all without objection.

²⁷ The Court asked for jury instructions concerning Billy. Trial Tr. vol. 4, 112:15-20. The government provided the instructions (document #75). Spinale did not. The Court instructed, based on its own research:

There has been testimony in this case from a canine handler. Because it is, of course, not possible for a dog to communicate its findings to us directly, the testimony relies on the interpretation of the dog's actions provider [sic] by the handler, Trooper Lynch. Because of the nature of this evidence, you're instructed to receive it with caution and not give it undue weight. It is to be considered as part of and along with all the other evidence in your deliberations.

Trial Tr. vol. 7, 13:21-14:4.

testified that, using a gas chromatograph flame ionization detector, he classified the sample as a light petroleum distillate. Trial Tr. vol. 4, 44:5-25. He did not identify the substance beyond that. The government submitted Drugan's lab report as an exhibit. Gov't Trial Ex. 14.

Spinale cross-examined the expert about the lack of a comparison sample. Drugan admitted that using a comparison sample is the "preferred practice." Id. at 51:5-6, 19-21. Spinale never challenged the reliability or admissibility of the test itself. Indeed, Spinale stipulated to the lab results. Trial Tr. vol. 3, 181:14-16.

4. Myers' Testimony: Thermal Imaging

Myers, who was the first-in firefighter, testified to his observations as well as interpretation of observations made with a thermal imaging camera brought in by another company of firefighters after he believed the fire had been extinguished. The camera showed white "hot spots" in all four walls, "pretty much around the place depending upon what you shined it on, pretty much 360 degrees," Trial Tr. vol. 1, 106:16-18, which according to Myers, meant just that the walls "had been heated" from the flames in other locations, but that the fire had not spread into the walls. Trial Tr. vol. 2, 21:22-22:3. While Myers believed that these results were consistent with an extinguished fire, in fact, the fire continued. Id. at 9:5-9.

Spinale cross-examined Myers, suggesting that visibility was poor, that he had seen "the glow" of the fire in an area of the office through a door to an area near the basement stairs. Id. at 27:22-28:12. Spinale, however, never challenged Myers' testimony concerning the meaning of "hot spots," relying on his expert, Titus, to give a different interpretation of what those "hot spots" meant, namely, evidence of fire in the walls, consistent with a basement fire traveling internally through the building. Trial Tr. vol. 6, 22:14-22.

5. Other Evidence

In addition to evidence concerning cause-and-origin, the government offered the testimony of Deputy Chief Nastri, who was the ranking officer in charge of the scene. His testimony included a reference to the fact that one of the responding firefighters had had a heart attack during the fire suppression efforts, which he survived; this testimony was not objected to.²⁸ Dave Lambert, the owner of Ro An jewelers testified to a "burnt toast smell" an hour before the fire started (which Domingos conceded could be the smell of an electrical fire).

Domingos testified concerning Hebshie's statements, that he had not stated that he had been doing painting in his store (paint cans being a possible source of fire), although there had been paint cans in the basement, that Hebshie began his day on the morning of April 21, leaving at 1:30 p.m., and setting the alarm with a code that identified him as the last person in the store. Trial Tr. vol. 3, 57:23-58:25. In addition, Hebshie told Domingos that lottery officials had removed his license to sell lottery tickets because he owed \$3,500, *id.* at 60:3-6,²⁹ and that a potential sale of the business did not go through because there had been a death in the family of the purchaser, *id.* at 60:9-12. David Lampert, the owner of the Ro An Jewelers, testified that on the day of the fire Hebshie "pretty much said that he's sorry that the whole building went down and that you never think that a fire could take down a building like that." Trial Tr. vol. 2, 133:1-4.

²⁸ The owners and employees of the adjoining businesses also testified concerning the amount of their loss from the fire, testimony which was objected to. (As described in note 59 *infra*, these objections were wrongly overruled by the Court.)

²⁹ John Desimas, a lottery official, testified that Hebshie owed \$3,312.42 in December 2000, when the license was in his sister Judith Foley's name. Trial Tr. vol. 5, 26:3-24. Hebshie cleared that debt, but when he attempted to transfer the license into his own name in February 2001, an audit found he owed \$5,368. *Id.* at 30:3-18, 31:9-15. The lottery revoked his license.

6. Defense Case

Titus, testifying for the defense, disagreed with Domingos' interpretations of the burn patterns and his theory of the fire's progression. He opined that the evidence pointed toward the basement as the fire's source.

a. Burn Patterns

Titus pointed out that the store's left-hand wall was *not* the area of greatest damage. The three other walls in the store collapsed; the left-hand wall was the only one left standing, the most "intact area," as Lynch noted. Trial Tr. vol. 4, 26:21. That the supposed area of origin remained standing suggested that the fire did not in fact start there. Trial Tr. vol. 6, 49:25-50:5.

In addition, Titus pointed to two burn patterns suggesting the fire began in the basement. First, the burn pattern on the wall just above the heating grate aligned almost exactly with the outline of the grate. Id. at 33:16-34:1; Gov't Trial Ex. 1-14 (suggesting that fire came up through the grate and burned there for some period of time). Id. at 36:10-23. This would also explain why there was significant damage along that part of the wall. He also pointed to a burned-through V-pattern on the far side of the left-hand wall as evidence that the fire broke out into the store from inside the walls. See Gov't Trial Ex. 1-10; Trial Tr. vol 6, 31:16-32:1.³⁰

b. Thermal Imaging

As Titus explained at trial, the presence of the hot spots on all four walls and the continuation of the fire appeared to be more consistent with the defense's theory that the fire

³⁰ Titus testified that in a building with open or balloon construction, there are continuous studs from the basement to the attic, so fire will shoot straight up, as in a chimney. Trial Tr. vol. 6, 17:8-11. In buildings with platform construction, each floor is completely separated so the fire will stop at each floor. Id. at 18:6-22. In buildings with mixed balloon and platform construction, fire will treat any open space, such as a pipe chase or a chimney and shoot straight up. Id. at 18:23, 19:7, see supra note 14. Deputy Nastri had described the building as having balloon construction; Domingos disagreed.

began in the basement. The white color on the thermal imaging camera represented high heat (that is, a burning fire). If the walls were warm from only residual heat, as Myers indicated, they would not have shown up so brightly on the camera. Trial Tr. vol. 6, 21:21-22:22. Further, hot spots on all four walls (as opposed to one or two), suggested that the fire was coming up from below, from the basement.³¹

c. Laboratory Analysis

Titus also testified that a control sample was an "essential" part of the scientific method and was necessary in order to validate results. Id. at 56:8-21.

Without any evidence about the basement's condition, photographs, samples, or even notes, Titus was able to argue only some inconsistencies in the government's theory. He could not present much proof of his own.

7. Government's Rebuttal

Wayne Miller, the government's rebuttal witness at trial and a former ATF agent, testified that, based on the materials he reviewed, he did not see anything to suggest the fire started in the basement. Id. at 127:6-9. Like Titus, Miller was able to review only the photographs and notes the investigators produced. He had no original information. Miller admitted that Domingos should have documented the state of the basement. Id. at 138:10-23.

D. Closing

³¹ Titus noted:

So you think about where the heat source could possibly be from, and since fire, of course, is venting upwards, you have to be thinking about the heat source being below that, so I would say in general any hot spots showing up on an imaging camera behind wall structures suggests that fire is coming up into that wall from below, that's about the only place it could come from.

Trial Tr. vol. 6, 23:19-25.

The government placed special emphasis on Billy the dog, implying that she had alerted to one space *to the exclusion of all the others* -- which was not the case. Billy had not been shown "all other" areas:

Billy knew what she was smelling for. She indicated an alert on one place and one place alone. . . . If it was the carpet that was setting her off, then she would have triggered everywhere else around her. . . . She triggered on one place, it wasn't on the heating grate, it was right underneath those newspapers. She didn't trigger on anywhere near the counter, she didn't trigger down the stairwell. That was the one place where she alerted to.

Id. at 171:5-13. Spinale did not object to the closing.

And the government reiterated the 97% accuracy figure for Billy: "They send [the sample] in to the lab and like 97 percent of the other times that she's ever done this she was right again." Id. at 13-15. Again, Spinale stood silent.

When it came time for Spinale to address the jury, he conceded Domingos' qualifications ("a very qualified person . . . I don't quarrel with any of his testimony. . . ."), id. at 188:11-13, that Lynch and his dog were "impressive," id. at 189:10, that there really was not much difference between the experts for each side, id. at 198:1-5, and that it was just about common sense, id. at 198:10.

E. Verdict

The jury found Hebshie guilty on all counts. He was sentenced to a mandatory fifteen years in prison. Hebshie appealed, and on December 4, 2008, the First Circuit affirmed his conviction and sentence.³² United States v. Hebshie, 549 F.3d 30 (1st Cir. 2008).

³² On appeal, Hebshie argued that (1) there was insufficient evidence to show that the mailings underlying the mail fraud counts were in furtherance of a scheme to defraud; (2) the court erred in its jury instructions on the mail fraud counts; (3) the court erred when it ruled that the crime of arson carries a five-year minimum mandatory term of imprisonment; and (4) the court erred in admitting evidence of financial damage incurred by victims of the arson.

F. Habeas Evidentiary Hearing

Both parties presented testimony at an evidentiary hearing held over four days to address: (1) whether defense counsel's performance was deficient; and (2) if so, whether the deficient performance resulted in prejudice. See Strickland, 466 U.S. at 687. As to the first prong, Hebshie presented testimony from his trial attorneys, John T. and Jay Spinale; his previous attorney, Peter Muse; and an evidence professor, Professor Jane Moriarty to identify any possible justifications for the Spinales' failure to move for a Daubert hearing, establish the standard for competent counsel in an arson case, and determine what the Spinales knew about the deficiencies in the government's investigation. As to the second prong, Hebshie presented testimony from John Lentini ("Lentini"), a forensics arson expert; Titus, the defense expert at trial; and Daniel Cronin ("Cronin"), the insurance investigator, to demonstrate what a Daubert hearing would have shown. The government called Domingos, the lead fire investigator at the scene who also testified at trial, and Michael Marquardt ("Marquardt"), a special agent with the ATF.

