



## NOTE

**What Is Fourth Amendment Contraband?**

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**Abstract.** The Supreme Court has held that the sniff of a trained drug detection dog is not a “search” under the Fourth Amendment because the dog does no more than reveal the existence of “contraband.” As technology advances, courts will have to confront new forms of purported “contraband-only” investigative techniques, ranging from “hash” searches for child pornography and electronic sniffers to “gun detectors” and swipes of counterfeit credit cards. This Note provides a three-step framework to evaluate those technologies under existing doctrine and addresses a question that has so far received little attention: What is “contraband” for purposes of the Fourth Amendment? This Note proposes using a definition of “anticipatory contraband” that requires not only examining whether something is illegal to possess as a matter of substantive criminal law but also demonstrating that the police knew in advance that there was no lawful right to private possession under the circumstances. This Note then applies the three-step framework and the theory of anticipatory contraband to a variety of new technologies. This analysis reveals that while the contraband-only doctrine encompasses a variety of investigative techniques, the “in-advance” requirement is surprisingly restrictive, requiring police and courts to be alert to the possibility of compromising legitimate private information.

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## Introduction

A police officer drives up and down a suburban street, using a laptop and an antenna to peer into every home he passes to look for the telltale signal of a stolen cell phone. A forensic investigator examines a confiscated hard drive, using a computer program to check every file and folder for child pornography without looking at a single image or watching a single video. A trained dog is deployed during a traffic stop, looking for evidence of prescription-strength opiates. Law enforcement personnel are increasingly turning to new technologies and techniques to uncover contraband goods. As this technology proliferates, courts must decide whether and when the use of this technology constitutes a “search” under the Fourth Amendment.<sup>1</sup>

Since 1983, the Supreme Court has recognized what has sometimes been called the “contraband exception” or the “contraband-only doctrine” of the Fourth Amendment.<sup>2</sup> Under this doctrine, the Court has held that an investigative technique that does no more than expose the existence of “contraband” is not a search within the meaning of the Fourth Amendment.<sup>3</sup> So far, this doctrine has been applied to only two methods of detection: trained drug-sniffing dogs and a chemical test capable of identifying a small sample of narcotics.<sup>4</sup>

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1. U.S. CONST. amend. IV (“The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.”).
  2. One note on terminology: the Supreme Court has not adopted any systematic name for the line of jurisprudence that allows for the warrantless use of drug detection dogs. The academic literature appears to be divided, referring to the doctrine variously as the “contraband exception” or as the “binary search” doctrine. Compare Timothy C. MacDonnell, *Orwellian Ramifications: The Contraband Exception to the Fourth Amendment*, 41 U. MEM. L. REV. 299, 302 & n.13 (2010) (referring to the “contraband exception”), with Ric Simmons, *The Two Unanswered Questions of Illinois v. Caballes: How to Make the World Safe for Binary Searches*, 80 TUL. L. REV. 411, 413-14 (2005) (referring to the “binary search” doctrine). This Note uses the term “contraband-only doctrine.” The Court has not referred to the “contraband-only doctrine” as such, but it has relied on the term “contraband” to explain its reasoning in key cases. See, e.g., *United States v. Place*, 462 U.S. 696, 707 (1983) (“A ‘canine sniff’ . . . does not expose noncontraband items that otherwise would remain hidden from public view . . . . Moreover, the sniff discloses only the presence or absence of narcotics, a contraband item.”). The Court has not used the phrase “binary search” in any of its opinions. The term “doctrine” should be preferred to “exception” because the Court has considered dog sniffs and other similar searches as not implicating the Fourth Amendment at all, as opposed to being an exception to the Fourth Amendment’s requirements.
  3. See *Place*, 462 U.S. at 706-07.
  4. *United States v. Jacobsen*, 466 U.S. 109, 122-26 (1984) (involving a chemical field test to detect cocaine); *Place*, 462 U.S. at 706-07 (involving dogs trained to detect narcotics).

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In 1984, Justice Brennan dissented in one of the earliest Supreme Court cases to address the contraband-only doctrine and wrote about a future in which technological advances would greatly expand the power of the police to conduct indiscriminate searches under the contraband-only doctrine.<sup>5</sup> As he warned:

[I]f a device were developed that, when aimed at a person, would detect instantaneously whether the person is carrying cocaine, there would be no Fourth Amendment bar, under the Court's approach, to the police setting up such a device on a street corner and scanning all passersby. In fact, the Court's analysis is so unbounded that if a device were developed that could detect, from the outside of a building, the presence of cocaine inside, there would be no constitutional obstacle to the police cruising through a residential neighborhood and using the device to identify all homes in which the drug is present.<sup>6</sup>

Those devices exist today. Not with cocaine, perhaps, but today's technology is nonetheless capable of detecting a wide variety of "contraband." Instead of detecting cocaine, the police can point a device at a person walking down a city street and determine whether he is carrying a gun,<sup>7</sup> and they can detect the presence of a stolen cell phone inside a home by doing nothing more than "cruising through a residential neighborhood."<sup>8</sup> As technology advances, the number of investigative technologies that purport to detect only contraband will increase further. Digital "hash" searches for child pornography,<sup>9</sup> remote gun detectors,<sup>10</sup> and "electronic sniffers"<sup>11</sup> all potentially fall within the contraband-only doctrine. Because the Court has interpreted contraband-only devices as not implicating the Fourth Amendment at all, the police could

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5. *Jacobsen*, 466 U.S. at 138 (Brennan, J., dissenting).

6. *Id.*

7. See, e.g., Tamer El-Ghobashy, *Police Tool Targets Guns*, WALL ST. J. (Jan. 23, 2013, 9:20 PM ET), <http://on.wsj.com/XyyBQS>.

8. *Jacobsen*, 466 U.S. at 138 (Brennan, J., dissenting); see, e.g., Lee Hermiston, *Iowa City Officer Develops Software to Find Stolen Wi-Fi-Enabled Devices: L8NT Can Be Used on Squad Car Laptop*, GAZETTE (Cedar Rapids, Iowa) (Sept. 8, 2015, 6:40 AM), <http://www.thegazette.com/subject/news/public-safety/iowa-city-officer-develops-software-to-find-stolen-wi-fi-enabled-devices-20150907>.

9. See Robyn Burrows, Comment, *Judicial Confusion and the Digital Drug Dog Sniff: Pragmatic Solutions Permitting Warrantless Hashing of Known Illegal Files*, 19 GEO. MASON L. REV. 255, 276-80 (2011) (explaining hash searches and exploring the contraband-only doctrine's application to their use in detecting child pornography).

10. See David A. Harris, *Superman's X-Ray Vision and the Fourth Amendment: The New Gun Detection Technology*, 69 TEMP. L. REV. 1, 29-37 (1996) (discussing the contraband-only doctrine and arguing that it should not apply to gun detectors).

11. See Mary Constantino, *Electronic Sniffers' Place: The Use of Electronic Sniffers Under the Search and Seizure Clause of the Fourth Amendment*, 2 CHARLOTTE L. REV. 333, 349-67 (2010) (applying the contraband-only doctrine to electronic sniffers under a variety of circumstances).

potentially employ these devices broadly, without the need for probable cause or even reasonable suspicion of wrongdoing.

Courts confronting these technological developments have struggled to define the scope of the contraband-only doctrine. In *United States v. Bah*, for example, the Sixth Circuit considered the judicial split on whether a swipe of a credit card suspected to be fraudulent falls under the contraband-only doctrine.<sup>12</sup> Other circuits have similarly confronted the legitimacy of warrantless “hash” searches for child pornography<sup>13</sup> and tracking illicit wireless signals.<sup>14</sup>

Although academic commentators and courts have begun to work through these novel applications of the contraband-only doctrine,<sup>15</sup> they have ignored the broader question lurking underneath the doctrine: What exactly is Fourth Amendment “contraband”? And when is a search properly considered “contraband only”? So far, courts and commentators have considered these questions briefly or not at all, without articulating any consistent definition of “contraband” or any method of determining whether a particular technology meets the requirements of the contraband-only doctrine.<sup>16</sup>

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12. 794 F.3d 617, 631-32 (6th Cir.) (summarizing previous court rulings with respect to credit card swipes and holding that there is no legitimate “privacy interest in the magnetic strip beyond that in the cards themselves”), *cert. denied*, 136 S. Ct. 561 (2015).
  13. *See United States v. Mann*, 592 F.3d 779, 782-86 (7th Cir. 2010) (discussing whether the use of a hash search tool capable of detecting child pornography exceeded the scope of a warrant permitting investigators to search a hard drive for evidence of crimes other than possession of child pornography).
  14. *See United States v. Stanley*, 753 F.3d 114, 121-22 (3d Cir. 2014) (applying the contraband-only doctrine to a device that tracked a wireless signal associated with downloading child pornography via an unauthorized connection to an unsecured router belonging to the defendant’s neighbor).
  15. To date, academic commentary on the contraband-only doctrine has largely been limited to the normative desirability of the doctrine and the implications that the doctrine has for our understanding of the Fourth Amendment. *See, e.g.*, Lewis R. Katz & Aaron P. Golembiewski, *Curbing the Dog: Extending the Protection of the Fourth Amendment to Police Drug Dogs*, 85 NEB. L. REV. 735, 736-39 (2007) (arguing that *United States v. Place*, 462 U.S. 696 (1983), should be overturned and the contraband-only doctrine eliminated); MacDonnell, *supra* note 2, at 300-04 (cautioning against expanding the contraband-only doctrine to new technologies and arguing for limits that could prevent that expansion); Kenneth J. Melilli, *Dog Sniffs, Technology, and the Mythical Constitutional Right to Criminal Privacy*, 41 HASTINGS CONST. L.Q. 357, 379 (2014) (arguing that the contraband-only doctrine is consistent with the Fourth Amendment’s purpose); Lawrence Rosenthal, *Binary Searches and the Central Meaning of the Fourth Amendment*, 22 WM. & MARY BILL RTS. J. 881, 887 (2014) (arguing against a libertarian view of the Fourth Amendment and using the contraband-only doctrine as support); Laurent Sacharoff, *The Binary Search Doctrine*, 42 HOFSTRA L. REV. 1139, 1177-80 (2014) (arguing that the implications of the doctrine demonstrate that the Fourth Amendment protects more than just informational privacy).
  16. *See, e.g.*, MacDonnell, *supra* note 2, at 303-04 (“The contraband exception, as currently articulated by the Supreme Court, is not limited to narcotics or canine sniffs. The only  
*footnote continued on next page*”).

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This Note is the first to take up those questions in detail. Part I begins by suggesting a framework for understanding the doctrine as it has been applied by the Supreme Court since *United States v. Place*<sup>17</sup> and *United States v. Jacobsen*.<sup>18</sup> Although the Court has not yet articulated a clear test for whether a particular investigative technique qualifies as “contraband only,” its decisions reveal three necessary criteria: (1) police must have lawful *access* to the place or thing to be analyzed; (2) the technique must not be overly *intrusive* on Fourth Amendment interests other than privacy; and (3) the technique must not be capable of *exposing* any facts to which a person has a “legitimate” right to privacy (in other words, noncontraband). Part I illustrates how these criteria have thus far allowed the Court to limit the spread of the contraband-only doctrine in cases like *Florida v. Jardines*,<sup>19</sup> *Missouri v. McNeely*,<sup>20</sup> and *Kyllo v. United States*.<sup>21</sup> Yet, critically, these cases reveal that the three-part analysis usually used by the Court in contraband-only cases is missing a crucial preliminary inquiry: What counts as “contraband” such that the contraband-only doctrine applies at all?

This question is more difficult than it first appears. Consider handguns, for instance. A naive view of the “what is contraband?” question might demand a binary answer—either handguns are contraband or they are not. In the context of gun ownership, however, arriving at a simple “yes” or “no” answer is fraught with complications. For some people and in some places, possession of a handgun may indeed be illegal.<sup>22</sup> But inside the home, or for individuals with a concealed carry permit, possession may not only be legal but protected by the Second Amendment.<sup>23</sup>

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specific limitation is that the test or investigative technique must only reveal the presence or absence of contraband. Thus, an individual’s person, papers, home, and effects are unprotected, so long as the test used is sufficiently discerning.”).

17. 462 U.S. 696 (1983).

18. 466 U.S. 109 (1984).

19. 133 S. Ct. 1409 (2013).

20. 133 S. Ct. 1552 (2013).

21. 533 U.S. 27 (2001).

22. *See, e.g.*, 18 U.S.C. § 922(g) (2015) (criminalizing possession of firearms under a variety of circumstances).

23. *See* *District of Columbia v. Heller*, 554 U.S. 570, 628-35 (2008) (holding that a ban on handgun possession in the home violates the Second Amendment). *Compare* *Moore v. Madigan*, 702 F.3d 933, 936 (7th Cir. 2012) (“To speak of ‘bearing’ arms within one’s home would at all times have been an awkward usage. A right to bear arms thus implies a right to carry a loaded gun outside the home.”), *with* *Peruta v. County of San Diego*, 824 F.3d 919, 939 (9th Cir. 2016) (en banc) (“[T]he Second Amendment right to keep and bear arms does not include, in any degree, the right of a member of the general public to carry concealed firearms in public.”). For a more in-depth discussion of the contraband-only doctrine as it applies to firearms, see Part III.B.3 below.

Part II offers an answer to this question, exploring what it means for a particular material to be “contraband” for purposes of the Fourth Amendment. It sets forth the foundation of a new theory of Fourth Amendment contraband that this Note terms “anticipatory contraband.” Under a theory of anticipatory contraband, Fourth Amendment contraband is defined as “any material or information for which police and investigators know in advance there is no lawful right to private possession under the circumstances.” This definition requires inquiry into not only whether possession is illegal as a matter of substantive criminal law but also whether police officers and investigators know *in advance*, given all the circumstances, that there is no legitimate right to private possession (hence “anticipatory” contraband).

Under this theory, it would not be enough for the police using handgun detection technology to discover afterwards that a particular person’s possession of a handgun was in fact unlawful under the circumstances. Anticipatory contraband would require that the police establish before deployment of the technology that there is no lawful right to private possession of a handgun under the circumstances. Otherwise, the police have no way of knowing whether use of the technology could compromise a legitimate expectation of privacy.

