In the
United States Court of Appeals
For the Seventh Circuit

No. 11-2894

UNITED STATES OF AMERICA,

Plaintiff-Appellee,

v.

CLACY WATSON HERRERA,

Defendant-Appellant.

Appeal from the United States District Court
for the Northern District of Illinois, Eastern Division.
No. 01 CR 1098-1—**Rebecca R. Pallmeyer**, *Judge.*

ARGUED SEPTEMBER 28, 2012—DECIDED JANUARY 9, 2013

Before POSNER, ROVNER, and SYKES, *Circuit Judges*.

POSNER, *Circuit Judge*. Two years ago, in response to a petition for a writ of mandamus filed by the government during the criminal trial of the defendant on drug charges, we ordered the district court to admit into evidence an exhibit labeled "Roberson Seizure 2"; to allow the government to recall Stephen Koop to testify at trial about the recovery of latent fingerprints from that exhibit; and to allow testimony regarding comparison of

the latent prints with patent fingerprints known to be the defendant's. *In re United States*, 614 F.3d 661 (7th Cir. 2010). The judge had excluded the exhibit and related testimony because he suspected, though on the most tenuous of grounds, that the government had tampered with the fingerprint evidence. He threatened to grant the defendant's request for a mistrial on the ground of prosecutorial misconduct that was (the judge believed) intended to avert a likely acquittal, a ground that if sustained would have barred any further prosecution of the defendant as placing him in double jeopardy. *Oregon v. Kennedy*, 456 U.S. 667, 679 (1982); *United States v. Catton*, 130 F.3d 805, 807-08 (7th Cir. 1997); see also *United States v. Buljubasic*, 808 F.2d 1260, 1265 (7th Cir. 1987). We also ordered the case reassigned to another district judge. This was done and the trial, which had been interrupted by the mandamus proceeding, resumed, and ended shortly in the conviction of the defendant. The judge sentenced him to 340 months in prison for a variety of drug-related offenses. He appeals.

Many of his arguments repeat ones he made in the mandamus proceeding. (In effect he is asking us to rehear our previous decision—two years after the deadline for asking for rehearing expired.) The only such argument that we didn't discuss is based on *Will v. United States*, 389 U.S. 90, 96-97 (1967), which forbids the use of mandamus as a substitute for an appeal that is forbidden—and the government is not permitted to appeal an evidentiary ruling in a criminal case once the trial has begun. 18 U.S.C. § 3731. But the Court in *Will* held only that the court of appeals hadn't explained

why the district court's ordering the government to give the defendant a bill of particulars was so "seriously disruptive of the efficient administration of criminal justice in the Northern District of Illinois" as to warrant mandamus. 389 U.S. at 104. The district judge's order in the present case was no run-of-the-mill mistaken procedural or evidentiary ruling. The order seriously disrupted the prosecution's case, and did so, as we are about to show, on the basis of utterly baseless but damaging imputations of grave (criminal, really) prosecutorial misconduct; involved the flouting of governing precedents; and would probably have resulted in a groundless acquittal. The order thus warranted correction by mandamus. See *United States v. Vinyard*, 539 F.3d 589, 591-92 (7th Cir. 2008).

The chain of events that culminated in the mandamus proceeding had begun with the district judge's decision to exclude evidence that two of the defendant's fingerprints had been recovered from a bag of heroin wrapped in tape and further encased in condoms and found in a drug courier's rectum. The heroin had been removed from the bag and placed in an evidence bag and then both it and the packaging (the tape and condoms) had been placed in another evidence bag and it was this second exhibit that was at issue. The district judge's ground for excluding it was his belief that the government hadn't adequately demonstrated the requisite "chain of custody"—hadn't demonstrated that there had been no opportunity to tamper with or otherwise mishandle the evidence between the time it was obtained and the trial. The judge made this ruling in the

face of the government's having offered ten witnesses to establish that the chain of custody had remained intact.