1. Testimony Re: Counsel's Performance

John T. Spinale had the "primary responsibility" for the case; his son, Jay Spinale, helped him in analyzing the scientific evidence and expert witnesses. Evid. Hr'g Tr. 137:18, 170:23-24, 174:6-8. Both testified that they had spent many hours researching and preparing Hebshie's defense but were unable to give specifics. John T. Spinale did remember, however, that he and his son "relied very heavily" on the National Fire Protection Association's "Guide for Fire and Explosion Investigations" or NFPA 921. Id. 137:1-8, see infra note 39.

John T. Spinale's strategy at trial was to attack the quality of the investigation and the

validity of the government's theory about the cause of the fire, and to rebut the motive evidence. Evid. Hr'g. Tr. 129:6-130:10, 131:11-18. When asked why he did not bring a Daubert challenge to the cause-and-origin testimony and the arson evidence, Spinale stated that he "assumed" predecessor counsel Muse had decided not to pursue a Daubert hearing. But he did not believe he had ever spoken with Muse about it.³³ Muse categorically contradicted him. Muse never told Spinale that he had already ruled out filing a Daubert motion or suggested not filing one. Id. at 218:24-219:4. In fact, he was "certain" he had discussed challenging the government's experts with the Spinale. Id. at 219:1-4. Titus underscored Muse's warnings. He warned Spinale about the misuse of canine testimony, the lack of control samples, and the lack of adequate investigation of alternative hypotheses.

Indeed, Spinale conceded there was no strategic reason for the failure to try to exclude or object to the expert testimony:

Q. (Hebshie's habeas counsel) And is it your testimony that if you had had a basis in law or fact to exclude the government's expert testimony, you would have done so?

A. (John Spinale) Certainly I would have objected to or moved to exclude testimony if I thought there was a basis for excluding it.

Q. (Hebshie's habeas counsel) So there was no strategic reason to

³³

Q. (Hebshie's habeas counsel) And you say that prior counsel had decided not to pursue a Daubert hearing. To whom are you referring?

A. (John Spinale) All prior counsel. I was -- I do not recall having a discussion with any prior counsel regarding a Daubert hearing.

Q. (Hebshie's habeas counsel) I think you testified to that earlier. So, what is the basis for the statement that prior counsel had decided not to pursue a Daubert hearing?

A. (John Spinale) Since they had not pursued a Daubert hearing, I made the assumption that they decided not to pursue a Daubert hearing, and maybe that's a poor choice of words, but that's where that word came from.

Q. (Hebshie's habeas counsel) So that was an assumption on your part?

A. (John Spinale) Yes.

Evid. Hr'g Tr. 151:23-152:11.

not do so; am I right?

A. (John Spinale) We did not strategize to allow that in.

Id. at 168:8-15.

When Jay Spinale was asked why he had not moved for a Daubert hearing on canine evidence or objected to it, he stated that his research had shown it to be admissible. Id. at 178:17-179:6. But when asked about why he had foregone a Daubert hearing on the cause-and-origin testimony and the accelerant test, he equivocated. At one point, he stated that he thought the government's experts made the wrong conclusions but not that their testimony was unreliable, id. at 198:21, 199:2; and at another point he stated that he believed that the arson evidence was not the core of the government's case, id. at 199:18-200:11.

I do not credit Jay Spinale's testimony at all. He admitted that he had taken pains not to prepare for the evidentiary hearing in any way; he had reviewed nothing. Id. 204:3-22.

2. Testimony Re: Prejudice

a. Cause-and-origin Testimony

(1) Basement Theory

Cronin, the insurance company investigator, called Domingos to discuss the fire. Domingos told him that it had started in the convenience store. Evid. Hr'g Tr. Ex. 8 at 1; Evid. Hr'g Tr. 234:3-5. Domingos, nevertheless, asked Cronin to call him when he went to the scene because Domingos wanted to go into the basement. When Cronin did so, Domingos did not show up. Evid. Hr'g Tr. 234:11-235:21; see also Evid. Hr'g Ex. 8, at 1 ("Custody of the fire scene had been released; however, Domingoes [sic] requested a call when the scene exam was scheduled, as he wanted to get into the basement."). Cronin testified that it was his usual practice to document the conditions of the basement, but here, he was unable to take a single

photograph. Evid. Hr'g Tr. 237:3-12. The building was then demolished; the basement was inaccessible.

Cronin did, however, take one photograph of the stairs leading down to the basement. See Evid. Hr'g Ex. 13. In fact, it was a photograph with a fuller view of the stairwell. Spinale never asked for any of the photographs from the insurance investigation. Titus testified that he had never seen the insurance photographs until the evidentiary hearing. And the photographs were significant. They showed that the lintel, the bar by the basement staircase that supports the floor, was charred and had significant soot deposits on it, indicating that fire came out of the basement.³⁴

Lentini, Hebshie's second arson expert, testified that the two photographs of the basement stairs (Domingos' and Cronin's) strongly suggested that the fire began in the basement. See Gov't Trial Ex. 12G; Evid. Hr'g Ex. 13. Burning along the lintel and along the top of a ladder in the staircase indicated fire had come up from the basement. Evid. Hr'g Tr. 110:8-18.³⁵ If the fire had started on the first floor, then the stairs down to the basement would not show the signs of fire damage that they did.

Domingos reiterated his view that he did not bother to take photographs in the basement because there were no signs of fire there. Id. at 380:2-381:2. He conceded that he never

³⁴ "The only way that that kind of staining on a very low structural item that is actually below the floor, below the first floor, the only way that that staining can happen is for the fire to be emanating from the basement and moving in a normal upward and outward manner up to the first floor." Id. at 271:17-22.

³⁵ "Let's draw a plane meaning a plane that's floor level. Anything below that is in the basement, and we don't expect the heat from the fire to go down in the basement. The ladder is charred. . . . [T]hat heat can only come from the basement." Id. at 115:3-11.

mentioned his observations of the basement in any report and that the basement stairwell was absent from the government's floor plan of the store introduced at trial.³⁶

Agent Marquardt, a long-time ATF agent and fire investigator, testified for the government, discounting the basement hypothesis based on Myers' (the first-in firefighter) observations. If the fire had begun in the basement, it would have continued to burn because Myers did not extinguish any flames in the basement. Id. at 464:13-15. Marquardt also testified that if there had been fire in the basement, "heavy heat and smoke" would have been "pouring up through that stairwell into that back area," yet Myers did not report seeing any fire back there. Id. at 465:4-7. Further, the "floor should have collapsed into the basement." Id. at 466:15-17.

(2) Building Construction and Burn Patterns

Lentini, the defense expert, testified that, in fact, the left-hand wall was not the area of greatest damage, precisely because the walls in this area were still intact. Id. at 50:21-24. Indeed, he asserted that the government experts' theory of the fire's movement was scientifically impossible. If the fire entered the pipe chase, it would go up, where it had a clear space not five feet to the left through the wall's vertical studs, as Domingos suggested. Id. at 36:-3-13.

Lentini also testified that Domingos' theory and testimony with respect to the movement of the fire³⁷ was based on a faulty understanding of fire dynamics. Id. at 90:2-9. First, the wall paneling next to the supposed point of origin was quarter-inch plywood paneling, which burns extremely easily. See Gov't Trial Ex. 1-14; Evid. Hr'g Ex. 4, 5. If the fire had started there, the

³⁶ When Domingos was asked about the stairwell's location at the evidentiary hearing, he placed it in the wrong area. Id. at 408:4-17. It was behind the partition in the back office area. Id. at 522:6-14.

³⁷ Domingos stated that the "heat source had come as a result of heat banking from this type of chase banking in behind the tin wall radiating and igniting . . ." Trial Tr. vol. 3, 118:5-7.

paneling would have been burned all the way through. Instead, it was only partially burned. Evid. Hr'g. Tr. 36:23-37:10. Second, the government experts concluded that the fire had started on the first floor and then burned upward, based on the "V-pattern." According to Lentini, there was not much of a "V-pattern;" the fire did not interact at all with a shelf just above the alleged point of origin. See Gov't Trial Ex. 1-14; Evid. Hr'g Ex. 4, 5. Typically, a fire would burn upward and then spread out when it hit the shelf; photographs suggested that that did not occur. Evid. Hr'g Tr. 37:10-15. The government's theory would have required the fire to burn up near the alleged point of origin, bypass the shelf, then fall down again near the pipe chase. According to Lentini, it was far more likely that the fire started in the basement, came up through the wall, and then broke out of the wall into the store, a conclusion he contended was reflected in the V-pattern where the wall had burned. Id. at 38:19-39:11. Gov't Trial Ex. 1-10; Evid. Hr'g Ex. 4.³⁸

(3) Thermal Imaging

Lentini disagreed with Myers' interpretation of the thermal imaging "hot spots." If the fire began along the left-hand wall of the store, the thermal image camera would show a "bright spot where the flame was," then the image would darken as it moved farther from that point. Evid. Hr'g. Tr. 47:2-7. Instead, there were white spots all around. The only way for all four walls to show hot spots would be if the entire room were on fire, an observation consistent with a basement fire traveling through the walls. Id. at 46:5-47:7; see also id. at 289:9-12 (Titus testifying) ("[T]he only way for the fire to get into the walls and generate those hot spots is to be able to move up from a lower area where it has access to those channels between the wall studs.").