Part III combines the lessons from Parts I and II to illustrate how a theory of anticipatory contraband illuminates the Court’s existing contraband-only doctrine. This application shows that while the contraband-only doctrine might apply to a variety of new technologies, law enforcement’s ability to effectuate warrantless searches remains limited. Finally, Part IV discusses some of the implications and unresolved questions of the theory of anticipatory contraband for courts and law enforcement officials considering new and old technologies under the contraband-only doctrine.

## **I. The *Place*/*Jacobsen* Framework**

### A. Origin of the Doctrine: *Place* and *Jacobsen*

The Supreme Court first recognized the contraband-only doctrine in the 1983 case *United States v. Place*.<sup>24</sup> Generally, the Fourth Amendment protects “the people . . . against unreasonable searches and seizures” and provides that “no Warrants shall issue, but upon probable cause.”<sup>25</sup> While not strictly dictated by the text of the amendment, the Court has held that outside special circumstances, “searches” are per se unreasonable without “prior approval”

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24. 462 U.S. 696 (1983).

25. U.S. CONST. amend. IV.

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from a judge in the form of a warrant.<sup>26</sup> Not all police actions, however, constitute “searches” for the purposes of the Fourth Amendment. For instance, the police may fly over private property and make naked-eye observations of a home without conducting a Fourth Amendment “search.”<sup>27</sup>

In *Place*, the Court held that an investigative technique that can do no more than reveal the presence of contraband (in that case, a trained dog’s sniff for drugs) is not a “search” under the Fourth Amendment.<sup>28</sup> Like much of the Court’s modern Fourth Amendment jurisprudence, the contraband-only doctrine is “the logical destination of a journey that began with the seminal case of *Katz v. United States*.”<sup>29</sup> In his now widely adopted *Katz* concurrence, Justice Harlan argued that the Fourth Amendment’s protection of privacy is best articulated by a two-part analysis: first, for police action to be considered a “search,” a person must “have exhibited an actual (subjective) expectation of privacy”; second, that expectation must “be one that society is prepared to recognize as ‘reasonable.’”<sup>30</sup> This latter “objective” requirement has often been recast as a requirement that a subjective expectation of privacy be a “legitimate” expectation.<sup>31</sup>

But these two conceptions of *Katz*’s second prong—reasonableness and legitimacy—have very different implications for the scope of the Fourth Amendment’s protections. A “reasonableness” requirement suggests that courts will not entertain fanciful or unrealistic expectations of privacy from a *probabilistic* point of view: a person standing on a street corner might subjectively believe that no one will observe him, but that is not a “reasonable” expectation in the sense that a reasonable person knows that someone standing on a street corner is very *likely* to be observed.<sup>32</sup>

A “legitimate” expectation of privacy, on the other hand, has nothing to do with how *likely* it is that a particular fact will remain hidden. Rather, legitimacy is concerned with whether society believes a fact *ought* to remain hidden. As Justice Rehnquist noted in *Rakas v. Illinois*, “[a] burglar plying his trade in a summer cabin during the off season may have a thoroughly justified

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26. See *Katz v. United States*, 389 U.S. 347, 357 (1967).

27. *California v. Ciraolo*, 476 U.S. 207, 215 (1986).

28. 462 U.S. at 706-07.

29. *Simmons*, *supra* note 2, at 415 (citing *Katz*, 389 U.S. 347).

30. 389 U.S. at 361 (Harlan, J., concurring).

31. See, e.g., *United States v. Chadwick*, 433 U.S. 1, 7 (1977) (“[T]he Fourth Amendment . . . protects people from unreasonable government intrusions into their legitimate expectations of privacy.”), *abrogated on other grounds by California v. Acevedo*, 500 U.S. 565, 575-79 (1991).

32. See, e.g., *United States v. Knotts*, 460 U.S. 276, 281-82 (1983).

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subjective expectation of privacy, but it is not one which the law recognizes as 'legitimate.'"<sup>33</sup>

It was against this backdrop that the Court considered *United States v. Place*.<sup>34</sup> Charged with narcotics trafficking, Raymond Place had been traveling from Miami to New York when agents of the Drug Enforcement Administration (DEA) seized his bags at LaGuardia Airport.<sup>35</sup> Place refused to consent to a search, yet the agents took Place's bags to John F. Kennedy International Airport for exposure to a sniff by a trained narcotics detection dog.<sup>36</sup> The dog "reacted positively," so the luggage was retained over the weekend until the following Monday, when the police obtained a search warrant based on the dog's positive reaction.<sup>37</sup>

At the Supreme Court, the primary issue was not the permissibility of a dog sniff *per se*. Instead, the Court was chiefly concerned with the initial seizure of Place's bags by the DEA agents and the applicability of *Terry v. Ohio* to the temporary seizure of personal belongings.<sup>38</sup> A majority of the Court held that, as a general matter, temporary seizure of property can be justified under the same principles that justify a *Terry*-type investigative stop.<sup>39</sup> However, the length of the detention (ninety minutes) made the seizure unreasonable.<sup>40</sup>

The Court could have stopped there. The contraband-only argument had not been addressed by any of the courts below,<sup>41</sup> the illegal seizure disposed of Place's case, and neither side had briefed or argued the contraband-only issue.<sup>42</sup> Nonetheless, the Court forged ahead and addressed the Fourth Amendment implications of exposing personal luggage to a sniff from a trained canine—and in doing so, it laid the groundwork for the contraband-only doctrine.

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33. 439 U.S. 128, 143 n.12 (1978).

34. 462 U.S. 696 (1983).

35. *Id.* at 698-99.

36. *Id.* at 699.

37. *Id.*

38. *See id.* at 700-06. *Terry v. Ohio* held that a police officer may (1) stop an individual whom he has reasonable suspicion to believe has committed or will soon commit a crime; and (2) proceed to frisk the individual provided that the officer has reasonable suspicion to believe that the individual is "armed and dangerous." 392 U.S. 1, 30-31 (1968).

39. *Place*, 462 U.S. at 700-06.

40. *Id.* at 709-10.

41. *See United States v. Place*, 498 F. Supp. 1217, 1228 (E.D.N.Y. 1980) ("Defendant does not contest the validity of sniff searches *per se* . . ."), *rev'd*, 660 F.2d 44, 53 (2d Cir. 1981) (resolving the case based on the illegal seizure of Place's bags without addressing the dog sniff issue), *aff'd*, 462 U.S. 696.

42. *See Place*, 462 U.S. at 719 (Brennan, J., concurring in the result) ("[The issue] was not briefed or argued in this Court.").

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The Court began by recognizing that “a person possesses a privacy interest in the contents of personal luggage.”<sup>43</sup> Notwithstanding that interest, the Court concluded that subjecting Place’s luggage to a canine’s sniff “did not constitute a ‘search’ within the meaning of the Fourth Amendment.”<sup>44</sup> First, the Court reasoned that the dog sniff was “much less intrusive” than “rummaging” through the luggage because a dog sniff “does not require opening the luggage.”<sup>45</sup> Second, the Court reasoned that “the sniff discloses only the presence or absence of narcotics, a contraband item” and “does not expose noncontraband items that otherwise would remain hidden from public view.”<sup>46</sup> Even though “the sniff tells the authorities something about the contents of the luggage, the information obtained is limited.”<sup>47</sup> Thus, two factors dictated the Court’s result: (1) “the manner in which the information is obtained” and (2) “the content of the information revealed by the procedure.”<sup>48</sup>

The *Place* decision was an inauspicious start for the contraband-only doctrine. As both Justice Brennan and Justice Blackmun noted in their concurring opinions, “[r]egardless of the validity of a dog sniff under the Fourth Amendment, the seizure was too intrusive.”<sup>49</sup> Further, the Court’s analysis of the contraband-only doctrine was extremely brief. The substantive discussion of the dog sniff takes up only two paragraphs and cites only one previous case, *United States v. Chadwick*, which held only that the Fourth Amendment “protects people from unreasonable government intrusions into their legitimate expectations of privacy.”<sup>50</sup> As Justice Brennan presciently declared, “the issue is more complex than the Court’s discussion would lead one to believe.”<sup>51</sup>

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43. *Id.* at 707 (majority opinion).

44. *Id.*

45. *Id.*

46. *Id.* Recent commentary has cast doubt on the Court’s assertion that a trained dog’s “sniff discloses only the presence or absence of narcotics.” See, e.g., Matthew Slaughter, *Supreme Court’s Treatment of Drug Detection Dogs Doesn’t Pass the Sniff Test*, 19 NEW CRIM. L. REV. 279, 291-94 (2016) (expressing the concern that dogs are not in fact trained to detect drugs but are instead trained to detect “chemical components [that] are not themselves illegal and can be found in legal products, thus leading to searches of non-contraband items”); see also *infra* Part III.A.2.

47. *Place*, 462 U.S. at 707.

48. *Id.*

49. *Id.* at 723 (Blackmun, J., concurring in the judgment); see *id.* at 719 (Brennan, J., concurring in the result).

50. *Id.* at 706-07 (majority opinion) (quoting *United States v. Chadwick*, 433 U.S. 1, 7 (1977), *abrogated on other grounds by California v. Acevedo*, 500 U.S. 565, 575-79 (1991)). In *Chadwick*, the Court concluded that the warrantless search of a footlocker seized from the trunk of an automobile during an arrest violated the Fourth Amendment. 433 U.S. at 15-16.

51. *Place*, 462 U.S. at 719 (Brennan, J., concurring in the result).

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Indeed, although the *Place* Court asserted that “the canine sniff is *sui generis*,”<sup>52</sup> the contraband-only doctrine returned to the Court just one year later in *United States v. Jacobsen*.<sup>53</sup> In that case, employees of a private freight carrier had examined a damaged package and observed a tube sticking out that was covered in several layers of packing material.<sup>54</sup> After cutting open the tube, the employees and their supervisor discovered several bags of white powder.<sup>55</sup> They called a DEA agent, who opened the bags, “removed a trace of the powder, subjected it to a chemical test and determined that it was cocaine.”<sup>56</sup> The Court considered whether the agent was required to obtain a warrant prior to conducting the test.<sup>57</sup>

As in *Place*, the Court first needed to address a threshold question, namely whether the initial seizure of evidence was permitted by the Fourth Amendment. The *Jacobsen* Court articulated what is now known as the private search doctrine, stating that searches and seizures by nongovernmental agents “d[o] not violate the Fourth Amendment because of their private character.”<sup>58</sup> The Court went on to conclude that once information has been exposed to a third party, the expectation of privacy disappears and “the Fourth Amendment does not prohibit governmental use of the now nonprivate information.”<sup>59</sup> The Court held that, on the facts, removal of the plastic bags by the DEA agent “enabled the agent to learn nothing that had not previously been learned during the private search” by the company employees.<sup>60</sup> As a result, the seizure was justified.

Thus, unlike in *Place*, resolution of the case hinged on the constitutionality of the allegedly contraband-only search. The issue had also been addressed below and briefed by the parties.<sup>61</sup> Perhaps owing to this distinction, the *Jacobsen* Court conducted a much more thorough analysis of the logic underlying the contraband-only doctrine. The Court began by reiterating the distinction drawn in *Katz* between a subjective expectation of privacy and an objective expectation of privacy: the latter, objective prong turns on whether

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52. *Id.* at 707 (majority opinion).

53. 466 U.S. 109 (1984).

54. *Id.* at 111.

55. *Id.*

56. *Id.*

57. *Id.*

58. *Id.* at 115.

59. *Id.* at 117.

60. *Id.* at 120.

61. See *United States v. Jacobsen*, 683 F.2d 296, 299-300 (8th Cir. 1982), *rev'd*, 466 U.S. 109; Brief for the United States at 19-26, *Jacobsen*, 466 U.S. 109 (No. 82-1167); Brief of Respondents at 12-15, *Jacobsen*, 466 U.S. 109 (No. 82-1167).

an individual's subjective expectation that a fact will remain private is one "that society is prepared to recognize as reasonable."<sup>62</sup> The Court then reasoned that because "[a] chemical test . . . merely discloses whether or not a particular substance is cocaine," it "does not compromise any *legitimate* interest in privacy."<sup>63</sup>

Crucially for the Court, the chemical test was not a search because "even if the results [we]re negative[,] . . . such a result reveals nothing of special interest."<sup>64</sup> If the powder in question had turned out to be sugar, flour, or baking powder, for instance, the chemical test would not have revealed that information to the police; the cocaine test would have merely come back negative. For the Court, it was enough that the test disclosed only the presence or absence of cocaine because "Congress has decided . . . to treat the interest in 'privately' possessing cocaine as illegitimate."<sup>65</sup>

The Court decided *Jacobsen* by a 7-2 vote.<sup>66</sup> Even Justice Blackmun, who had written separately in *Place* to express his reservations about the issue of dog sniffs, joined the *Jacobsen* majority.<sup>67</sup> Accordingly, despite the tenuous nature of *Place's* holding with respect to dog sniffs, *Jacobsen* firmly established the contraband-only doctrine in the Court's jurisprudence.

#### B. The *Place/Jacobsen* Three-Step Test: Access, Intrusiveness, and Exposure

Though the contraband-only doctrine has been applied for decades,<sup>68</sup> the Court has not expressly articulated a standard for evaluating whether and when an investigative technique fits within the contraband-only doctrine. What follows is an analysis of *Place* and *Jacobsen* that reveals a three-step test for determining whether the doctrine applies.

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62. *Jacobsen*, 466 U.S. at 122.

63. *Id.* at 123 (emphasis added).

64. *Id.*

65. *Id.*

66. *See id.* at 110; *id.* at 126-33 (White, J., concurring in part and concurring in the judgment) (departing from the majority's treatment of the private search doctrine and instead arguing that the search should have been upheld under the plain view doctrine); *id.* at 133 (Brennan, J., dissenting).

67. *Compare* United States v. Place, 462 U.S. 696, 723-24 (1983) (Blackmun, J., concurring in the judgment) (arguing that the Court should decline to resolve the dog sniff issue), *with Jacobsen*, 466 U.S. at 110.

68. *See, e.g.,* City of Indianapolis v. Edmond, 531 U.S. 32, 40 (2000) ("The fact that officers walk a narcotics-detection dog around the exterior of each car at the Indianapolis checkpoints does not transform the seizure into a search."); *see also* Florida v. Harris, 133 S. Ct. 1050, 1052, 1055-56 (2013) (holding that courts must apply a "totality of the circumstances" test when determining whether an alert from a drug-sniffing dog provides probable cause).

