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The Two Unanswered Questions of Illinois v. Caballes: How to Make the World Safe for Binary Searches

Ric Simmons*

*Michael E. Moritz College of Law, The Ohio State University, simmons.239@osu.edu

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Abstract

This Article discusses the recent Supreme Court decision Illinois v. Caballes, which held that the Fourth Amendment does not bar the use of drug-detection dogs, even in the absence of reasonable suspicion. It argues that the Caballes case paves the way for widespread and indiscriminant use of a new type of surveillance known as a binary search. A binary search is defined as a search which provides the law enforcement official with no information about the subject other than whether or not illegal activity is present. Drug-detection dogs are one example of a binary search, but there are many others which are being developed, such as portable gun detectors or software protocols that sift through all e-mails passing through an internet service provider looking for child pornography.

Since the Caballes case did very little in the way of defining binary searches and discussing the appropriate limitations (if any) on their use, the Article seeks provide some guidance to courts in evaluating the constitutionality of binary searches in the future. The Article begins by discussing the history of the binary search doctrine, focusing on its application to drug-detection dogs, which up until now have been the most common form of binary search in use. The Article then analyzes the Caballes decision itself, examining what it does and does not resolve about the constitutionality of binary searches. Finally, the Article attempt to resolve the important unanswered questions in Caballes: first, how accurate does a surveillance technique have to be in order to be considered a binary search, and second, how does the Fourth Amendment prohibition against unreasonable seizures limit or prevent the widespread use of binary searches?

The Two Unanswered Questions of *Illinois v. Caballes*: How to Make the World Safe for Binary Searches

RIC SIMMONS*

I. Introduction

In *The Adventure of the Blue Carbuncle,* Sherlock Holmes is presented with a worn, hard-felt hat that had been found in the street by a friend.[1] Using nothing but a magnifying glass and a set of forceps, the world's greatest forensic detective examines the hat and determines the following about its owner: he was highly intellectual; he had been well-off in the past but had now fallen on hard times due to an increasingly serious

* Assistant Professor of Law, Moritz College of Law at the Ohio State University. I would like to thank Angela Lloyd, Alexis Andrews, and Robert Ruhlin for their helpful feedback and comments on earlier drafts of this Article.

[1] *See* ARTHUR CONAN DOYLE, THE ADVENTURES OF SHERLOCK HOLMES 149 (1993).

drinking habit; his wife no longer loved him; he was physically out of shape; and he did not possess gas heat in his house.[2] However, for all his deductive abilities, Holmes confessed he was unable to determine whether the owner of the hat had been involved in criminal activity.[3]

Detective Holmes serves as a useful symbol for modern law enforcement agents, who, lacking his superhuman powers of observation and deduction, rely instead upon modern technologies and vast computer databases to conduct surveillance and analyze data. Using these new advances, today's law enforcement officials can deduce the most intimate details of our lives—from the contents of our private phone conversations[4] to the files we store on our computers[5]—and like Holmes, these agents must then sift through these details to try and surmise whether criminal activity is afoot. This process—the need to investigate potential criminal conduct through the distasteful but unavoidable invasion of individual privacy—creates the constant tension that underpins most of our Fourth Amendment jurisprudence.[6]

But the past few decades have seen the rise of a new category of surveillance, one which will conceivably allow law enforcement agents to bypass the unpalatable prying into individuals' private lives and instead provide a direct answer to the only question the agent truly cares about: whether or not the individual under surveillance is currently

[2] *Id*. at 152.
[3] *Id*. at 149-50. Of course, eventually Holmes was able to determine that although the owner of the hat was innocent, he did in fact play an unwitting role in the theft and subsequent hiding of a very valuable gem. *Id* at 158-69. But this was only after a further investigation which revealed additional confidential facts, both personal and commercial, regarding the potential suspects. *Id.*
[4] *See, e.g.*, Katz v. United States, 389 U.S. 347, 348 (1967).
[5] *See, e.g.*, United States v. Jarrett, 338 F.3d. 339, 340-41. (2003).
[6] *See, e.g.*, Terry v. Ohio, 392 U.S. 1, 21 (1968) (the "reasonableness" of a search under the Fourth Amendment depends on balancing "the need to search" against "the invasion which the search…entails").

committing a crime. This type of surveillance is known as a "binary search,"[7] since it provides the law enforcement agent with only a positive or a negative response as to the existence of illegal activity, and reveals nothing else about the individual under surveillance. The most widespread example of a binary search today is the use of drug detection dogs that alert only if they smell illegal substances. However, many other types of binary searches are just on the horizon, such as hand-held gun detectors, software protocols that sift through e-mails searching for illegal material, or facial recognition technology.[8] These emerging technologies are poised to revolutionize the way law enforcement agents investigate crime—and this revolution has just gotten a significant boost from the recent Supreme Court decision *Illinois v. Caballes*,[9] which held that the use of a drug detection dog during a legitimate traffic stop did not implicate the Fourth Amendment.[10]

But although *Caballes* provided a solid and unambiguous doctrinal justification for the indiscriminant use of drug detection dogs—and by extension, other forms of binary searches—it failed to answer two critical questions about such searches: first, what types of surveillance should qualify as a binary search; and second, what limits (if any) should be placed on their use?

This Article will propose answers to both of these questions, with the intention of providing guidance to future courts as they analyze and rule upon binary search questions. But first, it is important to understand how binary searches generally fit into the context of Fourth Amendment jurisprudence. Part II of the Article will provide an

[7] *See United States v. Colyer*, 878 F.2d 469, 474 (D.C. Cir. 1989).
[8] *See infra* notes 80–91and accompanying text.
[9] 543 U.S. ____; 2005 LEXIS 769 (2005).
[10] *Id.* at ___, *7–*8.

overview of the binary search doctrine and describe the state of the law at the time the Supreme Court heard the *Caballes* case.[11] Part III will review how the courts have applied the binary search doctrine, focusing on drug detection dogs, since they represent the first working example of a binary search in widespread use.[12] Part IV will analyze the *Caballes* decision itself, and clarify what it did and did not make plain about the use of drug detection dogs and binary searches more generally.[13] Finally, Part V will propose answers to the two questions that *Caballes* did not address: first, how accurate does a surveillance technique have to be before it can be considered a binary search; and second, what amount of delay and/or intrusion is permissible before a binary search implicates the Fourth Amendment—not as a search, but rather as an unconstitutional seizure?[14]

II. Legal Background of the Binary Search Doctrine

A. The birth of the doctrine and the subsequent controversy

Twenty-two years ago in *United States v. Place,*[15] the Supreme Court held that a canine sniff of a suitcase by a trained narcotics dog did not constitute a "search" under the Fourth Amendment.[16] The Court offered two rationales for this conclusion: first, a canine sniff is "non-intrusive" (at least when compared to an officer "rummaging through the contents of the luggage"); and second, the sniff could only detect evidence of a

[11] *See infra* notes 15–76 and accompanying text.
[12] *See infra* notes 77–161 and accompanying text.
[13] *See infra* notes 162–198 and accompanying text.
[14] *See infra* notes 199–245 and accompanying text.
[15] 462 U.S. 696, 707 (1983).
[16] *Place*, 462 U.S. at 707. Arguably, this conclusion was merely dicta, since the Supreme Court found the government action unconstitutional on other grounds, namely that the length of the seizure was out of proportion to the facts supporting reasonable suspicion. *Id.* at 709–10. *See, e.g.*, David A. Harris, *Superman's X-Ray Vision and the Fourth Amendment: The New Gun Detection Technology*, 69 TEMPLE L. REV 1, 33 (1996).

contraband item, leaving any private non-contraband items hidden from public view.[17] The Court rather myopically termed the canine sniff *sui generis,* since it was "aware of no other investigative procedure that is so limited in both the manner in which the information is obtained and in the content of the information revealed by the procedure."[18]

The Court was made aware of another such procedure less than six months later, when it was presented with the use of a chemical test to determine the presence of narcotics in the case of *United States v. Jacobsen.*[19] Fortunately, *Jacobsen* gave the Court an opportunity to refine its *Place* analysis somewhat and focus only on the content of information revealed by the procedure, ignoring the "non-intrusive" language in *Place.*[20] The *Jacobsen* Court further refined the concept of a "binary" search[21]—a search which can only reveal evidence of illegal activity and no other fact—and declared that such a search does not implicate the Fourth Amendment.[22]

In developing the binary search doctrine, the Court in *Place* and *Jacobsen* was not breaking new ground; rather, it was arriving at the logical destination of a journey which began with the seminal case of *Katz v. United States.*[23] *Katz* held that government surveillance implicates the Fourth Amendment if and only if it infringes on an

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[17] *Place*, 462 U.S. at 707.
[18] *Id.*
[19] 466 U.S. 109 (1984).
[20] *Id.* at 122–24. In determining whether the chemical test was a "search," the Court merely asked whether the government activity "infringe[d] an expectation of privacy that society is prepared to consider reasonable." *Id.* at 122. Later, in summarizing *Place*, the Court likewise ignored the "limited matter" aspect of the *Place* analysis, saying that the reason the canine sniff in *Place* was not a search was because "the governmental conduct could reveal nothing about non-contraband items." *Id.* at 124 n.24.
[21] Although *Place* and *Jacobsen* created and refined the concept of a binary search, the Court did not use the term in either case. The term was first coined by the D.C. Circuit in *United States v. Colyer*, 878 F.2d 469, 474 (D.C. Cir. 1989) ("As in *Place*, the driving force behind *Jacobsen* was the recognition that because of the binary nature of the information disclosed by the sniff, no legitimately private information is revealed….")
[22] *Jacobsen*, 466 U.S. at 122.
[23] 389 U.S. 347 (1967).

individual's "reasonable expectation of privacy."[24] Justice Harlan's famous concurrence further defined a "reasonable" expectation as one which the law recognizes as legitimate—not merely a subjective expectation of not being discovered.[25] An individual has no legitimate privacy interest in purely illegal activity;[26] thus, if a given type of investigation (such as a chemical drug test or a canine sniff) can *only* reveal evidence of illegitimate activity, it cannot by definition be a search.

But this destination did not please everyone on the Court. Disssenting in *Jacobsen*, Justice Brennan wrote that the binary search doctrine would allow police to release trained narcotics dogs into public areas "to roam the streets at random, alerting the officers to people carrying cocaine."[27] More ominous (at least to Justice Brennan), was the idea that someday law enforcement would develop a device that could instantaneously detect whether someone was carrying cocaine and then "set[] up such a device on a street corner and scan[] all passersby" or "cruis[e] through a residential neighborhood and us[e] the device to identify all homes in which the drug cocaine is present."[28]

These concerns resonated with at least two of the Justices hearing the *Caballes* case. *Caballes* once again presented the Court with the issue of whether the Fourth Amendment required any showing of probable cause or reasonable suspicion to justify the use of a drug detection dog. The Illinois Attorney General began her oral argument in *Caballes* by citing *Place* for the proposition that a sniff by a drug-detection dog was not a

[24] *Id.* at 361 (Harlan, J., concurring).
[25] *Id.* (Harlan, J., concurring).
[26] *Id.* (Harlan, J., concurring). *See infra* notes 71–74 and accompanying text.
[27] *Jacobsen*, 466 U.S. at 138 (Brennan, J., dissenting). Many commentators have rejected the binary search doctrine at least in part because of these concerns. *See, e.g.*, Harris, *supra* note 16, at 37–45.
[28] *Jacobsen*, 466 U.S. at 138 (Brennan, J., dissenting).

search and therefore did not implicate the Fourth Amendment.[29] Within the first two minutes, Justices Souter and Ginsburg immediately picked up where Justice Brennan had left off in his *Jacobsen* dissent and presented her with the logical (if extreme) conclusion of her argument:

> Justice Souter: …I assume nothing prevents the police from taking the dogs through every municipal garage in the United States and I suppose there's nothing that prevents the police from taking dogs to every homeowner's door, ringing the bell, and seeing if the dog gets a sniff of something when the door is opened.[30]
>
> …
>
> Justice Ginsburg: If we say, as you urge, a dog sniff is not a search, then the police are free to parade up and down every street in the country with dogs sniffing car trunks.[31]

To nobody's surprise, the *Caballes* majority affirmed *Place* and *Jacobsen* and confirmed that a sniff by a trained drug detection dog is not a search.[32] The decision is significant primarily because of the rationale the Court used to uphold these searches: by confirming the validity of the binary search doctrine,[33] the decision is certain to encourage law enforcement to make even broader use of drug detection dogs specifically and binary searches more generally. But the majority opinion failed to address the concerns articulated first by Justice Brennan in *Jacobsen* and echoed by Justices Souter

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[29] Illinois v. Caballes, No. 03-923, Oral Argument Transcript at 4.
[30] *Id.*
[31] *Id.* at 5.
[32] *Caballes*, 543 U.S. ____, ____; 2005 LEXIS 769, *7–*8 (2005).
[33] The Court had at least three different rationales it could have used to approve of the canine sniffs: first, the "plain smell" doctrine—that is, that the canine sniff is merely a more efficient tool for detecting something (in this case, a scent), that the officer already had a constitutional right to detect on his or her own (much like a flashlight assists an officer in seeing things in plain view that he or she already has a right to see); second, the limited intrusiveness/limited in scope argument—that is, that the method being used by the law enforcement agent is "non-intrusive" (because the dog does not enter the car or otherwise infringe on a protected place) and therefore does not constitute a search; and third, the binary search doctrine. Of these three, the Court chose the latter. *See Caballes*, 543 U.S. at ___, 2005 LEXIS at *6 ("We have held that any interest in possessing contraband cannot be deemed legitimate, and thus, governmental conduct that *only* reveals the possession of contraband compromises no legitimate privacy interest. (*citing Jacobsen*, 466 U.S. at 123)). *See also, infra* notes 115–161 and accompanying text.

and Ginsburg in their questions and ultimately in their dissenting opinions in *Caballes*:[34] if there are no Fourth Amendment restrictions on canine sniffs (or other binary searches), what is to prevent their widespread and indiscriminate use? But this question assumes too much; the real question is: if canine sniffs (and other binary searches) only reveal evidence of illegitimate activity, would we *want* to prevent their indiscriminate and widespread use? To refine the question still further, we should ask: what characteristics does a surveillance procedure need to have before it can be considered a "binary search" and therefore fall outside the restrictions imposed by the Fourth Amendment? This question remains unanswered by *Caballes*; indeed, it was not even asked by the *Caballes* Court.[35]

B. The tension between *Terry* and *Place/Jacobsen*

The use of drug detection dogs, such as the one in *Caballes*, represents a potential conflict between two lines of case law. The first arose from the seminal case of *Terry v. Ohio*,[36] which allowed for a brief search and seizure by law enforcement even without probable cause as long as the intrusion onto the Fourth Amendment rights was reasonable; i.e., properly limited and justified by specific and articulable facts.[37] The second, beginning with *Place* and continuing through *Jacobsen* and *Indianapolis v.*

[34] The *Caballes* decision was 6-2; Chief Justice Rehnquist did not participate in the decision. Justices Souter and Ginsburg each wrote a dissenting opinion, and Justice Souter joined Justice Ginsburg's dissent. *See Caballes*, 543 U.S. at ___, 2005 LEXIS at *10 (Souter, J., dissenting) ("[A]n uncritical adherence to *Place* would render the Fourth Amendment indifferent to suspicionless and indiscriminate sweeps of cars in parking garages and pedestrians on sidewalks…."); *id.* at *30–*31 (Ginsburg, J., dissenting) ("Today's decision…clears the way for suspicionless, dog-accompanied drug sweeps of parked cars along sidewalks and in parking lots…[n]or would motorists have constitutional grounds for complaint should police with dogs, stationed at long traffic lights, circle cars waiting for the red signal to turn green.")