³⁸ Titus testified that rebuttal witness Miller's conclusion that the grate would have turned "bright red" if exposed to fire was also scientifically incorrect. Evid. Hr'g Tr. 276:17-277:6.

b. Arson Evidence

(1) Canine Evidence

To the Spinales, Titus indicated great concerns about the use of accelerant-detection canines in the scientific community, *id.* at 264:1-14. Titus directed their attention to NFPA 921.³⁹ *Id.* at 259:25-260:7. NFPA 921 circumscribes the use of canines; they are meant simply to be tools to help investigators narrow the search area for ignitable liquids. NFPA 921 § 14.5.3.5 ("Canine ignitable liquid detection should be used in conjunction with, and not in place of, the other fire investigation . . . methods"); *id.* ("The proper objective of the use of canine/handler teams is to assist with the selection of samples that have a higher probability of laboratory confirmation than samples selected without the canine's assistance."). Titus gave the Spinales an article from the *Journal of Forensic Sciences* that highlighted the varying levels of reliability in accelerant detection depending on the substance in question and the canine handler. Evid. Hr'g. Tr. 259:1-7.; Evid. Hr'g Ex. 12 (Michael E. Kurtz et al., Effect of Background Interference on Accelerant Detection by Canines, 41 J. Forensic Sci. 868 (1996)). Titus told them that concerns arose from the fact that the handler has to interpret the dog's actions. Evid.

³⁹ NFPA 921 is promulgated by the Technical Committee of the National Fire Protection Association ("NFPA"), the largest fire protection organization in the world and is widely accepted as the standard guide in the field of fire investigation. (NFPA 921: Guide for Fire and Explosion Investigations (2001).) *See* Evid. Hr'g Tr. 371:6-12, 443:10-16; Fireman's Fund Ins. Co. v. Canon U.S.A., Inc., 394 F.3d 1054, 1058-59 (8th Cir. 2005); Hartford Ins. Co. v. Gen. Elec. Co., 526 F. Supp. 2d 250, 257 (D.R.I. 2007); Royal Ins. Co. of Am. v. Joseph Daniel Constr., Inc., 208 F. Supp. 2d 423, 426 (S.D.N.Y. 2002); Travelers Prop. & Cas. Corp. v. Gen. Elec. Co., 150 F. Supp. 2d 360, 366 (D. Conn. 2001); Technical Working Corp. on Fire/Arson Scene Investigation, Dep't of Justice, Fire and Arson Scene Evidence: A Guide for Public Safety Personnel (2000) (claiming that NFPA 921 is "a benchmark for the training and expertise of everyone who purports to be an expert in the origin and cause determination of fire investigation." *See* Evid. Hr'g. Tr. 371:6-12). Investigators are directed that "no specific hypothesis can be reasonably formed" until all relevant evidence is collected and all hypotheses must be based on data that is "capable of being verified." NFPA 921 §§ 2.3.1-2.3.7.

There was some debate during the evidentiary hearing as to whether the Spinales' reviewed the 2001 or the 2004 NFPA. The 2001 version was introduced at trial; however, counsel do not dispute that for the purpose of the sections cited here, there is no material difference between the two versions.

Hr'g Tr. 262:5-266:23. And he especially underscored the prejudice of allowing the testimony to be described as "accelerant detecting."⁴⁰ What investigators refer to as "accelerants" actually represent a wide range of common and frequently benign materials. In addition, such chemicals can be created by the breaking down of materials during a fire, such as decomposing carpet and other adhesives. "Unlike explosive- or drug-detecting dogs, these canines are trained to detect substances that are common to our everyday environment. . . . [M]erely detecting such quantities is of limited evidential value." NFPA 921 § 14.5.3.5. For these reasons, NFPA 921 requires not just laboratory corroboration, but also comparison samples. Id.⁴¹ And it emphasized concerns about the canine's reliability -- false positives and false negatives. Id. at § 14.5.35; see also, Evid. Hr'g. Exh. 12.⁴²

⁴⁰ The government's experts repeatedly referred to Billy as an "accelerant canine" or an "accelerant-detection dog."

1. DOMINGOS: "Trooper Lynch . . . is trained in accelerant canines for the Fire Marshal's office." Trial Tr. Vol. 3, 42:2-5.
2. LYNCH: There was an opening for an accelerant detection dog I ended up getting a Labrador Retriever as my accelerant detection dog Id. at 141:11-16.
3. GOVERNMENT: [D]escribe what kind of training goes through for an accelerant detection dog. Id. at 144:25-145:3; see also id. at 148:15 ("accelerant detection dog"); id. at 150:11 ("accelerant dog"); id. at 157:13-14 ("accelerant detection canine").

⁴¹ Lentini reiterated many of the same concerns. He stated that the Forensic Science Committee of the International Association of Arson Investigators were so bothered by the use of canine alerts at trial that it issued a white paper. The white paper stated that canines were "[a]n excellent tool for the selection of samples but not appropriate for presentation to juries just because of the potential prejudice. . . . People identify with the dogs." Evid. Hr'g Tr. 54:14-25. Lentini continued that the dog does not add any probative force to the laboratory findings, and is in fact often prejudicial. Id. at 56:2-5. "The laboratory is really the final arbiter of what is in that sample." Id.

Professor Moriarty also underscored reliability problems with canine evidence in the literature and the case. Evid. Hr'g Tr. 343:13-25.

⁴² Titus testified in the evidentiary hearing -- and I credit the testimony -- that his testimony had been prematurely cut off by government counsel and not rehabilitated by the defense on redirect. He had answered that he was prepared to accept "Billy is 100 percent accurate" but was not allowed to explain the concerns about proficiency *testing* and false positives. Evid. Hr'g Tr. 262:5-13, 263:9-16, 264:15-25, 265:3-23.

(2) Laboratory Analysis

According to petitioner's experts, the lack of a comparison sample did not just call into question the investigator's conclusions; it fundamentally undermined its validity, a "critical error," according to Lentini. Evid. Hr'g Tr. 64:22-24. He pointed out that the convenience store had items that would also have tested as "light petroleum distillate." He listed building materials and glue as an example, but noted particular concern that a can of Zippo or Ronson lighter fluid might have been knocked over by the high powered hoses and spread throughout the store with the water. Id. at 48:7-16. Lentini also pointed out that NFPA 921 emphasized the need for comparison samples in such a case as the one at bar. NFPA 921 § 14.5.3.4 provides:

The collection of comparison samples is especially important in the collection of materials that are believed to contain liquid or solid accelerants. For example, the comparison sample for physical evidence consisting of a piece of carpeting believed to contain a liquid accelerant would be a piece of the same carpeting that does not contain any of the liquid accelerant. Comparison samples allow the laboratory to evaluate the possible contributions of volatile pyrolysis products to the analysis and also to estimate the flammability properties of the normal fuel present.

Lentini noted that there was carpet and flooring away from the alleged area of origin that could have been collected. Evid. Hr'g Tr. 45:19-21. In fact, he also pointed out that the carpet in the alleged area of origin was "in very good shape for a carpet that supposedly had ignitable liquid put on it." Id. at 40:13-16. Titus testified that he recounted these concerns about the validity of the laboratory test to the Spinales.⁴³ In effect, without a comparison sample, the test told investigators very little.

⁴³ "[T]hese chemicals were part of the environment. They were part of a newsstand, cigarette lighters, any one of a thousand or any several of a thousand several consumer items that contain hydrocarbons." Evid. Hr'g Tr. 262:21-24.

Moreover, Titus testified that the government's failure to further identify the chemical in the sample was problematic. "[T]he term 'light petroleum distillate' is so generic and reflects so many different kinds of chemicals that either are parts of other products or parts of decomposition products in a fire that it has no meaning with regard to incendiary intent. . . ." Id. at 267:8-13.

III. ANALYSIS

To succeed on his ineffective assistance of counsel claim, Hebshie must show that his counsel's performance was deficient and that he suffered prejudice as a result. Strickland, 466 U.S. at 698.

A. Defense Counsel's Performance Was Constitutionally Deficient

To satisfy the "deficient performance" prong, Hebshie must show that his trial counsel's representation "fell below an objective standard of reasonableness." Id. at 687-88. The reasonableness of counsel's actions is considered in light of "prevailing professional norms." Id. at 688. There is a "strong presumption" that counsel's performance was reasonable. Indeed, courts are to apply "a heavy measure of deference to counsel's judgments." Id. at 691.

The case law describes two lines of cases. In one line, the record may show counsel's entire performance fell below the constitutional minimum. See, e.g., Williams v. Taylor, 529 U.S. 362 (2000) (finding counsel's performance ineffective where he failed to present substantial mitigation evidence to sentencing jury). In the other, the record may indicate that counsel, for the most part, provided adequate performance, yet he or she committed a single, critical error that renders the representation ineffective. Kimmelman v. Morrison, 477 U.S. 365, 386 (1986) (holding that counsel's "total failure to conduct pre-trial discovery" constituted ineffective

assistance); see also Murray v. Carrier, 477 U.S. 478, 496 (1986) ("[T]he right to effective assistance of counsel . . . may in a particular case be violated by even an isolated error of counsel if that error is sufficiently egregious and prejudicial."); Prou v. United States, 199 F.3d 37, 47, 48 (1st Cir. 1999) (finding failure to object to untimely filing that resulted in unlawful mandatory minimum sentence was ineffective assistance); Mason v. Hanks, 97 F.3d 887, 902 (7th Cir. 1996) (finding that failure to raise issue of inadmissible hearsay constituted deficient performance).

