

CERTIFIED FOR PUBLICATION
IN THE COURT OF APPEAL OF THE STATE OF CALIFORNIA
FIRST APPELLATE DISTRICT
DIVISION THREE

THE PEOPLE,
Plaintiff and Respondent,
v.
RAYMOND TIDD,
Defendant and Appellant.

A167548

(City & County of San Francisco
Super. Ct. Nos. CRI21008732,
SCN234453)

When a party seeks to introduce expert testimony, the trial court acts as a “‘gatekeeper’” to exclude testimony that lacks a reasonable basis. (*Sargon Enterprises, Inc. v. University of Southern California* (2012) 55 Cal.4th 747, 753, 770 (*Sargon*)). The question before us is whether the trial court adequately played this role, when it allowed a firearms toolmark analyst to testify that a cartridge case recovered from a crime scene had been fired from a particular gun.

After hearing the analyst’s testimony, a jury convicted defendant Raymond Tidd of assault with a firearm and discharge of a firearm from a motor vehicle. (Pen. Code, §§ 245, subd. (b), 26100, subd. (c); undesignated statutory references are to this code.) On appeal, defendant argues the firearms toolmark analyst provided no sufficient basis for his opinion matching the cartridge case to the gun. We agree, and because admission of this opinion testimony was prejudicial, we reverse the judgment.

BACKGROUND

The Shooting and Investigation

At approximately midnight on October 7, 2020, the victim of defendant's crimes left his friend's apartment in San Francisco to walk home. He had been drinking and was intoxicated. According to surveillance footage, a white sport utility vehicle (SUV) drove past the victim and then backed up to where he was walking on the sidewalk. The driver got out of the SUV and spoke briefly with the victim. When the driver got back into the SUV, the victim raised his middle fingers as the SUV drove away. The driver then quickly and erratically returned in the victim's direction. Two gunshots were fired, the second hitting the victim in his leg.

The victim remembered no details about this altercation or the shooting. Other witnesses saw the SUV speed away, but did not see the driver or whether the vehicle had other occupants. Witnesses could not identify the make, model, or license plate number of the SUV, but police issued a bulletin seeking the vehicle as depicted on the surveillance video: a large, white Mercedes SUV with silver metallic rims. Investigators also located a nine-millimeter Luger cartridge case, manufactured by Speer, on the street near where the shooting took place.

Six days after the shooting, officers located an SUV in San Francisco they believed had been used in the crime, based on its being a white Mercedes with similar body shape, window tinting, rims, grill, and moon roof. When Tidd approached the vehicle, they arrested and searched him, finding the keys to the SUV, a loaded gun, and an unfired nine-millimeter Luger cartridge manufactured by Speer. An unfired nine-millimeter cartridge, also manufactured by Speer, was recovered from the center console of the SUV. And Tidd's cell phone data showed that at 12:11 a.m. on October 8, his phone

had been connected to a cell phone tower about a mile and a half from the crime scene, indicating it was in the same general area just after the crime.

Investigators submitted for analysis the cartridge case found on the street near the shooting and the nine-millimeter Sig Sauer pistol found on defendant's person at the time of his arrest.

Legal Proceedings

Defendant was charged with attempted murder (§§ 187, subd. (a), 664; count one), assault with a semiautomatic firearm (§ 245, subd. (b); count two), and discharging a firearm from a motor vehicle (§ 26100, subd. (c); count three). The information further alleged Tidd personally and intentionally discharged a firearm while committing attempted murder, causing great bodily injury (§ 12022.53, subd. (d)); and he personally used a firearm when committing a felony (§ 12022.7, subd. (a)). On these counts, Tidd proceeded to jury trial. In addition, Tidd was charged with and pled guilty to possessing a firearm as a felon (§ 29800, subd. (a)(1)); carrying a loaded firearm in public as a felon (§ 25850, subd. (a)); and carrying a concealed firearm as a felon (§ 25400, subd. (a)(2)).

At trial, in addition to the evidence previously described, the People called a criminalist with the San Francisco Police Department by the name of Jacobus Swanepoel, offering him as an expert on firearms analysis, comparison, and identification. Swanepoel testified that he had completed coursework in, and had many years of experience doing, firearms-related toolmark comparisons. He testified to being a member of the Association of Firearm and Tool Mark Examiners (AFTE), although he admitted he had never taken a competency test AFTE administers to certify firearms toolmark examiners. He explained that in this case he had compared two crucial pieces of evidence: the single fired cartridge case the police department had

submitted for analysis and a “test fired” cartridge case known to have been fired from the nine-millimeter Sig Sauer pistol.