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In both *Place* and *Jacobsen*, the Court first examined whether the police had violated the Fourth Amendment by unreasonably seizing the evidence in question prior to carrying out the contraband-only search.<sup>69</sup> In other words, the Court asked whether the police had lawful *access* to the target of the contraband-only search. Next, the Court looked at the investigative technique *itself*, focusing on two factors: “the manner in which the information [wa]s obtained” and “the content of the information revealed by the procedure.”<sup>70</sup> Thus, the Court in both *Place* and *Jacobsen* asked three questions: (1) Did police have *lawful access* to the subject of the investigation? (2) How *intrusive* is the search technique itself? (3) What information is *exposed* by the search? This Note refers to these questions as questions of “access,” “intrusiveness,” and “exposure,” respectively.

*Access.* In both *Place* and *Jacobsen*, the Court had to address a threshold Fourth Amendment challenge to the seizure of evidence that provided the police the opportunity to conduct a contraband-only search in the first place. In *Place*, even though the police did not conduct a “search” by subjecting personal luggage to a dog sniff, the Fourth Amendment was violated because the bags were seized for an unreasonable length of time without probable cause.<sup>71</sup> Similarly, in *Jacobsen*, the Court made clear that if law enforcement agents had violated the Fourth Amendment in opening the package, the follow-on search would not have been valid regardless of the investigative technique employed.<sup>72</sup> The Court’s approach simply reflected the fact that technology is generally not a “magic wand”—detection usually requires physical proximity, which means that police seeking to use a contraband-only investigative technique will frequently (but not always) have to seize an object, detain a person, or cross onto private property in order to conduct the test. Thus, courts examining a claim that a particular investigation is covered by the contraband-only doctrine must first decide whether the police had *lawful access* to the person, place, or thing subjected to the allegedly contraband-only search technique.

*Intrusiveness.* The *Place* Court observed that a dog sniff “does not require opening the luggage” and is thus “less intrusive than a typical search.”<sup>73</sup> Somewhat similarly, the *Jacobsen* Court analyzed the “impact on any protected privacy interest” that the test itself might compromise.<sup>74</sup> The Court observed that although the testing process destroys the sample of the powder used, the

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69. See *Jacobsen*, 466 U.S. at 120-22; *Place*, 462 U.S. at 700-06.

70. *Place*, 462 U.S. at 707.

71. *Id.* at 709-10.

72. 466 U.S. at 114-15.

73. 462 U.S. at 707.

74. 466 U.S. at 125.

fact that “only a trace amount of material was involved” meant that the impact on the defendant’s privacy was de minimis.<sup>75</sup> Thus, the *intrusiveness* of the testing process on Fourth Amendment interests—such as privacy, bodily integrity, and property rights—is relevant.

*Exposure.* With respect to “the content of the information revealed,”<sup>76</sup> both *Place* and *Jacobson* considered it crucial that the test in question was *incapable* of revealing the presence of something *other* than contraband.<sup>77</sup> This principle stands at the very core of the contraband-only doctrine: because possession of contraband is “illegitimate,” the revelation of contraband’s existence does not violate an “interest in privacy that society is prepared to recognize as reasonable.”<sup>78</sup> Thus, courts must scrutinize any technology the government might seek to justify under the contraband-only doctrine to see if it really reveals “only” contraband.

This three-step test and the basic logic of the contraband-only doctrine was reaffirmed in the 2005 case *Illinois v. Caballes*.<sup>79</sup> In *Caballes*, the Court considered “[w]hether the Fourth Amendment requires reasonable, articulable suspicion to justify using a drug-detection dog to sniff a vehicle during a legitimate traffic stop.”<sup>80</sup> By a 6-2 vote, the Court adopted and extended the contraband-only portion of the *Place* decision, concluding that the use of a drug detection dog during a traffic stop was not a “search” within the meaning of the Fourth Amendment.<sup>81</sup>

Each of the *Place/Jacobsen* framework’s three steps discussed above is apparent in the *Caballes* decision. With respect to lawful access, it was crucial to the result in *Caballes* that the “initial seizure of [the defendant] when he was stopped on the highway was . . . concededly lawful.”<sup>82</sup> With respect to intrusiveness, the Court emphasized that “the dog sniff was performed [only] on the exterior of [the defendant’s] car,” thus minimizing “[a]ny intrusion on [his] privacy expectations.”<sup>83</sup> Finally, with respect to exposure, the Court noted

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75. *Id.*

76. *Place*, 462 U.S. at 707.

77. See *Jacobson*, 466 U.S. at 123 (“[E]ven if the results are negative—merely disclosing that the substance is something other than cocaine—such a result reveals nothing of special interest.”); *Place*, 462 U.S. at 707 (“[The dog’s sniff] does not expose noncontraband items that otherwise would remain hidden from public view . . .”).

78. *Jacobson*, 466 U.S. at 122-23.

79. 543 U.S. 405 (2005).

80. *Id.* at 407 (quoting Petition for a Writ of Certiorari at i, *Caballes*, 543 U.S. 405 (No. 03-923)).

81. *Id.* at 405, 409-10. Chief Justice Rehnquist took no part in the decision. *Id.* at 405.

82. *Id.* at 407.

83. *Id.* at 409.

that the dog sniff revealed *only* the existence of contraband, reiterating that there was thus no violation of a legitimate expectation of privacy.<sup>84</sup>

C. Accuracy Is Not a Factor in the Contraband-Only Doctrine

Although the Court has applied the *Place/Jacobsen* three-step framework to limit the scope of the contraband-only doctrine, it has consistently rejected another limit it might have imposed: the accuracy of a particular contraband-only detection technology. When deciding to apply the contraband-only doctrine, the Court treats the technology's accuracy as irrelevant. This Note attempts to explain why the Court does this and why it makes sense given the underlying logic of the doctrine.

Litigants and commentators have argued that accuracy should be a factor in weighing whether a search is contraband-only.<sup>85</sup> In *Caballes*, for instance, the respondent "argue[d] that the error rates, particularly the existence of false positives, call into question the premise that drug-detection dogs alert only to contraband."<sup>86</sup> In *United States v. Place*, the positive alert from the drug-sniffing dog was not immediately followed by a search but rather by the acquisition of a warrant *based* on the alert.<sup>87</sup> In the context of a traffic stop, however, once a dog sniff has provided probable cause, the search of the automobile can follow immediately, without need for a warrant.<sup>88</sup>

According to the respondent in *Caballes*, the potential for error meant that "a program of conducting dog sniffs will inevitably intrude on, or lead to intrusion on, legitimate privacy interests, unless the sniffs are so reliable that they never lead to physical searches of private spaces that turn out not to contain any drugs."<sup>89</sup> Justice Souter found this logic compelling in his dissent, concluding that "[t]he infallible dog . . . is a creature of legal fiction."<sup>90</sup> Because dogs are fallible, he reasoned, exposure to a drug-sniffing dog "is the first step in a process that may disclose 'intimate details' without revealing contraband."<sup>91</sup>

The majority of the Court, however, remained unpersuaded, relying on the idea that "an erroneous alert, *in and of itself*, [does not] reveal[] any

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84. *Id.* at 408-09.

85. *See, e.g.,* Simmons, *supra* note 2, at 451-59.

86. 543 U.S. at 409.

87. 462 U.S. 696, 699 (1983).

88. *See* Carroll v. United States, 267 U.S. 132, 147 (1925) (establishing the automobile exception to the Fourth Amendment, allowing the police to search a motor vehicle on a public highway without a warrant provided that probable cause is established).

89. Brief for the Respondent at 18, *Caballes*, 543 U.S. 405 (No. 03-923).

90. *Caballes*, 543 U.S. at 411 (Souter, J., dissenting).

91. *Id.* at 413 (quoting *Kyllo v. United States*, 533 U.S. 27, 37 (2001)).

legitimate private information.”<sup>92</sup> That is, after the dog sniff has been conducted and before the search by hand, the police have not learned any information in which a person has both a subjective and legitimate expectation of privacy. Following a potentially inaccurate sniff, the police may have a *mistaken* impression that contraband is present, but the police have exposed no true information in which a person might have a subjective expectation of privacy.

Consider three different hypothetical dogs, each with a different percentage chance that a positive alert will in fact indicate the existence of contraband: 0%, 10%, and 50%.<sup>93</sup> For our hypothetical 0% dog, no information whatsoever is exposed by the use of the dog by the police. In that case, it is difficult to see how privacy has been compromised: the police know no more about the contents of the sniffed person or container than they would have had they flipped a coin or consulted a psychic.

The situation is changed only slightly with our 10% dog. Use of the dog leaves the police with some idea of who might be carrying contraband, but the police know that most of the alerts are false. As a result, the police would likely lack probable cause for a follow-on hand search. The police could still choose to employ that dog—it might serve a deterrent effect, or it might be part of the handler or the dog’s training. But provided that the police do not conduct searches based on the unreliable alert, no real privacy interest has been compromised. At worst, the police now have an erroneous belief about an innocent person, with no private facts actually revealed. Indeed, the police have substantially *less* information than they would have had if they had employed a more reliable and arguably permissible dog.

Next, consider what happens if the police use a dog that alerts at an approximately 50% level of reliability. In that case, the police might be able to claim probable cause based on the dog’s alert and conduct a follow-on hand search. But standing alone, the accuracy of the dog sniff should not dictate whether a dog sniff is a search, as an erroneous alert does not actually reveal any legitimate private facts about the world. After the alert but before the hand search, the only “fact” that has been revealed is a statistical one: the person that the dog alerted to has a 50% chance of carrying contraband. For those without contraband, it is still the case that no true fact has actually been revealed.

To be sure, because of the dog’s imperfect reliability, innocent people might be searched and private facts might be revealed. But in its Fourth

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92. *Id.* at 409 (majority opinion) (emphasis added).

93. Academic commentary has referred to this value as the “positive predictive value” of a dog. *See, e.g.,* Simmons, *supra* note 2, at 452; *see also id.* at 458-59 (arguing that courts should use the positive predictive value when measuring error rates of contraband-only detection techniques and only permit the use of contraband-only detection techniques that have a demonstrably high positive predictive value).

Amendment jurisprudence, the Court has always considered distinct investigative steps as separate units of Fourth Amendment analysis.

Consider informants, for example. Informants are of course far from infallible, and the Court has frequently had to address whether and when the police may act based on information provided by an informant.<sup>94</sup> But analysis of an informant's reliability is always done in the context of a challenge to a search *based* on the informant's information. That is, if the police are investigating John Smith, they may generally ask an informant questions about Smith's activities without first determining how likely it is that the informant will provide accurate or reliable information. If the informant is unreliable and police execute a search based on the information provided, the Fourth Amendment would allow Smith to challenge that search on the ground that the police lacked probable cause.<sup>95</sup> But he would not be able to challenge consultation with the informant *in the first instance*, even though questioning the informant was the "first step in a process" that led to the exposure of private facts.<sup>96</sup>

Similarly, in *Florida v. Riley*, a plurality of the Court rejected a Fourth Amendment challenge to police conducting naked-eye observation of an individual's property from an airplane.<sup>97</sup> In analyzing whether this sort of aerial surveillance constituted a "search" under the Fourth Amendment, the Court did not consider whether the police intended to or were likely to conduct a follow-on search of the property if drugs were found.<sup>98</sup> Instead, the Court examined only whether the aerial surveillance itself compromised the right to privacy.<sup>99</sup> Acts are not considered Fourth Amendment searches merely because they might lead to information that will justify a follow-on search.

The approach to dog sniffs is similar: the accuracy of the dog sniff matters, but only as one part of the "totality of circumstances" that must be considered when determining whether there was probable cause to conduct any subsequent search.<sup>100</sup> The issue of accuracy does not bear on whether the dog sniff counts as a search in the first instance.

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94. See, e.g., *Illinois v. Gates*, 462 U.S. 213, 245 n.14 (1983) ("We have never required that informants used by the police be infallible . . .").

95. Cf. *Florida v. J.L.*, 529 U.S. 266, 269-74 (2000) (holding that an anonymous tip lacked "sufficient indicia of reliability" and was an insufficient basis for a stop and frisk under *Terry v. Ohio*, 392 U.S. 1 (1968) (quoting *Alabama v. White*, 496 U.S. 325, 327 (1990))).

96. See *Caballes*, 543 U.S. at 413 (Souter, J., dissenting).

97. 488 U.S. 445, 447-50 (1989) (plurality opinion).

98. See *id.* at 448-51.

99. *Id.* at 449-51.

100. See *Florida v. Harris*, 133 S. Ct. 1050, 1055 (2013).

There is good reason for this approach. Police should be able to know before employing a particular investigative technique whether the Fourth Amendment will be implicated. If, as Justice Souter argued, the device is seen as just one part of a “process”<sup>101</sup> and accuracy is imported into the standard for evaluating contraband-only detection devices, this clarity is lost because whether employing the device is a search will be based in part on actions taken *after* the investigative technique (like a dog sniff) is complete.

Consider a situation in which a police officer deploys a drug-sniffing dog but is called away on an urgent dispatch before he is able to conduct a follow-on search. In that instance, the dog sniff was just a dog sniff because no follow-on search occurred, and the only Fourth Amendment concern is the information revealed by the sniff itself. But it makes little sense to force the police to wait until after the sniff has been conducted in order to know whether the sniff implicates the Fourth Amendment. Instead, police actions should be analyzed based on the reasonableness of the action at the time it was taken.

Combining multiple discrete steps of an investigation (for example, the initial sniff by a dog and the follow-on hand search) into a single unit of Fourth Amendment analysis would force courts to analyze the subjective intentions of police officers. That is, courts would need to ask whether the police, at the time the dog was deployed, intended to conduct a follow-on search by hand if the dog positively alerted. The Court has consistently rejected this sort of analysis of subjective intent in its Fourth Amendment jurisprudence.<sup>102</sup>

As in cases involving an informant or aerial surveillance, the appropriate Fourth Amendment challenge is to the follow-on search, not the dog sniff in the first place—whether a dog is correct 10%, 50%, or 100% of the time. Inaccuracy does not *by itself* transform an otherwise contraband-only investigative technique into a Fourth Amendment search.