[35] The question certified by the Supreme Court in granting certiorari in *Caballes* was "Whether the Fourth Amendment requires reasonable, articulable suspicion to justify using a drug-detection dog during a legitimate traffic stop." *Caballes*, 543 U.S. at ___, 2005 LEXIS at *3–*4.

[36] 329 U.S. 1 (1968).

[37] *Id.* at 20-22.

Edmond,[38] had stated quite clearly (though arguably in dicta) that a canine sniff was not a search because it could only provide information about the existence of contraband and thus could not infringe on a "reasonable [legitimate] expectation of privacy."[39] In its simplest form, the *Caballes* case was about whether canine sniffs require some intermediary level of justification akin to a *Terry* stop or do not implicate the Fourth Amendment at all, as implied by the *Place* line of cases.[40]

1. *Terry's* restriction on seizures

Terry v. Ohio rejected the "all-or-nothing" approach to analyzing seizures, holding that the Fourth Amendment regulates police conduct even if it falls short of a "technical arrest."[41] In evaluating the propriety of a "stop and frisk" by a police officer, the Court held that the police officer's conduct must be "reasonable" in light of the circumstances.[42] This is a fact-specific inquiry, requiring a court to take into account the "governmental interest which allegedly justifies official intrusion" upon the defendant's rights, and requiring the law enforcement officer to show "specific and articulable facts…which reasonably warrant [the] intrusion."[43] Using this test, the *Terry* Court concluded that the "severe, though brief" intrusion caused by a body frisk was justified by the need to ensure the safety of an officer investigating possible criminal activity.[44]

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[38] 531 U.S. 32 (2000).
[39] *See Jacobsen*, 466 U.S. at 123-24. *See also Katz*, 389 U.S. at 351; *Place*, 462 U.S. at 706-7; *Edmond*, 531 U.S. at 40.
[40] The Illinois Supreme Court had held that canine sniffs do implicate the Fourth Amendment, and therefore applied *Terry* to determine whether the use of the drug-detection dog was "reasonably related in scope to the circumstances which justified the interference in the first place." *Caballes*, 207 Ill. 2d at 508; 802 N.E.2d at 204.
[41] Terry v. Ohio, 392 U.S. 1, 19 (1968).
[42] *Id.*
[43] *Id.* at 21-22.
[44] *Id.* at 24-27.

Terry therefore provides law enforcement officers with the ability to conduct some level of seizure even if they lack the probable cause to make a full-blown arrest, but it also limits law enforcement actions by requiring some level of reasonable (and fact-specific) suspicion before allowing even a low-level seizure. For example, if a law enforcement officer has a reasonable suspicion that an individual has committed or is about to commit a crime, *Terry* gives the officer the right to briefly detain the individual and ask a limited number of questions to confirm or deny the officer's suspicions.[45] However, even an initially valid detention could become unreasonable if it exceeds its initial justification in duration or severity.[46]

The Illinois Supreme Court had held that *Terry* was the controlling authority for the use of drug-detection dogs, at least in the context of traffic stops.[47] The key question for the Illinois court was whether the police officer's action in using the drug-detection dog was "reasonably related in scope to the circumstances which justified the interference in the first place."[48] More broadly, any time a law enforcement officer seeks to detain or otherwise physically interfere with an individual, the officer must ensure that the level of interference does not rise above a *de minimis* level and therefore require at least a *Terry* justification. This is true even if the surveillance that they are conducting itself needs no justification. For example, police officers are allowed to observe individuals and vehicles in public areas and watch for signs of illegal activity without any showing of suspicion at

[45] *See* Berkemer v. McCarty, 468 U.S. 420, 439 (1984).
[46] *Id.*
[47] *Caballes*, 207 Ill.2d at 508; 802 N.E.2d at 203.
[48] *Id.* at 508, 204. (quoting *Terry*, 392 U.S. at 19–20). However, the Illinois Supreme Court applied *Terry* to the search question as opposed to the seizure question, an approach which the United States Supreme Court did not support. *Compare id.* at 508–510 *with Caballes*, 543 U.S. at ____; 2005 LEXIS at *6-*9 (2005).

all.[49] However, they are not allowed to randomly order an individual to stop and stand still for ninety seconds while the officer conducts a visual examination of the individual's clothing and mannerisms; likewise, they cannot pull over an automobile without justification in order to closely examine its occupants, even if the occupants are in plain view.[50] Thus, if the use of the drug dog in *Caballes* was itself considered a "seizure," or if it impermissibly expanded the scope of a previously justified seizure, the surveillance method would violate the Fourth Amendment even if the search itself were permissible.

2. *Place* and *Jacobsen* and the evolution of the binary search doctrine

In *Place*, law enforcement agents briefly detained the defendant as he was waiting to board a plane from Miami to New York.[51] The defendant consented to a search of his luggage, but the law enforcement officers allowed him to board the plane without conducting a search.[52] Further investigation led the agents in Miami to contact the Drug Enforcement Agency in New York, and these agents approached the defendant after he claimed his bags at La Guardia.[53] The agents in New York still lacked probable cause, and the defendant (perhaps a bit wiser than he had been in Miami) denied their request to

[49] *See, e.g.*, Oliver v. United States, 466 U.S. 170, 178 (1983) ("[A]n individual may not legitimately demand privacy for activities conducted out of doors in fields, except in the area immediately surrounding the home.") *See also* United States v. Martin, 509 F.2d 1211, 1214 (9th Cir. 1975) ("We find nothing in the Katz opinion indicating that if an officer had merely stood outside the booth and heard what Katz was saying, Katz's rights would have been invaded. *Eavesdropping from a place where the officer has a right to be is a long-accepted technique of crime detection, not outlawed by the Fourth Amendment.* If Katz had talked loud enough to be overheard, his expectation of privacy would be gone. So here the activities in the Martin house were conducted in such a manner as to be seen and smelled from the adjoining property. Whatever expectation of privacy Martin and his cohorts had was defeated by their own activities.") (emphasis added).

[50] To stop a person for investigatory purposes, a police officer must "have a reasonable suspicion supported by articulable facts that criminal activity 'may be afoot.'" United States v. Sokolow, 490 U.S. 1, 7 (*quoting Terry*, 392 U.S. at 30). These facts must provide some level of objective justification, not just a hunch. *Id.*

[51] *Place*, 462 U.S. at 698.

[52] *Id.*

[53] *Id.* The defendant had told the Miami agents that he recognized they were police, which prompted even more suspicion on their part. They then investigated the address tags on the checked luggage and found they contained different street addresses. Upon further investigation, the agents learned that neither street address actually existed; moreover, the phone number the defendant had given the airline belonged to a third address. *Id.*

search his luggage.[54] The agents seized the luggage and took it to Kennedy airport, where a trained narcotics dog sniffed the bags and alerted to one of them.[55] A total of ninety minutes had elapsed since the agents had seized the luggage from the defendant.[56] After the intervening weekend, the agents used the canine sniff evidence to procure a warrant from a magistrate,[57] and upon opening the bag discovered over a kilogram of cocaine.[58]

The Court reviewed both the seizure of the luggage and the "search" (or quasi-search) by the drug-detection dog. The seizure was analyzed under the test set out by *Terry*: balancing "the nature and quality of the intrusion on the individual's Fourth Amendment interests against the importance of the governmental interests alleged to justify the intrusion."[59] The Court agreed with the government that the state had a substantial interest in identifying individuals who traffic in illegal drugs, and implied that the agents possessed specific and articulable facts to support their belief that the defendant was such an individual.[60] However, the Court held that the duration of the seizure was unreasonable under the *Terry* rationale.[61] The Court stopped short of setting

[54] *Id.* at 698–99.
[55] *Id.* at 699.
[56] *Id.*
[57] A positive reaction by a trained narcotics dog has universally been held to give police probable cause to search the item in question. *See, e.g.* United States v. Meyer, 536 F.2d 963, 966 (1st Cir. 1976) (holding that a positive alert by a drug-detection dog provides probable cause**;** *see also infra* note 106–108 and accompanying text.
[58] *Place*, 462 U.S. at 699.
[59] *Id.* at 703.
[60] *Id.* at 703. Although the Court never stated directly that the agents had specific and articulable facts, they based their decision on the duration of the seizure, implying that a shorter seizure would have been permissible (*id.* at 709–10); thus, the Court implied that the agents did indeed have enough specific and articulable facts to conduct a brief, limited *Terry* seizure.
[61] *Id.* at 709–10. The Court acknowledged that seizures of property can vary in their degree of intrusiveness, based on the duration of the seizure and the type of property being seized. *Id.* at 705–08.

a time limit for *Terry* seizures, but noted that it had never approved of a 90-minute seizure under the *Terry* doctrine.[62]

As far as the use of the drug detection dog, the court stated (in dicta)[63] that the canine sniff did not constitute a "search" and therefore did not implicate the Fourth Amendment.[64] The Court noted that the search in this case was both unobtrusive in its method and limited in the information that it obtained.[65] Unfortunately, the Court limited its conclusion to the specific facts of the case, stating that "the particular course of investigation that the agents intended to pursue here" was acceptable.[66] Believing that this type of investigation was *sui generis*,[67] the Court apparently felt no need to provide broader guidelines or standards which could assist future courts in analyzing such investigative procedures.

Jacobsen gave the Court a chance to correct this omission. In *Jacobsen*, a package being sent by Federal Express was accidentally damaged at the airport. The Federal Express employees opened the package to determine its contents for insurance purposes, and found tubes containing bags of white powder.[68] The employees contacted the Drug Enforcement Agency, and an agent arrived, cut open each of the four bags and subjected the powder to a series of chemical tests to determine whether the powder was cocaine.[69]

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[62] *Id.* at 709–10.
[63] Since the decision on the seizure issue was sufficient to decide the case, there was no need to discuss the issue of whether the use of the drug detection dog constituted a search. Indeed, the defendant did not specifically contest the validity of the canine sniff in the trial court, and the issue was not briefed or argued for the Supreme Court. *Id.* at 719 (Brennan, J., concurring). .
[64] *Id.* at 707.
[65] *Id.*
[66] *Id.*
[67] *Id.*
[68] *Jacobsen*, 466 U.S. at 111 (1984).
[69] *Id.* at 111–12, 112 n.1. The powder was placed in three different test tubes, causing the substance in each test tubes to change color if cocaine is present. As the Court pointed out, "Such a test discloses whether or

The actions by the private parties clearly did not implicate the Fourth Amendment,[70] so the Court focused on the investigation of the DEA agent who arrived after the package had been opened. The "seizure" which occurred when the DEA agent exercised dominion and control over the package and re-opened it to visually examine its contents was permissible because the package had already been examined by the Federal Express employees who had a right to examine it; thus, the defendants' "privacy interest in the contents of the package had been largely compromised."[71] The chemical test, however, went beyond what the private employees had done in the absence of state action, and required an application of the *Katz* test: does a field test which can only disclose the presence or absence of contraband violate an expectation of privacy that society is prepared to consider reasonable?[72]

The Court held that the defendants' Fourth Amendment rights were not violated by the test, since regardless of whether the test result was positive or negative, it would reveal nothing to the government agent that violated a reasonable and legitimate expectation of privacy. Quoting *Katz*, the Court noted that "a burglar plying his trade in a summer cabin during the off season may have a thoroughly justified subjective expectation of privacy, but it is not one which the law recognizes as "legitimate."[73] By focusing on the legitimacy requirement of the *Katz* test, the Court concluded that a chemical examination (and by extension, any other method of investigation) which can

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not the substance is cocaine, but there is no evidence that [the test] would identify any other substances." *Id.* at 112 n.1.

[70] *Id.* at 114–18.

[71] *Id.* at 120–21.

[72] *Id.* at 122.

[73] *Id.* at 100 n.22 (quoting Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J., concurring)).

only reveal the presence or absence of illegitimate or illegal activity is not a search under the Fourth Amendment.[74]

The Court went back to "clarify" its position from the *Place* case a year before. Before *Jacobsen*, *Place* was a rather unhelpful precedent in the search context for three reasons: first, the approval of the canine sniff was merely dicta; second, the Court explicitly stated that the search aspect of its analysis was intended for that specific fact pattern alone; and finally, the language used in approving the search had been somewhat messy and unfocused, highlighting not only the binary nature of the search but also its comparatively non-intrusive manner. The *Jacobsen* Court could not, of course, turn the *Place* dicta into a binding holding for canine sniffs, but it took pains to revise the meaning of the dicta to make it much more useful for future cases:

> [Defendant's] attempt to distinguish *Place*, arguing that it involved no physical invasion of Place's effects, unlike the [government] conduct at issue here. However. . .the *reason* [the canine sniff in *Place*] did not intrude upon any legitimate privacy interest was that the governmental conduct could reveal nothing about noncontraband items.[75]

The Court thus transformed the fact-specific dicta from *Place* into a precursor to the binary test of *Jacobsen*, a test that included a clear standard which was plainly intended to apply to future cases.

The Court did not re-visit the binary search doctrine for twenty-one years, when it granted certiorari in the *Caballes* case. *Caballes* was an opportunity for the Justices to merge the seizure restrictions of *Terry* with the permissive binary search doctrine of

[74] *Id.* at 100–01 ("Congress has decided…to treat the interest in 'privately' possessing cocaine as illegitimate; thus, governmental conduct that can reveal whether a substance is cocaine, and no other arguably 'private' fact, compromises no legitimate privacy interest.")

The *Jacobsen* Court also briefly considered whether the government agents had conducted an illegal "seizure" by destroying a small amount of the powder during the course of the chemical test. The Court easily found that the loss of such a "trace amount" of material was more than justified by the "substantial" law enforcement interest in conducting the test. *Id.* at 124n25.

[75] *Id*. at 124 n.24 (emphasis in the original).

Place and *Jacobsen*, thus providing lower courts—and police—a clear standard to follow in evaluating (and designing) binary searches in the future. As we will see, the Court effectively declined that opportunity, resoundingly affirming the binary search doctrine of *Place* but leaving the question of possible limitations for another day.[76] Before turning to the decision itself, it will be useful to examine how the binary search doctrine has been applied in the lower courts, using canine sniffs as a case study to illustrate the potential promise and potential dangers of this type of investigation.

III. Application of the Binary Search Doctrine

A. Potential types of binary searches

As noted above,[77] the term "binary search" was first used five years after *Jacobsen* by the D.C. Circuit in a case involving the use of a drug detection dog on the sleeper car of a train.[78] Since then, other forms of binary searches have appeared, both in academic scholarship and in the real world: "gun detectors" that will only alert if the individual is carrying a firearm;[79] handheld mechanical explosive detectors;[80] software that can monitor thousands of e-mails being sent over the internet and alert a human

[76] *See, e.g.*, *Caballes*, 543 U.S. at ____; slip. op. at 4 ("In this case, the dog sniff was performed on the exterior of respondent's car while he was lawfully seized for a traffic violation. Any intrusion on respondent's privacy expectations does not rise to the level of a constitutionally cognizable argument."). *See also* notes 175-188 and accompanying text.

[77] *See supra* note 21.

[78] United States v. Colyer, 879 F.2d 469, 474 (D.C. Cir 1989) ("As in *Place*, the driving force behind *Jacobsen* was the recognition that because of the binary nature of the information disclosed by the sniff, no legitimately private information is revealed: That is, 'the governmental conduct could reveal nothing about noncontraband items.'" (citation to *Jacobsen* omitted)).

[79] Alyson R. Rosenberg, *Comment: Passive Millimeter Wave Imaging: A New Weapon In the Fight Against Crime or a Fourth Amendment Violation?* 9A LB. L.J. SCI. & TECH. 135, 138–40 (1998).