Having compared the two cases and found “sufficient” similarities between them, Swanepoel announced his opinion, over defendant’s *Sargon* objection, that “both [the analyzed] cartridge case, and this test fire w[ere] fired in the same firearm.” Swanepoel did not qualify, hedge, or otherwise admit to any uncertainty with regard to this opinion. And when asked whether a different firearm could have fired the analyzed case, he first offered this platitude—“I haven’t compared every firearm in the world”—and then asserted “it would be rare to find another firearm that exhibits that same signature or pattern or fingerprint.”

The basis for Swanepoel’s certitude was not apparent from his trial testimony. On cross-examination, he admitted there was “no threshold or standard about how similar two items of evidence have to be” for him to identify them as a match. He explained that he had photographed enlarged views of six aspects of the two cartridge cases where the impressions and striations (i.e., dings and scratches) were similar on the two items. But he freely admitted that in his photographs juxtaposing aspects of the cartridge cases there were also “differences intermingled with the similarities,” *and* that there were differences between the two items apparent in each of four comparison photographs the defense exhibited. None of these observed differences shook his confidence, however, and Swanepoel offered no explanation for why he found the similarities more compelling than the differences. Swanepoel testified he does not “count up to see if there are more similarities or more differences,” and he requires “no set number of markings” to identify a match. He simply makes a subjective judgment call about “the pattern overall.”

Swanepoel’s trial testimony was consistent with testimony he had earlier provided at a pretrial hearing, held pursuant to Evidence Code section 402. Defendant had moved to exclude or limit Swanepoel’s testimony, citing *People v. Kelly* (1976) 17 Cal.3d 24 (*Kelly*) and, in the alternative, *Sargon* and a case applying *Sargon* to firearms toolmark evidence. (See *People v. Azcona* (2020) 58 Cal.App.5th 504 (*Azcona*)). At the hearing on the motion, Swanepoel’s testimony was in some respects more detailed than the testimony he later provided at trial, but the additional information offered little of substance. Pretrial, Swanepoel testified that his opinion was based on, not only his own “training and experience,” but also unnamed “validity studies that have been published in the field that establish[] what individualization is, what it looks like, what firearms examiners typically look for and evaluate.” He explained that in comparing the cartridge cases in this case he had used “the AFTE theory of identification.” But he also admitted this “theory” was basically just “a verbalization . . . that we can offer an opinion of common origin” when we conclude “[t]here is a sufficient quality and quantity of marks” that look similar, and when the similarities exceed what we would expect from different firearms. Unlike in fingerprint comparisons, where Swanepoel said a match requires 10 or 11 points of favorable comparison, with firearms toolmarks “[t]here is no specific standard.”

Swanepoel was asked, on cross-examination at the pretrial hearing, about two reports put out by the National Academy of Sciences (NAS) and a third report, by the President’s Council of Advisors on Science and Technology (PCAST), expressing concern about the reliability of firearms-related toolmark analysis. The 2008 NAS report, entitled “Ballistic Imaging,” concluded “[t]he validity of the fundamental assumptions of uniqueness and

reproducibility of firearms related tool marks has not yet been fully demonstrated.” (National Research Council of the National Academies, *Ballistic Imaging* (2008), at pp. 81–85, boldface omitted.) A NAS report the following year reached a similar conclusion, as did the 2016 PCAST report.¹ Swanepoel’s response to these studies was to point out their limitations and to assert the science had progressed since 2008. He did not, however, cite a single study, new or old, to support the uniqueness of firearms-related toolmarks, even though this assumption—that an individual firearm actually has a detectable “signature”—was the bedrock on which his entire opinion was built. Nor did he cite any evidence that the results obtained by trained practitioners of the AFTE theory of identification were reproducible and reliable, let alone that he personally had ever demonstrated success in correctly determining when two cartridge cases had been fired in the same gun.

At the conclusion of the pretrial hearing, the trial court largely denied defendant’s motion, ordering only that Swanepoel refrain from asserting his opinion “to a scientific certainty.”

At the conclusion of the trial, the jury failed to reach a verdict on the attempted murder charge but found defendant guilty on the other two felony counts, and found true that defendant personally used a firearm and personally inflicted great bodily injury. (§§ 12022.5, subd. (a), 12022.7, subd. (a).) The trial court sentenced defendant to nine years and eight months, and this appeal ensued.