This case fits more closely in the latter category. There was not a complete failure of defense (although candidly, counsel's performance came close). Defense counsel consulted with and presented an expert and cross-examined witnesses about some of the inconsistencies in their case. Cf. Dugas v. Coplan, 428 F.3d 317, 342 (1st Cir. 2005) (remanding on ineffective assistance of counsel where counsel did not present an arson expert on defense.) What counsel *did not do* is to move for a Daubert hearing prior to trial on any expert issue. They *did not* seek exclusion of any of the proposed expert testimony which was the core of the arson case, or move for its limitation. *They did not* argue that the expert testimony failed to meet the minimal threshold for reliability of scientific evidence in NFPA 921 and should not have been admitted at all. *They did not* alert the Court to the ways in which the government's investigation undermined their very ability to present a defense.

And their trial performance did not remotely make up for the inadequacies in their pretrial preparation, especially with respect to Lynch and Drugan, the arson evidence witnesses. *They did not* object to Lynch's testimony that went far beyond the proper use of canine evidence. *They did not* object to the government's improper argument about Billy's "failure" to alert

anywhere else in the store, except for where Domingos concluded the fire started. *They did not* object when the government used Billy's failure to alert as substantive evidence of Hebshie's guilt.

I address the Daubert issues generally with respect to all of the expert evidence. I then turn to the unique problems with the arson evidence -- the canine and the laboratory analyses. I then address Domingos' and Miller's testimony.

1. Counsel Erred in Failing to Move for a Daubert Hearing on any Expert Testimony

Scientific evidence, as recognized by Daubert, 509 U.S. 579, and its progeny, requires a different kind of trial preparation for both the court and counsel. Scientific evidence must be "not only relevant, but reliable," that is, "derived by the scientific method" and "supported by appropriate validation." Id. at 589-90. The court must conduct "a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue." Id. at 592-93.

Daubert's extra vigilance is essential for two reasons: First, while opinion testimony is generally excluded, expert witnesses are permitted to opine on the basis of evidence not given to the jury. See Fed. R. Evid. 703. Second, as I have previously written, "a certain patina attaches to an expert's testimony unlike any other witness; this is 'science,' a professional's judgment, the jury may think, and give more credence to the testimony than it may deserve." United States v. Hines, 55 F. Supp. 2d 62, 64 (D. Mass. 1999); see also Michigan Millers Mut. Ins. Corp. v. Benfield, 140 F.3d 915, 920 (11th Cir. 1998) ("The use of 'science' to explain how something occurred has the potential to carry great weight with a jury, explaining both why counsel might

seek to couch an expert witness's testimony in terms of science, as well as why the trial judge plays an important role as the gate-keeper in monitoring the evidentiary reliability of such testimony.").

When scientific evidence does not meet the minimal requirements, advocacy tools that may be effective as to other evidence are not effective here. Just because the testimony has been admitted sends the jury the message that the opinions are entitled to some weight. See N.J. Schweitzer & Michael J. Saks, The Gatekeeper Effect, 15 Psychol. Pub. Pol'y & L. 1, 12 (2009) ("[J]urors assume that judges review scientific evidence before it is presented to them, and that any evidence used in a trial must be above some threshold of quality. Because of these assumptions, jurors seem to be less critical of scientific evidence used in trials and are more persuaded by it."). Cross-examination suffices only when experts have reached different conclusions, but the underlying approach is sound. Where it is not, exclusion, or in some situations, limitation, is the only option. See United States v. Green, 405 F. Supp. 2d 104, 109 (D. Mass. 2005) (limiting the ballistics expert to describing the similarities between the shell casings, but not the ultimate conclusion that they came from a specific pistol "to the exclusion of every other firearm in the world").

Despite ample reasons for defense counsel to be on notice of serious problems with the government's expert evidence -- from Titus, from Muse, arguably from their own investigation⁴⁴ -- they did not request a Daubert hearing as to anything. They *knew* that there were problems in the Domingos cause-and-origin investigation and the Drugan laboratory analysis that undermined their validity; they *knew* that the failure to take a control sample in this case was

⁴⁴ Further, if Jay Spinale was as familiar with NFPA 921 as he testified he was at the evidentiary hearing, Evid. Hr'g Tr. 177:13-16, he should have recognized serious deficiencies in the documentation.

inconsistent with the scientific method and NFPA 921 § 14.5.3.4 (governing collection of comparison samples); they *knew* that the investigation of the basement was inadequate, or at least, not fully documented; and they *knew* or should have known that the canine evidence was supposed to be admitted for only a limited purpose, namely, assisting in the selection of samples that have a "higher probability of laboratory confirmation than samples selected without the canine's assistance," and that testimony beyond those purposes was potentially prejudicial, Evid. Hr'g Tr. 255:1-266:5.

Contesting the reliability of this evidence in a Daubert hearing was plainly within the "prevailing professional norms." By 2006, when Hebshie was tried, the public and professional literature reflected increasing scrutiny of arson evidence by experts in both the scientific and legal fields as well as by the public at large. While counsel need not read every article pertaining to the subject at hand, he must "keep[] abreast of current legal literature and developments." Model Code of Prof'l Responsibility EC 6-2 (1980); see also Strickland, 466 U.S. at 688 ("Prevailing norms of practice as reflected in American Bar Association standards . . . [are] "guides to determining what is reasonable.")⁴⁵

Popular legal casebooks, such as David L. Faigman et al., Science in the Law: Forensic Science Issues (2002), highlighted problems in many cause-and-origin techniques. In addition, in the early 2000s, several reports and articles were published that impugned arson investigatory techniques as well as forensic evidence more generally. Notably, in 2005 Congress passed

⁴⁵ Indeed, in the early 2000s, there were two cases in this Circuit that raised the question of defense counsel's effectiveness in an arson case. See Dugas v. Coplan, 428 F.3d 317, 342 (1st Cir. 2005) (remanding for a hearing on the question of whether counsel was ineffective in not obtaining an arson expert); United States v. Correia, 77 F. App'x. 12 (1st Cir. 2003), aff'g No. 00-10246-RWZ, 2002 WL 31052766 (D. Mass. Sept. 13, 2002) (affirming the trial court's decision to grant a new trial based on counsel's ineffectiveness in not obtaining a defense arson expert, and failing to pursue other defense avenues).

legislation calling for a review of forensic evidence. See Science, State, Justice, Commerce, and Related Agencies Appropriations Act of 2006, Pub.L. No. 109-108, 119 Stat. 2290 (2005).⁴⁶ Even the popular press reported on the concerns raised by forensic evidence. The *Chicago Tribune* ran a series of such articles in 2004, "Forensics Under the Microscope." This series included an exposé on arson evidence. Def.'s Mem. Supp. 2255 Pet. Mot. New Trial Ex. D (Maurice Possley, Arson Myths Fuel Errors, Chi. Trib., Oct. 18, 2004) (document #137-5).⁴⁷

Finally, case law raised concerns about arson expert testimony similar to the concerns raised in this investigation. See, e.g., Fireman's Fund Ins. Co. v. Canon U.S.A., Inc., 394 F.3d 1054, 1058 (8th Cir. 2005) (holding district court's exclusion of expert arson evidence proper where experts failed to compare hypothesis to evidence from scene in violation of NFPA 921); Mich. Millers, 140 F.3d at 920 (finding no abuse of discretion where trial court excluded arson expert's testimony because his methodology did not support his conclusion); Ind. Ins. Co. v. Gen. Elec. Co., 326 F. Supp. 2d 844, 850-51 (N.D. Ohio 2004) (holding that cause-and-origin expert's failure to properly collect evidence, in violation of NFPA 921, Section 9-5.1, "Documenting the Collection of Physical Evidence," made his investigation unreliable.); Am. Family Ins. Grp. v. JVC Am. Corp., No. 00-27 DSD/JMM, 2001 WL 1618454, at *3-4 (D. Minn. Apr. 30, 2001) (excluding expert testimony where expert did not apply methodology recommended by NFPA).

⁴⁶ This legislation resulted in the 2009 National Academy of Sciences Report, "Strengthening Forensic Science in the United States: A Path Forward," that questioned the reliability of forensic evidence used in courts across the country.

⁴⁷ Just a few months before Hebshie's trial began, the Innocence Project Arson Review Committee released its report excoriating the suspect "science" used to convict Cameron Todd Willingham and Ernest Ray Willis of arson and murder. Arson Review Committee, Innocence Proj Report on the Peer Review of the Expert Testimony in the Cases of State of Texas v. Cameron Todd Willingham and State of Texas v. Ernest Ray Willis (2006) (Mem. in Support Ex. A (document #137-1)).

While most of the above cases are civil, it cannot be that science is different in criminal cases than in civil ones. Bad science is bad science; unreliable methodologies are unreliable methodologies, no matter the side of the docket. See Paul C. Giannelli, The Supreme Court's "Criminal" Daubert Cases, 33 Seton Hall L. Rev. 1071, 1111 (2003) ("Daubert has evolved into a stringent standard in civil cases; D. Michael Risinger, Navigating Expert Reliability: Are Criminal Standards of Certainty Being Left on the Dock?, 64 Alb. L. Rev. 99, 149 (2000) (comparing "the heightened standards of dependability imposed on expertise proffered in civil cases" with "expertise proffered . . . in criminal cases [which] has been largely insulated from any change in pre-Daubert standards or approach."). Paradoxically, and perhaps shamefully, this standard has not been consistently imposed in criminal cases.").

There was nothing remotely "strategic" about counsel's failures to request a Daubert hearing on Domingos' testimony. John T. Spinale said so. Evid. Hr'g Tr. 168:8-15. If he believed he could have, he would have tried to exclude the expert testimony. Id. His explanations for not doing so could not be more disingenuous: He claimed that he had not spoken to prior counsel about a Daubert hearing; he just "assumed" that counsel had waived it or that it was too late. I do not credit that testimony. Predecessor counsel Muse was "certain" that he had discussed challenging the government's experts with the Spinales. Evid. Hr'g Tr. 218:24-219:4.