[80] *See* http://www.usiegroup.com/r_productDetails.aspx?PID=249&PcatID=100 (company selling the "E 3500-Portable Advanced Explosives Detector").

agent only if illegal material (such as child pornography) is attached to the message;[81] facial recognition devices that can scan an individual faces in a crowd and only alert if the face matches that of a known fugitive.[82]

Although none of these technologies yet exist in a perfect binary form, many of them are already being used by law enforcement. Gun detectors,[83] heat detectors,[84] mechanical narcotic detectors,[85] and software that "sniffs" out e-mails passing through the internet,[86] are all examples of technologies currently in use by law enforcement that could theoretically become binary searches if properly refined. For an investigative technique to be considered a pure binary search, it must only give the user a positive or negative response about whether the individual or item being investigated is committing a

[81] *See, e.g.*, Ric Simmons, *From* Katz *to* Kyllo: *A Blueprint for Adapting the Fourth Amendment to Twenty-First Century Technologies*, 53 Hastings L.J. 1303, 1352 (2002). The federal government currently uses an "internet-sniffing" protocol known as "DCS1000" (formerly known as "Carnivore") which can be attached to an internet service provider's site and sift through incoming and outgoing e-mails, looking for and then copying messages to or from the target individual. *See* Dan Eggen, *'Carnivore' Glitches Blamed for FBI Woes; Problems With E-Mail Surveillance Program Led to Mishandling of al Qaeda Probe in 2000, Memo Says*, Washington Post, May 29, 2002 at A7. Obviously in its current form the protocol is non-binary and requires not just a warrant but a Title III order before it can be used; but future versions of the protocol could conceivably be designed to only detect illegal activity to simply alert law enforcement as to the name of the individual sending the offending e-mail.

[82] *See* Richard Winton, *LAPD officers field-test a hand-held computer using facial recognition to identify suspects. Critics raise issues of privacy and reliability*, L.A. TIMES, December 25, 2004 at B1 (describing a hand-held computer in use by the Los Angeles police which compares the suspects' face to a database of known fugitives or gang members). In an interaction described in the article, the device claimed 94% accuracy in identifying a certain individual as a known gang member. *Id.* When used on individuals in public places, such a device does not require probable cause, since individuals in public have no reasonable expectation of privacy in their facial appearance in public. However, if the device were converted to give only a binary output – a signal sent to law enforcement if it found a match with a known fugitive, for example—it could conceivably be used in private areas without violating the Fourth Amendment. For a discussion on the constitutionality of such searches, *see* John J. Brogan, *Facing the Music: The Dubious Constitutionality of Facial Recognition Technology*, 23 HASTINGS COMM. & ENT. L.J. 65 (2002).

[83] *See* Rosenberg, Comment, *supra* note 79 at 138–40.

[84] *See* United States v. Kyllo, 533 U.S. 27, 29–30 (2001).

[85] *See* Richard S. Julie, *High Tech Surveillance Tools and the Fourth Amendment: Reasonable Expectations of Privacy in the Technological Age*, 37 Am. Crim. L. Rev. 127, 137–39 (2000) (describing the "Sentor," which relies on principles of gas chromatography and mass spectrometry to analyze air which is sucked in from near a person's body. As of now the Sentor is decidedly non-binary; it can inform law enforcement, for example, whether the subject of the search is taking prescription drugs for treating HIV. *Id.* at 138. The device also has accuracy concerns, since it might result in a false positive for an individual who was near illegal drugs in the past (or with someone who had a large amount of drugs) but who at the moment was not carrying any illegal drugs. *Id.* at 138–39.

[86] *See* Eggen, *supra* note 81, at A7.

crime. As of now, all of these devices return too much information to the law enforcement user to be termed binary searches. For example, hand-held gun detectors exist that use passive millimeter wave imagery to display an outline of metal objects carried by an individual.[87] In such a format, use of the gun detector is plainly a "search;" even though it does not physically interfere with the individual under surveillance, it provides the law enforcement officer with information about the individual that is covered by a reasonable expectation of privacy: to wit, an outline of all of the metal objects carried in their clothing. However, in order to turn this tool into a binary search device, the manufacturer could simply remove the graphic display from the device and instead install software that could "read" the image seen by the device and alert the user if and only if the object being detected were determined to be a firearm. Only in that form would the device pass the binary search test, since it would only tell the law enforcement officer one thing about the individual under surveillance: whether that person was carrying a concealed firearm.[88]

Likewise, heat detectors and software that scans e-mails are currently unable to distinguish between innocent heat emissions and electronic transmissions and those that definitively show that the defendant is committing a crime; instead, they pass along their output (which includes information about legitimate, protected activities) to their human operators.[89] It is then up to the human operators of these devices to study the heat

[87] *See* Rosenberg, Comment, *supra* note 79 at 138–40.

[88] Even this would not constitute a binary search unless the device were being used in a jurisdiction (or under specific circumstances) in which it was illegal to carry a concealed firearm.

[89] In *Kyllo*, the Court famously noted that the thermal imager in question could inform law enforcement of "the hour each night the lady of the house takes her daily sauna and bath." *Kyllo*, 533 U.S. at 38.

patterns or e-mails and determine whether a crime is being committed—and in the act of studying these images or transmissions, the human operator is conducting a search.[90]

Thus, although the binary search doctrine has the potential to become extremely important in decades to come, most of the binary searches that could someday be used by law enforcement are not yet a reality—at least not in a pure binary form. Almost all of these devices require a level of technology that remains just over the horizon in order to be converted into binary searches. Essentially, of all the binary searches mentioned in law review articles and court cases, only two are currently in use by law enforcement: canine sniffs and chemical field tests (like the one used in *Jacobsen*).[91]

While chemical field tests are certainly binary searches, the doctrine has little practical application in their context. In almost every case in which a chemical field test is used, the law enforcement officer has already demonstrated probable cause in order to justify the seizure of the substance being tested. Thus, almost by definition, law enforcement officers need not rely on the binary search doctrine to justify chemical field tests, because they were already required to show probable cause in order to get the

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[90] *See, e.g., id.* at 40-41.

[91] There is a third category of binary searches that have been considered (infrequently) by courts: the use of merchandise tags by private stores which are programmed to set off an alarm if an individual leaves the store without paying for the merchandise. Like canine sniffs and chemical field tests, an alert from such a device tells law enforcement only one thing: that the defendant is involved in illegal activity; and, also like canine sniffs and chemical field tests, such an alert will constitute probable cause and lead to a full-scale search of the individual's bag. Such devices are predominantly used by private companies, which are not covered by the Fourth Amendment—but in rare cases in which courts have found the private security guards to be "state actors," they have applied the binary search doctrine to approve the use of such devices. *See* Lucas v. United States, 411 A.2d 360, 364 (D.C. 1980) (implying in dicta that the use of the merchandise tags would be constitutional even without reasonable suspicion, because "[i]t reveals nothing about the subject or his belongings other than whether he is carrying store merchandise with live tags beyond the point where he should have paid for the merchandise and had the tags removed.")

Although the private aspect of the use of merchandise tags generally puts them beyond the scope of the Fourth Amendment, the broad extent of their use demonstrates the potential efficiency of binary searches, while their relative non-intrusiveness demonstrates the potential promise of binary searches as an extremely effective but narrowly-tailored surveillance tool which would not violate an individual's Fourth Amendment rights.

substance in the first place.[92] Canine sniffs, on the other hand, can be effectively used to detect narcotics or other contraband at a distance, thus providing law enforcement with a powerful tool to search for illegal activity without probable cause or even reasonable suspicion. Given these factors, it is no surprise that canine sniffs have become widely used by law enforcement.[93]

Therefore, canine sniffs are unique: they belong to a category of searches that could conceivably revolutionize the way law enforcement agents conduct surveillance in the near future, but (because they do not rely upon a new and emerging technology) they themselves have been around for over thirty-five years.[94] Literally hundreds of federal cases have assessed the propriety of canine sniffs under different circumstances, and the Supreme Court has now visited the issue twice (though neither visit was particularly enlightening for the law enforcement agents and courts that utilize and evaluate these searches on a regular basis).[95] By accident of history, canine sniffs have become the test case for the impending flood of binary search techniques to come.

B. Canine sniffs – the first practical, widespread use of binary searches

The first known use of detection dogs in this country was in World War II, when the United States Army trained approximately 140 dogs to detect trip wires and non-metallic landmines.[96] By the late 1960's and early 1970's, as drug use became more

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[92] The *Jacobsen* case was a rare exception to this rule, since it involved suspected contraband which was legitimately in the hands of a private third party (a shipping company), who then called in the law enforcement officers to test the substance which they had inadvertently spilled. *Jacobsen*, 466 U.S. at 114–18.

[93] In 1991, the Congress Office of Technology reported that canine detection is the one of the most widely used, accurate, durable, and flexible system available for detecting illegal drugs and explosives. *Technology Against Terrorism: The Federal Effort*, (1991), Congress Office of Technology, OTA-ISC-481.

[94] *See infra* note 98 and accompanying text.

[95] *See Place*, 462 U.S. at 706–07; *Caballes*, 543 U.S. at ____; 2005 LEXIS at *4–*9.

[96] Paul B. Jennings, *Origin and History of Security and Detector Dogs*, in Canine Sports Medicine and Surgery, 17 (Mark F. Bloomberg, Jon F. Dee, Robert A. Taylor eds. (1988); *see also* The Military Working Dog History at http://www.militaryworkingdog.com/history. Only two units of detection dogs were

widespread in the military, the army began training dogs to detect drug possession among its servicemen.[97] Civil law enforcement warmed to the idea as well, beginning with the United States Customs Service in 1970,[98] and quickly spreading to all levels of law enforcement involved in drug interdiction.[99]

The first reported case in which a drug-detection dog was used to establish probable cause was a general army court-martial in 1972.[100] After quoting an extensive amount of testimony from the dog's handler as to the reliability (and asserted infallibility)

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activated, and they ended up performing poorly under battle conditions – a surprise given the successful use of military dogs performing other wartime tasks such as tracking, scouting, and sentry duties. Jennings at 17–18.

[97] *Id.* at 18.

[98] Max A. Hansen, *United States v. Solis: Have the Government's Supersniffers Come Down With a Case of Constitutional Nasal Congestion?*, 13 SAN DIEGO L. REV. 410, 414 n.22 (1976). In 1974 the U.S. Customs Service dogs screened over 90,000 vehicles, 4 million mail packages, and over 6 million units of cargo, resulting in the seizure of over 22,000 pounds of marijuana and 38 pounds of heroin and cocaine. *Id.* at 416 n.31.

[99] *See* Vicki Hyman Kenner, *Pooches Are Put Through Their Paces*, TIMES-PICAYUNE (New Orleans, L.A.), Sept. 18, 1998, at B1 ("Large law enforcement agencies often have entire divisions with state-of-the-art facilities devoted to canine work, but smaller cities and towns may have only one or two canine officers. . . .")

The dog breeds most frequently used by the federal government are German shephards, Belgian malinois, English springer spaniels, labrador retrievers, and golden retrievers. The United States Department of Agriculture uses Beagles at airports to sniff for contraband. J. Christopher Hain, *World Howling for Bomb Dogs: Shortage of Trained Dogs Snags Security Efforts at PBIA, Elsewhere*, Palm Beach Post A1 (Nov. 30, 2001). Smaller dogs such as beagles and terriers have proven themselves to be very effective, but may not be as practical for use in the field. *See, e.g.,* Sandra Guerra, *Criminal Law: Domestic Drug Interdiction Operations: Finding the Balance*, 82 J. Crim. L. & Criminology 1109 (1992) (arguing that because smaller dogs have "superior sensory abilities," and because larger dogs can be unduly intimidating, police forces should be required to use only smaller, "non-threatening breeds" for canine sniffs); Robert C. Bird, *An Examination of the Training and Reliability of the Narcotics Detection Dog*, 85 KY L.J. 405, footnote 41 (1997) (agreeing that smaller dogs have better olfactory abilities, but noting that law enforcement agents prefer larger breeds because they can traverse obstacles more effectively).

The training of a narcotics detection dog takes approximately 2-6 weeks; however, training a human being to properly handle the dog and interpret its reactions takes approximately 10 -16 weeks. *See id.* at 412.

[100] United States v. Unrue, 46 C.M.R. 882, 886 (United States A.C.M.R. 1972). The Fifth Circuit in the same year heard a case in which a drug-detection dog was used by United States Customs on some footlockers that were being shipped from Jamaica, but the Fourth Amendment concerns were obviously not present in that case. *See* United States v. Johnson, 469 F.2d 973, 975 (5th Cir. 1972). Also earlier that year, the United States Air Force Court of Military Review heard a case in which a dog was used to provide probable cause for a search, but explicitly refused to rule on whether the alert alone was sufficient to provide probable cause. United States v. Ponder, 45 C.M.R. 418, 434 (United States A.F.C.M.P. 1972). Evidence of identification of a defendant by bloodhounds had been admissible for decades prior to 1972. *See* Annotation, 18 ALR3d 1221; 1 Wigmore, Evidence, 177 (3d ed 1940).

of the dog,[101] the United States Army Court of Military Review held that the dog's alert alone was sufficient to give the law enforcement agents probable cause,[102] and on appeal the United States Court of Military Appeals agreed.[103]

The first reported civilian case followed closely afterwards, when in 1974 the D.C. Circuit upheld the issuance of a warrant based on a canine sniff of footlockers in a baggage terminal.[104] In a precursor to *Place* and *Caballes,* the defendant claimed that the canine sniff itself was a search, and the court summarily dismissed the argument as "frivolous."[105] Between 1974 and 1983, when *Place* was decided, every circuit court to address the question held that drug detection dogs were sufficient to provide probable cause, although they were split as to whether or not the use of the dog itself implicated the Fourth Amendment.[106] In 1977, the Supreme Court itself decided *United States v.*

[101] The dog's handlers described how the dog "Rex" alerted, the intensive training regimen the dog had undergone, and numerous examples of his successfully locating drugs. The Sergeant in charge of drug detection dogs at the fort characterized Rex as "the best dog…in the Southeastern United States." *Unrue*, 46 C.M.R. at 883–86.

[102] *Id.* at 886.

[103] United States v. Unrue, 22 U.S.C.M.A. 466, 470 (1973).

[104] United States v. Fulero, 498 F.2d 748, 749 (D.C. Cir. 1974). Since drug detection dogs were not in general use at the time for general crime prevention, the local law enforcement had to borrow a drug detection dog and its handler from the United States Customs Service. *Id.* In finding the dog "Chief" to be reliable, the court merely noted that the handler testified that Chief had accurately found drugs ten times or more, and had been "consistently reliable" over the two years he had worked at customs. *Id.*

[105] *Id.*

[106] *See, e.g.*, United States v. Meyer, 536 F.2d 963, 966 (1st Cir. 1976) (positive dog sniff provides probable cause; silent on the question of whether the sniff itself implicates the Fourth Amendment); United States v. Bronstein, 521 F.2d 459, 463 (2d Cir. 1975) (positive dog sniff provides probable cause; dog sniff allowed in this case because there was "reliable information that reasonably triggered the surveillance"); United States v. Sullivan, 625 F.2d 9, 11–12 (4th Cir, 1980) (positive dog sniff provides probable cause; implies that some reasonable suspicion is necessary before a drug-detection dog can be used);; United States v. Goldstein, 635 F.2d 356, 361 (5th Cir. 1981) (positive dog sniff provides probable cause; use of the dog does not implicate the Fourth Amendment); United States v. Lewis, 708 F.2d 1078, 1080 (6th Cir. 1983) (same); United States v. Klein, 626 F.2d 22, 27 (7th Cir. 1980) (positive dog sniff provides probable cause; implies that some reasonable suspicion is necessary before a drug-detection dog can be used); (United States v. Beale, 674 F.2d 1327, 1333–34 (1982) (holding that a dog sniff is a Fourth Amendment intrusion which must be justified by "articulable suspicion"); United States v. McCranie, 703 F.2d 1213, 1218 (10th Cir.1983) (positive dog sniff provides probable cause; law enforcement must have "some suspicion" before using a drug-detection dog).