¹ (See National Research Council of the National Academies, *Strengthening Forensic Science in the United States: A Path Forward* (2009), at p. 154; President’s Council of Advisors on Science and Technology, *Forensic Science in Criminal Courts: Ensuring Scientific Validity of Feature-Comparison Methods* (2016), at pp. 68, 104–112.)

DISCUSSION

Defendant contends the trial court abused its discretion by permitting Swanepoel to opine that the bullet case found at the scene of the shooting matched a test cartridge fired from defendant's gun. According to defendant, " 'match' " testimony is unreliable because there is no scientific basis for a conclusion that every gun has a unique signature and because no objective standards govern whether there are sufficient similarities between the markings for an expert to find a match. He argues the expert testimony should have been limited to allowing Swanepoel to point out consistencies between the recovered cartridge case and a test cartridge case and to opine that the gun could not be excluded as the source of the recovered cartridge case. We review the trial court's decision on the permissible scope of Swanepoel's opinion for abuse of discretion. (*Azcona, supra*, 58 Cal.App.5th at p. 513.)

To begin with an admittedly unlikely hypothetical: Suppose the prosecution had sought to introduce expert testimony from a palm reader who, after careful study of the lines on defendant's hands, was prepared to testify as to certain events in defendant's past—perhaps including whether he had committed the offense with which he was charged. The witness would testify to having trained with experts in ancient Indian and modern European palmistry, to having decades of experience in reading palms, and to having conducted her examination of defendant's hands in compliance with best practices set forth by the professional association of which she was a member.² She would explain, with the aid of an enlarged photograph of

² The World Divination Association publishes a manual for palm readers with chapters explicating "[m]ajor [l]ines," "[m]inor [l]ines," and "[m]arkings." (Savory & Puhle, *Palmistry Manual: World Divination*

defendant's palm, exactly which lines and patterns formed the basis for her opinion. And she would acknowledge that her opinion was subjective, even as she insisted that the possibility of its being wrong was remote. Would this testimony be admissible under *Sargon*? Of course not.

Is Swanepoel's testimony appreciably different? On this record, we cannot say that it is. The People introduced *no* studies to support the assumptions on which his forensic technique relies, and *no* evidence that Swanepoel's admittedly subjective assessment was in any way reliable. As the proponents of this evidence, the People failed to establish a reason to believe the opinion they sought to introduce could be trusted, other than the fact that, like our hypothetical palm reader, Swanepoel had "training and experience" in the technique he chose to employ. Perhaps Swanepoel's method is sufficiently reliable that, in an appropriate case, his opinion that two cartridge cases were fired in the same gun could properly be admitted in a court of law. Perhaps not. The problem in this case is that the People failed to introduce evidence of the reliability of his methods, and they are not entitled to a presumption of reliability. *Sargon* demands more.

I.

In *Sargon*, our high court charges a trial court with acting "as a gatekeeper to exclude" expert opinion testimony that is "based "on

Association (2022) <<https://www.amazon.com/Palmistry-Manual-World-Divination-Association/dp/B09S65SYGT>> [as of Aug. 28, 2024].) The Association of Independent Readers and Rootworkers "promotes quality service and ethical conduct" among its members with training requirements, accreditation, recommendations, and guidance. (<https://www.readersandrootworkers.org/wiki/About_the_Association_of_Independent_Readers_and_Rootworkers> [as of Aug. 28, 2024].) It also offers an introduction to palm reading. (<<https://www.readersandrootworkers.org/wiki/Category:Palmistry>> [as of Aug. 28, 2024]).

assumptions of fact without evidentiary support,” ” or on guesswork and conjecture. (*Sargon, supra*, 55 Cal.4th at p. 770.) “The trial court’s gatekeeping role does not involve choosing between competing expert opinions,” but it does require the trial court to make a “preliminary determination whether the expert opinion is founded on sound logic.” (*Id.* at p. 772.) The trial court must “ ‘determine whether, as a matter of logic, the studies and other information cited by experts adequately support the conclusion that the expert’s general theory or technique is valid.’ ” (*Ibid.*)

Applying *Sargon* here, the problem is not that blue-ribbon panels have expressed doubts about firearms toolmark analysis, though they have. The problem is that Swanepoel cited no studies or other information to support the validity of his technique. *Sargon* leaves to the jury the task of declaring a victor in the proverbial battle of experts, but it allows a contestant to take the field—or an expert to take the stand—only after demonstrating that “ ‘as a matter of logic, the studies and other information’ ” on which the expert relies adequately support the conclusion the expert has drawn. (*Sargon, supra*, 55 Cal.4th at p. 772.) That showing was never made here.