#### D. The *Place/Jacobsen* Three-Step Test as It Has Been Applied

Despite the potentially broad application of the contraband-only doctrine in the three decades since *Place*, the Court has held a firm line and not yet invoked the contraband-only doctrine to justify any new types of technologies or permit detection of any new classes of contraband. The Court has used each of the three steps of the *Place/Jacobsen* framework to reject proposed contraband-only investigative techniques.

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101. *Caballes*, 543 U.S. at 413 (Souter, J., dissenting).

102. *See, e.g.*, *Brigham City v. Stuart*, 547 U.S. 398, 404 (2006) (“An action is ‘reasonable’ under the Fourth Amendment, regardless of the individual officer’s state of mind, ‘as long as the circumstances, viewed *objectively*, justify [the] action.’” (alteration in original) (quoting *Scott v. United States*, 436 U.S. 128, 138 (1978))).

1. Access

In three notable cases, the Court has ruled that the police violated the Fourth Amendment in the course of deploying a drug-sniffing dog without disturbing the central logic that supports the *use* of drug-sniffing dogs: *City of Indianapolis v. Edmond*,<sup>103</sup> *Rodriguez v. United States*,<sup>104</sup> and *Florida v. Jardines*.<sup>105</sup>

The first of these cases was *Edmond*, in which the Court held that a drug interdiction checkpoint that made use of drug-sniffing dogs violated the Fourth Amendment.<sup>106</sup> Crucially, this holding rested entirely on the initial seizure of the defendant at the checkpoint rather than the dog sniff itself.<sup>107</sup> Even though the majority ruled the checkpoints unconstitutional, the Court observed in dicta that the use of a drug-sniffing dog “does not transform the seizure into a search.”<sup>108</sup>

A similar logic underlies the Court’s recent decision in *Rodriguez*. There, a six-member majority held that an otherwise lawful traffic stop may not be prolonged beyond the “time reasonably required to complete [the stop’s] mission” solely for the purpose of conducting a sweep with a drug-sniffing dog.<sup>109</sup> Neither the majority nor Justice Thomas’s dissent questioned the core holding in *Caballes* that a drug-sniffing dog may be used in the course of a traffic stop.<sup>110</sup> Instead, the majority reasoned that the lengthy seizure inherent in an *extended* traffic stop violated the Fourth Amendment without addressing whether the dog sniff that followed was a “search.”<sup>111</sup>

While *Edmond* and *Rodriguez* dealt with police seizure of an individual in order to conduct a contraband-only sweep, the 2013 case *Florida v. Jardines* implicated a different set of Fourth Amendment interests.<sup>112</sup> In *Jardines*, the police brought a drug-sniffing dog to the front door of the home of Joelis Jardines in response to an unverified tip about a marijuana-growing

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103. 531 U.S. 32 (2000).

104. 135 S. Ct. 1609 (2015).

105. 133 S. Ct. 1409 (2013).

106. 531 U.S. at 34-36, 41-42.

107. *See id.* at 41-42.

108. *Id.* at 40.

109. *Rodriguez*, 135 S. Ct. at 1612, 1616-17 (alteration in original) (quoting *Illinois v. Caballes*, 543 U.S. 405, 407 (2005)).

110. *See id.* at 1612; *id.* at 1618 (Thomas, J., dissenting) (“[T]he use of a well-trained narcotics-detection dog . . . generally does not implicate legitimate privacy interests . . .” (second alteration in original) (quoting *Caballes*, 543 U.S. at 409)). Justice Alito also dissented, arguing that extension of the traffic stop was justified because the police officer had reasonable suspicion. *See id.* at 1623 (Alito, J., dissenting).

111. *Id.* at 1612 (majority opinion).

112. 133 S. Ct. 1409 (2013).

operation.<sup>113</sup> After the dog alerted to the presence of drugs, the police left the scene and obtained a warrant. When the warrant was executed, marijuana was discovered and Jardines was charged with cannabis trafficking.<sup>114</sup>

The Court considered whether the officer's use of a drug-sniffing dog outside a home constituted a search under the Fourth Amendment.<sup>115</sup> Writing for five Justices, Justice Scalia held that the use of the dog in this manner constituted a search under the Fourth Amendment and was therefore unconstitutional when conducted without a search warrant.<sup>116</sup>

This holding, however, did not directly undermine the core logic of *Place* and its progeny. *Place's* and *Caballes's* holdings with respect to drug-sniffing dogs were founded on *Katz* and emphasize the Fourth Amendment's protection of *privacy*. Justice Scalia's *Jardines* opinion, on the other hand, rested on the Fourth Amendment's protection of *property*. Because the police officer's use of a dog on the curtilage of the home constituted a trespass under common law, the police officer's actions constituted a search *regardless* of "whether the officers' investigation of Jardines' home violated his expectation of privacy under *Katz*."<sup>117</sup> Thus, the majority opinion in *Jardines* can be read as a recapitulation of *Place's* requirement that the police must have lawful access to the person, place, or thing that is the subject of a contraband-only investigative technique.

Notably, Justice Kagan, joined by Justices Ginsburg and Sotomayor, wrote in a separate concurrence that she "could just as happily have decided [the case] by looking to Jardines' privacy interests."<sup>118</sup> For Justice Kagan, the use of a drug-sniffing dog is "in every way that matters" like using a pair of high-powered binoculars to peer through the windows of a home.<sup>119</sup> Though Justice Kagan did not explicitly disavow *Place* or *Caballes*, her concurrence would put the basic rationale behind the contraband-only doctrine under strain.

Justice Kagan distinguished the use of a drug-sniffing dog outside a home from the use of one outside a car (as in *Caballes*) on the ground "that people's expectations of privacy are much lower in their cars than in their homes."<sup>120</sup> *Caballes*, however, was not founded on some diminished expectation of privacy inherent in a person's *vehicle*—rather, *Caballes* was based on the idea that illegal drugs receive *no privacy protection at all*, regardless of where they might be

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113. *Id.* at 1413.

114. *Id.*

115. *Id.*

116. *Id.* at 1412, 1417-18.

117. *Id.* at 1417.

118. *Id.* at 1418 (Kagan, J., concurring).

119. *Id.*

120. *Id.* at 1419 n.1.

found.<sup>121</sup> The illegitimate nature of the drugs the dog detected in *Caballes* had nothing to do with where they were found: drugs are no more lawful to possess in the home than they are in the trunk of a car or in a package sent through the mail. Thus, under the Court's traditional articulation of the contraband-only doctrine, the Fourth Amendment analysis should not change when drugs are transferred from the trunk of a car to the home.

Justice Kagan's concurring opinion can be read in one of two ways. First, it might be read as a wholesale rejection of the contraband-only doctrine. Justice Ginsburg, for instance, who signed onto the concurrence, seemed to adopt something close to this position in her *Caballes* dissent.<sup>122</sup> Alternatively, Justice Kagan might be articulating a narrower carve-out from the contraband-only doctrine's broad scope, in which a general interest in privacy surrounding activities in the home protects even contraband from police detection. This position tracks some of the language used by Justice Scalia in the thermal imaging case *Kyllo v. United States*,<sup>123</sup> and it was recently adopted by the Seventh Circuit in *United States v. Whitaker*,<sup>124</sup> where the court relied in part on Justice Kagan's concurrence to hold that a dog sniff in an apartment hallway constitutes a search regardless of whether the police committed a technical trespass.<sup>125</sup>

In either event, Justice Kagan's concurrence received only three votes, so the basic foundation of the contraband-only doctrine seems to be safe for the time being. The crucial takeaway of *Jardines*, along with *Edmond* and *Rodriguez*, is that the Court has been willing to rigorously apply the requirement that the police have lawful access before conducting a contraband-only investigative search.

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121. *Illinois v. Caballes*, 543 U.S. 405, 408 (2005) ("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.'" (quoting *United States v. Jacobsen*, 466 U.S. 109, 123 (1984))).

122. *See id.* at 422 (Ginsburg, J., dissenting) ("The Court has never removed police action from Fourth Amendment control on the ground that the action is well calculated to apprehend the guilty.").

123. 533 U.S. 27, 40 (2001) ("Where, as here, the Government uses a device that is not in general public use, to explore details of the home that would previously have been unknowable without physical intrusion, the surveillance is a 'search' and is presumptively unreasonable without a warrant.").

124. 820 F.3d 849 (7th Cir. 2016).

125. *Id.* at 852-54.

## 2. Intrusiveness

Writing in dissent in *Caballes*, Justice Ginsburg expressed concern about the potential use of an “intimidating animal.”<sup>126</sup> She was joined by Justice Souter, who worried that the introduction of a dog can “be quite intrusive.”<sup>127</sup> Though a dog sniff has not been held to be intimidating or intrusive enough to constitute a “search,” other potentially contraband-only techniques have been disavowed under the Fourth Amendment on these grounds.

Most notably, any technology that requires a bodily intrusion has been held to be a Fourth Amendment search, regardless of the information revealed. In *Skinner v. Railway Labor Executives’ Ass’n*, the Court applied the Fourth Amendment to a drug testing scheme mandated for railroad employees.<sup>128</sup> The Court observed that blood tests, the collection of urine samples, and the use of breathalyzers “reveal no . . . facts in which the employee has a substantial privacy interest” because such tests “can be used only to ascertain the presence of alcohol or controlled substances in the bloodstream.”<sup>129</sup>

Nonetheless, the Court held that such tests are searches under the Fourth Amendment because the tests themselves compromise bodily integrity.<sup>130</sup> “[T]his physical intrusion, penetrating beneath the skin, infringes an expectation of privacy that society is prepared to recognize as reasonable.”<sup>131</sup> Even a breathalyzer test “requires the production of alveolar or ‘deep lung’ breath” and thus “implicates similar concerns about bodily integrity.”<sup>132</sup> Urine tests do not require bodily intrusions, but “the process of collecting the sample to be tested, which may in some cases involve visual or aural monitoring of the act of urination, itself implicates privacy interests.”<sup>133</sup>

The Court has consistently found that “bodily intrusions” implicate the Fourth Amendment irrespective of the type of evidence they obtain.<sup>134</sup> For instance, in *Missouri v. McNeely*, the Court held that “a compelled physical intrusion beneath [the defendant’s] skin and into his veins to obtain a sample of his blood for use as evidence in a criminal investigation . . . implicates an

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126. 543 U.S. at 421 (Ginsburg, J., dissenting).

127. *See id.* at 411 n.2 (Souter, J., dissenting).

128. 489 U.S. 602, 606, 616-18 (1989).

129. *Id.* at 626.

130. *See id.* at 616.

131. *Id.*

132. *Id.* at 616-17 (quoting *California v. Trombetta*, 467 U.S. 479, 481 (1984)).

133. *Id.* at 617.

134. *See, e.g., Winston v. Lee*, 470 U.S. 753, 759 (1985) (“A compelled surgical intrusion into an individual’s body for evidence . . . implicates expectations of privacy and security of such magnitude that the intrusion may be ‘unreasonable’ even if likely to produce evidence of a crime.”).

individual's 'most personal and deep-rooted expectations of privacy.'"<sup>135</sup> When an investigative technique compromises Fourth Amendment interests in some way other than the revelation of private facts—like the violation of bodily integrity—the contraband-only doctrine does not apply.

### 3. Exposure

While lawful access and nonintrusiveness are prerequisites to applying the contraband-only doctrine, the core of the doctrine is its "exposure" prong: an investigative technique cannot be "contraband-only" if it in fact exposes the existence of something other than contraband.

This part of the doctrine was most notably applied in *Kyllo v. United States*, in which the Court held that police conducted a "search" within the meaning of the Fourth Amendment when they used a thermal imaging device to measure heat emanating from a home.<sup>136</sup> In *Kyllo*, the police, sitting in a police car on a public street, aimed a thermal imaging device at the home of Danny Kyllo and detected that "the roof over the garage and a side wall of [Kyllo's] home were relatively hot compared to the rest of the home and substantially warmer than neighboring homes."<sup>137</sup> The police concluded that the heat was due to Kyllo's use of halide lights to grow marijuana in his home and sought a warrant based in part on the thermal imaging results.<sup>138</sup>

Note that the police never left a public street, so there was no physical trespass that might invalidate the search.<sup>139</sup> Similarly, the thermal imaging device was entirely passive, picking up only heat radiating from the home,<sup>140</sup> so it is difficult to see how the test constituted any sort of intrusion of the type at issue in *Skinner* or *McNeely* (as discussed in Part I.D.2 above). Thus, the only remaining *Place/Jacobsen* factor to consider was the *nature of the information* revealed by the search.

The government explicitly invoked the contraband-only doctrine, citing both *Place* and *Jacobsen* and arguing that when the agents used the thermal imaging device, there was "no intrusion on private activities or private information."<sup>141</sup> Writing for the majority, Justice Scalia rejected this argument.<sup>142</sup> Though the "Agema Thermovision 210" was relatively crude and

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135. 133 S. Ct. 1552, 1558 (2013) (quoting *Winston*, 470 U.S. at 760).

136. 533 U.S. 27, 31-40 (2001).

137. *Id.* at 29-30.

138. *Id.* at 30.

139. *See id.* at 31-32.

140. *See id.* at 29-30.

141. *See* Brief for the United States at 24-26, *Kyllo*, 533 U.S. 27 (No. 99-8508).

142. *Kyllo*, 533 U.S. at 37-40.

showed only large-scale details of the house's thermal signature, the device could nonetheless "disclose, for example, at what hour each night the lady of the house takes her daily sauna and bath."<sup>143</sup> The potential exposure of such "intimate" activities meant that the logic of the dog sniff in *Place* could not be applied to the thermal imaging device used in *Kyllo*.<sup>144</sup>

## II. What Is Fourth Amendment Contraband?

The "exposure" step of the *Place/Jacobsen* three-part test requires police to determine whether an investigative technique exposes the presence of something other than contraband. This framing of the problem, however, leaves a preliminary question unanswered: How should "contraband" be defined for the purposes of the Fourth Amendment?