Chadwick,[107] in which a drug detection dog was used, and implied that the alert by the dog would have been sufficient to obtain a warrant.[108] Surprisingly, the Court did not even discuss the question of whether the use of the dog constituted a search under the Fourth Amendment,[109] and the case was cited in *Place* only for the well-settled proposition that an individual has a protected privacy interest in the contents of his or her luggage.[110]

Place itself, of course, stated (albeit in dicta) that the use of a drug-detection dog did not implicate the Fourth Amendment.[111] In the twenty-two years between *Place* and *Caballes*, the lower courts have almost uniformly held that a canine sniff is not a search under the Fourth Amendment.[112] Many of these cases simply cite to *Place*, sometimes quoting its relatively vague explanation,[113] but a relatively consistent pattern of holdings has been somewhat muddled by the different rationales that courts use to support this conclusion.[114] In fact, numerous courts have upheld suspicionless canine sniffs without resorting to the binary search doctrine—a doctrine that is relatively recent and somewhat

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[107] 433 U.S. 1 (1977).

[108] *Id.* at 15. The Court noted that "on this record the issuance of a warrant by a judicial officer was reasonably predictable….") However, the Court held that even though the law enforcement agents had probable cause after the canine sniff, they should have sought and acquired a warrant before opening the luggage. *Id.* at 15-16.

[109] The law enforcement agents arguably had articulable facts to justify the canine sniff (for example, agents observed talcum powder leaking from the baggage, which is commonly used to mask the smell of marijuana, and the defendants fit a "drug courier profile" (*id.* at 3)), but certainly not probable cause. However, the Court did not address the issue at all, presumably assuming that the use of the drug detection dog did not even implicate the Fourth Amendment.

[110] *Place*, 462 U.S. at 707 (1983). Indeed, *Place* did not cite *any* authority for its decision that a canine sniff is not a "search" under the Fourth Amendment. *Id.*

[111] *Id* at 706-07.

[112] *See, e.g.*, United States v. Rodriguez-Morales, 929 F.2d 780, 788 (1st Cir. 1991). For an overview of the canine sniff case law during this period, *see generally* 150 ALR F3d. 399, §2a.

[113] *See, e.g., Rodriguez-Morales*, 929 F.2d at 788 (1st Cir. 1991); United States v. Harvey, 961 F.2d 1361, 1363 (8th Cir. 1992);

[114] *See infra* notes 115–161 and accompanying text. This near-uniformity of decisions in the lower courts made it somewhat surprising that the Court granted certiorari in the *Caballes* case—and then issued a decision that was so narrowly tailored that it did little more than reiterate what had already been established in *Place* and *Jacobsen* twenty years ago.

controversial.[115] In the wake of *Place*, courts which chose not to rely on the binary search doctrine offered two other justifications for allowing canine sniffs without probable cause: the "plain smell" doctrine, and the "non-intrusive" method of the sniff itself.[116] Before *Caballes* was decided, it was possible that the Supreme Court could have retreated from the binary search language of *Place* and *Jacobsen* and settled on one of these justifications instead to explain the constitutionality of suspicionless canine sniffs.

D. Other possible rationales to support canine sniffs

The binary search doctrine is not without its critics. The most common critique of the doctrine is that it seeks to legitimize a search based on *ex post facto* examination of what the police find as a result of the search.[117] Of course, if this is what the binary search doctrine implied, it would indeed be flawed, but a true binary search is defined not by what the search *actually* detects, but rather what it is *able* to detect. Thus, there is no need to conduct an *ex post facto* examination of the search; a court can determine whether a surveillance procedure is indeed a binary search without needing to know what, if anything, the surveillance detected.

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[115] *See* Harris, *supra* note 16, at 37–45 ("Simply put, the reasoning that undergirds both *Place* and *Jacobsen* is wrong and dangerous; its implications are nothing less than frightening.")

[116] *See* 150 A.L.R. Fed. 399, § 3 ("Most federal courts reason that dog sniffs are not searches for Fourth Amendment purposes, because they are only minimally intrusive, and because they occur in places where individuals do not have heightened expectations of privacy. There is no privacy interest in the odor that emanates from even a closed container because that odor is accessible to the public. Moreover, drug sniffs do not require the opening of, or identify the contents of, containers; they merely indicate the presence or absence of drugs.")

[117] *See, e.g.*, Harris, *supra* note 16, at 41 ("It seems almost too basic a proposition to restate, but what police find as a result of the search can play no part in determining whether the officers violated the Fourth Amendment in conducting the search.") Professor Harris also brings up another criticism: namely, when Congress or state legislatures declare certain substances or activities to be illegal, they are not necessarily saying that individuals have no privacy interests in conducting those activities. *Id.* at 40-41. Although this is true, the binary search doctrine is not based on the legislative intent behind the criminal laws in question, but rather the reach of the Fourth Amendment. The Court has repeatedly held that the Fourth Amendment protects only "legitimate" activity, and not illegal activity. *See, e.g.*, Katz v. United States, 389 U.S. 347, 361 (1967) (Harlan, J., concurring).

We have also seen Justices of the Supreme Court reluctant to embrace the binary search doctrine: recall Justice Brennan's dissent in *Jacobsen* in which he describes the "Orwellian world" that will arise when law enforcement develops long-distance "narcotics detectors" that can see through walls, car doors, and clothes.[118] However, it is worth noting that police officers today, without such devices, intrude onto our privacy in myriad ways which are constitutional but still intrusive: they observe our actions in public places watching for "suspicious" activity; they employ undercover officers and informants to infiltrate our private activities in search of illegal activity; they might pull us over or stop us on the street based on a hunch, a pretext, or even a racially-motivated profile. A true binary search, properly utilized by law enforcement, would in many ways be far less intrusive of individuals' privacy, since it would provide law enforcement officers with extremely limited information about our private lives.

However, given the reluctance on the part of some commentators and judges to accept the binary search doctrine, it is not surprising that some courts have looked to other justifications to support the *Place/Jacobsen* holding. Some courts have relied upon the "plain smell" doctrine, while others have focused on the lack of physical intrusiveness involved in these searches.

1. The "plain smell" doctrine.

Some courts which have approved canine sniffs have relied upon the "plain smell" doctrine – that the dog is merely an "extension" of the police officer, enhancing his or her senses rather like a flashlight or binoculars help the officer to use his or her plain sight.[119] Therefore, since the police officer does not violate the Fourth Amendment

[118] United States v. Jacobsen, 466 U.S. 109, 138 (1984) (Brennan, J., dissenting).
[119] *See infra* note 121 and accompanying text.

by merely detecting a smell that is emanating into a public area (or into a private area where the officer is lawfully present),[120] the detection of the scent should not become a "search" under the Fourth Amendment merely because the officer uses a device (in this case a dog) to enhance his or her ability to detect the scent.[121]

This line of cases distinguishes between "sense-enhancing" and "sense-replacing" devices, stating that the former are constitutional because they merely assist the law enforcement officer in a more accurate detection of what he or she could already detect, while the latter give the officer more information than could otherwise be detected by his or her five senses.[122]

Although intuitively appealing, this approach has serious flaws; most significant among them being the impossibility of drawing a line between "sense-enhancing" and "sense-replacing" devices. Obviously at some point a "sense-enhancing" device becomes *so* ultrasensitive that any court would concede that it is providing the officer with information not detectable by his or her normal senses: a miniature microphone planted next to the defendant's phone, for example, or a thermal imager across the street from the defendant's house. Both of these are examples of devices which merely amplify inputs that human beings can already sense, but in both cases the courts have held that the use of

[120] *See* Johnson v. U.S., 333 U.S. 10 (1948) (smell can be sufficient to provide probable cause providing law enforcement officer is qualified to identify the odor and the odor is distinctive enough).
[121] *See, e.g.*, United States v. Bronstein, 421 F.2d 459, 461 (2nd Cir. 1975) (noting that if a police officer had smelled the drugs, the sniffing would not be a search, and that the same analysis applied when a drug dog conducted the sniffing); United States v. Johnson, 660 F.2d 21, 22 (2nd Cir. 1981) (a sniff of the air does not become impermissible merely because it was done by a dog instead of a human being); United States v. Sullivan, 625 F.2d 9, 13 (4th Cir. 1980) (dog sniff is no more a search than a sniff by the human agent); Horton v. Goose Creek Independent School Dist., 690 F.2d 470, 477 (5th Cir. 1982).
[122] *See, e.g., Place*, 462 U.S. at 719–20 (Brennan, J., concurring). Justice Brennan disagreed with the majority's dicta that use of a drug-detection dog was not a search, and he cited the sense-enhancing/sense-replacing distinction as a reason—although he argued that drug-detection dogs were in fact sense-*replacing*. Justice Brennan distinguished a drug-detection dog from an electronic homing device used in an earlier case because the homing device did nothing more than "allow the police to do more efficiently what they could do using their own senses," while the drug-detection dog added "a new and previously unobtainable dimension to human perception. *Id.* (Brennan, J., concurring).

these items was a "search."[123] Most recently, the *Kyllo* case itself helped put this unscientific and legally dubious distinction to rest. The government attorney in *Kyllo* had argued that the thermal imager used by the officers was only a "sense-enhancer," since it merely sensed heat that was emanating from the house, and heat was something that any human could detect on his or her own.[124] The Supreme Court rejected this argument, holding that it was irrelevant whether the device was detecting heat that came through the wall (which could theoretically be felt by a human being on the outside) or whether the device was sending signals that pierced the wall to gather information about the inside of the house (which could not possibly be detected by a human being on the outside).[125]

Canine sniffs themselves are an excellent example of the problems in making this distinction, for the simple reason that courts cannot agree as to whether a canine sniff is sense-replacing (because it gives the officials information about "something entirely hidden from human senses")[126] or sense-enhancing.[127] Like the thermal imager in *Kyllo*, a canine sniff tells the law enforcement officer private information that he or she could not possibly detect with his or her own naked senses. Thus, to claim that canine sniffs are not "searches" because they merely enhance the senses of the law enforcement officer is a doctrinally weak argument. As a hypothetical, imagine a mechanical device that could record the most minute traces of scent in the air around a person or a home and identify the scent for the officer. An officer using this device could conceivably know what the subject had eaten for breakfast, what he or she was carrying inside a purse or

[123] *See, e.g., Katz*, 389 U.S. at 362 (Harlan, J., concurring); *Kyllo*, 533 U.S. at 34 (2001).
[124] Oral Argument at 12–13, 30, Kyllo v. United States, 533 U.S. 27 (2001).
[125] *Kyllo*, 533 U.S. at 35–6.
[126] *See*, e.g., State v. Elkins, 354 N.E. 2d 716, 718 (Ohio Ct. App. 1976).
[127] *See*, e.g., Horton v. Goose Creek Indep. Sch. Dist., 690 F.2d 470, 477 (5th Cir. 1982) (comparing the use of a drug detection dog to a flashlight and accepting canine sniffs in principle as allowed under a "plain smell" rule).

bag, or even the scent (and thus perhaps eventually the names) of the people who had been intimate with the subject over the past twenty-four hours. Would all this be permissible simply because the officer was only detecting the scent pattern of the molecules in the air around the individual, and scent happens to be one of the five natural senses that the officer possesses? If the machine used another method to analyze the molecules in the air around the subject – a complex chemical analysis unrelated to the molecules' scent pattern, for example – would the search then suddenly become objectionable simply because of the method used to identify those molecules?

In short, what makes the canine sniff more palatable than other searches is not that the dog happens to be using his sense of smell in searching for narcotics (a detection method that law enforcement agents are coincidentally allowed to use themselves without having to show probable cause); it is the fact that the dog is trained to only react to the presence of narcotics, a contraband item. As a result, the law enforcement officer cannot possibly learn anything about the subject or item in question other than the presence or absence of the contraband.

2. The "non-intrusive" nature of the search

Canine sniffs have also been justified under the theory that they are not physically invasive and therefore do not implicate the Fourth Amendment.[128] This rationale is even more suspect than the "plain smell" justification, since it focuses on the *actions* of the law enforcement officer rather than the type of information that is acquired. Although courts do (and should) care about the level of physical invasion when they are determining whether a seizure has occurred (and the degree of the seizure if one in fact has

[128] *See, e.g.*, United States v. Harvey, 961 F.2d 1361, 1363 (8th Cir. 1992).

occurred),[129] this factor should not be relevant in determining whether or not a *search* has occurred. Obviously in evaluating the propriety of an investigative procedure, a court must ensure both that the search was valid and the seizure was permissible, but it is important not to conflate the two analyses.

Unfortunately there is a significant amount of Supreme Court precedence behind this doctrine, though most of it has fallen into disrepute.[130] In the early days of Fourth Amendment jurisprudence, the Court relied upon the "trespass" doctrine, which allowed law enforcement officers to investigate in any manner they wanted, as long as they did not physically invade the defendant's property.[131] In *Katz*, the Court famously rejected the trespass doctrine,[132] focusing instead on whether the search violated the defendant's "reasonable expectation of privacy."[133] This shift was not only an important defeat for formalism, it also guaranteed that the Fourth Amendment would remain relevant as newer and less physically invasive methods of surveillance were developed. If the trespass doctrine remained good law today, law enforcement agents could constitutionally conduct a broad range of surveillance by pointing parabolic microphones at homes, intercepting and copying e-mails, eavesdropping on phone calls, and detecting

[129] *See infra* notes 235–239 and accompanying text.
[130] As noted below, *Katz* and *Kyllo* have gone a long way towards eliminating the "physical invasiveness" of the surveillance method in determining whether a search has occurred. *See infra* notes 132–135 and accompanying text.
[131] *See, e.g.*, Olmstead v. United States, 277 U.S. 438, 466 (1928) (upholding the use of a device to tap telephone wires because the device was affixed to wires outside the defendant's house); Goldman v. United States, 316 U.S. 129, 135 (upholding the use of a "slap-microphone" that was attached to a wall adjoining the defendant's office because the surveillance device did not physically invade the defendant's property); United States v. Silverman, 365 U.S. 505, 512 (1961) (precluding the use of a "spike-microphone" that was drilled through an adjoining wall and made contact with the defendant's property because it violated the defendant's property rights).
[132] Katz v. United States, 389 U.S. 347, 353 (1967). The federal agents in *Katz* attached a microphone to the outside of a phone booth that the defendant used, so there was clearly no violation of the defendant's property rights. *Id.* at 362 (Harlan, J., concurring).
[133] *Id*. at 360 (Harlan, J., concurring). Justice Harlan also noted that the presence or absence of "physical intrusion" should not be the primary inquiry in determining whether a Fourth Amendment violation has occurred.

the amount of heat that was being emitted from houses.[134] These technologies (and others that are currently being developed) would allow law enforcement to acquire nearly unlimited amounts of private information about the public without every "physically invading" a protected area. In this sense *Katz*'s rejection of the trespass doctrine was extraordinarily prescient: although the idea of a device that could "see through walls" was probably mere science fiction at the time *Katz* was decided, the "reasonable expectations" test was integral to the *Kyllo* decision precluding the warrantless use of thermal imagers on the defendant's home.[135]

There are unwelcome signs that the Court has not totally abandoned the "physical invasion" element in determining whether a search has occurred. "Intrusiveness" is frequently cited as a factor in evaluating a search. In some cases, courts use the term "intrusive" to mean the degree to which a search intrudes onto private and protected information.[136] However, occasionally a court uses the term "intrusive" to mean the level of physical invasiveness, and cites the level of physical invasiveness as a factor in deciding whether the search is permissible.[137] Most recently, in *Bond v. United States*,[138]

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[134] Some (but not all) of these activities are now regulated or precluded by statute, and presumably would be even if the Fourth Amendment allowed them. *See, e.g.* 18 U.S.C. §§ 2510-22 (2000) ("Title III" regulations which set strict standards on law enforcement can tapping a phone, and Electronic Communications and Privacy Act amendments which cover electronic communications). Thus, many of these surveillance methods would likely still be illegal even if the trespass doctrine remained – but only until Congress decided to change the law.