To be sure, a portion of Swanepoel’s testimony is unobjectionable under *Sargon*. There are two stages to his comparative analysis, and the problems do not arise until the second. The first stage involves “class characteristics,” which are “features that the manufacturer designs” into the firearm, such as “the number of lands and grooves down the barrel or the direction of twists of that barrel.”³ When a weapon is fired, these features leave characteristic

³ Lands are interior portions of a rifled barrel that lie between grooves that are carved into the barrel to put a stabilizing spin on a bullet as it travels down the barrel after firing. (*A Simplified Guide to Firearms Examination*, Common Terms)

marks on a cartridge case. If class characteristics differ, for example if the barrel of a firearm has rifling with a right-hand twist but the marks on a cartridge case indicate a left-hand twist, the analyst can rule out a match. But because class characteristics are, by definition, characteristics common to an entire class of firearms, they can only be used to rule out a match, not to make one. Defendant does not challenge the admissibility of Swanepoel's opinion to the extent it is based on common class characteristics. In the trial court and on appeal, he acknowledges Swanepoel could permissibly testify that the two cartridges are sufficiently similar that the Sig Sauer pistol could not be excluded from the class of firearms that could have fired the cartridge case submitted for analysis.

Because class characteristics did not rule out a match in this case, Swanepoel proceeded to a second stage, in which he considered what he calls "individualized characteristics." Swanepoel testified that individualized characteristics may be random, unintended results of the manufacturing process. Or they may result from heavy use of a firearm over time. He asserted that these characteristics lend every firearm "its own signature or its own fingerprint," and that, where there is "sufficient agreement in individual characteristics" between a test fire and an unidentified cartridge case, an analyst can affirmatively conclude that both were fired in the same firearm. Swanepoel offered no studies to support this theory. He pointed to no track record of success for its practitioners. And unlike the analysis of class characteristics, this theory rests on assumptions not apparent to a lay jury. Indeed, when jurors were given an opportunity to submit questions for Swanepoel, one juror asked whether "another firearm of the same make"

<<https://www.forensicsciencesimplified.org/firearms/glossary.html>> [as of Aug. 28, 2024].)

would leave “a similar impression on the cartridge.” Swanepoel responded that, except as to class characteristics, it would not. Nowhere in his testimony before the jury or at the pretrial hearing did he cite evidence for this crucial assumption underlying his analysis.

Yet Swanepoel opined, not that the two cartridge cases “could have been” fired in the same firearm, or even that they “likely were”; he flatly asserted they “*were* fired in the same firearm.”⁴ (Italics added.) Swanepoel admitted he had no “statistics or probabilities” to support his opinion or to quantify an appropriate level of certainty for it, and he offered no studies or competency test results to back it up. In the complete absence of any such supporting evidence, we must conclude Swanepoel’s opinion was “based on a leap of logic or conjecture,” and was therefore inadmissible over a *Sargon* objection. (*Sargon, supra*, 55 Cal.4th at p. 772.) *Sargon* requires the trial court to serve as a gatekeeper, not to wave an expert witness through when he flashes a badge. On the record in this case, the trial court abused its discretion in admitting Swanepoel’s opinion that the analyzed cartridge case and the test fire “were fired in the same firearm.”

⁴ On cross-examination, Swanepoel agreed with the proposition that it was “more likely than not that this [Sig Sauer pistol] fired the cartridge casing” he was analyzing, but he immediately explained that as a firearms examiner this was not language he would use to express his conclusion. Then he explained that by agreeing to “more likely” he was “saying it *is* this firearm,” and by “not” he was expressing that the chance of finding another firearm “with the same signature or the same fingerprint is remote or really small.” (Italics added.) In other words, Swanepoel made clear he meant something quite different from the “more likely than not” standard familiar to lawyers. And in closing, the prosecutor emphasized to the jury just how certain Swanepoel was, urging them not to get distracted by word games around “more likely than not.” “I got news for you,” he announced. “If a gun—if it’s the same thing . . . *conclusively* the same thing then it is *also* more likely than not the same thing.” (Italics added.)