This Part proposes clarifying the "exposure" step of the contraband-only doctrine by using a definition of "anticipatory contraband" that includes two elements: (1) illegality of possession under substantive criminal law and (2) awareness in advance by police and investigators of the illegality under the circumstances. This definition means that contraband cannot be defined in a vacuum or in the abstract: police must show that when a particular contraband-only detection device was actually employed, they could anticipate that the device would not reveal legitimate private information.

### A. Contraband Defined by Substantive Criminal Law

In the three decades since *Place*, the Court has addressed only one kind of contraband: drugs. *Place* and *Jacobsen* both dealt with the detection of cocaine,<sup>145</sup> and subsequent cases have similarly dealt only with techniques designed to detect illicit narcotics, a seemingly straightforward instance of contraband.<sup>146</sup>

Indeed, the Court has essentially taken the contraband nature of illicit drugs for granted without discussing what it means for the target of an investigation to be "contraband." The academic literature is similarly bereft of

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143. *Id.* at 36, 38.

144. As noted above, *Kyllo* has also been read more broadly to bar the use of a device that reveals *any* detail of the inside of a home regardless of the "legitimacy" of the information revealed. *See supra* notes 123-25 and accompanying text.

145. *See* *United States v. Jacobsen*, 466 U.S. 109, 111 (1984); *United States v. Place*, 462 U.S. 696, 699 (1983).

146. *See, e.g., Florida v. Jardines*, 133 S. Ct. 1409, 1413 (2013) (involving a "drug-sniffing dog . . . trained to detect the scent of marijuana, cocaine, heroin, and several other drugs"); *Illinois v. Caballes*, 543 U.S. 405, 406 (2005) (involving a "narcotics-detection dog"); *see also Kyllo*, 533 U.S. at 29-30 (involving a thermal imaging device employed to detect halide lights used to grow marijuana).

any in-depth analysis of what it means for something to be “contraband.”<sup>147</sup> But if the contraband-only doctrine is to be expanded to new technologies capable of detecting novel forms of contraband, courts will need to grapple with this question.

The Court’s opinion in *Jacobsen* provides a possible starting point in the search for an answer. There, the Court observed that there is no objective right to privacy in cocaine because “Congress has decided . . . to treat the interest in ‘privately’ possessing cocaine as illegitimate.”<sup>148</sup> Under that broad rubric, the Fourth Amendment’s protection does not extend to any item for which “Congress has decided” possession is “illegitimate.” This closely tracks *Black’s Law Dictionary*, which defines “contraband” in part as those items “that are unlawful to import, export, produce, or possess.”<sup>149</sup> Taking this definition at face value for the time being and surveying criminal statutes, we can identify at least five potential categories of goods and information that might fall under the Fourth Amendment contraband doctrine: drugs, weapons, child pornography, “derivative” contraband, and evidence of drugs or alcohol in the body.<sup>150</sup>

*Drugs.* Federal law makes simple possession of any controlled substance a crime, though the prohibition contains many exceptions for certain classes of people and under certain circumstances.<sup>151</sup> Indeed, since the Court first recognized the contraband-only doctrine in *Place*, drugs have been the paradigmatic contraband for Fourth Amendment purposes, and drug-sniffing dogs have been the paradigmatic “contraband-only” search.

*Weapons.* Federal law bans the possession of chemical, biological, and nuclear weapons.<sup>152</sup> While simple possession of explosives is not per se illegal under federal law, it is unlawful for any person to “receive” explosives without

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147. See, e.g., *Simmons*, *supra* note 2, at 425 (noting without further analysis that “[f]or 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 crime”).

148. *Jacobsen*, 466 U.S. at 123.

149. *Contraband*, BLACK’S LAW DICTIONARY (10th ed. 2014).

150. The term “contraband” can also be used to describe goods that are illegal to carry across borders or on the high seas. See *id.* (also defining “contraband” as “[i]llegal or prohibited trade”). This Note does not address these examples of contraband, as existing Fourth Amendment doctrine allows customs and border enforcement agents broad discretion in searching people and goods crossing borders. See, e.g., *United States v. Flores-Montano*, 541 U.S. 149, 155-56 (2004) (holding that the government may conduct suspicionless searches for contraband at international borders).

151. See 21 U.S.C. § 844(a) (2015). For a discussion of how drugs that are legal under state law while remaining illegal under federal law (for instance, marijuana) might be treated under the contraband-only doctrine, see notes 314-17 and accompanying text below.

152. See 18 U.S.C. §§ 175(a), 229(a)(1), 832(c) (2015).

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a license, which effectively criminalizes unlicensed possession.<sup>153</sup> Firearms present a more difficult case. While the Court has held that the Second Amendment protects the right to private possession of firearms in the home, that right is “not unlimited.”<sup>154</sup> Possession of certain firearms remains unlawful, and possession of all kinds of firearms is unlawful for certain people in all places and for all people in particular places.<sup>155</sup>

*Child pornography.* Child pornography is categorically banned, and possession of it is subject to severe criminal penalties.<sup>156</sup> The only exception is a narrow carve-out for the National Center for Missing and Exploited Children (NCMEC), which functions as a clearinghouse for law enforcement to identify victims of child pornography.<sup>157</sup>

The potential scope of the contraband-only doctrine, however, does not stop with these three clear-cut categories. There are other situations in which a particular expectation of privacy might not be legitimate for purposes of the Fourth Amendment:

*Derivative contraband and stolen property.* In contrast to so-called “pure” contraband, which is illegal to possess regardless of how it is used, “derivative” contraband is illegal to possess as a *result* of its use.<sup>158</sup> Similarly, stolen property and the proceeds of criminal transactions are contraband.<sup>159</sup> Arguably, the contraband-only doctrine might extend to “derivative” contraband and stolen property every bit as much as it would to “pure” contraband: a thief has no more legitimate right to privacy in stolen goods than a drug dealer has in a cache of marijuana.

*Alcohol or drug metabolites in the body.* In addition to the categories discussed above, there is information that is not illegal to possess but the presence of which is nonetheless “illegitimate.” Most notable is the presence of alcohol or drug metabolites in the body: if drugs are illegal to use, and if it is illegal to drive under the influence of alcohol, then arguably the expectation of privacy in the presence of drug metabolites or alcohol in the bloodstream is one that society is not prepared to recognize as reasonable under those circumstances. Though the Court has previously concluded that alcohol and drug testing

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153. See *id.* § 842(a)(3)(A).

154. See *District of Columbia v. Heller*, 554 U.S. 570, 595 (2008).

155. See, e.g., 18 U.S.C. § 922.

156. See *id.* § 2252A(a)(5)(B).

157. See *id.* § 2258D(a); see also *About Us*, NAT’L CTR. FOR MISSING & EXPLOITED CHILD, <http://www.missingkids.com/About> (last visited Apr. 4, 2017).

158. See *Contraband*, BLACK’S LAW DICTIONARY (10th ed. 2014) (defining “derivative contraband” as “[p]roperty whose possession becomes unlawful when it is used in committing an illegal act”).

159. See *Bennis v. Michigan*, 516 U.S. 442, 459-60 (1996) (Stevens, J., dissenting).

constitutes a Fourth Amendment search, those cases have almost always turned on the intrusive nature of the test in question and not on the quality of information revealed.<sup>160</sup> This leaves open the possibility that a nonintrusive test for drugs or alcohol could pass constitutional muster under the contraband-only doctrine.

B. Contraband Defined by Circumstances Known to the Police in Advance

As the survey in Part II.A shows, the contraband-only doctrine is potentially quite broad and may encompass a wide variety of technologies designed to detect a diverse set of contraband materials. In essence, anything that is ever illegal to possess might fall within the doctrine were contraband described exclusively by substantive criminal law. Determining whether something is “contraband,” though, is not as simple as reading criminal statutes.

There is no material for which possession is completely and categorically unlawful. Even for something like biological and chemical weapons, which the United States has pledged by treaty not to possess or employ,<sup>161</sup> federal law contains exceptions to the criminal ban on possession. In the case of biological weapons, possession is lawful for authorized government or military actors engaged in research.<sup>162</sup> For chemical weapons, possession is permitted for government actors engaged in destruction of chemical weapons.<sup>163</sup>

For all forms of contraband, there are at least some individuals for whom possession is lawful. This makes defining contraband and “contraband-only” search techniques difficult because whether possession of a particular object is legitimate depends at least in part on the circumstances: while a dog might be trained to detect the scent of explosives or marijuana, the police must also know whether that material is actually contraband under the circumstances.

Courts could approach this problem on a post hoc basis, permitting the use of contraband-only detection devices provided that the person in question did

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160. See, e.g., *Missouri v. McNeely*, 133 S. Ct. 1552, 1558 (2013) (observing that the “compelled physical intrusion beneath [the defendant’s] skin and into his veins to obtain a sample of his blood” constitutes a Fourth Amendment search).

161. See Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction art. I, *opened for signature* Jan. 13, 1993, S. EXEC. DOC. NO. 104-33 (1996), 1974 U.N.T.S. 45; Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction art. I, *opened for signature* Apr. 10, 1972, 26 U.S.T. 583, 1015 U.N.T.S. 163.

162. See 18 U.S.C. § 175(b) (allowing possession of biological agents for “prophylactic, protective, bona fide research, or other peaceful purpose[s]”).

163. *Id.* § 229(b) (exempting government agencies and actors engaged in chemical weapon destruction activities from criminal liability).

not actually have a right to possess the contraband under the circumstances. This, however, could allow police to employ devices that expose legitimate private information essentially unchecked because courts will rarely see cases where the target of the device was in fact possessed legitimately: police will only ever bring charges in situations where possession turned out to be illegal, allowing those who lawfully possessed the material in question to go, albeit with their privacy violated.

The Court's opinion in *Kyllo* helps provide an answer to this quandary. Despite the fact that the Court deemed the use of a thermal imager a Fourth Amendment "search," the device at issue there *was* capable of detecting illegal activity—indeed, the police found exactly the kind of contraband they were looking for when they employed the device.<sup>164</sup> But the Fourth Amendment is not satisfied merely because police activity happens to result in the discovery of contraband. For the *Kyllo* Court to reject application of the contraband-only doctrine to the thermal imaging device, it was crucial that a police officer using the device "know *in advance* whether his through-the-wall surveillance [will] pick[] up 'intimate' details" because only then can the officer "know in advance whether [the search] is constitutional."<sup>165</sup>

This "in-advance" requirement is at the heart of Fourth Amendment jurisprudence and is crucial to defining contraband for purposes of the contraband-only doctrine. Courts care little about what is known *after* a search is conducted: a police officer who discovers contraband while rummaging through the pockets of a random passerby could always argue later that there was no legitimate right to privacy in whatever contraband he happened to find. Police conduct must be evaluated based on the information that was available to officers *before* they took an action.

Framing the problem this way helps clarify the meaning of Fourth Amendment contraband. Police officers must not only know whether a particular good or material is potentially illegal to possess as a general matter—they must also know whether the good or material *under those circumstances* is in fact illegal to possess. The contraband-only doctrine is predicated on the idea that something like a dog sniff cannot reveal legitimate private information. But if possession of the good for which the dog is trained to sniff turns out to be lawful in a given situation, then legitimate information has in fact been revealed. Accordingly, "contraband" for the purposes of the Fourth Amendment contraband-only doctrine should be defined as "any material or information for which police and investigators know in advance there is no lawful right to private possession under the circumstances."

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164. See *Kyllo v. United States*, 533 U.S. 27, 29-30, 34-35 (2001).

165. *Id.* at 39.

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For some forms of contraband, this inquiry may be relatively straightforward. With materials like child pornography and chemical weapons, for instance, possession is only lawful for government actors or specifically authorized organizations,<sup>166</sup> meaning that there is no chance an individual will ever have a legitimate expectation of privacy in those materials—either possession is lawful (in which case it is not private) or possession is private (in which case it is not lawful).

Many illegal drugs arguably fit into a similar category. For something like heroin, lawful possession requires not only registration with the government but also extensive recordkeeping and submission to administrative inspections by government agents.<sup>167</sup> As a result, there is arguably no true expectation of privacy for lawful possession of these tightly controlled drugs. In these situations, the theory of anticipatory contraband might still allow categorical answers to the question, “Is this contraband?”

But in many other circumstances, courts would be presented with more complicated issues. A firearm, for instance, might be contraband in some circumstances (on federal property)<sup>168</sup> and legal in others (on a public street by a licensed carrier).<sup>169</sup> Private possession of a drug like Vicodin might be legitimate for some (those with a prescription) and illegitimate for others (anyone without a prescription).<sup>170</sup> Only by looking at the information possessed by police in advance can courts determine whether the material in question qualifies as “contraband.” This “anticipatory” definition of contraband addresses Justice Kagan’s argument in *Jardines* that a dog sniff at the door of a home is the same as the use of high-powered binoculars “in every way that matters.”<sup>171</sup> If a police officer peers through the windows of a home with binoculars, that officer has no way of knowing in advance what he is likely to see—he may see a crime in progress, a family sitting down to dinner, or “the lady of the house tak[ing] her daily sauna and bath.”<sup>172</sup> The same police officer

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166. See 18 U.S.C. § 229(b) (exempting government agencies and actors engaged in chemical weapon destruction activities from criminal liability); *id.* § 2258D(a) (exempting the NCMEC and its agents from criminal liability for possessing child pornography where such possession “aris[es] from the performance” of statutorily designated monitoring and verification activities).

167. See *id.* § 822(a) (requiring registration for prescribing controlled substances); 21 U.S.C. § 827(a)-(b) (2015) (setting out reporting requirements); *id.* § 880(a)-(b) (allowing administrative inspections).

168. See 18 U.S.C. § 930.

169. See, e.g., ARIZ. REV. STAT. ANN. § 13-3112 (2015); FLA. STAT. § 790.06 (2016); VA. CODE ANN. § 18.2-308 (2017).

170. See 21 U.S.C. § 844(a).

171. *Florida v. Jardines*, 133 S. Ct. 1409, 1418 (2013) (Kagan, J., concurring).

172. *Kyllo v. United States*, 533 U.S. 27, 38 (2001).

deploying a properly trained contraband-detecting dog, however, knows in advance that the dog will *only* reveal the presence of illicit material in which there is no legitimate expectation of privacy.<sup>173</sup> Only with a device like a contraband-detecting dog can the police be assured that there is no risk of revealing something *other* than contraband.