[135] *Kyllo*, 533 U.S. at 31.

[136] *See, e.g.*, United States v. Cuevas-Sanchez, 821 F.2d 248, 251 (5th Cir. 1987) (in assessing the constitutionality of attaching a video camera to a pole to monitor the defendant's backyard, the court notes that "the government's intrusion is not minimal.")

[137] *See, e.g.*, Powers v. Plumas Unified School Dist., 192 F.3d 1260, 1266 (9th Cir. 1999) (holding that a dog sniffing students in close proximity violates the Fourth Amendment because "the level of intrusiveness is greater when the dog is permitted to sniff a person than when a dog sniffs unattended luggage.") The *Powers* court concluded that this greater level of "intrusiveness" meant that the canine sniff constituted a "search" under the Fourth Amendment, because the use of the dog was "offensive" and thus infringed on the students' "reasonable expectation of privacy." *Id.* The link between the "offensiveness" of the method used by law enforcement and the degree to which someone's reasonable expectation of privacy is infringed is not clear; however, the link between offensiveness and the degree of *seizure* is quite strong. *See also* Horton v. Goose Creek Independent School District, 690 F.2d 470, 479–80 (5th Cir. 1982) (drug detection

the Supreme Court held that the squeezing of the defendant's bag in an overhead bin on a bus was an unconstitutional search, not because the officer impermissibly obtained information that the defendant reasonable expected to be private, but rather because "[p]hysically invasive inspection is simply more intrusive than purely visual inspection."[139]

We have already seen how *Place* itself looked in part to the level of physical invasiveness involved in a canine sniff, approving the sniff partially because of the less intrusive method of the search.[140] *Jacobsen* immediately clarified the *Place* doctrine, ignoring the "intrusiveness" aspect of the language[141]—but many lower courts continued to cite both the binary nature and the non-intrusiveness of the canine sniff in evaluating its constitutionality.[142] The "non-intrusiveness" factor also resurfaced in the Supreme Court in *Indianapolis v. Edmond,*[143] a 2000 case which tangentially involved canine sniffs. In *Edmond*, the Court evaluated the constitutionality of random checkpoints meant to check passing cars for narcotics.[144] The Court struck down the use of the

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dog sniffing an individual is a "search" due to the "degree of personal intrusiveness," since it is offensive and embarrassing.); United States v. Reyes, 349 F.3d 219, 224 (5th Cir. 2003) (use of drug detection dog was found not to be a search in part because the method used was "non-intrusive;" the dog was four to five feet away from the individuals being sniffed).

[138] 529 U.S. 334 (2000).

[139] *Id.* at 337.

[140] *Place*, 462 U.S. at 707. *See also supra* note 65 and accompanying text. In looking to the "less intrusive manner" of the canine search, the *Place* Court might not have been concerned with physical invasiveness, but may in fact only have been re-stating the binary nature of the test using confusingly broad language. According to the Court, the reason the manner was "unobtrusive" was that it "does not require opening of the luggage. It does not expose noncontraband items that otherwise would remain hidden from public view, as does, for example, an officer's rummaging through the contents of the luggage." *Id.* Whatever the *Place* Court meant by the term "less intrusive manner," the *Jacobsen* decision – and now the *Caballes* decision – made it clear that the only reason a canine sniff does not implicate the Fourth Amendment's restrictions on searches is because it is a binary search, not because it is physically non-invasive.

[141] *Jacobsen*, 466 U.S. at 124 n.24 (emphasis in the original). *See also supra* note 75 and accompanying text.

[142] *See, e.g.*, United States v. Harvey, 961 F.2d 1361, 1363 (8th Cir. 1992).

[143] 531 U.S. 32 (2000).

[144] *Id.* at 40–42.

checkpoints as an unconstitutional seizure,[145] and in dicta it cited *Place* for the proposition that the use of the narcotics-detection dog itself did not transform the seizure into a search.[146] The *Edmond* Court went on to undo the good work done in *Jacobsen* by justifying the *Place* doctrine for two reasons: first, the sniff "is not designed to disclose any information other than the presence or absence of narcotics," and second, "an exterior sniff of an automobile does not require entry into the car."[147]

One of the hopes for the *Caballes* decision was that it would clarify the meaning of the *Place* doctrine once and for all – are canine sniffs non-searches merely because of their binary nature, or does the degree (or absence) of physical intrusion also play a role in determining whether a search has occurred? Luckily, this was one of the few questions—perhaps the only question—that*Caballes* answered unequivocally.[148]

This is not to say that the level of physical intrusiveness is completely irrelevant to the question of whether or not a surveillance procedure is constitutional. The duration, degree, and nature of the physical intrusion are key elements in determining whether or not a *seizure* has occurred – indeed, this has been and will continue to be one of the key limitations for the use of canine sniffs and other binary searches.[149] But it is critical to unlink the seizure question from the search question, and for a court to evaluate both the search aspect of a surveillance procedure, and then independently evaluate whether or not the procedure constitutes an unconstitutional seizure.[150] Using physical invasiveness as a

[145] *Id.* at 44.
[146] *Id.* at 40.
[147] *Id.*
[148] *See infra* notes 175–179 and accompanying text.
[149] *See infra* notes 235–239 and accompanying text.
[150] The Fifth Circuit had the correct approach in a pre-*Place* case: "We must analyze the question of whether dog sniffing is a search in terms of whether the sniffing offends reasonable expectations of privacy, *Katz v. United States*, 389 U.S. 347, 88 S. Ct. 507, 19 L. Ed. 2d 576 (1967), and must look at the degree of intrusiveness of the challenged action to determine whether it is the type of activity that can be

factor for determining whether a *search* occurred is analogous to the old, discredited "trespass" doctrine of *Olmstead,* focusing on how the search is conducted rather than on the type of information it reveals. The difference in approach is more than just academic hair-splitting: if the absence of physical intrusion is seen as a critical component of the search evaluation, then newer technologies (and many existing technologies) that produce non-binary results could conceivably be accepted merely because they are completely non-invasive. Should a wiretap of a phone be considered less of a "search" because it does not physically intrude onto the property of an individual? Is a thermal imager (or a more sophisticated X-Ray device) less of a "search" because it is not physically invasive? If courts do not keep the search question and the seizure question distinct, there is a real danger that surveillance methods which reveal extremely private information will become more palatable merely because they are not physically invasive.[151]

A pair of cases from the First Circuit illustrate the dangers of conflating the two concepts. In *United States v. Quinn,*[152] the court considered a twenty-five minute traffic stop under *Terry* principles, and decided the police in the case possessed "strong grounds for suspicion" which justified such a long delay.[153] The *Quinn* court then briefly considered the propriety of the canine sniff itself, and concluded (rather dubiously) that based on *Place,* the law enforcement agents needed "reasonable suspicion" in order to

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tolerated in a free society. *Terry v. Ohio,* 392 U.S. 1, 88 S. Ct. 1868, 20 L. Ed. 2d 889 (1968)." Horton v. Goose Creek Independent School Dist., 690 F.2d 470, 476-77 (1982).

[151] This danger is especially acute because non-invasive searches do not *feel* like a search; thus, these searches might seem more acceptable to lay citizens, even if they reveal intimate details of a person's home or possessions.

[152] 815 F.2d 153 (1st Cir. 1987).

[153] *Id.* at 158.

conduct a canine sniff.[154] Since the seizure had already been separately analyzed, it appeared that the court was holding that the search itself required reasonable suspicion.

A few years later, in *United States v. Rodriguez-Morales*,[155] the same court was faced with a case in which a car had been legally impounded for non-criminal reasons. The officers lacked even a reasonable suspicion to justify a search of the car,[156] but they conducted a canine sniff of the car, which indicated the presence of narcotics. The court upheld the canine sniff of the car under these circumstances,[157] arguing somewhat unpersuasively in a footnote that the reasonable suspicion requirement from *Quinn* could be distinguished: "In *Quinn*, the central issue involved the legality of temporarily detaining the object to be sniffed—a detention for which reasonable suspicion was required. The *Quinn* language, therefore, must be read in that context."[158] Thus, the First Circuit somewhat belatedly came to the conclusion that the legality of the seizure must be analyzed separately from the legality of the search.

The Illinois Supreme Court made this same mistake in the *Caballes* case. Its application of the *Terry* doctrine to the propriety of the traffic stop itself was proper, and had it continued to examine only the seizure aspects of the canine sniff under the *Terry* doctrine, the analysis would have been appropriate. Instead, the court held that the canine sniff "unjustifiably broadened the scope of an otherwise routine traffic stop," thus violating the Fourth Amendment, merely because the use of the dog broadened the scope of the stop.[159] In so doing, the court conflated the *search* aspects of the canine sniff (which do not implicate the Fourth Amendment) with the potentially illegal *seizure*

[154] *Id.* at 159.
[155] 929 F.2d 780 (1st Cir. 1991).
[156] *Id.* at 788–89.
[157] *Id.* at 789.
[158] *Id.* at 789 n.4.
[159] *Caballes*, 207 Ill.2d at 509.

aspects of a canine sniff: extended delay of the stop, intimidation or humiliation caused by the use of the dog, or perhaps the physical invasiveness of the canine sniff. If the court had argued that, under the facts of the case, the use of the dog caused unreasonable delay, or unreasonable embarrassment or humiliation, or was unreasonably invasive, the canine sniff could have been held unconstitutional under *Terry.*[160] However, the court did not point to any of these variables – probably because under the facts of the case, the canine sniff took no extra time and was minimally intimidating and invasive.[161]

Thus, by the time *Caballes* reached the Supreme Court, the binary search doctrine itself was at a crossroads: it had been given a rocky birth in *Place,* gotten a large boost from *Jacobsen,* but was by no means secure—lower courts were looking to other reasons to justify *Place,* and even the Supreme Court in *Edmond* was casting doubt as to the future of the doctrine.

IV. The *Caballes* Decision and What It Means for Binary Searches

A. The facts of *Caballes*

On November 12, 1998, Roy Caballes was driving through the rain from Chicago to Las Vegas on Interstate 80.[162] In his trunk was a large quantity of marijuana with a street value of over $250,000.[163] At approximately 5:04, Caballes was pulled over by

[160] This was the opinion expressed by Justice Ginsburg in her dissent in the *Caballes* case. *See* Illinois v. Caballes, 543 U.S. at ____; 2005 LEXIS at *28 –*31 (Ginsburg, J., dissenting); *see also infra* notes 194-198 and accompanying text.

[161] The extent of acceptable delay and/or invasiveness is a key question for the future application of binary searches, one that the Supreme Court failed to address, *see infra* note 180-188 and accompanying text; and one that this Article attempts to define, *see infra* notes 230–245.

[162] People v. Caballes, 207 Ill. 2d 504, 506; 802 N.E.2d 202, 203 (2003). Mr. Caballes was driving six miles an hour above the speed limit. *Id.*

[163] *Id*. at 508, 203.

Illinois State Trooper Daniel Gillette for speeding.[164] Trooper Gillette called the stop in to the dispatcher, and then proceeded to process the speeding ticket.[165] A second State Trooper, Craig Graham of the Illinois State Police Drug Interdiction Team, heard Gillette's radio transmission and decided to drive out to the location with his trained drug-sniffing dog.[166] Just under ten minutes later, Graham arrived at the scene and his dog began sniffing around the outside of Caballes' car.[167] Within a minute, the dog had alerted to the trunk and the Troopers had probable cause to conduct a search.[168] They recovered the marijuana and charged Caballes with one count of cannabis trafficking.[169]

Caballes was found guilty after a bench trial and sentenced to twelve years in prison.[170] He appealed the case, arguing that the police were required to have a "reasonable articulable suspicion" before they could conduct the canine sniff.[171] The appellate court disagreed, but the Illinois Supreme Court accepted the case and reversed the conviction.[172] According to the Illinois Supreme Court, the canine sniff "unjustifiably enlarge[ed] the scope of a routine traffic stop," and thus required "specific and articulable facts" to justify its use.[173] The Supreme Court granted certiorari in the case on April 5, 2004, stating the question presented as "whether the Fourth Amendment requires

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[164] *See* Illinois v. Caballes, No. 03-923, Brief of Arkansas and 27 Other States as Amici Curiae in Support of Petitioner, 2003 U.S. Briefs 923 (June 29, 2004) at *1 [hereinafter "Caballes State Amici"]. Trooper Gillette called the dispatcher at 5:06 pm to check the defendant's plates, so it is reasonable to assume the defendant was pulled over a few minutes prior to that time.
[165] *Caballes*, 543 U.S. at ____; 2005 LEXIS at *2.
[166] *Id.* at ____, *2–*3.
[167] *Caballes State Amici*, *supra* note 164, at *2 –*3. It was 5:15 when Trooper Gillette changed the activity code of the stop to a narcotics detention; thus, the dog alerted at some point before 5:15.
[168] *Id.*
[169] *Id.* at 3.
[170] *Caballes*, 543 U.S. at ____; 2005 LEXIS at *3. Caballes was also fined $256,136, which was the street value of the marijuana. *Caballes*, 207 Ill. 2d at 506; 802 N.E.2d at 203.
[171] *Caballes*, 543 U.S. at ____; 2005 LEXIS at *3.
[172] *Id.*
[173] *Id.*

reasonable, articulable suspicion to justify using a drug-detection dog during a legitimate traffic stop."[174]

B. What the Court accomplished: affirming the binary search doctrine

Given what is at stake for the efficiency of law enforcement activities and the potential for widespread intrusions onto our privacy (not to mention the rarity of a Supreme Court decision on the subject), the *Caballes* decision is particularly disappointing. The majority opinion is barely over four pages long, and fails to cite *Terry* or any other seizure case. The only helpful portion of the opinion is the resounding affirmation of the binary search doctrine, as initially set forth by *Place* and clarified and refined by *Jacobsen*: the Court confirmed that "official conduct that does not 'compromise any legitimate interest in property' is not a search subject to the Fourth Amendment."[175] Like *Jacobsen*, it re-interpreted *Place* by stating that the reason a canine sniff by a drug detection dog did not constitute a search was because it "'discloses only the presence or absence of narcotics, a contraband item.'"[176] The *Caballes* Court ignored the "less intrusive manner" aspect of the *Place* rationale and thus consigned it to irrelevance—or, more accurately, disassociated the level of intrusiveness in the method of the search from the question of whether the surveillance procedure is a search under the Fourth Amendment. As noted below, the level of intrusiveness is relevant to the question of whether a seizure has occurred—but this inquiry must be independent of the question of whether the investigative procedure was a binary search.

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[174] *Id.* at *4. In addition to the briefs by the parties, amicus briefs were filed on the side of the government by the Illinois Association of Chiefs of Police and the Major Cities Chiefs Association, the United States Department of Justice, and the Attorneys General of 28 other states. The American Civil Liberties Union and the National Association of Criminal Defense Lawyers filed amicus briefs on the side of the defendant.

[175] *Caballes*, 543 U.S. at ___, 2005 LEXIS at *6 (quoting United States v. Jacobsen, 466 U.S. 109, 123 (1984)).

[176] *Id.* at *8 (quoting *Place*, 464 U.S. at 707).