In reaching this conclusion, we follow our colleagues in the Sixth District who unanimously concluded in *Azcona* that a trial court abused its discretion by admitting similar firearms toolmark evidence over a *Sargon* objection. (*Azcona, supra*, 58 Cal.App.5th at p. 514; *id.* at p. 528 (conc. opn. of Greenwood, P.J.)) The firearms toolmark analyst who testified in *Azcona* gave testimony similar to the testimony in our case: he compared two bullet cases, found their class characteristics were the same, saw “ ‘six individual marks in a row’ ” that met his “ ‘identification criteria,’ ” and on that basis opined that the two bullets “ ‘were fired from the same gun.’ ” (*Id.* at p. 510.) He then added for good measure, words he said were “ ‘good to add on now[a]days’ ”—“ ‘not just that they were fired from the same gun, but to the practical exclusion of all other guns.’ ” As in our case, the expert witness in *Azcona* “did not support that conclusion with anything more definitive than a broad reference to having ‘done numerous studies on the subject trying to see what can happen by random chance.’ ” (*Id.* at p. 514.) The *Azcona* court thus concluded, his “purportedly infallible conclusion is a leap too far from what the underlying method allowed,” and “[t]he trial court abused its discretion by failing to limit the expert’s opinion to what was actually supported by the material the expert relied on.” (*Ibid.*)

True, a ray of daylight separates the opinion testimony in *Azcona* from the testimony in our case, but the difference is not enough to change the result. In *Azcona*, the witness testified that the similarities between cartridge cases were “ ‘much more than can ever happen by random chance,’ ” and that both bullet cases came from the same firearm “ ‘to the practical exclusion of all other guns’ ” (*Azcona, supra*, 58 Cal.App.5th at p. 514), whereas Swanepoel declined to exclude all other guns because he “ha[d]n’t compared every firearm in the world.” Examining every firearm in the world

would hardly be “‘practical,’ ” so these two standards may be effectively the same. Regardless, the point is that each witness presented as a virtual certainty his opinion that the two cartridge cases being examined had been fired from the same gun, and yet neither cited a single study or any other information to support the validity of their toolmark comparison technique.

If firearms toolmark comparison has been scientifically validated as a forensic technique, the People could have introduced studies to establish that fact. Recent civil cases applying *Sargon* show what, in a different context, sufficient support can look like. For example, *Garner v. BNSF Railway Co.* (2024) 98 Cal.App.5th 660 concluded a trial court had erred in excluding expert testimony that a trainman’s long exposure to diesel exhaust was more likely than not a cause of his non-Hodgkin’s lymphoma. (*Id.* at pp. 665–666.) Although the proponent of this testimony did not have a “scientific publication expressing precisely the same conclusion at which the expert ha[d] arrived,” the expert was able to point to extensive epidemiological literature linking diesel exhaust to cancers in multiple organs, and to explain why those studies could be reliably extrapolated to establish causation as to non-Hodgkin’s lymphoma, a type of blood cancer.⁵ (*Id.* at pp. 666, 677, 680.)

By contrast, causation testimony was properly excluded in *Onglyza Product Cases* (2023) 90 Cal.App.5th 776, where a cardiologist offered the

⁵ In brief, the expert calculated an excess cancer risk to plaintiff posed by the amount of diesel exhaust to which he had been exposed (*Garner v. BNSF Railway Co.*, *supra*, 98 Cal.App.5th at p. 677), then linked this elevated risk of cancer generally to plaintiff’s particular illness. He testified that “‘diesel exhaust has been shown to be a mixture of mutagenic carcinogens,’ ” meaning substances that “act directly on DNA, causing mutations.” (*Id.* at p. 680.) As a result, “tumors in one site are relevant to development of tumors in other sites,’ ” and the bone marrow where Mr. Garner’s lymphoma originated was a known target site for the effects of diesel exhaust. (*Ibid.*)

opinion that a particular diabetes drug was capable of causing heart failure. (*Id.* at p. 781.) The trial court’s “detailed exclusion order” explained that the proposed testimony relied on “a shifting results-based methodology that fails to logically and consistently weigh all relevant evidence.” (*Id.* at p. 785.) The cardiologist had relied on a study that found an increased incidence of heart failure among those using the diabetes drug, even though the authors of that study cautioned that their study did not alone establish a causal link, and problems plagued the other evidence on which he relied. (*Id.* at pp. 786–789.)

Of course, these civil cases are easily distinguished from the case before us, but they show that in other contexts courts can and do grapple with scientific evidence to make the assessment *Sargon* requires, whether an expert’s opinion is logically sound and adequately supported. (*Sargon, supra*, 55 Cal.4th at p. 772.) But courts can engage in that effort only if the party seeking to admit the evidence offers support for it that courts can scrutinize—precisely what did not happen here.