The judge was disturbed because the exhibit had, according to an evidence log sheet, gained 20 grams in weight between May and September 2001. (Yet he attached no significance to its having gained 190 grams between September 2001 and the trial.) He thought the weight gain might have been attributable to federal officers' pressing a piece of adhesive tape containing the defendant's fingerprints (obtained elsewhere) onto the packaging of the heroin. That suspicion grew into a conviction, for which there was no rational basis, that government lawyers had lied about the chain of custody. To no avail the government explained that the reason for the increase in weight was that the bag with the fingerprints, after being opened so that the presence and amount of the illegal drug contained in it could be verified, and later closed up again, had been weighed together with other bags. The reported weight was the weight of the package containing all the bags, and thus there were more bags in it. Obviously the package would not have gained 210 grams (20 + 190)—almost half a pound—from replacing a piece of the tape in which one of the bags was wrapped by a piece of tape containing the defendant's fingerprints.

The judge acknowledged that his supposition of tampering was "speculative." That was an understatement. For among other things the defendant had not been extradited to the United States until long after the alleged tampering, and until he was extradited the gov-

ernment did not have a set of fingerprints known to be his. And no one has explained how fingerprints on another piece of material could have been transferred to the *adhesive* side of the tape, which was where they were found. It's one thing to press your finger on the adhesive side of a tape and remove the finger, leaving a print, but another thing to press a piece of paper containing your fingerprint on the adhesive side of the tape—try removing the paper without destroying the print.

The defendant's petition, and amended petition, for rehearing did not defend the judge's conjecture that the weight discrepancy indicated tampering. We concluded that while the defendant could argue at trial that the jury should disregard the fingerprint evidence, there was no justification for excluding it in advance of trial on the "speculative" ground excogitated by the judge. Once the government presents evidence, as it did here (remember the ten witnesses), that adequate precautions had been taken to preserve the evidence challenged by the defendant, it has established admissibility, though at trial the defendant can challenge the adequacy of the precautions and present evidence of tampering. *United States v. Lee*, 502 F.3d 691, 697-98 (7th Cir. 2007); *United States v. Kelly*, 14 F.3d 1169, 1175 (7th Cir. 1994); *United States v. Brumfield*, 686 F.3d 960, 965 (8th Cir. 2012); see also *Melendez-Diaz v. Massachusetts*, 557 U.S. 305, 311 n. 1 (2009). And that means by the way that even if our mandamus order was ultra vires it didn't undermine the fairness of the trial or the justice of the defendant's conviction. The fingerprint evidence

should not have been excluded, and once admitted confirmed his guilt. We take up at the end of our opinion the defendant's distinct argument that the reassignment of the case to another judge prejudiced the jury, and show that that argument has no merit either.

The fresh issue relating to the fingerprint evidence is whether the prints of two fingers found on the adhesive tape were the defendant's. They were latent rather than patent fingerprints. Patent fingerprints are made by pressing a fingertip covered with ink on a white card or similar white surface, and are visible. Latent fingerprints are prints, usually invisible, left on a smooth surface when a person touches it with a finger or fingers. Laboratory techniques are employed to make a latent fingerprint visible so that it can be compared with other fingerprints. The latent prints on the adhesive tape on the bag of heroin in this case were found by a fingerprint examiner to match the defendant's patent prints made in the course of the criminal investigation, and the government therefore offered the match as evidence of the defendant's participation in the drug ring. The defendant argues that methods of matching latent prints with other latent prints or with patent prints have not been shown to be reliable enough to be admissible as evidence under the standard for reliability set forth in Fed. R. Evid. 702, 703; *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 592-93 (1993); and *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 149 (1999).