Finally, the Court buttressed the binary search doctrine by tying it to the language in *Kyllo*,[177] its most significant recent Fourth Amendment case. As the Court noted:

> Critical to [the *Kyllo]* decision was the fact that the device was capable of detecting lawful activity—in that case, intimate details in a home, such as "at what hour each night the lady of the house takes her daily sauna and bath." The legitimate expectation that information about perfectly lawful activity will remain private is categorically different from respondent's hopes or expectation concerning the nondetection of contraband in the trunk of his car. A dog sniff…that reveals no information other than the location of a substance that no individual has any right to possess does not violate the Fourth Amendment.[178]

In short, the other rationales that lower courts had proposed to justify the indiscriminate use of canine sniffs—the "plain smell" doctrine and the "non-intrusive method" rationale[179]—were rejected, and the binary search doctrine is now firmly entrenched in Fourth Amendment jurisprudence.

C. What the Court failed to accomplish: proper definition and limitation of binary searches

Now that the court has cleared the way for the use of indiscriminate binary searches, two questions come to mind. The first is definitional: What, exactly, is a "binary search"? An easy definition is that it is a surveillance method that only reveals the presence or absence of illegal activity, and nothing more. But that definition is too easy, as it turns out: it does not help law enforcement officers and judges in the real world decide whether a given surveillance method is accurate enough to find refuge in the *Caballes* holding. What if a device or a surveillance technique accurately reveals nothing more than the presence or absence of illegal activity 99% of the time—but 1% of the time it mistakenly alerts, thereby triggering a full-scale search of an individual who is not

[177] 533 U.S. 27 (2001).
[178] *Id.* at *8–*9 (citations omitted).
[179] *See supra* notes 115–161 and accompanying text.

involved in any sort of illegal activity? This first question deals with the *accuracy* of the surveillance.

The second question returns to the issue of "intrusiveness." Although most courts have properly de-linked the question of physical invasiveness from the question of whether a search has occurred, we cannot ignore the seizure issue entirely. Law enforcement agents may develop a binary search technique which is perfectly accurate—but which requires the subject to submit to a five-minute wait, or perhaps undergo a humiliating or intimidating procedure. Although the process would still not be a "search" under *Caballes*, it might easily be considered a seizure under *Terry*. This question deals with the *limitations* on binary searches.

The *Caballes* Court briefly attempted to address the first major question surrounding binary searches: the acceptable level of false positives. But its two-sentence response will likely fail to convince binary search opponents and provide little ammunition for proponents of the doctrine. After raising the question of false positives, the Court first notes that there is nothing in the record to support the argument that "false positives [] call into question the premise that drug-detection dogs alert only to contraband."[180] Although technically true, the Court is rather transparently dodging an uncontroverted issue of fact: that drug-detection dogs do occasionally alert even if no narcotics are present.[181] And then the Court attempts a doctrinal justification for

[180] *Id.* at *7 (**"**Although respondent argues that the error rates, particularly the existence of false positives, call into question the premise that drug-detection dogs alert only to contraband, the record contains no evidence or findings that support his argument.")

[181] As Justice Souter noted in his dissent, the case law in the field contains ample evidence of the fallibility of drug detection dogs. *See id.* at *12 - *13 (citing six lower court federal cases and the reply brief in the *Caballes* case as evidence that drug detection dogs have a false positive rate as high as 60%). *See also* Bird, *supra* note 99, at 411 -15 (noting that Rhode Island police dogs correctly alert 95-98% of the time). How to properly measure the accuracy of drug detection dogs is yet another issue that was not discussed by *Caballes* majority, and in many lower courts it is unclear if the "accuracy rate" of the dog in question refers

sidestepping the issue: **"**Moreover, respondent does not suggest that an erroneous alert, in and of itself, reveals any legitimate private information, and, in this case, the trial judge found that the dog sniff was sufficiently reliable to establish probable cause to conduct a full-blown search."[182]

The Court's logic appears to run as follows: first, a canine sniff does not implicate the Fourth Amendment because it is a binary search—that is, it cannot possibly provide law enforcement with any information in which the subject of the search has a legitimate expectation of privacy.[183] Second, assuming there could be some false positives in this particular method of search, the false positive itself does not reveal any information in which the subject of the search has a legitimate expectation of privacy.[184] And finally, although a false positive will invariably lead to a search which *does* reveal information in which the subject has a legitimate expectation of privacy, the question whether the alert following a canine sniff provides probable cause is separate and distinct from whether the sniff is a "search" in the first place[185]—and the probable cause question is a much easier standard to meet than the binary search standard.

This legalistic slight of hand is not sustainable. The Court's logic would allow the use of extremely inaccurate binary searches, as long as they were accurate enough (50%, perhaps) to create probable cause. For example, if an automatic gun detector were developed that could be pointed at an individual and determine with 60% accuracy whether or not the person was carrying an illegal firearm, the Court's logic would allow law enforcement officers to use the device arbitrarily on individuals walking down the

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to the false positive rate or the positive predictive value of the alert. *See infra* notes 209-213 and accompanying text.

[182] *Id.* at *7.

[183] *Id.*

[184] *Id.*

[185] *Id.*

street or driving in their cars. The Court would apparently be unconcerned about the 40% false positive rate, since the police learn nothing legitimate and private about an individual when the machine mistakenly alerts in their case.[186] Then, once the device alerted, the 60% chance that the individual was carrying an illegal item would be more than enough to provide probable cause to search the individual.[187] The result would be that 40% of the time, the police would be conducting an unjustified search of an individual who had a protected interest in all the items he or she was carrying. In short, by separating the binary search question from the probable cause question, the Court is potentially opening the door to any investigative procedure which is reliable enough to provide probable cause, so long as the procedure itself does not provide law enforcement any privileged information.

The *Caballes* Court also hints at the potential limitation that the seizure line of cases might have on canine searches, though even the term "hints" is generous. The only potential reference to the question comes from one sentence: "In this case, the dog sniff was performed on the exterior of respondent's car while he was lawfully seized for a traffic violation."[188] This sentence implies (perhaps) that the ruling would have been different if the dog sniff had been more physically invasive (inside the car, say, or a sniff of the respondent himself), or if the respondent had not already been lawfully seized for

[186] This might not be true, of course, if there were consistent reasons why the device came up with a false positive, and if the law enforcement officer using the device could then deduce private, legitimate information about the subject of the search from the false positive alone. For example, imagine a mechanical narcotics detector which only gave a false alert when the subject of the search was carrying a certain kind of prescription drug. If this were the case, officers who used the device regularly would learn "protected" information from the false alerts—i.e., they would have used the device without probable cause to discover information about legitimate (and very private) items that the person was carrying.

[187] Although the Supreme Court has refused to assign a "numerically precise degree of certainty" to determine whether or not probable cause exists, it has held that probable cause exists if there is a "substantial basis" for concluding that there is a "probability" of criminal activity. Illinois v. Gates, 462 U.S. 213, 235 (1983).

[188] *Caballes*, 543 U.S. at ____; 2005 LEXIS at *8.

another purpose. But the sentence provides no useful guidance as to what level of invasiveness would trigger Fourth Amendment protection; the most that can be said about this passage is that it leaves the door open for the Court to provide in a later case the guidelines that it should have provided in *Caballes.*

The dissents by Souter and Ginsburg show no such reluctance to point out the both problems in defining binary searches and the potentially critical ways in which *Terry* might limit their use. Justice Souter addressed the issue of false positives, rejecting the majority's creative logic which separated the binary search question from the probable cause question.[189] Since the canine sniffs "reveal undisclosed facts about private enclosures [which are] used to justify a further and complete search of the enclosed area," the sniff is not in fact simply a binary search that can only reveal information about the existence of contraband.[190] Rather, it is "the first step in a process that [given the possibility of false positives] may disclose intimate details without revealing contraband…."[191] The possibility of a false positive, therefore, distinguished the canine sniff from the chemical test in *Jacobsen*, since the chemical test "would either show with certainty that a known substance was contraband or would reveal nothing more," while the canine sniff lacks both the "certainty and the limit on disclosure that may follow."[192]

In other words, even Souter's dissent accepts the theory of binary searches, but it limits the application of the theory to cases in which the binary search provided

[189] *Id.* at *****13–*15 (Souter, J., dissenting). Justice Souter first establishes a fact which the majority was unwilling to acknowledge: that drug dogs do indeed have error rates. Noting that the "infallible dog…is a creature of legal fiction," he cites six different cases in which courts have found significant error rates in canine sniffs. *Id.* at *12–*13 (Souter, J., dissenting).
[190] *Id.* at *15 (Souter, J., dissenting)
[191] *Id.* (Souter, J., dissenting) (internal quotations omitted).
[192] *Id.* at *19 -*20 (Souter, J. dissenting).

"certainty" of the existence of contraband. Thus, Justice Souter at least suggests an answer to the critical question of how accurate a procedure has to be in order to be considered a "binary search;" unfortunately, his proposed requirement of 100% accuracy is not likely to be met by any real-life investigative method. Indeed, even the chemical field test in *Jacobsen* could not provide absolute certainty, since there is always the possibility of human error in administering the test. Thus, Justice Souter's certainty requirement is either an indirect rejection of the binary search doctrine or it simply begs the question of how reliable a binary search must be before it is held to provide the "certainty" that he requires.

Justice Ginsburg's dissent focuses on the other glaring omission in the majority opinion: what limitations (if any) are placed on canine sniffs by the *Terry* line of cases defining reasonable seizures?[193] Justice Ginsburg notes that *Terry* does not merely require justification for the initial seizure, but further requires that the law enforcement officer's actions during the seizure must be "reasonable related in scope to the circumstances which justified the interference in the first place."[194] Thus, although the original traffic stop in *Caballes* was valid, Justice Ginsburg argues that the canine sniff could still be unconstitutional if it impermissibly expanded the "scope" of the seizure.[195] She then attempts to define what types of actions can impermissibly expand a seizure's "scope," conceding that in this case (as with many canine sniffs), there was no undue delay because of the use of the drug detection dog.[196] She notes that a drug detection dog can make a stop "broader" and "more adversarial," exposing the subject to "the

[193] *Id.* at *25 (Ginsburg, J., dissenting).
[194] *Id.* (Ginsburg, J., dissenting) (quoting Terry v. Ohio, 392 U.S. 1, 20 (1968)).
[195] *Id.* at *27 (Ginsburg, J., dissenting).
[196] *Id.* (Ginsburg, J., dissenting).

embarrassment and intimidation of being investigated, on a public thoroughfare, for drugs."[197] Justice Ginsburg warns that the result of not applying *Terry* in this context will be "suspicionless, dog-accompanied drug sweeps of parked cars along sidewalks and in parking lots," and "police with dogs, at long traffic lights, circl[ing] cars waiting for the red signal to turn green."[198]

Justice Ginsburg is correct, of course, in pointing out that *Terry* must create some limit on the amount of "seizure" that is permissible when a binary search takes place absent any articulable suspicion—a point which the majority does not even address. However, Justice Ginsburg's interpretation of "reasonably related in scope to the circumstances justifying the initial interference" is quite narrow. She also does not address an arguably more important question: assuming the canine sniff is not merely added onto a pre-existing, justifiable seizure, what circumstances create a "seizure" in the first place? To take her own examples, if a car is parked or stopped on its own for a long traffic light, does the use of a drug-detection dog on the car constitute a "seizure"? What about using a dog outside the perimeter of someone's house? Or walking a dog along a public sidewalk adjacent to a line of people waiting to enter a nightclub? Justice Ginsburg seems to imply that at least some and perhaps all of these actions by law enforcement would constitute seizures and require at least reasonable suspicion under *Terry*, but aside from repeating her opinion that drug dogs are "embarrassing" and "intimidating," she provides no useful test for determining when using a drug dog implicates the seizure limitations of the Fourth Amendment.

[197] *Id.* at *28–*29 (Ginsburg, J., dissenting) . She also notes that a "drug-detection dog is an intimidating animal," and that "drug dogs are not lap dogs." *Id.* at *28 (Ginsburg, J., dissenting) (quoting United States v. Williams, 356 F.3d 1268, 1276 (10th Cir. 2004) (McKay, J., dissenting). As it turns out, some drug-detection dogs *could* be lap dogs; in fact, lap dogs (such as beagles and terriers) are in many ways better suited to the job than larger, more intimidating dogs. *See supra* note 99.

[198] *Id*. at *30–*31. (Ginsburg, J., dissenting).

The majority's refusal to engage the dissents on these critical points does more to endanger the future of the binary search doctrine than the dissents themselves. For binary searches to be successfully utilized in the future, courts will have to understand—and clearly state—both the level of accuracy necessary before a surveillance procedure can be considered binary, and the severity of seizure permissible before the procedure violates the *Terry* principle. The final section of this Article proposes potential answers to each of these questions.

V. Resolving the Unanswered Questions: Defining and Limiting Binary Searches

It will hopefully be obvious by now that in defining and limiting binary searches, courts must look beyond canine sniffs and consider technologies that do not yet exist. Assume the police owned a small hand-held device which detected the presence of narcotics in any passing car, and they were able to use that device in the same manner as a radar detector, pointing it at the highway and getting a reading from every car within range. Such a device does, perhaps, seem extraordinarily intrusive—but it would make many other, more intrusive and more invidious forms of investigation obsolete: pulling over cars that fit a certain "profile"; pretextual stops based on minor traffic or safety violations; intimidating drivers into consenting to a search during a stop; and even roadblocks set up ostensibly to check for drunk drivers but during which officers also look for evidence of narcotics and other contraband.[199] Whether our privacy and security

[199] The incentive for law enforcement officials to set up pretextual roadblocks is quite strong given the recent decision of *Edmond*, in which the Supreme Court held that although it is permissible to set up roadblocks to check for drunk drivers (*see* Michigan Dept. of State Police v. Sitz, 496 U.S. 444, 451

will be better or worse off in such a scenario is open to debate; what is clear is that *Caballes* has paved the way for such a device to become a reality.

Of course, the above hypothetical presents the "perfect" binary search scenario, one which may never exist. In the real world, as reflected in the two *Caballes* dissents, binary searches are vulnerable to two criticisms: the possibility of false positives, and the intrusiveness or delay they create. The former issue raises the question of defining binary searches: how accurate must they be before they can be considered a binary search? The latter issue raises the question of seizures: how intrusive can they be before they implicate *Terry* and therefore require some level of reasonable suspicion in order to justify the "seizure" that they cause?

Naturally, these questions are all relative; when compared with traditional forms of investigation, a binary search will usually be more accurate and less intrusive. But this argument only supports the obvious point that if an officer *does* have sufficient justification to conduct a search, binary searches (or quasi-binary searches) are preferable to more traditional forms of investigation: a sweep with a hand-held metal detector is preferable to a pat-down; a canine sniff is preferable to a police officer opening your trunk and riffling through your belongings. In other words, if the police know specific and articulable facts which justify a search,[200] it would be better for everyone to give the police a device that can search for weapons in a more accurate and less intrusive manner. Likewise, if an officer has probable cause to search through your trunk, it would be preferable (i.e., a less intrusive search and a less prolonged seizure) if she conducted the search by simply ordering a trained drug-detection dog to sniff the outside of your car.

(1990), it is impermissible to set up roadblocks "whose primary purpose was to detect evidence of ordinary criminal wrongdoing," such as drug trafficking. *Edmond*, 531 U.S. at 41-42.

[200] *See Terry*, 392 U.S. at 22.

But of course the tantalizing promise (or ominous threat) of binary searches is that they can be permissibly used at times when police do not possess the level of suspicion necessary to justify a search or even a *Terry*-style pat-down. And to reach this level of constitutional comfort with binary searches, those who advocate such searches must demonstrate more than the self-evident fact that such procedures are less of a search and less of a seizure than the old-fashioned methods; rather, binary searches must be shown to be *so* accurate a search and *so* non-intrusive a seizure that they do not implicate the Fourth Amendment at all.[201] Such a showing would allow widespread and indiscriminate use of the search method in question, for if it is not a search and not a seizure, it is entirely unregulated by the Constitution.