The Attorney General contends that in this case we can dispense with such foundational evidence because Swanepoel admitted “his process and conclusions were subjective.” His admission of subjectivity is said to have closed any analytical “gap that might exist between his techniques and his conclusions.” How can that be? If calling an expert opinion “subjective” were enough to wave it past *Sargon*’s gatekeeper, courts would have no basis for excluding the subjective opinion of our hypothetical palm reader. And the Supreme Court would not have gone to the trouble in *Sargon* of differentiating expert assessments of lost profits that were admissible from those that were not. “The lost profit inquiry is always speculative to some degree,” the Court observes, so an expert’s opinion on lost profits necessarily involves at least some element of subjectivity. (*Sargon, supra*, 55 Cal.4th at

pp. 775, 763.) Yet a claim for “‘anticipated profits dependent upon future events [is] allowed where their nature and occurrence can be shown by evidence of reasonable reliability.’” (*Id.* at p. 774.) That is, an expert may offer a subjective opinion, but the opinion must still be established as reasonably reliable.

The fact that Swanepoel’s forensic technique was entirely subjective is significant in assessing what kind of validation it requires, but not in the way the Attorney General urges. Swanepoel’s methodology was to look carefully at the evidence and then simply make a judgment based on “the pattern overall.” Because his technique employs no articulable standards—no minimum criteria for declaring two cartridge cases a match, and no protocol for addressing observed differences between them—it is not possible to validate his work by examining results that other practitioners of the “AFTE theory of identification” achieve. After all, an outside reviewer would not know whether the analysts who chose to subject their work to scrutiny were using the same criteria as Swanepoel employed, or different ones. The only way to validate Swanepoel’s technique is with an individualized assessment of *Swanepoel’s* ability correctly to distinguish cartridge cases fired from the same weapon from cartridge cases fired from different weapons with the same class characteristics.

A useful parallel can be drawn to *People v. Jackson* (2016) 1 Cal.5th 269 (*Jackson*), although that case does not apply *Sargon* because the expertise it evaluated was that of a bloodhound, rather than a human. In *Jackson*, a dog had trailed and identified the defendant based on his scent, and the Court reaffirmed the admissibility of such dog trailing evidence, provided a sufficient foundation is laid. (*Jackson*, at p. 320.) Central to that foundation, our high court explained, is a showing of “the training and

reliability of the dog.” (*Id.* at p. 322.) Reliability in *Jackson* was shown with evidence that the bloodhound who identified the defendant had successfully navigated practice runs on blind trails—runs on which her handler did not know the correct path or the target being trailed—and double-blind trails, in which the outside evaluator also did not have this information. (*Id.* at pp. 311, 322.) Additionally, the dog had proven herself reliable in the field; the court recited evidence of challenging tasks the dog had successfully accomplished and statistics on a task where her record was less than perfect. (*Id.* at p. 311.) “[W]hile the reliability of a machine can be duplicated and passed down the assembly line with relative ease, the abilities and reliability of each dog desired to be used in court must be shown on an individual basis before evidence of that dog’s efforts is admissible,” the Court explained. (*Id.* at p. 316.)

So too, here. Intending no disrespect with the canine comparison, because the expert opinion in this case is based on an entirely subjective technique, where the analyst identified a match based on an “overall” impression, admissibility “‘must be shown on an individual basis.’” (*Jackson, supra*, 1 Cal.5th at p. 316.) A proper foundation requires a showing that Swanepoel is able reliably to determine whether or not two cartridge cases have been fired in the same firearm. If Swanepoel has ever subjected his skills in this regard to examination, that fact was not before the trial court. The evidence was instead that, although a practical test of some kind is required to obtain an AFTE certification credential, Swanepoel never earned that credential.

The absence of evidence of the examiner’s reliability is an important difference between this case and *People v. Rivas* (2015) 238 Cal.App.4th 967. There, the court rejected a *Sargon* challenge to the admissibility of

fingerprint comparison evidence, in part because the “proficiency in properly comparing fingerprints” of the analyst was “regularly tested,” and she had been “certified as a fingerprint analyst by the International Association for Identification.” (*Id.* at pp. 978, 980, 974.) The analyst in *Rivas* “openly acknowledged that fingerprint comparisons are inherently subjective,” although her technique appears less subjective than Swanepoel’s. (*Id.* at p. 977; see *id.* at p. 979 [“methodology requires recognizing and categorizing scores of distinctive features in the prints”].) Also, the evidence for the uniqueness of fingerprints was much stronger than the (nonexistent) evidence in this case of the uniqueness of a “signature or fingerprint” for each firearm. (See *id.* at p. 980 [statistician estimated probability of two people having identical fingerprints at 1 in 64 billion].)