More significant, Spinale could not have reasonably believed that a Daubert hearing was waived when *the Court* asked him over and over again if he wanted such a hearing - even mid-trial. Indeed, the government's claim that Spinale did not move for a hearing because he feared

the Court would be aggravated is absurd. This Court explicitly invited the challenge so that critical scientific issues could be hashed out outside of the presence of the jury.

2. Failure to Challenge Canine Evidence Was Error

As described below, Lynch's testimony about the canine evidence played a role in this case that far outstripped the limited purposes for which canine testimony may be admitted. There were errors of two sorts: First, counsel should have asked for a Daubert/Kumho Tire hearing at the outset. Second, during the trial, counsel plainly should have objected on both Daubert and Rule 403, Federal Rules of Evidence grounds to Lynch's truly extravagant testimony about Billy the dog, her powers, her accuracy, her role in accelerant-detection in general and in this case, and to the government's closing.

a. Failure to Move for Daubert Hearing

The government argues that there was no basis for error in counsel's failure to move for a Daubert hearing in connection with the canine testimony, on three grounds: First, this claim was not included in the defendant's habeas petition; second, canine testimony is not the appropriate subject of a Daubert hearing; and third, the failure to call for one was fully justified by the case law.

There is no question that Hebshie challenged counsel's failure to move for a Daubert hearing on the canine testimony. His habeas petition includes as grounds for his ineffective assistance claim that "[t]rial counsel waived Daubert hearing with respect to . . . use of accelerant-detecting canine" and that "[t]rial counsel failed to object to prejudicial and irrelevant testimony concerning use of canine to locate petroleum derivative." Mot. to Vacate 5 (document #136). Hebshie more than adequately addressed the Daubert issue in his memorandum

supporting his habeas petition, Def.'s Mem. Supp. 2255 Pet. and Mot. New Trial 4, 22 (document #137); the evidentiary hearing, Evid. Hr'g Tr. passim; and the supplemental habeas memorandum; Def.'s Post-Hr'g Mem. Supp. 2255 Pet. 8, 10, 13-15, 25 (document #177).

Next, the government argues -- improbably, to be sure -- that canine testimony is not the appropriate subject of a Daubert hearing because "neither the canine nor its handler is offering expert opinion testimony," just "whether and where the canine" alerted. Gov't Post-Hr'g Mem. Supp. Opp'n Def.'s 2255 Mot. 10 (document #179). The argument is simply extraordinary given the testimony *in this* case. Lynch opined about the dog's superior olfactory capabilities, his unique ability to read the dog, the protocol for canine investigations, how he trains the dog, and even Billy's error rate. Rule 702 of the Federal Rules of Evidence encompasses all "scientific," "technical," and "other specialized" knowledge. Lynch had specialized training and knowledge to assist in his handling of the dog and his interpretation of the dog's reactions. His testimony rested "upon an experience confessedly foreign in kind to the jury's own." Kumho Tire, 526 U.S. at 149. Even if Lynch's testimony were not, strictly speaking, scientific testimony as Daubert suggests, it was surely expert, experiential testimony, which Kumho Tire addresses; either way a hearing was required.

In fact, one court, applying both the federal standard and an analogous state standard, excluded testimony of a canine handler on precisely the grounds argued here. In Farm Bureau Mut. Ins. Co. v. Foote, 14 S.W.3d 512, 518 (Ark. 2000), for example, the Supreme Court of Arkansas affirmed the trial court's exclusion of a canine handler who sought to testify about "the alleged superior ability of his canine partner, Benjamin, to detect the presence of accelerants

after a fire," that he could discriminate between different types of chemicals," and that he had an accuracy rate of "100%." The court held:

[W]e conclude that the proffered testimony concerning the dog's alleged superior ability to detect the presence of accelerants does not pass muster using either the Daubert or Prater [v. State, 820 S.W.2d 429 (Ark. 1991)] analysis. Farm Bureau simply did not make any showing regarding the scientific validity of the evidence. For instance, [the canine handler] did not produce the study allegedly conducted by [the director of the Florida State Crime Laboratory, cited by the canine handler], so there was no way of ascertaining the techniques used or the potential rate of error.

Id. at 520.

Likewise, another court, responding to just the kind of motion that ought to have been filed in the case at bar, excluded the testimony of a dog handler. It did so because the dog's alert was not confirmed by laboratory analysis. And without such confirmation, the dog's alert was in effect being used as substantive evidence of arson. The court noted:

[T]he use of the dog alert as substantive evidence is beyond the accepted scope and application of the technique as described in the NFPA guide. See § 16.5.4.7 (describing the role of canine investigation as "assisting in the location and collection of samples for laboratory analysis"). Use of expert testimony beyond its proper application and scope is neither relevant nor helpful to the trier of fact.

United States v. Myers, No. 3:10-00039, 2010 WL 2723196, at *3 (S.D.W.Va. July 8, 2010). To be sure, this case presents different facts. Billy's "alert" *was* confirmed by the laboratory, albeit with the deficiencies described below (a single sample, a generic result, from a restricted area on the fire scene). But what makes Myers analogous was the way in which the government in this case used Billy's *failure* to alert anywhere else as substantive evidence of guilt.

Several courts have held it in the district court's discretion to admit canine evidence but that fact hardly ends the inquiry. United States v. Berrelleza, 90 F. App'x. 361, 365 (10th Cir. 2004) (finding that failure to subject canine evidence to Daubert hearing was not abuse of discretion); United States v. Paccione, Nos. 99-1211(L), 99-1212, 2000 WL 34251719, at *3 (2d Cir. Feb. 3, 2000) (holding the same); United States v. Marji, 158 F.3d 60, 63 (2d Cir. 1998) (finding no abuse of discretion where the district court admitted canine evidence corroborated by "substantial additional evidence"). Just because an issue involves the exercise of *discretion* does not mean it is automatically admitted. Discretion, after all, only means that the Court can admit, exclude, or limit, based on the facts of the case at bar.

Indeed, the purpose of a pretrial hearing is to help the Court determine just how to exercise its discretion. The hearing is not about whether a particular methodology is valid in general, but whether it was properly applied in this case, and appropriate to the task at hand.⁴⁸ See Kumho Tire, 526 U.S. at 153-54.⁴⁹ Without a Daubert/Kumho Tire hearing to test the metes and bounds of the testimony, the Court may have no idea of the context for the expert testimony -- no idea what the "task at hand" is.

The Court's concerns in Daubert and Kumho Tire apply with special force here:

⁴⁸ See D. Michael Risinger, Defining the "Task at Hand": Non-Science Forensic Science after Kumho Tire v. Carmichael, 57 Wash. & Lee L. Rev. 767, 773 (2000).

⁴⁹ Justice Breyer, in Kumho Tire discusses Daubert's general holding:

[T]he Federal Rules of Evidence "assign to the trial judge the task of ensuring that an expert's testimony both rests on a reliable foundation and is relevant to the task at hand["] . . . [and its discussion of] certain more specific factors, such as testing, peer review, error rates, and "acceptability" in the relevant scientific community, some or all of which might prove helpful in determining the reliability of a particular scientific "theory or technique."

526 U.S. at 141 (internal citations omitted).

First, the appropriate use of canine evidence is merely to assist investigators in the selection of samples, not to replace any other forms of investigation. NFPA 921 § 14.5.3.5 ("Canine ignitable liquid detection should be used in conjunction with, and not in place of, the other fire investigation . . . methods . . .").

Second, NFPA 921 contains a lengthy warning about the proper use of canine evidence and the significant possibility of canine error -- both false positives and false negatives.

"Research has shown that canines have responded or have been alerted to pyrolysis products that are not produced by an ignitable liquid and *have not always responded when an ignitable liquid accelerant was known to be present.*" *Id.* at § 14.5.3.5 (italics supplied); see, also, Evid. Hr'g Ex. 12, Michael E. Kurz et al., Effect of Background Interference on Accelerant Detection by Canines, 41 J. Forensic Sci. 868 (1996). Notwithstanding that caution, the government argued that the jury should consider the dog's *failure* to alert to other areas as substantive evidence that the positive alert was inculpatory. And Lynch opined without objection that Billy was correct 97% of the time and when she was not, it was because of her handler's error. Counsel not only failed to challenge any of this, he could not recall even asking the government for reports on the testing of the dog at issue. Evid. Hr'g Tr. 141:21-25.

Third, NFPA 921 warns that canines are trained to alert to common benign substances. § 14.5.3.5. ("Unlike explosive- or drug-detecting dogs, these canines are trained to detect substances that are common to our everyday environment. . . . [M]erely detecting such quantities is of limited evidential value.").

Fourth, the firefighting operations had severely damaged the building and moved around material within the store. Even if Billy alerted on some materials, the material could be from

somewhere else in the room, or the building. Moreover, Billy was deployed only in Hebshie's store and only in the cleared area on its left side, where Domingos believed the fire had started.

Fifth, Titus expressly warned about the use of the phrase "accelerant-detection" to describe what Billy did. Billy alerted to a broad class of common chemicals, some of which were not "accelerants" in the sense of substances brought into a scene for the purposes of arson.

As NFPA §14.5.3.5 notes:

Unlike explosive- or drug-detecting dogs, these canines are trained to detect substances that are common to our everyday environment. The techniques exist today for forensic laboratories to detect submicroliter quantities of ignitable liquids, but because these substances are intrinsic to our mechanized world, merely detecting such quantities is of limited evidential value.