The method the examiner used is called ACE-V and is the standard method for determining whether two

fingerprints are from the same person. See Scientific Working Group on Friction Ridge Analysis, Study and Technology, "Standards for Examining Friction Ridge Impressions and Resulting Conclusions," Sept. 13, 2011, www.swgfast.org/documents/examinations-conclusions/111026_Examinations-Conclusions_1.0.pdf (visited Jan. 4, 2013); Michele Triplett & Lauren Cooney, "The Etiology of ACE-V and Its Proper Use: An Exploration of the Relationship Between ACE-V and the Scientific Method of Hypothesis Testing," 56 *J. Forensic Identification* 345, 346 (2006). The defendant is therefore mounting a frontal assault on the use of fingerprint evidence in litigation, an attack the courts have frequently rebuffed. See, e.g., *United States v. Havvard*, 260 F.3d 597, 601 (7th Cir. 2001); *United States v. George*, 363 F.3d 666, 672-73 (7th Cir. 2004); *United States v. Crisp*, 324 F.3d 261, 268-70 (4th Cir. 2003); *United States v. Mitchell*, 365 F.3d 215, 235-46 (3d Cir. 2004).

ACE-V is an acronym for analysis, comparison, evaluation, and verification, and has been described as follows:

> The process begins with the analysis of the unknown friction ridge print (now often a digital image of a latent print). Many factors affect the quality and quantity of detail in the latent print and also introduce variability in the resulting impression . . . . If the examiner deems that there is sufficient detail in the latent print (and the known prints), the comparison of the latent print to the known prints begins.
>
> Visual comparison consists of discerning, visually "measuring," and comparing—within the comparable areas of the latent print and the known prints—the

> details that correspond. The amount of friction ridge detail available for this step depends on the clarity of the two impressions. The details observed might include the overall shape of the latent print, anatomical aspects, ridge flows, ridge counts, shape of the core, delta location and shape, lengths of the ridges, minutia location and type, thickness of the ridges and furrows, shapes of the ridges, pore position, crease patterns and shapes, scar shapes, and temporary feature shapes (e.g., a wart).
>
> At the completion of the comparison, the examiner performs an evaluation of the agreement of the friction ridge formations in the two prints and evaluates the sufficiency of the detail present to establish an identification (source determination). Source determination is made when the examiner concludes, based on his or her experience, that sufficient quantity and quality of friction ridge detail is in agreement between the latent print and the known print. Source exclusion is made when the process indicates sufficient disagreement between the latent print and known print. If neither an identification nor an exclusion can be reached, the result of the comparison is inconclusive. Verification occurs when another qualified examiner repeats the observations and comes to the same conclusion, although the second examiner may be aware of the conclusion of the first.

National Research Council of the National Academy of Sciences, *Strengthening Forensic Science in the United States: A Path Forward* 137-38 (2009).

The methodology requires recognizing and categorizing scores of distinctive features in the prints, see Davide Maltoni et al., *Handbook of Fingerprint Recognition* 97-101 (2d ed. 2009); Federal Bureau of Investigation, *The Science of Fingerprints: Classification and Uses* 5-86 (2006), and it is the distinctiveness of these features, rather than the ACE-V method itself, that enables expert fingerprint examiners to match fingerprints with a high degree of confidence. That's not to say that fingerprint matching (especially when it involves latent fingerprints, as in this case) is as reliable as DNA evidence, for example. Forensic DNA analysis involves comparing a strand of DNA (the genetic code) from the suspect with a strand of DNA found at the crime scene. The comparison is done with scientific instruments and determines whether the segments are chemically identical. Errors are vanishingly rare provided that the strands of code are reasonably intact. As we explained in *United States v. Ford*, 683 F.3d 761, 768 (7th Cir. 2012),

> What is involved, very simply, in forensic DNA analysis is comparing a strand of DNA (the genetic code) from the suspect with a strand of DNA found at the crime scene. See "DNA Profiling," *Wikipedia*, http://en.wikipedia.org/wiki/DNA_profiling (visited May 31, 2012). Comparisons are made at various locations on each strand. At each location there is an allele (a unique gene form). In one location, for example, the probability of a person's having a particular allele might be 7 percent, and in another 10 percent. Suppose that the suspect's DNA and the DNA at the crime scene contained the same alleles