The Court recognized this in *Caballes*, noting that the “critical” distinction between the thermal imager used in *Kyllo* and the dog sniff used in *Caballes* was the fact that the imager was “capable of detecting lawful activity.”<sup>174</sup> The word “capable” is crucial: police must know in advance that the device is *incapable* of revealing private information. In *Caballes*, the dog sniff was incapable of revealing anything but “the location of a substance that no individual has any right to possess.”<sup>175</sup> As a result, use of the drug-detecting dog was not a “search” under the Fourth Amendment.<sup>176</sup>

### III. Applying the Theory of Anticipatory Contraband to New Technologies

A theory of anticipatory contraband combines the *Place/Jacobsen* framework discussed in Part I with the definition of contraband advanced in Part II. This Part explores how an anticipatory contraband theory applies to a variety of different technologies that might arguably fit within the contraband-only doctrine. This analysis demonstrates that while the warrantless use of a variety of new technologies may be permitted by the contraband-only doctrine, the in-advance requirement is surprisingly restrictive and requires police and courts to be alert to the possibility of compromising legitimate private information.

#### A. Narcotics Detection Technologies

##### 1. Electronic sniffers

One of the most straightforward expansions of the contraband-only doctrine is to the use of so-called “electronic sniffers.” When a dog conducts a sniff as part of a criminal investigation, the dog is in essence acting as a particular type of technology: taking in air, analyzing the scent according to criteria dictated by his handlers, and responding when a particular scent is identified. In much the same way, “[e]lectronic sniffers work by detecting

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173. For a discussion of recent commentary that argues that dogs trained to detect drugs may in fact alert on noncontraband items, see notes 206-15 and accompanying text below.

174. *Illinois v. Caballes*, 543 U.S. 405, 409 (2005) (emphasis added).

175. *Id.* at 410.

176. *Id.*

molecules that surround a suspect person or item and then identifying them based on their chemical composition.”<sup>177</sup>

Making use of the *Place/Jacobsen* three-step test, it becomes apparent that the use of electronic sniffer technologies is a logical expansion of the contraband-only doctrine. First, with respect to access, there is no reason to believe that use of an electronic device instead of a dog changes the Fourth Amendment calculus. If police were to trespass on a suspect’s curtilage, for instance, then using an electronic substitute like a sniffer device would constitute a search just as much as using a dog would.<sup>178</sup>

Second, with respect to intrusion, electronic sniffers may actually be less physically imposing than the dogs the Court has already allowed under the contraband-only doctrine. As Justice Ginsburg noted in her *Caballes* dissent, “[a] drug-detection dog is an intimidating animal.”<sup>179</sup> Indeed, the National Institute of Justice recommends using electronic sniffers in place of dogs for searches of individuals, noting that “dogs are not usually used to screen people because some people fear dogs and because a dog might bite someone.”<sup>180</sup> Electronic sniffers are of course unable to bite and generally require only close proximity to the target object, or at most a brief surface swipe with a cloth.<sup>181</sup>

Finally, with respect to exposure, electronic sniffers can be designed to reveal essentially the same information a dog does: a binary indication of a targeted scent or scents.<sup>182</sup> Provided that sniffers are programmed to detect only materials that carry no legitimate expectation of privacy, the contraband-only doctrine dictates that their use should be considered in the same light as dog sniffs are under the Fourth Amendment.

This argument draws from an idea articulated by Orin Kerr, who has argued that when police conduct an examination of digital data (for example, a

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177. See Constantino, *supra* note 11, at 335.

178. See *Florida v. Jardines*, 133 S. Ct. 1409, 1416 (2013) (“To find a visitor knocking on the door is routine (even if sometimes unwelcome); to spot that same visitor exploring the front path with a metal detector, or marching his bloodhound into the garden before saying hello and asking permission, would inspire most of us to—well, call the police. The scope of a license—express or implied—is limited not only to a particular area but also to a specific purpose.”).

179. 543 U.S. at 421 (Ginsburg, J., dissenting).

180. JOHN E. PARMETER ET AL., NAT’L INST. OF JUSTICE, U.S. DEP’T OF JUSTICE, NIJ GUIDE 601-00, GUIDE FOR THE SELECTION OF DRUG DETECTORS FOR LAW ENFORCEMENT APPLICATIONS 22 (2000), <https://www.ncjrs.gov/pdffiles1/nij/183260.pdf>.

181. Constantino, *supra* note 11, at 335-36 (discussing collection methods).

182. See *id.* at 354 (“Field electronic sniffers are calibrated to detect only a limited set of substances. They cannot indicate what fragrance a woman is wearing, or whether there is an organic substance on a suspect’s clothes. They are limited to the detection and identification of certain specific contraband substances for which they have been preprogrammed.”).

hard drive), a search does not occur until “that data, or information about that data, is *exposed to human observation*.”<sup>183</sup> That is, a Fourth Amendment search is defined by the information exposed to the human operator of technology as opposed to whatever information may be available to the technology itself.

Consider drug-sniffing dogs, for instance. A dog’s nose is unbelievably sensitive, capable of taking in a wide variety of smells. Dogs can detect not only drugs and bombs but also evidence of some medical conditions like lung cancer.<sup>184</sup> When a drug-sniffing dog is employed, all of this information is theoretically available to the dog: the scent of cancer might be taken in along with the scent of cocaine or marijuana. The dog, though, has been trained (or, we might say, “programmed”) to pay attention only to the scents that indicate contraband and ignore the scents that indicate something other than contraband. Because the presence of such noncontraband scents is never revealed to the human handler, the Fourth Amendment is not implicated. Similarly, electronic sniffers that are technically capable of identifying noncontraband can be programmed to reveal only contraband.

One objection to the use of electronic sniffers that has been raised is the purported distinction between “natural” sniffers, like drug-sniffing dogs, and electronic sniffers that rely on “technology.”<sup>185</sup> This objection, however, should be dismissed. First, the Court has already accepted “technology”-based contraband-only detection techniques—namely, the chemical test that was at issue in *United States v. Jacobsen*.<sup>186</sup> There, the test was entirely technological in nature, but the Court saw no reason to distinguish the case from *Place* for the purposes of the Fourth Amendment.

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183. Orin S. Kerr, *Searches and Seizures in a Digital World*, 119 HARV. L. REV. 531, 548 (2005) (emphasis added). Kerr argues that “focusing on the exposure of data most accurately transfers our physical world notions of searches to the context of computers” and that such an approach “reinforces the traditional Fourth Amendment concern with limiting the scope of searches” while being “easier to administer than the alternatives.” *Id.* at 551-52. This result has been adopted by several courts. *See, e.g.*, *United States v. Rivera-Morales*, 166 F. Supp. 3d 154, 164 (D.P.R. 2015); *In re Warrant to Search a Certain E-Mail Account Controlled & Maintained by Microsoft Corp.*, 15 F. Supp. 3d 466, 472 (S.D.N.Y. 2014), *rev’d and remanded*, 829 F.3d 197 (2d Cir. 2016), *reh’g en banc denied*, No. 14-2985, 2017 WL 362765 (2d Cir. Jan. 24, 2017); *United States v. Stierhoff*, 477 F. Supp. 2d 423, 442-44 (D.R.I. 2007), *aff’d*, 549 F.3d 19 (1st Cir. 2008); *United States v. Wicks*, 73 M.J. 93, 100-01 (C.A.A.F. 2014).

184. *See, e.g.*, R. Ehmann et al., *Canine Scent Detection in the Diagnosis of Lung Cancer: Revisiting a Puzzling Phenomenon*, 39 EUR. RESPIRATORY J. 669, 672 (2012).

185. *See* Constantino, *supra* note 11, at 357 (“Sniffers work by using advanced software and scientific techniques to break down and identify substances on the molecular level. Their utilization of technology allows them to smell things that no human or canine nose ever could. This is significant because the courts have held that sometimes the utilization of technology can turn conduct into a search.” (footnote omitted)).

186. 466 U.S. 109, 122-23 (1984) (holding that a chemical test of a nominal amount of unidentified powder was not a search under the Fourth Amendment).

Second, the distinction between supposedly “natural” dogs and “technological” electronic sniffers is an arbitrary one. While a dog’s ability to *smell* is inborn, there is nothing natural about the ability to identify specific drugs and communicate their presence to a handler. It takes extensive human-driven and human-designed training to create a drug-sniffing dog.<sup>187</sup> A trained dog is a “technology” of sorts, and courts should not attempt to draw a line between dogs and other forms of technology merely because dogs seem more familiar.

## 2. Prescription drug-sniffing dogs

That is not to say that “sniffing” is always permissible under the Fourth Amendment: what material is being sniffed *for* matters a great deal. As the contraband-only doctrine has developed, narcotics have been the only type of contraband explicitly recognized by the Court.<sup>188</sup> It is important to note, however, the relatively narrow range of drugs the Court has held to be Fourth Amendment contraband.

*Place* and *Jacobsen* both dealt with powder cocaine.<sup>189</sup> *Caballes* and *Jardines* dealt with marijuana.<sup>190</sup> The defendant in *Harris* was charged with illegal possession of pseudoephedrine, but the dog that conducted the initial search was trained only to detect “methamphetamine, marijuana, cocaine, heroin, and ecstasy.”<sup>191</sup> Thus, the Court has only had occasion to address methods of investigation that reveal a handful of commonly abused drugs.

This is not due to any biological limitation: dogs can be trained to detect a wide variety of scents, including prescription drugs, in the same way they can be trained to detect “street” drugs like cocaine and marijuana.<sup>192</sup> Warrantless

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187. See *Florida v. Harris*, 133 S. Ct. 1050, 1054 (2013) (describing the training undergone by a drug-sniffing dog and its handler, including 120 hours of initial training, forty hours of refresher training, and weekly training exercises).

188. See *supra* notes 145-46 and accompanying text.

189. See *Jacobsen*, 466 U.S. at 111-12; *United States v. Place*, 462 U.S. 696, 699 (1983).

190. See *Florida v. Jardines*, 133 S. Ct. 1409, 1413 (2013); *Illinois v. Caballes*, 543 U.S. 405, 406 (2005).

191. See 133 S. Ct. at 1053-54. It is uncertain whether we should consider this an example of a false alert by Aldo, the dog used by the police officer in *Harris*. While methamphetamine itself was not discovered, pseudoephedrine is a precursor ingredient of “cooked” methamphetamine, and the officer in *Harris* surmised that the defendant “probably transferred the odor of methamphetamine to the door handle, and Aldo responded to that.” *Id.* at 1054. If that were the case, then arguably Aldo in fact detected contraband, albeit in an extremely small quantity.

192. See PARMETER ET AL., *supra* note 180, at 21 (“[D]ogs can, in principle, be trained to detect any type of drug or any type of chemical substance. However, a single dog cannot be trained to detect all drugs.”); see also *Fitzgerald v. State*, 864 A.2d 1006, 1009, 1018 (Md. 2014) (discussing a dog capable of detecting diazepam, which is available by prescription).

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use of such dogs would raise significant constitutional questions. Drugs like heroin can only be possessed lawfully in the rare contexts of tightly regulated research or medical environments, where the expectation of privacy is substantially diminished (if not altogether eliminated) because those with lawful possession are already required to register possession with the government and submit to rigorous documentation and audit requirements.<sup>193</sup> Possession of these drugs, then, will never really be both private and legitimate at the same time. For many other drugs, however, possession is lawful provided only that an individual has a “valid prescription or order.”<sup>194</sup>

Imagine that, while investigating an individual suspected of dealing illegally in prescription drugs, police expose the suspect’s vehicle to a dog trained to detect the scent of a prescription drug like Vicodin. A positive result in this context *could* indicate the presence of contraband—or it could indicate that the suspect had back surgery last week and was lawfully prescribed Vicodin by his doctor.

This type of “false” positive is different from an alert caused by a defect in the technology used to conduct the search. For a dog trained to alert only to nonprescription drugs, an alert might be *erroneous* in the sense that the dog indicates drugs are present when drugs are in fact absent. But in that case, it is difficult to say that any privacy interest has been compromised by the dog sniff itself. A false alert might leave the police with a *mistaken* impression about an individual, but no private fact has actually been revealed. In other words, an individual has no subjective expectation of privacy in an item that one does not in fact possess. Indeed, the *Caballes* Court observed that “an erroneous alert, in and of itself, [does not] reveal[] any legitimate private information.”<sup>195</sup>

In the case of the prescription drug-sniffing dog, on the other hand, two types of false positives are possible: the dog might *erroneously* alert where no Vicodin is present, or the dog might *accurately* alert when Vicodin is present but in a situation where possession of the drug is legal. As noted above, the former situation compromises no legitimate expectation of privacy. But where a dog *accurately* alerts to a *lawfully possessed* drug, the owner’s privacy *has* been compromised because legitimate private information has been disclosed. When a prescription drug-sniffing dog alerts to such an individual, the police have learned a potentially sensitive medical detail about the suspect even before conducting a follow-on search.

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193. See 21 U.S.C. § 822 (2015) (requiring registration for prescribing controlled substances); *id.* § 827(a)-(b) (setting out reporting and recordkeeping requirements); *id.* § 880 (allowing administrative inspections).

194. *Id.* § 844(a) (exempting possession of prescription drugs from the criminal statute).

195. 543 U.S. at 409.

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Without first searching an individual's medical records, which itself raises serious privacy concerns, it is impossible for the police to know *in advance* whether the drug is legitimate. Thus, the use of a prescription drug-sniffing dog fails at the "exposure" step of the *Place/Jacobsen* test,<sup>196</sup> and the employment of such a technique should be considered a "search" for the purposes of the Fourth Amendment.

This analysis presents some interesting wrinkles for the Court's existing contraband-only jurisprudence. Thus far, in cases involving drug-sniffing dogs, the Court has only discussed the dogs' ability to detect a handful of drugs: methamphetamine, marijuana, cocaine, heroin, and ecstasy.<sup>197</sup> Of these five drugs, marijuana, heroin, and ecstasy are Schedule I drugs, with no accepted medical use as a matter of federal law.<sup>198</sup>

Cocaine and methamphetamine, however, are Schedule II drugs, which means there are currently accepted medical uses for those drugs.<sup>199</sup> As a result, these drugs can potentially be obtained pursuant to a lawful prescription.<sup>200</sup> Because the Court has seemingly taken the contraband nature of these drugs as a given, there are at least two different conclusions we might draw from this observation. First, it may simply be that the Court has not considered the lawful uses of these drugs, and dogs capable of detecting cocaine and methamphetamine ought to be treated the same way as dogs capable of detecting drugs like Vicodin that are more commonly prescribed.