An important initial point is that binary searches do not necessarily have to be 100% accurate[202] and completely non-intrusive; in other contexts, the Fourth Amendment allows some types of surveillance (such as plain view)[203] and some types of seizures (such as a brief stop to inquire)[204] without any showing of justification. The *Caballes*

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[201] Assuming, of course that the Court continues to adhere to the current "all-or-nothing" structure of Fourth Amendment jurisprudence for searches: an investigative technique either implicates the Fourth Amendment and thus requires probable cause, or it does not implicate it and requires no showing of suspicion at all. In *Caballes*, the Supreme Court was invited to create a new intermediate *Terry*-like category for searches (*see, e.g.*, People v. Caballes, 207 Ill.2d 504, 509-10; 802 N.E.2d 202, 205-5 (2003) (Illinois Supreme Court held that a canine sniff was unconstitutional without "specific and articulable facts" to support the sniff)), but it declined to do so. *Caballes*, 543 U.S. at ___, 2005 LEXIS at *7 –*8.

[202] *But see id.* at *19–*20 (Souter, J., dissenting) (proposing that binary searches should not implicate the Fourth Amendment if they provide "certainty" as to the presence of contraband).

[203] *See* Minnesota v. Dickerson, 508 U.S. 366, 375 (1993) ("[I]f contraband is left in open view and is observed by a police officer from a lawful vantage point, there has been no invasion of a legitimate expectation of privacy and thus no 'search' within the meaning of the Fourth Amendment.")

[204] *See* Florida v. Bostick, 501 U.S. 429, 434 (1991) ("Our cases make it clear that a seizure does not occur simply because a police officer approaches an individual and asks a few questions"); Florida v. Royer, 460 U.S. 491, 497 (1983) ("Law enforcement officers do not violate the Fourth Amendment by merely approaching an individual on the street or in another public place, by asking him if he is willing to answer some questions, by putting questions to him if the person is willing to listen, or by offering in evidence in a criminal prosecution his voluntary answers to such questions. Nor would the fact that the officer identifies himself as a police officer, without more, convert the encounter into a seizure requiring some level of objective justification" (citations omitted)). In *Terry*, the Court noted that "not all personal intercourse between policemen and citizens involves "seizures" of persons. Only when the officer, by means of

Court itself appeared to accept a certain level of inaccuracy, since it implied that a false positive alert that did not itself reveal legitimate private information did not constitute a search.[205] But *how* accurate and *how* non-intrusive a binary search must be before it falls off the radar screen of the Fourth Amendment? These are the critical unresolved questions of *Caballes.*

A. Accuracy

1. Calculating error rates

The first step is to ensure that judges understand some basic principles in measuring the error rates of binary searches. When courts evaluate the level of accuracy attained by drug-detection dogs, they tend to conflate different concepts: success rates, error rates, false positive rates, etc.[206] Even worse, some courts look to absolute numbers of errors instead of examining the rate of errors, which is a rather meaningless indicator of accuracy.[207] Other courts do not look to any quantitative measure at all, relying instead on testimony from the dog's handler that the dog has been "trained" or that there have been "few complaints" of false positives.[208] If binary searches are to become

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physical force or show of authority, has in some way restrained the liberty of a citizen may we conclude that a "seizure" has occurred." *Terry*, 392 U.S. at 19 n.16.

[205] *Caballes*, 543 U.S. at ___, 2005 LEXIS at *7. *See also supra* notes 180–187 and accompanying text.

[206] *See, e.g.*, United States v. Kennedy, 131 F.3d 1371, 1378 (10th Cir. 1997) (noting that the dog in question had an "success rate" of 71%; "success rate" was calculated by dividing the total number of alerts by the total number of true positives.).

[207] *See, e.g.*, Laime v. State, 347 Ark. 142, 149, 60 S.W.3d 464, 476 (2001) (court noted that drug dog "Moose" had been incorrect "at least ten times and possibly as many as fifty times.")

[208] *See* United States v. Meyer, 536 F.2d 963 (1st. Cir 1976); *United States v. Sundby*, 186 F.3d 873, 876 (8th Cir. 1999) ("To establish the dog's reliability, the affidavit need only state the dog has been trained and certified to detect drugs. An affidavit need not give a detailed account of the dog's track record or education."). *See generally* Dave Hunter, *Common Scents: Establishing a Presumption of Reliability for Detector Dog Teams Used in Airports in Light of the Current Terrorist Threat*, 28 U. DAYTON L. REV. 89, 95-96 (2002) (courts usually only require the handler's testimony that the dog is trained and reliable). Ostensibly these courts are using this low standard simply in order to determine if the alert is sufficient to establish probable cause, but since many courts simply adopt the *Place* rationale along for indiscriminate canine sniffs without any examination of the dog's level of accuracy, the inquiry into reliability for probable cause becomes the *de facto* inquiry into the level of accuracy necessary to be considered a binary search.

widespread, it is imperative that courts develop a consistent and thorough procedure for evaluating their accuracy.

As a starting point, it should be noted that the relevant measure of a binary search's accuracy is the rate at which it returns an incorrect positive response.[209] Of course, an inaccurate binary search might also produce a certain percentage of false *negatives*, but this would not be of constitutional concern; it would simply make the search method somewhat less efficient.[210] A false negative simply means that the binary surveillance procedure has failed to detect the actual presence of illegal activity, but a false positive means that an innocent subject will be subjected to a search even though he or she was not involved in any illegal activity.

There are two important points to consider in calculating the rate of incorrect positive responses generated by a binary device. The first is the difference between the false positive rate and the positive predictive value. A false positive rate is calculated by dividing the number of false positives by the total number of searches conducted by the device. The positive predictive value is calculated by dividing the total number of true positives by the total number of positive responses returned by the device. For example, let us assume that in the course of one year, a drug dog conducts one thousand sniffs for narcotics, and alerts one hundred times out of the thousand. Of those one hundred

[209] An "inaccurate" binary search could also be defined as a binary search that revealed a small amount of legitimate, non-contraband information to the officer. However, the doctrinal underpinnings of *Place*, *Jacobsen*, and *Caballes* strongly suggest that there is no room to compromise in this dimension of "accuracy": a method that reveals any amount of non-contraband information will violate the binary search doctrine entirely by infringing on the subject's legitimate expectation of privacy.

[210] As an extreme example, assume law enforcement develops a computer software program which copies and opens every e-mail that passes across an internet service provider, looking for illegal images of child pornography. In order to make the software into a pure binary search, the detection algorithm would presumably be set to alert only upon seeing the most extreme and obvious images of child pornography. This would ensure a false positive rate of close to zero, but it would allow a lot of false negatives—cases in which milder but still illegal child pornography escaped notice. This would make the software somewhat less useful—it would perhaps detect only one out of every one hundred (or one thousand) images of child pornography that it examined—but the high rate of false negatives would not affect its constitutionality.

positive alerts, ninety are accurate and ten are false positives. This translates into a 1% false positive rate (10 false positives out of 1,000 attempts, meaning that only 1% of subjects are falsely accused by the dog), but a 90% positive predictive value (90 true positives out of 100 positive responses, meaning that once the dog returns a positive response, the law enforcement agent can only be 90% sure that contraband is actually present). The two different measurements are significant because although the false positive rate is constant for any given device or procedure, the positive predictive value will vary widely depending on the actual frequency of the illegal activity that is being investigated. In our example above, 9 out of every 100 subjects were carrying narcotics, but if the dog were randomly sampling the general population, the number might be closer to 9 out of 100,000. Assuming the dog still falsely alerts 1% of the time (a consistent 1% false positive rate), he will now falsely accuse 1,000 individuals (and correctly alert to the 9 carrying narcotics), but because there are so many fewer true positives, the positive predictive rate would be dramatically lower: 9 out of 1,009, or 0.9%. In other words, if the illegal activity being searched for is very rare (or at least very rare among the pool of subjects being searched), the vast number of innocent subjects will inflate the absolute number of false positives, and make the binary search much less accurate. Thus, when courts begin to set guidelines for how reliable a surveillance technique before it can be classified as a binary search, they should be suspicious of low "false positive" rates.

As an example, consider a piece of software that searches for child pornography by reading through e-mails passing across an internet service provider or by invading the hard drives of home computers. When it detects an e-mail or a file that appears to

contain child pornography, the software would alert a human operator with nothing more than the name of the subject who sent or owned the file. The human operator would then use this positive alert to acquire a warrant to seize and search the subject's computer files. Under the *Caballes* doctrine, this procedure would conceivably be considered a binary search, since it provides the user with no information beyond whether or not an individual is engaged in illegal activity. As a binary device, law enforcement agents could send the software sniffing through e-mails and personal hard disks without limitation.

But how accurate is this hypothetical piece of software? Law enforcement agents might boast that it has an impressively low .01% false positive rate, but if it reads through one million e-mails and files over the course of a year, and only ten of those million actually contain child pornography, the software will alert to one hundred and ten subjects over the course of the year, and only 9% of those alerts will be accurate. In the other 91% of cases, law enforcement officers will be granted a warrant to read through an e-mail or computer file that contains nothing but innocent material in which the owner has a reasonable and legitimate expectation of privacy.

Perhaps this is an acceptable level. Certainly today law enforcement agents rely upon less-than-perfect methods in seeking probable cause, and in so doing they end up conducting searches of innocent individuals. For example, they may act on a tip from an informant which ends up being incorrect, or they may seek a warrant after observing activity that appears to be suspicious but is actually innocent. It would be absurd—and unrealistic—to require absolute certainty from binary searches. But courts should understand the implications of the reliability numbers that they are given.

The second, related point is how these numbers would be affected if law enforcement officers began using binary searches indiscriminately. Today, even though law enforcement officers have the right to use canine sniffs without any level of suspicion, the expense and relative scarcity of drug-detection dogs mean that an officer is unlikely to call in a canine unit unless she already has some suspicion—perhaps merely a hunch—that the subject is carrying narcotics.[211] This discrimination increases the proportion of individuals in the pool who actually are carrying narcotics, thus increasing the positive predictive rate (assuming a consistent false positive rate).

In other words, if law enforcement officers use binary searches indiscriminately, without relying on reasonable suspicion or any other indicators that illegal activity may be present, they will decrease the positive predictive rate of their binary device.[212] Thus, although *Caballes* gives law enforcement agents the right in theory to utilize binary searches with impunity, in practice such indiscriminate use will gratuitously increase the rate at which the binary search infringes on individuals' Fourth Amendment rights. As of now, the courts have not set out a required level of accuracy—indeed, the two sentences that the *Caballes* Court devotes to this issue would allow for very inaccurate binary devices, so long as they were reliable enough to provide probable cause.[213] However, once binary searches become more common—and perhaps once they begin taking forms more ominous and alien than the familiar drug-detection dog—courts are likely to demand greater levels of accuracy. Until the technologies begin to approach 100%

[211] This is mostly due to a lack of resources: since drug-detection dogs (and their handlers) are expensive, it might not make sense to use them indiscriminately in every situation, even if law enforcement officers have the right to do so. However, if mechanical devices are produced that can conduct a binary search for narcotics, the cost of conducting such a search could become much lower—analogous to the use of a radar detector—and police would have no economic incentive to conduct a binary search only when suspicious circumstances exist.

[212] *See* Bird, *supra* note 99, at 427-32.

[213] *Caballes*, 543 U.S. at ____; 2005 LEXIS at *7, *see also supra* note 180-186 and accompanying text.

certainty level, law enforcement agents could conceivably boost the accuracy rates—and make binary searches more palatable—by using the devices only in situations where there is a relatively high chance of detecting illegal activity.

2. Standard of accuracy

The *Caballes* case presented two possible standards for accuracy before a specific type of surveillance could be considered a "binary search." The first, put forward by the majority opinion with little analysis, was to essentially allow any binary search as long as it was reliable enough to provide the law enforcement officer with probable cause.[214] Thus, as long the false positives themselves did not disclose legitimate, protected information to the law enforcement officer, using the binary technique would not implicate the Fourth Amendment.[215] As noted above,[216] this argument de-links the binary search itself from the full-blown search that inevitably follows a binary search; justifying the former on the grounds that a false positive does not in itself reveal any information about the subject, and then independently justifying the latter on the grounds that a positive result from a binary search, even one with a significant error rate, is sufficient to provide probable cause to support the search. The Court's analysis is blind to the fact that in practice, a false positive does in fact lead to a search, and thus does reveal legitimate protected information about the subject—and this willful blindness would result in court approval of binary searches with exceedingly high error rates, leading to a large proportion of unjustified searches of innocent individuals.

The other proposed standard was put forward by Justice Souter in his dissent. By linking the false positives to the searches which they will inevitably engender, he argued

[214] *Id.* at *7.
[215] *Id.*
[216] *See supra* notes 180 - 201 and accompanying text.

that for a binary search to be truly "binary," it would have to provide the law enforcement officer with "certainty" that illegal activity was present.[217] Without 100% certainty, according to Justice Souter, there will be a chance that the so-called binary search will start a process in motion that will inescapably lead to the warrantless search of a legitimate, protected area controlled by an innocent individual.[218] But a test that requires "certainty" can never be met in real life; there is always the possibility of error – indeed, even the "certain" case of *Jacobsen* still contained the possibility of human error in administering the test.

A proper analysis must acknowledge (as Justice Souter does) that a false positive will in fact lead to disclosure of legitimate, protected information. But this does not mean that only "perfect" binary searches should be allowed; such a requirement would effectively eviscerate the binary search doctrine, [219] a doctrine which is now firmly entrenched in Fourth Amendment jurisprudence. However, given the possibility that binary searches will gain widespread use, potentially affecting millions of people a day, courts should impose an extremely high standard of accuracy to ensure this new legal doctrine is not abused by law enforcement. This would entail two requirements, one procedural, the other substantive.

The procedural step would be to require trial judges to conduct an independent evaluation of any method or technique which the prosecutor claims to be a binary search. In other words, whenever law enforcement conducts a binary-type surveillance without

[217] *Id.* at *13 - *15 (Souter, J., dissenting).
[218] *Id.* (Souter, J., dissenting).
[219] This, of course, is exactly what Justice Souter had in mind when he proposed a "certainty" standard that was unattainable by any real-world binary device. As noted above, *supra* note 117–118 and accompanying text, the binary search doctrine has its critics, but at this point it seems clear that the Supreme Court has accepted them as constitutional, and any attempt to abolish them by applying an unworkable standard of accuracy will fail. Thus, a more useful course of action would be to set an extremely high—but still attainable—standard and set up procedural safeguards to ensure that the standards are in fact met.

reasonable suspicion and seeks to admit evidence that resulted from the surveillance under the *Caballes* doctrine, the prosecutor bears the burden of proving to the court that the surveillance method in question was sufficiently accurate to be classified as a binary search.[220] This evaluation could be analogized to the *Daubert* hearings in evaluating expert evidence, in which the trial judge acts as the "gatekeeper" in determining whether a particular field or discipline is reliable enough to be admissible.[221] Unlike the *Daubert* context, however, where a judge must simply determine whether a particular science or methodology is "scientifically valid,"[222] a judge evaluating a binary search would impose a much stricter standard[223] – but the point of the procedural requirement is to ensure that the judge has the information necessary to make an evaluation as to the level of accuracy of the surveillance in question. Of course, if the law enforcement officer possessed probable cause to carry out the search, there will be no need to conduct such a hearing; similarly, if the law enforcement agent possessed some degree of reasonable suspicion, the court would first conduct a *Terry* inquiry to see whether the agent had sufficient articulable facts to justify the search.[224] If so the search would pass constitutional muster without the need to resort to the *Caballes* doctrine; if not, the court would proceed with a hearing to determine whether the search was a binary search and thereby fell outside the reach of the Fourth Amendment.

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[220] Some courts have shown resistance to a requirement that the government demonstrate the accuracy rates of their drug-detection dogs. In United States v. Dicesare, 765 F.2d 890 (9th Cir. 1985), the appellate court upheld the lower court's decision prohibiting disclosure of the United States Customs Service narcotics training manual on the grounds that it would compromise investigative techniques.