> at each of the two locations. The probability that the DNA was someone else's would be 7 percent if the comparison were confined to the first location, but only .7 percent (7 percent of 10 percent) if the comparison were expanded to two locations, because the probabilities are independent. Suppose identical alleles were found at 10 locations, which is what happened in this case; the probability that two persons would have so many identical alleles, a probability that can be computed by multiplying together the probabilities of an identical allele at each location, becomes infinitesimally small—in fact 1 in 29 trillion, provided no other comparisons reveal that the alleles at the same location on the two strands of DNA are different. This is the same procedure used for determining the probability that a perfectly balanced coin flipped 10 times in a row will come up heads all 10 times. The probability is $.5^{10}$, which is less than 1 in 1000.

Chemical tests can determine whether two alleles are identical, but a fingerprint analyst must visually recognize and classify the relevant details in the latent print—which is difficult if the print is incomplete or smudged. "[T]he assessment of latent prints from crime scenes is based largely on human interpretation. . . . [T]he process does not allow one to stipulate specific measurements in advance, as is done for a DNA analysis. Moreover, a small stretching of distance between two fingerprint features, or a twisting of angles, can result from either a difference between the fingers that left the prints or from distortions from the impression process." National Research Council, *supra*, at 139.

Matching latent fingerprints is thus a bit like an opinion offered by an art expert asked whether an unsigned painting was painted by the known painter of another painting; he makes or rejects a match on the basis of visual evidence. Eyewitness evidence is similar. The eyewitness saw the perpetrator of a crime. His recollection of the perpetrator's appearance is analogous to a latent fingerprint. He sees the defendant at the trial—that sighting is analogous to a patent fingerprint. He is asked to match his recollection against the courtroom sighting—and he is allowed to testify that the defendant *is* the perpetrator, not just that there is a close resemblance. A lineup, whether photo or in-person, is a related method of adducing matching evidence, as is handwriting evidence.

Matching evidence of the kinds that we've just described, including fingerprint evidence, is less rigorous than the kind of scientific matching involved in DNA evidence; eyewitness evidence is not scientific at all. But no one thinks that only scientific evidence may be used to convict or acquit a defendant. The increasingly well documented fallibility of eyewitness testimony, see Elizabeth F. Loftus *et al.*, *Eyewitness Testimony: Civil and Criminal* (4th ed. 2007); *United States v. Ford*, *supra*, 683 F.3d at 764-66, has not banished it from criminal trials. *Perry v. New Hampshire*, 132 S. Ct. 716, 728 (2012).

Evidence doesn't have to be infallible to be probative. Probability of guilt is a function of all the evidence in a case, and if items of evidence are independent of one

another in the sense that the truth of any one item is not influenced by the truth of any other, the probability of guilt may be much higher if there is evidence from many independent sources (several eyewitnesses, an eyewitness plus fingerprints, etc.) than it would be were there only the evidence of one eyewitness, say. If "the prosecution submits three items of evidence of the defendant's guilt (and the defendant submits no evidence of his innocence), and the probability that item 1 is spurious is 10 percent, the probability that item 2 is spurious is also 10 percent, and likewise item 3 [, then the] probability that all three are spurious (assuming that the probabilities are independent—that is, that the probability that one piece of evidence is spurious does not affect the probability that another is), and therefore that the defendant should be acquitted, is only one in a thousand (.1 x .1 x .1)." *United States v. Williams*, 698 F.3d 374, 379 (7th Cir. 2012).