Sixth, these concerns made Lynch's decision to take only one sample, no comparison or control samples, all the more problematic. True, NFPA 921 § 14.5.3.4 describes instances in which comparison samples may not be necessary for the "valid identification of ignitable liquid residue," but that was not the case here. The ambient environment of the convenience store included a range of common products, which could well have tested positive. The fire itself could have produced substances that would have tested positive. And, in any event, comparison samples were essential precisely to test the observations of the officers on the scene. "The determination of whether comparison samples are necessary is made by the laboratory analyst, but because it is usually impossible for an investigator to return to a scene to collect comparison samples, they *should be* collected at the time of the initial investigation." *Id.* (emphasis added).

Given everything that the Spinales knew about the canine alert *in this case*, it was constitutional error for them not to ask for a Daubert hearing. There was no "imaginable strategic or tactical reason for the omission." Prou, 199 F.3d at 48. While they indicated that

they did not challenge the evidence or ask for a hearing because they thought the evidence was admissible, they were simply wrong. See Evid. Hr'g Tr. 136:1-22, 178:17-25. The testimony *may be* admissible -- but only if certain conditions are met. They were not.

The subsequent testimony of Lynch -- which went so far afield -- made the failure to air these issues in advance in a Daubert hearing all the more troubling.

b. Failure to Object to Lynch's Testimony

The testimony of canine handler Lynch was a lengthy, almost mystical, account of the dog's powers. He went on about the dogs he had trained and his attachment to "his" dogs, including an unrelated dog, Amore, a narcotics-sniffing dog who died six years before the fire at issue. He touted the unique olfactory qualities of the dogs with whom he had worked. He spoke emotionally about his particular relationship with Billy, who had died before the trial, and his uncanny ability to communicate with her. (Lynch's testimony extended over 56 pages of direct examination.) His testimony was frequently entirely subjective -- how strong the alert was, how he understood Billy's expressions, interpreted the sounds she made even in the dark. And he repeatedly vouched for the animal -- that she was 97% accurate, that if Billy were wrong it was the handler's error not the dog's.

Billy was identified as an "accelerant-detection" dog, as if the substance she identified -- "light petroleum distillate" -- was necessarily associated with arson fires; it was not. Lynch was permitted to testify that the dog did not alert to anything else on the premises, Trial Tr. vol. 3, 177:9-15; Trial Tr. vol. 4, 17:22-25, 19:25-20:4, under circumstances when the scientific literature (described above) casts doubt on the significance of the dog's failure to alert, and the testimony suggested that Billy had been directed only to the left side of Hebshie's store.

Although counsel cross examined Lynch, challenging the fact that only one sample was taken, and that Billy was limited to certain areas, and although he conceded that Lynch's testimony was "over the top," Evid. Hr'g. Tr. 148:8, he never objected. Lynch's testimony went far beyond any plausible relevance of the use of a dog to help select the locations for the collection of a sample to be tested.

Indeed, Lynch's testimony was not the first time that the jury heard about Billy's prowess. Even before Lynch testified, Domingos recounted what he had seen when the dog was brought into Hebshie's store, the kind of alert she gave, and what it meant, without objection.

And the theme was recited yet again in the government's closing. The government gave credence to the dog's evidence, far beyond what it deserved, arguing, "Billy knew what she was smelling for. She indicated an alert on one place *and one place alone*. It was a strong alert. If it was the carpet that was setting her off, then she would have triggered everywhere else around her." Trial Tr. vol. 6, 171:5-9 (italics supplied). The Spinales remained silent.⁵⁰

In addition to the grounds described above (which would have provided a basis for a Daubert/Kumho Tire hearing) counsel should have objected to the testimony based on the following:

On the 97% accuracy: There are no peer reviewed standardized methods of training detective dogs; their reliability is in fact highly variable. See NFPA § 14.5.3.5 (concerning false positives and false negatives). Indeed, as of the time the case went to trial, the Journal of Forensic Science had reported the results of studies indicating a substantial error rate with canine alerts, far higher than Lynch was describing. Evid. Hr'g Tr. 343:7-12, see also, Evid Hr'g Ex. 12,

⁵⁰ On the contrary. In John Spinale's closing, he noted how "impressive" Lynch and his dog were. Trial Tr. Vol. 6, 189:10.

Michael E. Kurz et al., Effect of Background Interference on Accelerant by Canines, 41 J. Forensic Sci. 868 (1996). There is no indication that the Spinales had any idea what the 97% was based upon. Lynch apparently just announced the figure ipse dixit.⁵¹

On Lynch's references to drug-detecting and explosive-detecting dogs that he had trained: As the above reference suggests, drug-detecting and explosive-detecting dogs are different from accelerant-detecting dogs, although Lynch's testimony put all such canine evidence in the same category. Drug-detecting and explosive-detecting dogs typically do not alert to substances common in the every day environment.

On the subjectivity of the testimony: Lynch went on and on about what he understood about Billy, as if his relationship with Billy somehow enhanced the reliability and probative value of the results -- that she was unique, that he could "read her face," that he was with her 365 days a year, that he knew her personality, "the way her eyes shifted," the ways her ear shifted, etc.

On taking comparison samples: According to Lynch, his special relationship with his dog justified his failure to take comparison samples. His decision was based on the "type of alert" he had from the dog as well as whether Domingos requested that he take a sample. The need for a comparison sample, however, does not relate to the accuracy of the dog, but to the significance of the laboratory analysis to the investigation -- the chemistry of pyrolysis, the nature of the environment.

⁵¹ See Illinois v. Caballes, 543 U.S. 405, 411-12 (Souter, J., dissenting) ("The infallible dog, however, is a creature of legal fiction. . . . [T]heir supposed infallibility is belied by judicial opinions describing well-trained animals sniffing and alerting with less than perfect accuracy, whether owing to errors by their handlers, the limitations of the dogs themselves, or even the pervasive contamination of currency by cocaine." (discussing drug-sniffing dogs)).

By the end of the testimony, Lynch had gone far beyond the limited purpose for which canine evidence could lawfully be presented. Spinale should have objected under Rule 403 or Rule 702 of the Federal Rules of Evidence to all statements that suggested that the alert had any validity beyond helping the fire investigators to choose samples. And the Spinales' failure to object to Lynch's testimony was exacerbated by their failure to object to the government's closing and their own remarks to the jury.

Billy's alert was not dispositive of either where the fire began or that it was arson. She had not been permitted to go "everywhere" in the fire scene. She had been directed only to an area that was safe for her, and only to the left wall in Hebshie's store. And her olfactory skills and the "strength" of the alert, as understood by Lynch, hardly entitled the jury to conclude that the substance alerted to had a role in an arson, rather than a relatively common light petroleum distillate, especially without comparison samples. In effect, everything that the literature warned about in dealing with canine evidence happened here. Spinale's failure to object was not remotely "sound strategy." Kimmelman, 477 U.S. at 381.

3. Failure to Request a Daubert Hearing on the Laboratory Test and Drugan's Testimony Was Error

A reasonably competent lawyer surely should have moved for a Daubert hearing on the laboratory analysis. The laboratory test proving the presence of an accelerant was *the* most powerful evidence of intent to commit arson. Even if the jury credited Domingos' cause-and-origin testimony -- that the fire began in Hebshie's store -- they did not have to conclude that the fire was arson, particularly given the substances for sale in the store. Not only did John Spinale fail to request a Daubert hearing on the laboratory accelerant test, he stipulated to it. Trial Tr. vol. 3, 181:14-16.

First, a reasonably competent counsel would have challenged the test results of "light petroleum distillate" and their characterization as accelerants. Titus warned the Spinales as much, alerting them that "light petroleum distillate" is such a generic category and includes so many benign chemicals that it literally has no meaning in connection with a finding of "incendiary intent." Evid. Hr'g Tr. 267:8-13.⁵² Spinale's files contained laboratory analysis from K-Chem Laboratories, the experts Muse had retained, which disputed the significance of the finding.

In similar incidences finding petroleum products that are natural to the scene (sold there) is expected. These products heat up normally and the containers will either melt or burst allowing the liquid petroleum product to spill. Even if these products were stored in a different location, the action of the firefighters spraying hoses can move these petroleum products around allowing them to be found in a different location. This in turn can cause accelerant detecting K-9's to find false samples that will mislead investigators.

Evid. Hr'g Ex. 17, at 1-2.

Second, the laboratory results were especially problematic here without comparison samples. NFPA 921, which Jay Spinale claimed that he and his father had read and re-read, underscores the importance of collecting comparison samples when testing for accelerants. See NFPA 921 § 14.5.3.4 ("The collection of comparison samples is especially important in the collection of materials that are believed to contain liquid or solid accelerant."). As described above, the laboratory test was significant only if a substance were found in the fire scene that was not there before, not part of the ambient environment of Hebshie's convenience store, or not produced by the heat of the fire itself.

⁵² Titus also discussed the need for a control sample with the Spinales. Evid. Hr'g Tr. 268:15-269:6.

Spinale was on notice with regard to these problems; there was simply no downside to requesting a Daubert hearing. "Where, as here, an attorney fails to raise an important, obvious defense without any imaginable strategic or tactical reason for the omission, his performance falls below the standard of proficient representation that the Constitution demands." Prou, 199 F.3d at 48; see also Rompilla v. Beard, 545 U.S. 374, 394 (2005) (O'Connor, J., concurring) (finding that counsel's performance was objectively unreasonable where counsel failed to investigate an issue that was "at the very heart of the prosecution's case" and that "threatened to eviscerate one of the *defense's* primary . . . arguments").

4. Failure to Request Daubert Hearing on Cause-and-Origin Evidence Was Error

The government suggests that since there was no reason to doubt the reliability of the cause-and-origin testimony, the Spinales' failure to request a Daubert hearing could not have been deficient. See United States v. Davis, 406 F.3d 505, 509 (8th Cir. 2005) ("[C]ounsel cannot be said to be ineffective for failing to challenge the FBI's methodology on a basis that was not advanced by the scientific community at the time of trial."). The claim is extraordinary. There were surely concerns about which the Spinales were well aware -- the failure to take control samples, to document the investigation of the basement, the interpretation of the thermal camera, inconsistent testimony about the building construction. And, as with the laboratory and canine evidence, there was no reason *not to*.