Second, there might be a need to add some sort of probabilistic caveat to the definition of contraband. Although cocaine can be prescribed, its medical use is rare and generally confined to use by doctors for local anesthesia in some eye, ear, and throat surgeries.<sup>201</sup> As a result, while cocaine is theoretically lawful to possess, a police officer deploying a dog in search of cocaine knows that the probability of encountering bona fide lawful possession is staggeringly low.

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196. See *supra* Part I.D.3.

197. See *Florida v. Jardines*, 133 S. Ct. 1409, 1413 (2013) (involving marijuana); *Florida v. Harris*, 133 S. Ct. 1050, 1053 (2013) (involving a dog trained to detect methamphetamine, marijuana, cocaine, heroin, and ecstasy); *Caballes*, 543 U.S. at 406 (involving marijuana); *United States v. Place*, 462 U.S. 696, 699 (1983) (involving cocaine).

198. See 21 U.S.C. § 812(b)-(c); see also 21 C.F.R. § 1308.11 (2016) (listing all drugs and substances assigned to Schedule I, including marijuana, heroin, and methylenedioxymethamphetamine (ecstasy)).

199. See 21 U.S.C. § 812(b)-(c); see also 21 C.F.R. § 1308.12 (listing all drugs and substances assigned to Schedule II, including "cocaine . . . and [its] salts, isomers, [and] derivatives" and "[m]ethamphetamine, its salts, [and] isomers").

200. See 21 U.S.C. §§ 812(b), 844(a).

201. See Nat'l Inst. on Drug Abuse, U.S. Dep't of Health & Human Servs., *Cocaine* 3 (2016), <https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/1141-cocaine.pdf>.

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Drawing that line, however, is a difficult task. While rare, methamphetamine is occasionally prescribed in low doses for “treatment of attention deficit hyperactivity disorder (ADHD) and as a short-term component of weight-loss treatments.”<sup>202</sup> The proportion of illegal use to legal use is still likely to be quite high, but this sort of line-drawing exercise undermines the bright-line rule upon which the contraband-only doctrine seems to rely. A dog sniff is purportedly not a search because it is supposed to be *incapable* of revealing a legitimate private fact.<sup>203</sup> Setting some sort of probabilistic bar alters this bright line to a requirement that it merely be *extremely unlikely* that legitimate private facts will be revealed.

One possible answer to this dilemma lies in the fact that prescription versions of these otherwise unlawful drugs tend to be distinguished in some chemical way from unlawful forms of the drugs. Prescription cocaine, for instance, is usually found in an aqueous solution, distinct from the powdered or crystalline “crack” forms most commonly abused.<sup>204</sup> Similarly, with methamphetamine, the prescribed doses are much “lower than those typically abused.”<sup>205</sup> If it could be shown that trained dogs can use differences like composition or dosage to reliably distinguish between the prescription and nonprescription versions of these drugs, then it could still be said that dogs are “incapable” of detecting legitimate private information.

This issue, however, is just one facet of a deeper and more fundamental objection to the categorization of drug-sniffing dogs as true contraband-only detection devices. Whatever the drugs being discussed, the Court has thus far taken for granted that dogs are in fact capable of distinguishing between drugs and other lawful products.

A growing body of academic commentary, however, argues that a deeper probe into the scientific underpinnings of dog sniffs undermines that assumption.<sup>206</sup> These commentators have observed, for instance, that methyl benzoate, which is the chemical compound thought to be smelled by dogs to detect cocaine, is also found in many legal compounds like food additives and

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202. See Nat’l Inst. on Drug Abuse, U.S. Dep’t of Health & Human Servs., No. 13-4210, Methamphetamine 1 (2013), <https://d14rmgtrwzf5a.cloudfront.net/sites/default/files/methrrs.pdf>.

203. See *Illinois v. Caballes*, 543 U.S. 405, 409-10 (2005) (describing the critical distinction between a thermal imager and a dog as the fact that a thermal imager is “capable of detecting lawful activity”).

204. *Compare Cocaine Hydrochloride Topical Solution*, DRUGS.COM, <https://www.drugs.com/pro/cocaine-hydrochloride-topical-solution.html> (last visited Apr. 4, 2017) (describing prescription cocaine as an “aqueous solution”), with Nat’l Inst. on Drug Abuse, *supra* note 201, at 3 (describing typical street cocaine as a “fine, white, crystalline powder”).

205. See Nat’l Inst. on Drug Abuse, *supra* note 202, at 1.

206. See, e.g., Katz & Golembiewski, *supra* note 15, at 755 (“[I]t is not possible for a dog to distinguish the scent of all contraband from otherwise legal substances.”).

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perfumes.<sup>207</sup> Similarly, they have observed that dogs trained to detect heroin are actually smelling acetic acid, which can be found in legal products like pickles and certain prescription drugs.<sup>208</sup>

The theory of anticipatory contraband can help guide courts and commentators struggling to reconcile the contraband-only doctrine with this new scientific understanding. As discussed above in Part II.B, the key inquiry in defining the contraband-only doctrine is asking whether the investigative method in question is capable of exposing facts in which a person has a legitimate right of privacy.

So asking, as some commentators have, whether a dog is “actually” smelling or alerting to a drug per se or to some chemical byproduct of the drug<sup>209</sup> is not the relevant question. Similarly, asking *how* the dog arrives at an alert is not really relevant. What matters is the information disclosed—what does a positive alert actually tell the police officer employing the dog? Even if the dog may be relying in part on a particular chemical that is also associated with lawful products, it is possible that some other factors—say, the concentration of the chemical in the air or the presence of other olfactory cues—may allow the dog to nonetheless reliably distinguish drugs from legal products.

For instance, one study found that even though snapdragon flowers give off methyl benzoate in large concentrations, drug-sniffing dogs were reliably able to distinguish between cocaine and snapdragons.<sup>210</sup> And even though methyl benzoate is used in commercial perfumes, anecdotal and some laboratory evidence indicates that drug-sniffing dogs do not alert to perfumes

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207. See Taylor Phipps, *Probable Cause on a Leash*, 23 B.U. PUB. INT. L.J. 57, 66 (2014) (“[D]ogs that are trained to detect cocaine alert not to cocaine itself, but to a chemical byproduct in cocaine known as methyl benzoate.”); see also *Methyl Benzoate*, NAT’L CTR. FOR BIOTECHNOLOGY INFO., [https://pubchem.ncbi.nlm.nih.gov/compound/methyl\\_benzoate](https://pubchem.ncbi.nlm.nih.gov/compound/methyl_benzoate) (last visited Apr. 4, 2017) (“[Methyl benzoate] is used in perfumery, as a solvent for cellulose esters and ethers, resins, rubber, and as a flavoring. It is also used as a dye carrier for dyeing polyester fibers, additive for disinfectants, soy sauce, and pesticides.”).

208. See Katz & Golembiewski, *supra* note 15, at 755.

209. See, e.g., Robert M. Bloom & Dana L. Walsh, *The Fourth Amendment Fetches Fido: New Approaches to Dog Sniffs*, 48 WAKE FOREST L. REV. 1271, 1285 (2013) (“[D]rug-detection dogs do not alert to the illegal substances themselves, but to byproducts of the drug.”); Katz & Golembiewski, *supra* note 15, at 755 (“Courts are split as to whether an alert to methyl benzoate—which is the tell-tale odor of cocaine but is found in many legal products—is actually an alert to cocaine.” (footnote omitted)); Slaughter, *supra* note 46, at 291-92 (expressing the concern that dogs are not trained to detect drugs but are instead trained to detect “chemical components [that] are not themselves illegal and can be found in legal products, thus leading to searches of non-contraband items”).

210. Michelle M. Cerrera & Kenneth G. Furton, *An Assessment of Detection Canine Alerts Using Flowers That Release Methyl Benzoate, the Cocaine Odorant, and an Evaluation of Their Behavior in Terms of the VOCs Produced*, FORENSIC SCI. INT’L, June 2015, at 107, 114.

or colognes.<sup>211</sup> If evidence shows that dogs can generally distinguish between cocaine and legal products containing methyl benzoate, then the alert discloses no legitimate private information. If, on the other hand, dogs are unable to distinguish between cocaine and other (lawful) substances that contain methyl benzoate, then cocaine-sniffing dogs start to look a lot more like the prescription drug-sniffing dogs discussed and rejected in Part III.A.2 above.

Another way of looking at this problem is to ask what exactly is happening when a dog gives a false alert—that is, an alert where no contraband is subsequently found. There are three distinct possibilities.

First, the dog may have alerted because the contraband substance is in fact present but only in miniscule quantities. For instance, in *Florida v. Harris*, a dog trained to detect methamphetamine alerted on the door handle of a car that turned out to contain ingredients required to “cook” the drug but not the drug itself.<sup>212</sup> The police officer surmised that the owner of the car had touched the handle after handling the drug and transferred a “residual odor.”<sup>213</sup> In this type of case, the dog was not really making a false alert at all—methamphetamine is contraband, regardless of the amount of the drug present. This answers, at least in part, the criticism that drug-sniffing dogs are not truly contraband-only because they sometimes alert to cocaine-contaminated money.<sup>214</sup> If a person possesses cocaine unknowingly, the police might not be able to make an arrest, but that doesn’t mean that possession becomes legitimate: the cocaine on a dollar bill is still a controlled substance, albeit in miniscule quantities.

Second, a dog may falsely alert because of a *mistake* by either the handler or the dog. If, for instance, the dog “alerts” because it is frightened by a loud noise or because the handler has misinterpreted the dog’s behavior, no information has been revealed. As discussed in Part I.C above, the contraband-only doctrine likely permits use of the dog in such a case—although these sorts of false alerts

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211. See Kenneth G. Furton et al., *Identification of Odor Signature Chemicals in Cocaine Using Solid-Phase Microextraction—Gas Chromatography and Detector-Dog Response to Isolated Compounds Spiked on U.S. Paper Currency*, 40 J. CHROMATOGRAPHIC SCI. 147, 154-55 (2002) (concluding that “certified detector dogs can readily distinguish” the odors of ten perfumes containing methyl benzoate from street cocaine); Mark E. Smith, Comment, *Going to the Dogs: Evaluating the Proper Standard for Narcotic Detector Dog Searches of Private Residences*, 46 HOUS. L. REV. 103, 103 n.\*, 122-23 (2009) (discussing the results of interviews conducted by the author, a police sergeant with experience and training as a handler of narcotics-detecting dogs). *But see* *Horton v. Goose Creek Indep. Sch. Dist.*, 690 F.2d 470, 474 (5th Cir. 1982) (per curiam) (describing an incident in which drug-sniffing dogs were employed in a school and alerted to a student who had a small bottle of perfume).

212. 133 S. Ct. 1050, 1054 (2013).

213. *Id.*

214. See, e.g., *Illinois v. Caballes*, 543 U.S. 405, 411-12 (2005) (Souter, J., dissenting); Katz & Golembiewski, *supra* note 15, at 756.

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lower the accuracy of the contraband-only technique, they do not lead to the revelation of legitimate private information.

Third, and in contrast to the prior two examples, a dog may falsely alert because a substance that is not contraband has a similar enough scent profile to trigger a false alert. In that case, the false alert *has* revealed a private fact in which a person has a legitimate expectation of privacy. If it is really true that something like perfume or flowers cannot be distinguished by a dog trained to detect cocaine, then those dogs should not be considered contraband-only.

While this question is outside the scope of this Note, one important observation should be made. Some commentators have cast doubt on the use of drug-sniffing dogs by pointing to examples where a drug-sniffing dog alerted to an individual and some noncontraband item (for example, perfume) was later found.<sup>215</sup> This sort of anecdotal evidence should be taken with a grain of salt. Any one of the three scenarios discussed above might be the cause of any particular false alert—the presence of perfume may be one explanation for a false alert, but it is impossible to tell whether it is the *correct* explanation in any given case.

The best way to approach this problem will be to conduct focused empirical research that examines whether a dog's sniff can really distinguish contraband from other similar noncontraband items. If so, then the Court's current jurisprudence regarding drug-sniffing dogs can stand. Otherwise, it may need to be revisited.

B. Weapons Detection Technologies

1. Anthrax screening of mail

Since the 2001 attacks involving anthrax spores sent through the mail, the U.S. Postal Service has employed a "Biohazard Detection System" that analyzes mail to detect the presence of anthrax spores.<sup>216</sup> The contents of a letter are protected from arbitrary search and seizure.<sup>217</sup> Thus, one might argue that any technology that looks "inside" an envelope and examines the contents without a warrant or other justification is impermissible under the Fourth Amendment.

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215. See Katz & Golembiewski, *supra* note 15, at 782 (citing *Horton*, 690 F.2d at 474).

216. See U.S. Postal Serv., FAQ: What Is the USPS® Biohazard Detection System? (n.d.), <http://about.usps.com/news/state-releases/sc/2013/FAQ-BDS.pdf>.

217. *Ex parte Jackson*, 96 U.S. 727, 733 (1878) ("No law of Congress can place in the hands of officials connected with the postal service any authority to invade the secrecy of letters and such sealed packages in the mail; and all regulations adopted as to mail matter of this kind must be in subordination to the great principle embodied in the fourth amendment of the Constitution.").

The contraband-only doctrine, however, provides one possible answer. With respect to access, no seizure or trespass is required because the Postal Service already has lawful possession of the envelope. With respect to intrusion, the anthrax detection process does not interfere with or disturb the contents of the letter. And with respect to exposure, weaponized anthrax spores are illegal to possess outside tightly regulated laboratory settings, where possession would not be truly private.<sup>218</sup>

There is thus no legitimate expectation of privacy in anthrax contained inside an envelope sent through the mail. The *Place/Jacobsen* framework is satisfied, and the anthrax detection process reveals no more than the presence of an illicit substance that investigators know is illegal in advance. Suspicionless screening of mail for anthrax is thus justified under the contraband-only doctrine.