The Attorney General points out that defendant could have elicited, but did not, the names of particular studies that Swanepoel thought supportive of his testimony. But that was not defendant’s burden. Rather, the *proponent* of evidence bears the burden to establish a foundation for its admission. (*People v. Ramos* (1997) 15 Cal.4th 1133, 1177; see also *Jackson, supra*, 1 Cal.5th at p. 321 [proponent of proffered evidence has the burden of producing evidence as to the existence of preliminary or foundational facts, citing Evid. Code, § 403, subd. (a)]; *People v. Cornwall* (2005) 37 Cal.4th 50, 83 [Evid. Code, § 403 “requir[es] the proponent of evidence to supply an adequate foundation”], disapproved on another ground in *People v. Doolin* (2009) 45 Cal.4th 390, 421 & fn. 22.) We cannot speculate on what evidence would have been introduced if other questions had been asked of Swanepoel. We can only assess whether the evidence actually introduced laid an adequate foundation.

Because the evidence in this case did not lay an adequate foundation, we conclude that the trial court abused its discretion by allowing Swanepoel's opinion before the jury. (See *Sargon, supra*, 55 Cal.4th at p. 773 ["To determine if a court abused its discretion, we must . . . consider 'the legal principles and policies that should have guided the court's actions'"].) The People introduced no evidence that a firearm has a unique "signature or fingerprint," no evidence that there is a reliable method a toolmark examiner can employ to determine whether two cartridge cases were fired in the same firearm, and no evidence that Swanepoel's entirely subjective assessments were, in fact, reliable. The People, accordingly, provided no sufficient foundation for his opinion testimony.

II.

For clarity, it may be helpful to point out what we do not decide today. Amici curiae The Wilson Center for Science and Justice at Duke Law School and a group of scientists and scholars urge us to analyze the admissibility of firearms toolmark evidence under the test set forth in *Kelly, supra*, 17 Cal.3d 24. They would have us hold that in criminal courts in California, firearms toolmark examiners may include or exclude a class of firearms as the source for a fired cartridge case, but may go no further. In particular, examiners may not assert that characteristics specific to an individual firearm enable them to conclude that two cartridge cases were fired in the same gun, amici curiae urge. Defendant, for his part, raises no claim under *Kelly* but, on the basis of similar scholarly publications and case law, urges us to adopt a similar rule about the proper limits of firearms toolmark evidence. We properly decline both invitations.

We take no position on whether *Kelly* should apply when a firearms toolmark analyst opines that cartridge cases were fired in the same firearm.

As the Attorney General points out, in *People v. Cowan* (2010) 50 Cal.4th 401, 470–471 (*Cowan*), the California Supreme Court previously concluded that the firearms toolmark evidence before it was neither new enough nor sufficiently foreign to the everyday experience of jurors to require *Kelly* analysis. In the years since, a few courts in other jurisdictions have been more skeptical about admitting firearms toolmark identification evidence. (See, e.g., *United States v. Shipp* (E.D.N.Y. 2019) 422 F.Supp.3d 762; *Abruquah v. State* (Md. 2023) 296 A.3d 961.) Scholars, too, have expressed concern about the reliability of such opinion testimony. (See, e.g., Garrett et al., *Judging Firearms Evidence and the Rule 702 Amendments* (2023) 107 *Judicature* 40, 41 [documenting and explaining why, “after decades of rote acceptance of the assumptions underlying firearms comparison evidence, judicial engagement and skepticism in the technique have surged”]; Faigman et al., *The Field of Firearms Forensics is Flawed* (May 2022) *Scientific American* [reporting Ames Laboratory study, conducted after the PCAST report, found “[t]he same examiner looking at the same bullets a second time reached the same conclusion only two thirds of the time,” while “[d]ifferent examiners looking at the same bullets reached the same conclusion less than one third of the time”].)⁶ The *Azcona* court, which was unanimous in its

⁶ These shocking statistics are rendered less alarming with the additional information that, in most instances where two examinations of the same evidence produced different results, at least one of those was a conclusion that the evidence was insufficient to determine whether or not the two items were fired in the same weapon. (Dorfman & Viliant, *A Re-analysis of Repeatability and Reproducibility in the Ames-USDOE -FBI Study* (2022) 9 *Statistics and Public Policy* 175, 176–178.) But one need look no further than the facts in *Cowan* for an example of a more extreme variation between two assessments of the same evidence. In *Cowan*, the toolmark analyst first opined that bullets test-fired from a seized pistol did *not* match bullets

Sargon holding, divided on the issue of whether recent changes in the attitude of the scientific community toward firearms toolmark comparisons rendered such evidence also inadmissible under *Kelly*. (See *Azcona, supra*, 58 Cal.App.5th at pp. 512–513; *id.* at p. 525–527 (conc. opn. of Greenwood, P.J).) The *Kelly* challenge is not properly before us, however, as defendant expressly waived it in his opening brief on appeal. (See *People v. Duff* (2014) 58 Cal.4th 527, 550 fn. 9 [issues not raised in appellant’s opening brief are waived].)