Here again, the Spinales' failure to ask for a Daubert hearing on Domingos' testimony, prior to trial, or even during the trial when the Court invited him to do so, was not remotely a "strategic choice[]" made after thorough investigation of law and facts relevant to plausible

options," Strickland, 466 U.S. at 690, as the government argues.⁵³ It was not remotely the product of an "informed tactical decision," Rompilla 545 U.S. at 395 (O'Connor, J., concurring), but instead, of a lack of preparation, even thought.⁵⁴ It was error, plain and simple.

B. Counsel's Deficient Performance Prejudiced Hebshie

To satisfy the "prejudice" prong, Hebshie must establish that but for his counsel's deficiency, there is a "reasonable probability" that the outcome would have been different. Peralta v. United States, 597 F.3d 74, 79 (1st Cir. 2010). He need not show "that counsel's deficient conduct more likely than not altered the outcome" of his trial, only "a probability sufficient to undermine confidence in [that] outcome." Strickland, 466 U.S. at 693-94.

With respect to the Rule 403 objections (to Lynch, the government's closing), Hebshie must show that the Court would have sustained the objections and that the exclusion of the testimony would likewise "undermine confidence" in the verdict. With respect to the Daubert issues, Hebshie must demonstrate a reasonable probability not only that the Court would have granted a hearing, but that the outcome would have been exclusion or limitation of the testimony, a result that would have "undermine[d] confidence" in the verdict.

The First Circuit permits courts to examine prejudice cumulatively. "Strickland clearly allows the court to consider the cumulative effect of counsel's errors in determining whether a defendant was prejudiced." Dugas, 428 F.3d at 335 (quoting Kubat v. Thieret, 867 F.2d 351, 370 (7th Cir. 1989)) ("We thus find that these three issues, taken together . . . are sufficient to

⁵³ One can envision how the failure to request a Daubert hearing could be a strategic choice. For example, counsel, fully prepared to cross-examine an expert, and less than certain that the challenges would lead to exclusion after a Daubert hearing, may prefer not to alert the government to the points he or she is likely to make on cross-examination. That kind of strategic calculus was not at all involved in the case at bar.

⁵⁴ Nor is a lack of time a reasonable excuse. Counsel had a year and three months to prepare for trial.

raise a genuine dispute of material fact concerning prejudice."); see also Reiner v. United States, No. 09-118-P-H, 2010 WL 1490303, at *9 (D. Me. Apr. 13, 2010) (evaluating errors cumulatively).

1. Is There a Reasonable Probability the Court Would Have Granted a Daubert Hearing?

The answer is an unequivocally, yes, as to the cause-and-origin testimony, the laboratory accelerant sample, and the canine evidence.

2. Is There a Reasonable Probability That as a Result of the Daubert Hearing, the Court Would Have Excluded or Limited Evidence?

In order to evaluate the outcome of a potential Daubert hearing, the evidence needs to be divided into two categories -- the cause-and-origin testimony, which purported to show where the fire began, on the one hand, and the laboratory and canine evidence, which purported to show that the fire was incendiary in nature. There is no question that had evidence in the latter categories been excluded or limited, even if the cause-and-origin testimony remained, confidence in the verdict would be undermined. I therefore begin with laboratory and canine evidence.

a. Laboratory Accelerant Sample Test

There is a "reasonable probability" the Court would have excluded the laboratory accelerant sample test, for all of the reasons already described:⁵⁵ Investigators did not take any

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The collection of comparison samples is especially important in the collection of materials that are believed to contain liquid or solid accelerants. For example, the comparison sample for physical evidence consisting of a piece of carpeting believed to contain a liquid accelerant would be a piece of the same carpeting that does not contain any of the liquid accelerant. Comparison samples allow the laboratory to evaluate the possible contributions of volatile pyrolysis products to the analysis and also to estimate the flammability properties of the normal fuel present.

comparison samples in direct contravention of NFPA 921 guidelines. They took a sample from only one location -- the area that they had already concluded was the point of origin. Control samples are essential in any experiment or test in order to discount *false positives*. The logic applies even more forcefully here. As even Domingos and Drugan acknowledged, many common materials will test positive for accelerants. Trial Tr. vol. 3, 98:14-99:15; Trial Tr. vol. 4, 48:4-49:6; Lentini Aff. Ex. 4, at 50 ("Forensic Science Committee Positions on Comparison Samples") (document #139-4); see also, Evid. Hr'g Tr. 48:7-16; Evid. Hr'g Ex. 17, (Higgins' Letter), at 1-2. Moreover, the laboratory result was generic and broad classification into which a host of benign materials may fall.

The government argues that the single sample would have passed Daubert scrutiny because NFPA 921 states that while multiple samples are desirable, "[i]t is recognized that comparison samples may be unavailable due to the condition of the fire scene. It is also recognized that comparison samples are frequently unnecessary for the valid identification of ignitable liquid residue." NFPA 921 § 14.5.3.4. That reasoning simply does not apply here.

One sample was demonstrably unreliable here. Without a control, the jury could not know if "light petroleum distillate" was found on the carpet because Hebshie used an ignitable liquid to start a fire or because of something in the ambient environment or a product of the fire. A test without a control is as good as no test at all.

Making matters worse, the investigator's failure to collect additional samples was compounded by the razing of the building. The defense had no way to contest the significance of the laboratory test. They were entirely dependent on the government's limited investigation.

NFPA 921 § 14.5.3.4.

See NFPA 921 § 14.3 ("Every attempt should be made to protect and preserve the fire scene as intact and undisturbed as possible Generally, the cause of a fire or explosion is not known until near the end of the investigation. . . . As a result, the entire fire scene should be considered physical evidence and should be protected and preserved.)."

As the Supreme Court pointed out in Kumho, when performing a Daubert inquiry, the relevant question is "not the reasonableness *in general*" of a particular methodology, but "the reasonableness of using such an approach . . . to draw a conclusion regarding *the particular matter to which the expert testimony was directly relevant*." Kumho Tire Co., 526 U.S. at 153; see also Faigman et al., supra, at § 7-1.1. (Daubert's "gatekeeping requirement would be defeated if multiple techniques were allowed to hide behind a global claim of expertise. In other words, Daubert appears to require that an expertise be unpacked, so that the court can permit those methods and principles it is persuaded are valid, and only those, to be offered to the factfinder. Kumho Tire makes that requirement explicit").

The government cannot just say that in some situations, or in general, a single sample will suffice. They have to show that *in this case, on these facts*, a single sample was reliable. And it was not.

b. Canine Evidence

There is also a "reasonable probability" that the Court would have excluded the canine testimony or severely limited it. If the laboratory accelerant test were excluded, the canine alert would also have been excluded. NFPA 921 § 14.5.3.5 warns: "Any canine alert not confirmed by laboratory analysis should not be considered validated." If the dog alerts on a specific spot, the investigators know there is a better chance that laboratory analysis will reveal the presence of

an accelerant. But without laboratory corroboration, the canine alert is questionable. See Carr v. State, 482 S.E.2d 314, 318 (Ga. 1997), (overturning a murder conviction because laboratory sample tested negative for the presence of accelerants), (*overruled on other grounds by Clark v. State*, 515 S.E.2d 155 (Ga. 1999)). .

In any event, apart from the laboratory test, if, at a Daubert hearing, the government had presented an offer of proof mirroring Lynch's testimony, there is no question that testimony would have been severely limited or excluded and if it had not been excluded or limited before the trial, it would have been excluded afterwards as Lynch began to wax poetic about his dog's unique prowess. As noted above, NFPA 921 and the scientific literature have accepted canine alerts *only* as tools to help investigators narrow the search area. Lynch's testimony went far beyond that.

c. Cause-and-Origin Testimony (Domingos and Miller)

Domingos (and Miller on rebuttal) testified both as to cause-and-origin and their conclusion that the fire was arson. As to the latter testimony -- that the fire was arson -- there is surely a "reasonable probability" of exclusion. Without a valid accelerant laboratory test, Domingos' and Millers' opinions that the fire was incendiary was simply not reliable.

Whether I would have allowed Domingos and Miller to conclude that the fire started in Hebshie's store is a closer question. Domingos' interpretations of the burn patterns, the heating grate, and other such evidence likely would have been admitted since they were his opinions based on his observation of the scene and experience in other fire scenes. While defense counsel had disagreed with these interpretations, they countered through cross-examination and rebuttal

testimony, although, to be sure, examination that was not as effective as it could have been had there been a hearing.