The defendant intimates that any evidence that requires the sponsorship of an expert witness, as fingerprint evidence does, must be found to be good science before it can be admitted under the doctrine of the *Daubert* case and Rules 702 or 703 of the Federal Rules of Evidence. But expert evidence is not limited to "scientific" evidence, however such evidence might be defined. *Kumho Tire Co. v. Carmichael*, *supra*, 526 U.S. at 150-51; *Tuf Racing Products, Inc. v. American Suzuki Motor Corp.*, 223 F.3d 585, 591 (7th Cir. 2000). It includes any evidence created or validated by expert methods and presented by an expert witness that is shown to be reliable. In a case involving an alleged forgery of a

painting, there might be expert scientific evidence based on tests of the age of the canvas or paint; but there might also be expert evidence, offered by a dealer or art historian or other art expert, on the style of a particular artist. That evidence would be the expert's opinion, based on comparison with other paintings, of the genuineness of the painting alleged to be a forgery. See, e.g., *Levin v. Dalva Brothers, Inc.*, 459 F.3d 68, 78-79 (1st Cir. 2006); *United States v. Tobin*, 576 F.2d 687, 690-91, 693 (5th Cir. 1978).

Fingerprint experts such as the government's witness in this case—who has been certified as a latent print examiner by the International Association for Identification, the foremost international fingerprint organization (there are only about 840 IAI-certified latent examiners in the world, out of 15,000 total examiners)—receive extensive training; and errors in fingerprint matching by expert examiners appear to be very rare. Of the first 194 prisoners in the United States exonerated by DNA evidence, none had been convicted on the basis of erroneous fingerprint matches, whereas 75 percent had been convicted on the basis of mistaken eyewitness identification. Greg Hampikian *et al.*, "The Genetics of Innocence: Analysis of 194 U.S. DNA Exonerations," 12 *Annual Rev. of Genomics and Human Genetics* 97, 106 (2011). The probability of two people in the world having identical fingerprints is not known, but it appears to be extremely low. Steven M. Stigler, "Galton and Identification by Fingerprints," 140 *Genetics* 857, 858 (1995); David A. Stoney & John I. Thornton,

"A Critical Analysis of Quantitative Fingerprint Individuality Models," 31 *J. of Forensic Sciences* 1187 (1986). The great statistician Francis Galton estimated the probability as 1 in 64 billion. Galton, *Finger Prints* 110 (1892); Stigler, *supra* at 858. That was not an estimate of the probability of a mistaken matching of a latent to a patent or another latent fingerprint. Yet errors in such matching appear to be very rare, though the matching process is judgmental rather than scientifically rigorous because it depends on how readable the latent fingerprint is and also on how distorted a version of the person's patent fingerprint it is. Examiners' training includes instruction on how to determine whether a latent print contains enough detail to enable a reliable matching to another print. Ultimately the matching depends on "subjective judgments by the examiner," National Research Council, *supra*, at 139, but responsible fingerprint matching is admissible evidence, in general and in this case.

The other issues presented by the appeal that merit discussion arise from the interruption of the trial by the mandamus proceeding and the resulting reassignment of the case to a different district judge. The consequence was an eleven-day hiatus in the trial. The defendant argues that when the trial resumed, the jurors, remembering the skeptical remarks that the original judge had made about the government's evidence, must have thought that he had been "punished" for siding with the defendant by being removed and therefore that the jury should convict. That is unpersuasive con-

jecture. Because of sickness most commonly, but sometimes for other reasons, such as belated discovery of a ground for recusal, a judge is sometimes replaced during a trial and when that happens the new judge tells the jury that such replacements happen occasionally and the jurors are not to worry about the change in judges or speculate about the reason for it. The new judge in this case didn't explain the cause of the delays but did say:

> It is very important for me to emphasize this instruction, that however you may feel about the delays in this case, you are not to hold those feelings against anybody in this courtroom . . . . In fact, I am going to instruct you right now that you not speculate about the causes or reasons for the delays at all . . . . To the extent that you have been told or you have come to believe that the delays are somehow the fault of the government or the fault of the defense counsel, I am instructing you that you put those concerns out of your mind completely . . . . At the end of this case, we will not be asking you, did the trial go smoothly? And if not, whose fault was it? That will not be a question you will be asked to consider. The only question you will be asked to consider at the conclusion of this case is, did the government meet its burden of proof? That's the only question. And concerns about delays are not to be in your mind at all . . . . From time to time there are reasons that we have to interrupt the smooth progress of a trial. It's happened to me before. This was one of those occasions . . . . Your consideration of the

> evidence should not be influenced in any way by any assumptions you may have made or any conclusions you may have drawn about delays.