On the *Sargon* challenge that is before us, we see no basis for adopting a categorical rule forbidding the admission of firearms toolmark testimony that two cartridge cases were fired in the same firearm. *Sargon* does not empower the courts to settle scientific debates (*Sargon, supra*, 55 Cal.4th at p. 772), and in another case there might be evidence sufficient to provide an adequate foundation for such testimony. What the evidence might establish in another case, we cannot say. (Cf. *People v. Lamb* (2024) 16 Cal.5th 400, 434 [firearms toolmark analyst’s “conclusions were uncontroverted and supported by testimony concerning . . . the science of firearm and toolmark comparison”].) What we can say is that, in this case, the proponents of the proffered testimony failed to establish a foundation for admitting it.

Pseudoscience has had a bad record in the courtroom. (See, e.g., *Gimenez v. Ochoa* (9th Cir. 2016) 821 F.3d 1136, 1144, fn.4 [collecting sources undermining forensic evidence of matching bite marks, hair, etc.]; *In re Richards* (2016) 63 Cal.4th 291, 313, 305 [forensic dentist with “impressive” qualifications repudiates his own trial testimony].) As judges, our method for

recovered from the victim’s body, only to reach the opposite conclusion after reexamining the evidence once trial began. (*Cowan, supra*, 50 Cal.4th at pp. 418, 468.)

distinguishing admissible opinion evidence from dangerous pseudoscience is to insist that the proponent of opinion testimony offer sufficient evidence of an opinion's reliability. That standard was not met here.

III.

The Attorney General argues that even if the trial court abused its discretion in admitting the expert testimony, we need not reverse the judgment because its admission was not prejudicial. We apply the familiar standard for state law error, under which we reverse only if it is reasonably probable defendant would have achieved a more favorable result in the absence of the error. (*People v. Watson* (1956) 46 Cal.2d 818, 836; see *People v. Duarte* (2000) 24 Cal.4th 603, 618–619.) In this context, a reasonable probability “ “does not mean more likely than not, but merely a *reasonable chance*, more than an *abstract possibility*.” ’ ” (*Richardson v. Superior Court* (2008) 43 Cal.4th 1040, 1050.)

That standard *is* met here. The prosecutor himself referred to the cartridge case as “[t]he most crucial piece of evidence in this case.” He told the jury Swanepoel had concluded defendant’s gun “fired that casing,” that they were “conclusively the same.” The record indicates the jury focused on this opinion testimony, as during its deliberations it asked for a readback of Swanepoel’s testimony regarding the striations and the defense cross-examination. Without this testimony, the evidence of defendant’s guilt would have been considerably more tenuous: he drove an ostensibly “unique” vehicle that was similar to the one involved in the shooting, he was in the general area of the crime at the time of the shooting, and he had a gun that could not be excluded as the source of the cartridge at the crime scene. But no one definitively tied defendant’s SUV to the crimes or identified defendant as the driver, the sole occupant of the vehicle, or the shooter.

While the properly admitted evidence on its own might have been sufficient to persuade a jury that defendant fired the gunshots and wounded the victim, that evidence is significantly less compelling than the case actually presented to the jury. In our view, there is more than an abstract possibility that if the jury had not heard Swanepoel's testimony that defendant's gun had fired the cartridge found at the crime scene, it would not have been convinced beyond a reasonable doubt that defendant was guilty of the two felonies, and personally used a firearm and inflicted great bodily injury. The judgment must therefore be reversed.⁷

DISPOSITION

The judgment is reversed. The matter is remanded for further proceedings consistent with the views expressed in this opinion.

TUCHER, P. J.

WE CONCUR:

FUJISAKI, J.
RODRÍGUEZ, J.

People v. Tidd (A167548)

⁷ Because we reach this conclusion, we need not consider defendant's contentions that the prosecutor committed misconduct in discussing the toolmark evidence during closing argument.

Trial Court: City and County of San Francisco Superior Court

Trial Judge: Hon. Stephen M. Murphy

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