I have greater concern about the investigator's failure to document any other potential cause -- take photographs of the basement, take samples from other areas of the store for laboratory analysis. See Pekarek v. Sunbeam Prods. Inc., 672 F. Supp. 2d 1161, 1176-77 (D. Kan. 2008) (allowing expert testimony ruling out specific items as possible causes of fire but excluding opinion that cause of fire was electrical blanket where expert failed to follow reliable methodology). Petitioner argues that Domingos' failure to abide by essential steps in the scientific method means that his conclusions were not supported by "appropriate validation," Daubert, 509 U.S. at 590, or "accompanied by a sufficient factual foundation;" Boucher v. U.S. Suzuki Motor Corp., 73 F.3d 18, 22 (2d Cir. 1996) (quoting Gumbs v. Int'l Harvester, Inc., 718 F.2d 88, 98 (3d Cir. 1983)).⁵⁶

With the building demolished shortly after the fire, there was no way for investigators to test other hypotheses about how the fire started. While the government pointed to the sizable number of pictures taken -- over a hundred -- proper documentation is about quality, not just quantity. See Ind. Ins. Co. v. Gen. Elec. Co., 326 F. Supp. 2d 844, 850-51 (N.D. Ohio 2004) (holding that cause-and-origin expert's failure to properly collect evidence, in violation of the

⁵⁶ NFPA 921 repeatedly insists on the importance of documenting the investigation. NFPA 921 § 13.1 states: "Thorough and accurate documentation of the investigation is critical because it is from this compilation of factual data that investigative opinions and conclusions will be supported and verified." See also id., at § 13.2 ("A visual documentation of the fire scene is "the most efficient reminder[] of what the investigator saw while at the scene. Patterns and items may become evident that were overlooked at the time the photographs or videos were made."); id. at § 14.3 (Preservation of the Fire Scene and Physical Evidence). Section 13.2.5.6(a) directs investigators to take photographs of areas near the supposed point of origin, *even if there is no visible damage*. See id. at § 13.2.5.6(a) ("Rooms within the immediate area of the fire origin should be photographed, even if there is no damage."). The DOJ Manual, Fire and Arson Scene Evidence, supra, at 29-30, similarly emphasizes the necessity of proper documentation.

section of NFPA 921 entitled, "Documenting the Collection of Physical Evidence," made his investigation unreliable).

Documentation is necessary to test a hypothesis; in fact, reproducibility is the sine qua non of "science."

[A] key question to be answered in determining whether a theory or technique is scientific knowledge . . . [is] whether it can be (and has been) tested. 'Scientific methodology today is based on generating hypotheses and testing them to see if they can be falsified; indeed, this methodology is what distinguishes science from other fields of human inquiry.'

Daubert, 509 U.S. at 593 (quoting Michael D. Green, Expert Witnesses and Sufficiency of Evidence in Toxic Substances Litigation: The Legacy of Agent Orange and Bendectin Litigation, 86 Nw. U. L. Rev. 643, 645 (1992)); see also id. (quoting Karl Popper, Conjectures and Refutations: The Growth of Scientific Knowledge 37 (5th ed. 1989) ("[T]he criterion of the scientific status of a theory is its falsifiability, or refutability, or testability"). The government experts had it both ways; their documentation had significant gaps and the scene was long gone.

In Chester Valley Coach Works v. Fisher-Price, Inc., No. Civ. A. 99 cv 4197, 2001 WL 1160012 (E.D.Pa. Aug. 29, 2001), the trial court excluded expert testimony under Daubert where the expert failed to follow the scientific method set out in NFPA 921. The expert "put[] the cart before the horse" by approaching his fire investigation with a hypothesis already in place, id. at *5, and never seriously considered other possible causes of the fire; id. at *7. Similarly, in Bryte ex rel. Bryte v. Am. Household, Inc., 429 F.3d 469 (4th Cir. 2005), the Fourth Circuit held that where the fire expert failed to consider and rule out other possible causes, his inspection was properly excluded for being "inconsistent with the NFPA standards, which require investigators

to exclude "[a]ll other reasonable origins and causes." Id. at 478 (quoting NFPA 921 § 2-3.6 (1999 ed.)).

In Fireman's Fund Ins. Co. v. Canon U.S.A., Inc., 394 F.3d 1054, 1058 (8th Cir. 2005), the Eighth Circuit held that the district court appropriately excluded expert cause-and-origin testimony where the experts failed to "carefully examine[] th[eir] hypothesis of fire origin against empirical data obtained from fire scene analysis and appropriate testing, as required by NFPA 921." Id. at 1059; see also Pekarek v. Sunbeam Prods, Inc., 672 F. Supp. 2d 1161, 1176 (D. Kan. 2008) ("[T]roubling is [the expert]'s failure to investigate or consider the significance of the two tripped or off circuit breakers in the panel, and whether their condition provided any evidence of the source of the fire. Additionally, [his] report and deposition testimony reflect a failure to fully account for what was obviously a possible alternative cause of the fire. . . .").

Because Miller's conclusion vis-a-vis the cause of the fire is drawn entirely from Domingos' testimony and report, it presents the same problems. Miller never went to Hebshie's store. (Indeed, it was long gone. Trial Tr. vol. 6, 136:25-127:1. He testified that he based his opinions on the fire marshal's report and photographs, the ATF reports, a time sheet from the alarm company, and an additional interview he conducted with Domingos.⁵⁷ Id. at 109:19-25, 113:18-114:1. He did no independent evaluation of the evidence. And while Miller gave his

⁵⁷ Q: And any opinions that you've [sic] drawing today or in the past are based in part on your conversations with Mr. Domingos; isn't that true?
A: Some of the conclusions, yes.

Trial Tr. vol. 6, 137:16-19.

opinion with certainty, he acknowledged the incomplete nature of the investigation and that evidence regarding the basement would have been important. Id. at 138:10-23.⁵⁸

Testimony similar to that of Miller was excluded in Weisgram v. Marley Co., 169 F.3d 514, 519-20 (8th Cir. 1999). In Weisgram, the Eighth Circuit held that the district court had abused its discretion in admitting the testimony of two experts on the cause-and-origin of a fire. It held that opinions given by Freeman, the fire captain who investigated the scene, about the cause of the fire should have been excluded because they were not supported by the record. It also excluded the testimony of an electrician, who based much of his conclusions on the faulty observations and opinions of Freeman. Id. at 519l; see also Kozar v. Sharp Elecs. Corp., No. 04-901, 2005 WL 2456227, at *3 (W.D. Pa. Sept. 30, 2005) (excluding expert report where expert failed to comply with NFPA 921 and his report was based primarily on opinion of another expert, who was precluded through Daubert).

Nevertheless, I need not reach that question of whether I would have excluded Domingos' and Millers' cause-and-origin testimony. As I describe below, the exclusion of the laboratory analysis and the limitation of the canine evidence would surely be enough to undermine confidence in this verdict. Without them, Domingos' and Millers' cause-and-origin testimony was not enough to prove a crime. Just because the fire may have started in Hebshie's store does not rule out accidental ignition.

3. Is There a Reasonable Probability That Exclusion or Limitation of the Expert Evidence Would Have Undermined Confidence in the Verdict?

⁵⁸ He repeatedly limits his conclusions to "the information given to him." See id. at 112:1-2 ("It is the lowest burn that I have information about being at and near floor level."); Id. 112:2-3 ("I have no information that there was any fire in the basement."); id. at 113:25-114:1 ("[E]limination of other factors based on the information I received.").

The Court considers three factors in its prejudice inquiry: first, the strength of the state's case; second the effectiveness of the defense's case at trial; and third, the effect of the evidence's exclusion in undermining the government's case. Gonzalez-Soberal v. United States, 244 F.3d 273, 278 (1st Cir. 2001).

The government's case consisted of (1) the accelerant laboratory test and canine evidence; (2) the cause-and-origin testimony placing the fire's location in Hebshie's store; and (3) evidence about Hebshie's motive, including testimony that he owed \$5,000 to the lottery, that a potential buyer had fallen through, that Hebshie had a \$30,000 insurance policy, and that he had been uncooperative with the insurance claims investigator.

Without the laboratory test or the canine evidence, there was no other direct evidence of arson.

The motive testimony was not substantial and, to a degree, was undercut by other evidence. First, the fact that Hebshie left just minutes before the alarm went off cuts both ways. It could suggest that he set the fire and took off. At the same time, the fact that Hebshie set the alarm with his personal passcode makes arson more improbable. Similarly, the timing of the fire seems very risky for a relatively small award. It makes little sense to set a fire at the busiest time of day -- midday on a Saturday -- when both other stores in the building were open and there might be foot traffic on the street?

The government argues that counsel's errors did not prejudice Hebshie because Spinale cross-examined Domingos and Drugan about the lack of a control and the possibility that the positive could have come from other products. But as has already been shown, cross-examination was not remotely to deal with severe and fundamental problems with the laboratory

test and the canine evidence. Indeed, to say that the exclusion of either the accelerant laboratory analysis or the canine evidence would have undermined this verdict and grievously prejudiced Hebshie, is an understatement. There would have been no case at all.⁵⁹

IV. CONCLUSION

As Larry A. Hammond, past president of the American Judicature Society, noted:

By routinely allowing into evidence expert testimony that we know should have been excluded, and by closing courthouse doors to claims for redress after conviction, the courts have contributed to the problems we face today.

Larry A. Hammond, The Failure of Forensic Science Reform in Arizona, 93 *Judicature* 227, 2 (2010). In fact, he suggested, one thing that each of the cases in which there have been wrongful convictions necessarily have in common is that each were presided over by a judge, an appellate court, and typically had post conviction habeas review. And then he concluded:

One would hope that with the announcement of every exoneration, the judges across whose desks these cases passed would pause to ask, 'what can we do to make sure that this doesn't happen again?'

This Court recognizes the importance of finality in criminal cases, particularly after time and resources have gone into the trial, and after a jury has pronounced guilt. But finality cannot trump fairness or justice. If Hebshie's defense of serious charges was fatally undermined by ineffective counsel, I am duty bound to say so. Therefore, Hebshie's habeas petition is

GRANTED.

⁵⁹ Hebshie also claims Strickland errors in the Spinales' failure to object to testimony that a firefighter suffered a heart attack. I agree. Indeed, counsel's error in not objecting to this testimony was compounded by this Court's error. The Court wrongly overruled counsel's objection to testimony concerning how much money the owners of the other stores lost. Finally, Hebshie claims a Strickland error in connection with counsel's failure to object to the Court's erroneous mail fraud instruction. See United States v. Hebshie, 549 F.3d 30, 31 (1st Cir. 2008). While I agree that these two errors represent deficient performance, standing alone, they did not prejudice Hebshie.

SO ORDERED.

Date: November 15, 2010

/s/ Nancy Gertner

NANCY GERTNER, U.S.D.C.