There is no history of which we're aware of miscarriages of justice resulting because juries draw erroneous inferences from the replacement of a judge. See *United States v. Gayles*, 1 F.3d 735, 738 (8th Cir. 1993); *United States v. LaSorsa*, 480 F.2d 522, 531 (2d Cir. 1973).

The defendant complains that the new judge pressured the jury to complete its deliberations in a day and that with more time it might have acquitted him. There is no evidence to support that accusation of a judge noted for her patience. The first judge had assured the jury that the trial would not interfere with any of the jurors' vacation schedules. When trial resumed on August 2 the jury was down to 12 because one of the two alternates had been excused and the other had replaced a juror who had been excused. One of the remaining jurors had long-standing vacation plans for August 5, and the original judge had (with the government's consent) assured her when the government sought mandamus and the trial was adjourned that she would not need to show up on or after that date. When the trial resumed, another juror asked in open court what the jury should do in light of the possibility that the juror with vacation plans would leave before the trial ended. In response, and without objection by the defendant's lawyer, the judge said "we can't proceed" with fewer than 12 jurors. That was true (since the parties would not stipulate to a jury of 11, see Fed. R. Crim.

P. 23(b)(2)), though what was also true but she rightly did not say, because it would have sown confusion, is that while the *trial* could not continue without 12 jurors, if once the jury retired for its deliberations one of the jurors then decamped the judge could allow the remaining 11 to render a verdict even without the lawyers' consent. Fed. R. Crim. P. 23(b)(3).

August 4 turned out to be the last day of the trial. Closing arguments and the reading of the instructions to the jury took until the afternoon. The jury retired to consider its verdict at about 3:45 and returned 7 hours later with a verdict of guilty on eight counts and not guilty on the remaining six. The defendant argues that the jurors had rushed to complete their deliberations, knowing there would not be 12 jurors the next day. Given the strength of the government's case and the length of the jury's deliberations, and the fact that there was only one defendant and that the jury acquitted him on some counts, it is unlikely that even if they hadn't been expecting to lose the twelfth juror the next day, the jurors would have taken more time to deliberate than they did, though they might have broken at dinner time and resumed the following morning. The judge did not, as in the cases that the defendant cites to us, *United States v. Blitch*, 622 F.3d 658, 670 (7th Cir. 2010), and *United States v. Chaney*, 559 F.2d 1094, 1098 (7th Cir. 1977), set a deadline, either explicit or implicit, for the jury's deliberations. On the contrary, after instructing the jury, and only moments before the jury left the courtroom to deliberate, the judge told them: "I think I mentioned earlier that from this point on, the

schedule is up to you. I realize [by] the way that the trial has been bumpy, and I will make every effort to accommodate your schedule from this moment on, whatever your decisions are. I appreciate your time. I think all of us do. You are excused to deliberate on your verdict." That was the opposite of pressuring the jury to complete its deliberations in a day. The jurors were unlikely to feel rushed when the judge had gone out of her way to tell them that she would make every effort to accommodate their schedules. Had the jurors been unable to agree on a verdict on August 4, the foreman would have told the judge that they couldn't reach a verdict and she would have either discharged them and declared a mistrial or allowed the 11 remaining jurors to return the next day and deliberate.

When the jury retired to deliberate, knowing that one juror would leave on vacation the next day and perhaps believing that 12 jurors had to be present to render a verdict, no juror asked the judge a question such as: "Does this mean we must render a verdict by the end of the day or can we just report our inability to reach a verdict?" Or: "What if we can't complete our deliberations by the end of the day?" Such questions would have flagged concerns that the judge would doubtless have addressed. No questions were asked. That suggests that the jurors were not concerned that the trial might end without a verdict unless they rushed their deliberations.

AFFIRMED.