[221] *See* Daubert v. Merrell Dow Pharmaceuticals, 509 U.S. 579, 592-93 (1993) (holding that judges are responsible for determining whether the proffered expert testimony is scientific evidence which would assist the trier of fact).

[222] *Id.*

[223] *See infra* notes 226–229 and accompanying text.

[224] *Terry*, 392 U.S. at 20–21.

Although conducting this evaluation will be time-consuming at first, courts will quickly begin to establish precedents as to the acceptability or fallibility of certain techniques. Thus, once a device's accuracy rate had been established by precedent, there would be no reason why courts in the same jurisdiction should need to decide *de novo* whether, say, a drug dog or a specific type of gun detector was considered a binary search. In such a case all a court would have to determine would be whether the specific use of the binary search in that particular case was proper (e.g, was the drug detection dog properly trained, or was the gun detector properly calibrated). The reliance on precedent to certify or reject certain forms of surveillance will also provide helpful guidance to law enforcement agents as to what devices and procedures they would be allowed to use without reasonable suspicion.[225]

As far as the substantive standard itself, it must be high enough to ensure that the binary search doctrine's inevitable widespread indiscriminant application does not result in overwhelming numbers of unjustified searches of innocent subjects. Justice Souter's "certainty" requirement was unworkable in the real world, but given the enormous number of binary searches which might be conducted on innocent individuals, courts should adopt a standard that adapts the desire for "certainty" to the imperfections of the real world. For example, a standard analogous to the "beyond a reasonable doubt" standard in the criminal jury instructions context might be appropriate. As in the probable cause context, courts will probably shy away from quantifying exactly the level

[225] As noted above, *supra* note 224, if the law enforcement agent possessed probable cause or even reasonable suspicion to conduct the search, there might be no need to conduct a hearing to determine whether the surveillance was a binary search; rather, the court could simply conduct a *Terry* inquiry to ensure that the law enforcement agent possessed sufficient "specific and articulable facts to reasonably warrant the intrusion." *Terry*, 392 at 20-21. If so, the search would be constitutional regardless of its status as a binary search; if not, the prosecutor could still seek to get the search "certified" as a binary search, in which case it would not need to pass the *Terry* test.

of accuracy required[226] (especially because any number chosen would be rightly seen as arbitrary), but in conducting their analysis, they should be careful to focus on the positive predictive value of the method—that is, the percentage chance that a positive alert will in fact indicate the existence of contraband. This will require not just evidence of the false positive rate during training or testing (although this could help the judge to determine the positive predictive value), but actual numbers from the field work conducted by law enforcement officers using the device or procedure. As noted above,[227] using a binary device or procedure indiscriminantly will tend to decrease the positive predictive value due to the high volume of innocent individuals that will be targeted. This will not necessarily lead to an unacceptably low level of accuracy; if the device or procedure has an extremely high false positive rate, the positive predictive value could remain quite high even if the binary search is used randomly on the general population.[228] However, if the binary search in question has a lower false positive rate (for newer technology still in development, for example), law enforcement officers could bolster the positive predictive value and perhaps meet a "beyond a reasonable doubt" standard by only using the device or procedure in settings or on individuals with a higher-than average likelihood of being guilty.[229] By exercising discretion in the use of these less accurate binary searches, and

[226] *See, e.g.*, Illinois v. Gates, 462 U.S. 213, 238 (1983) (noting that probable cause is defined as a "fair probability" and avoiding any numerical probability requirement).
[227] *See supra* notes 211–212and accompanying text.
[228] For example, assume a binary search with a false positive rate of one in ten million, and assume further it was searching for contraband (such as possession of computer child porn files) which was possessed by one in one hundred thousand people. If used randomly on the general population, this search would have a positive predictive value of over 99% (for example, if used on ten million people in one year, it would return 101 positive results, 100 of which would be true positives and only one of which would be a false positive). This could certainly satisfy a "beyond a reasonable doubt" standard for accuracy.
[229] This is not to say the law enforcement officers would have to have some level of "reasonable suspicion" before conducting the binary search; such a requirement would obviate the need for the binary search doctrine in the first place. There may be many contexts in which the likelihood of finding illegal activity would be significantly increased even if the law enforcement officer could not articulate specific facts to justify reasonable suspicion: officers acting on an unquantifiable hunch, for example, or only using the

thereby reducing the proportion of innocent individuals subject to the search, law enforcement could dramatically increase the positive predictive value of the search in practice and thus potentially meet the "beyond a reasonable doubt" standard imposed by the courts.

B. Invasiveness

Once binary searches have been properly and consistently defined, their use may still be limited by the Fourth Amendment's prohibition against unreasonable seizures. A device or procedure may be truly binary, in that it returns only information about the presence or absence of illegal activity with a very high positive predictive value—but if it requires the subject of the search (or her belongings) to be detained for an unreasonable amount of time, its use may constitute an unconstitutional seizure.[230]

This Article has already the importance of separating the binary search determination from the seizure question, since the level of "physical invasiveness" should not make the surveillance any more or less likely to be found a binary search.[231] But assuming a court does determine that a given device or procedure constitutes a valid binary search, the court must then look to the degree of seizure involved in the case and determine if it is serious enough to implicate *Terry*. If not, the government action will be constitutional; if so, the courts must apply the balancing test mandated by *Terry* to see if enough reasonable suspicion existed to justify the seizure.

As long as the seizure question is separated from the binary search question and analyzed on its own, it becomes relatively simple to resolve, since it does not require the

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binary device in certain locations (such as airports or bus depots) where illegal activity is more likely to be occurring.

[230] *See, e.g.*, *Place*, 462 U.S. at 709 (Ninety minute seizure of individual's luggage was unreasonable).

[231] *See supra* notes128–161 and accompanying text.

courts to do anything they are not already doing in other contexts. There is an enormous amount of case law to guide courts as to what actions on the part of law enforcement constitute a *Terry* stop, and what actions go so far as to require probable cause.[232] Generally, two different factors come into play: the length of the search[233] and the physical invasiveness of the search.[234] In determining whether a certain delay or level of invasiveness is reasonable, courts will look to the specific facts of each case: for example, whether the item being seized an individual, a piece of luggage, or a piece of mail.[235]

There are two contexts in which a court would evaluate whether a binary search involved an improper seizure: first, to determine whether the use of the binary search *itself* was a seizure; and second, in a situation (as in *Caballes*) in which law enforcement already had probable cause to effect a seizure, and then conducted a binary search during the course of the already legitimate seizure. In each case, there is sufficient case law

[232] These determinations are always very fact-specific, but the tests for judges to follow have been set out in numerous cases. *See, e.g.*, Florida v. Royer, 460 U.S. 491, 500 (1983) ("[A]n investigative detention must be temporary and last no longer than is necessary to effectuate the purpose of the stop. Similarly, the investigative methods employed should be the least intrusive means reasonably available to verify or dispel the officer's suspicion in a short period of time. It is the state's burden to demonstrate that the seizure it seeks to justify on the basis of a reasonable suspicion was sufficiently limited in scope and duration to satisfy the conditions of an investigative seizure." (citations omitted)).

[233] *Place* itself made clear the importance of the delay caused by the search: although the drug sniff itself was a suitable binary search, the 90-minute seizure of the bag was such a prolonged delay that the procedure violated the Fourth Amendment. *Place*, 462 U.S. at 709. A lengthy delay can also convert an otherwise permissible "investigative stop" justified under *Terry* into an arrest which must be supported by probable cause. *See, e,g.*, United States v. Sharpe, 470 U.S. 675, 685 (1985) ("Obviously if an investigative stop continues indefinitely, at some point it can no longer be justified as an investigative stop.")

[234] One of the factors in determining the level of "physical invasiveness" is the "intimidating" or "offensive" nature of the conduct by the law enforcement. *See, e.g.*, Powers v. Plumas Unified School Dist., 192 F.3d 1260, 1266 (9th Cir. 1999) (a dog sniffing students in close proximity violates the Fourth Amendment because "the level of intrusiveness is greater when the dog is permitted to sniff a person than when a dog sniffs unattended luggage.") The *Powers* case unfortunately applied the "intrusiveness" factor to the *search* question rather than the *seizure* question, holding that the canine sniff infringed on the students' "reasonable expectation of privacy" because the use of the dog was "offensive." *Id.* The link between the "offensiveness" of the method used by law enforcement and the degree to which someone's reasonable expectation of privacy is infringed is not clear; however, the link between offensiveness and the degree of *seizure* is quite strong.

[235] *Compare* United States v. Place, 462 U.S. 696, 709 (1983) (90-minute seizure of someone's luggage is unreasonable) *with* United States v. Van Leeuwen, 397 U.S. 249, 252 (1970) (one day seizure of a letter that had been sent through the mail not unreasonable).

already to guide courts in determining whether a seizure occurred. In the first context, if the binary search does not cause the subject of the search any delay and is not physically invasive, no seizure has occurred. This principle could conceivably cover the vast majority of binary searches—when a portable gun detector scans passing pedestrians and automobiles, for example; or a video camera records images and sends them to a computer running facial recognition software; or a computer program screens e-mails being sent through the internet. As long as all of these searches only produce binary results, they do not constitute a search, and since they do not "seize" the subject of the search or any of his or her possessions, they do not implicate the Fourth Amendment in any way. After *Caballes*, drug detection dogs that merely sniff the outside of an automobile are also not a seizure; Justice Ginsburg's dissent notwithstanding,[236] their use does not create a level of humiliation or intimidation significant enough to implicate the Fourth Amendment.

However, all binary searches may not be so unobtrusive. It is certainly conceivable that a binary search may cause some minor amount of delay—the subject might have to stand still for a moment while the dog sniffs her or while the gun detector gets an accurate reading. Or a mechanical narcotics detector may only work if it is physically touching the subject. As soon as we add in some level of delay or physical invasiveness, two questions arise – does the subject of the stop feel free to "disregard the police and go about his business,"[237] and if not, can the seizure be justified under *Terry* principles? Thus, assuming the police do not possess an articulable suspicion to justify the stop under *Terry*, any amount of delay or physical invasiveness must be consensual.

[236] Illinois v. Caballes, 543 U.S. ___, ___; 2005 LEXIS 769, *28–*29 (2005) (Ginsburg, J., dissenting).
[237] *See* Florida v. Bostick, 501 U.S. 429, 434 (1991) (police may approach an individual and ask questions, as long as the individual feels free to disregard the police and terminate the encounter).

The analysis becomes somewhat more complicated if law enforcement seeks to prolong an otherwise legitimate stop, as was the case in *Caballes*. The Illinois Supreme Court in *Caballes* found that the addition of a drug detection dog to the traffic stop violated the Fourth Amendment because it changed the "scope" of the seizure;[238] the United States Supreme Court made it clear that there must be some more tangible extra element of seizure in order to implicate the Fourth Amendment.[239] In such a case, courts must determine whether the binary search created an extended delay or an element of physical invasiveness beyond what was justified by the original stop.[240] For example, if law enforcement agents have set up a roadblock for a permissible purpose (such as checking for drunk drivers[241] or illegal immigrants[242]), the agents are allowed to conduct a binary search during that roadblock as long as the search does not increase the amount of time required for the stop.[243]

However, any extra delay of an otherwise legitimate stop will require additional articulable facts to justify the seizure. For example, if a police officer during a legitimate traffic stop has completed writing the traffic citation, she cannot then force the motorist to wait an additional amount of time for the arrival of a drug detection dog unless she has

[238] Illinois v. Caballes, 207 Ill.2d 504, 508-10, 802 N.E.2d 202, 204-5 (2004).
[239] Caballes, 543 U.S. at ___; 2005 LEXIS at *8.
[240] *See, e.g.*, Merrett v. Moore, 58 F.3d 1547, 1553 (11th Cir. 1995) (since drug detection dogs used at an otherwise constitutional roadblock did not increase the amount of delay suffered by motorists, the "state's decision to use dogs at the roadblocks does not make the operation unconstitutional.")
[241] *See, e.g.*, Michigan Dept. of State Police v. Sitz, 496 U.S. 444, 456 (1990) (allowing a delay of twenty-five seconds at a random sobriety checkpoint).
[242] *See* United States v. Martinez-Fuerte, 428 U.S. 543, 544-48 (1976) (allowing a delay of up to three to five minutes at random roadblocks meant to check for illegal immigrants).
[243] *See, e.g.*, *Moore*, 58 F.3d at 1553; United States v. Jeffus, 22 F.3d 554, 557 (4th Cir. 1994) (fifteen minute wait at a routine traffic stop was not unreasonable, and because the standard aspects of a traffic stop took the entire fifteen minutes, the use of a drug detection dog during that time did not increase the length of the seizure and was therefore constitutional).

acquired additional articulable facts to justify a longer seizure.[244] If there is any additional delay or invasiveness caused by the binary search, the court should conduct a *Terry* analysis to see if any articulable facts justified the extension of the seizure, balancing the level of reasonable suspicion supporting the extension with the increased severity of the seizure.[245]

VI. Conclusion

Although surveillance techniques and data analysis methods have improved dramatically over the last hundred years, law enforcement agents for the most part must still search for evidence of illegal activity the same way they did in the eighteenth century: by spying, snooping, and eavesdropping on our lives. Law enforcement investigators must invariably recover large amounts of private information about any particular suspect (as well as information about those who are not even suspected) and then sift through that information to determine whether the suspect is guilty of a crime. Given this fact, it is inevitable that as data-gathering and information-sharing technologies become more sophisticated, the actions of law enforcement agents will conflict ever more deeply with our civil liberties and privacy rights. This conflict is harmful to both sides of the balance: it limits the effectiveness of the new technologies that law enforcement agents have at their disposal to investigate crime; and it inevitably

[244] *See, e.g.*, United States v. Fernandez, 18 F.3d 874, 877–78 (10th Cir. 1994) ("[A]n officer conducting a routine traffic stop may request a driver's license and vehicle registration, run a computer check, and issue a citation. When the driver has produced a valid license and proof that he is entitled to operate the car, he must be allowed to proceed on his way, without being subject to further delay by police for additional questioning.") (citations omitted).

[245] *See. e.g.*, United States v. Taylor, 934 F.2d 218, 221 (9th Cir. 1991). In *Taylor*, the defendant's car was stopped at a permissible roadblock checking for illegal aliens and the length of the seizure was then increased by sixty seconds so that a drug detection dog could sniff the exterior of the car. The Ninth Circuit held that because the defendant "became increasingly nervous and uneasy at the end of the initial check for aliens," his behavior constituted minimal, articulable suspicion and therefore justified the brief further delay." *Id.* In this case the extra amount of seizure was minimal (a mere sixty seconds) and therefore could be justified by a very low level of reasonable suspicion.

reveals more and more intimate details about our private lives to law enforcement officials.

Binary searches will quite possibly revolutionize the way in which law enforcement agents conduct surveillance. *Illinois v. Caballes* has given law enforcement agents a green light (if not a cart blanche) to develop and use this type of surveillance aggressively and broadly. At the same time, modern technologies are quickly evolving to the point where machines and computers can supplant humans as the agents which sift through the private, protected data in order to determine whether criminal activity is present. *Caballes* will likely provide the impetus for law enforcement agents to adapt emerging technologies to turn them into binary searches. But even this preliminary step of designing binary search techniques—not to mention using them or evaluating them in court—requires courts to provide the relevant actors with a sensible and uniform method of analysis.

Although the binary search doctrine remains controversial, and will no doubt become more so as law enforcement agents push the envelope regarding how (and how often) they use such searches, both proponents and critics of the doctrine should agree that binary searches must be more carefully defined and evaluated. After*Caballes* , there is no question that the binary search doctrine is here to stay; now we must ensure they can safely and effectively deliver on their promise.