## 2. Radiological sensors

In the wake of the 9/11 attacks, cities and ports around the United States began employing a variety of sensors designed to detect nuclear weapons, nuclear material, and so-called “dirty bombs.”<sup>219</sup> These devices alert when exposed to the telltale radiation of nuclear materials.<sup>220</sup> Given the permissibility of anthrax sensors, it might seem to follow that radiological sensors designed to detect nuclear material and weapons are similarly justified by the contraband-only doctrine.

Using the contraband-only doctrine to justify the use of these sensors, however, faces an unexpected challenge from the field of nuclear medicine. A variety of medical conditions can be treated through the targeted use of “radioisotopes” or “radiopharmaceuticals” that emit radiation.<sup>221</sup> These radiopharmaceuticals make use of radiation that is not easily distinguishable from the type that might be given off by a nuclear weapon. Indeed, patients

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218. See 18 U.S.C. § 175 (2015).

219. See, e.g., Bob Hennelly, *How NY Officials Prepare for Threat of a Dirty Bomb*, WNYC NEWS (Apr. 16, 2010), <http://www.wnyc.org/story/71790-how-ny-officials-prepare-for-threat-of-a-dirty-bomb>.

220. See *Breakthrough Detection Technologies*, U.S. DEP’T HOMELAND SECURITY, <https://www.dhs.gov/breakthrough-detection-technologies> (last updated Oct. 4, 2015) (discussing various nuclear detection technologies, with links to more detailed descriptions of each).

221. See *Radioisotopes in Medicine*, WORLD NUCLEAR ASS’N, <http://www.world-nuclear.org/information-library/non-power-nuclear-applications/radioisotopes-research/radioisotopes-in-medicine.aspx> (last updated Dec. 28, 2016).

undergoing these treatments can trigger radiation detectors as many as ninety-five days after receiving therapy.<sup>222</sup>

Thus, radiological sensors face the same potential problem as a prescription drug-sniffing dog: a positive result could be a sign of a nuclear weapon (the possession of which is clearly illegitimate) or could just be a sign that the individual passing through the sensor had a recent thyroid problem, which is sometimes treated with radiation therapy. This concern is not merely theoretical: in one case, a forty-six-year-old man who had recently been treated with radioactive iodine was subjected to a strip search and prolonged detention after setting off a radiation alarm in Orlando International Airport.<sup>223</sup> He was released after a long delay and only after showing authorities documentation of his treatment.<sup>224</sup> Unless sensors can distinguish between illicit nuclear materials and radiation caused by medical treatments, they fail at the exposure step of the contraband-only doctrine.

Note, however, that the use of such sensors might nonetheless be permitted under the Fourth Amendment. The possibility of revealing noncontraband information merely means that the use of radiological sensors is a search—not that the search is unreasonable. The special needs doctrine of the Fourth Amendment allows an exception to the usual probable cause and warrant requirements where “special needs” like public safety make the requirement impractical. Under this doctrine, the Court has permitted the police to erect highway sobriety checkpoints to protect the public from drunk drivers<sup>225</sup> and has allowed warrantless searches to enforce probation requirements.<sup>226</sup> Given the potentially catastrophic threat posed by nuclear weapons, the special needs doctrine would very likely justify the use of such sensors. Justice Ginsburg raised a similar argument in her dissent in *Illinois v. Caballes*, arguing that even if a dog were not permitted to sniff for drugs without a warrant, “the immediate, present danger of explosives would likely justify a bomb sniff under the special needs doctrine.”<sup>227</sup>

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222. See Kalyan Kumar Gangopadhyay et al., *Triggering Radiation Alarms After Radioiodine Treatment*, 333 BRIT. MED. J. 293, 293-94 (2006) (discussing examples of nuclear medicine patients triggering radiation detectors); *id.* at 294 tbl.1 (showing the number of days after exposure to particular radionuclides that a patient can trigger a radiation detector).

223. See *id.* at 293 (discussing an instance where an individual was detained after a radiation detector alerted).

224. *Id.*

225. See *Mich. Dep’t of State Police v. Sitz*, 496 U.S. 444, 455 (1990).

226. See *Griffin v. Wisconsin*, 483 U.S. 868, 880 (1987).

227. 543 U.S. 405, 425 (2005) (Ginsburg, J., dissenting). Justice Souter joined Justice Ginsburg’s dissent and wrote separately to note that he did not want to “prejudge a claim of authority to detect explosives and dangerous chemical or biological weapons  
*footnote continued on next page*

### 3. Gun detectors

While anthrax and nuclear bombs seem like obvious candidates for contraband, traditional firearms present a much more complicated question. A variety of remote “gun detectors” are either in use or in development,<sup>228</sup> and their use could arguably fall under the contraband-only doctrine. These detectors vary technically, but they generally rely on examining the radiation given off by a human body and highlighting areas of the body in which no radiation is detected—in other words, parts of the body where the radiation is obstructed by something (say, a gun).<sup>229</sup> Because these devices are entirely passive, they likely pass muster under the “intrusion” step of the *Place/Jacobsen* analysis. If used on a street or in an otherwise public setting, they pass the “access” step as well.

When it comes to the “exposure” step, however, the use of remote gun detectors raises two substantial issues. First, whether and when a gun constitutes contraband is controversial and heavily contingent on the surrounding circumstances. In *District of Columbia v. Heller*, the Court upheld an individual’s right to possess firearms inside the home.<sup>230</sup> Thus, there must be at least some circumstances where possession of firearms is “legitimate.” Indeed, there is an active split in judicial authority concerning the application of *Heller* to possession of a concealed weapon outside the home.<sup>231</sup>

Beyond the Second Amendment, most states’ substantive laws allow for concealed carry of a firearm with a permit under at least some circumstances.<sup>232</sup> If a person is lawfully allowed to carry a concealed weapon, then use of a device that reveals the weapon reveals information in which a person has a legitimate expectation of privacy.<sup>233</sup>

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that might be carried by a terrorist who prompts no individualized suspicion.” *Id.* at 417 & n.7 (Souter, J., dissenting).

228. See Harris, *supra* note 10, at 5-15 (describing gun detection technology); see also NICHOLAS G. PAULTER, NAT’L INST. OF JUSTICE, U.S. DEP’T OF JUSTICE, NIJ GUIDE 602-00, GUIDE TO THE TECHNOLOGIES OF CONCEALED WEAPON AND CONTRABAND IMAGING AND DETECTION 33-40 (2001), <https://www.ncjrs.gov/pdffiles1/nij/184432.pdf>.

229. See, e.g., El-Ghobashy, *supra* note 7.

230. 554 U.S. 570, 635 (2008).

231. Compare *Moore v. Madigan*, 702 F.3d 933, 936 (7th Cir. 2012) (“A right to bear arms thus implies a right to carry a loaded gun outside the home.”), with *Peruta v. County of San Diego*, 824 F.3d 919, 939 (9th Cir. 2016) (en banc) (“[T]he Second Amendment right to keep and bear arms does not include, in any degree, the right of a member of the general public to carry concealed firearms in public.”).

232. See Justine E. Johnson-Makuch, Note, *Statutory Restrictions on Concealed Carry: A Five-Circuit Shoot-Out*, 83 FORDHAM L. REV. 2757, 2770-71 (2015).

233. See Harris, *supra* note 10, at 58 (“If one of the central underpinnings of [*Place and Jacobsen*] is that the method in question detects only contraband, the new concealed weapons laws make for a drastically different outcome. Simply put, under these laws  
*footnote continued on next page*”)

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This means that as a general matter, remote gun detectors suffer from the same false positive problem as prescription drug-sniffing dogs and radiological sensors. Key to resolving this issue is the “in-advance” requirement for defining contraband. Depending on the circumstances, the police might be able to establish *before employing the device* that possession of a gun by a particular individual is a crime.

The *Heller* majority was careful to note that there are at least two ways in which the right recognized in the Second Amendment is “not unlimited.”<sup>234</sup> First, the Court stated that the Second Amendment does not extend to “dangerous and unusual weapons.”<sup>235</sup> Thus, Congress may ban the possession of certain types of weapons entirely, in exactly the same way as it has banned the possession of narcotics. And indeed it has. *Heller* did not disturb the wholesale federal ban on the possession of a “machinegun”<sup>236</sup> or the federal ban on any weapon that is not “detectable . . . by walk-through metal detectors.”<sup>237</sup>

Second, the *Heller* Court recognized that its ruling did not disturb “longstanding prohibitions on the possession of firearms by felons and the mentally ill, or laws forbidding the carrying of firearms in sensitive places such as schools and government buildings.”<sup>238</sup> The Court was careful to note that this list was not exhaustive,<sup>239</sup> and it is probably safe to assume that the ban on juvenile possession of handguns<sup>240</sup> would be upheld as well. For certain individuals, then, and in certain places, firearms are contraband.<sup>241</sup>

Thus, if the identity of the target for a gun-detecting device is known, the police may be able to use public records to determine whether that individual is permitted to carry a concealed firearm. If not, then the use of a gun detector on that person likely fits under the contraband-only doctrine because the detector can only reveal the presence of an illegally possessed firearm. Further, if possession of a firearm is illegal in a certain location, then the police could use the device on any individual in that location. For instance, at a school or on federal property where possession of a firearm is prohibited, any weapon

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concealed guns are not always contraband. Therefore, applying the *Place* and *Jacobsen* reasoning would seem questionable at best.” (footnote omitted).

234. 554 U.S. at 626.

235. *Id.* at 627.

236. See 18 U.S.C. § 922(o)(1) (2015). “Machinegun” is also defined elsewhere as a weapon that can shoot “more than one shot, without manual reloading, by a single function of the trigger.” 26 U.S.C. § 5845(b) (2015).

237. 18 U.S.C. § 922(p)(1)(A).

238. 554 U.S. at 626.

239. *Id.* at 627 n.26.

240. See 18 U.S.C. § 922(x)(2)(A).

241. See *id.* § 922(g) (criminalizing possession of firearms for certain classes of individuals).

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would be contraband, so the police could be assured in advance that use of the device would not compromise any legitimate privacy interest.

The second and more substantial problem for gun detectors is whether they really reveal contraband “only.” The above analysis assumes a hypothetical gun detector capable of accurately distinguishing guns from other objects. The remote gun detectors currently in use, however, largely work by revealing the outline of all objects underneath clothing, leaving it to the police to determine whether the outline is one of a gun.<sup>242</sup> This means that the detectors resemble the infrared detectors in *Kyllo v. United States*, which give the police no way of knowing in advance what objects will be revealed by the detector.<sup>243</sup>

To sidestep this problem, the detectors would need to be designed so that “when the machine detects an object of a particular shape and size, it might use computer software to compare this data to ‘known’ profiles of either weapons or common nonweapon objects, or both.”<sup>244</sup> In this way, the police would be provided only with binary information of “gun is present” or “gun is not present” without receiving any more information when an object other than a gun is detected. Otherwise, use of a gun detector would be a search under the Fourth Amendment because it might reveal legitimately private information.

### C. Child Pornography Detection Technologies

Investigators searching for digital child pornography frequently rely on forensic tools that make use of a technique known as “hashing.” A hash algorithm takes the binary code of a computer file and generates a unique signature (or “hash value”) for that file.<sup>245</sup> That signature can then be compared to the signatures of files known to be child pornography.

For the purposes of forensic analysis, hash algorithms are usually selected to have two important properties. First, the hash value of the function “will be, for all practical purposes, uniquely associated with the input.”<sup>246</sup> That is, when run through the hash function, every file will ideally return a different value, creating a unique digital “fingerprint” for the file, which is called the “hash

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242. See, e.g., Al Baker, *Police Working on Technology to Detect Concealed Guns*, N.Y. TIMES: CITY ROOM (Jan. 17, 2012, 4:39 PM), <https://nyti.ms/2lFTr5t>.

243. See 533 U.S. 27, 38-39 (2001).

244. Harris, *supra* note 10, at 11.

245. Richard P. Salgado, *Fourth Amendment Search and the Power of the Hash*, 119 HARV. L. REV. F. 38, 39 (2006); see also Eric Johnson, Note, *Lost in the Cloud: Cloud Storage, Privacy, and Suggestions for Protecting Users' Data*, 69 STAN. L. REV. 867, 906 (2017); Michael Mestitz, Note, *Unpacking Digital Containers: Extending Riley's Reasoning to Digital Files and Subfolders*, 69 STAN. L. REV. 321, 352-53 (2017).

246. Salgado, *supra* note 245, at 39; Mestitz, *supra* note 245, at 352.



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The larger issue, however, is the threshold question how police gain *access* to a hard drive to conduct a hash search in the first place. One could imagine, for instance, law enforcement officers making use of a computer virus to conduct an essentially random search of computers. The virus could be spread over the Internet and programmed to scan every file on infected computers, reporting back to law enforcement officers when known instances of child pornography are detected.<sup>253</sup> Indeed, a virus intended to do exactly that was written and spread by an unknown hacker in 2001.<sup>254</sup> Though that virus was spread by a private individual and did not make use of a hash algorithm, the potential for similar police behavior clearly exists. In his article *Orwellian Ramifications: The Contraband Exception to the Fourth Amendment*, Timothy MacDonnell raises the specter of such a search, citing it as one example of why the contraband-only doctrine should be done away with altogether.<sup>255</sup>

The use of such a virus by the police, however, should be rejected under the contraband-only doctrine. While a virus employing a hash algorithm likely fulfills the exposure step of the *Place/Jacobsen* framework (in that only the presence of contraband is revealed), it fails at the access and intrusion steps of that analysis. First, installing a virus on a computer and then using resources on that computer (such as electricity, memory, and processing time) is arguably every bit as much of a trespass on private interests as the use of a dog on the curtilage of a home. In that light, a child pornography-detecting virus starts to look a lot more like the dog sniff in *Florida v. Jardines*, where the Court rejected a search based on the Fourth Amendment's protection of property interests.<sup>256</sup>

Second, any unauthorized program has the potential to compromise the security of the computer, opening the computer up to further attacks and intruding further on private interests. Consider the example of the Sony BMG "Rootkit" designed to enforce copyright protections. In 2005, researchers discovered that Sony compact discs installed hidden software on computers to prevent copying of the music on the disc.<sup>257</sup> After the software was deployed, researchers discovered that multiple unrelated computer viruses had exploited

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253. See Michael Adler, Note, *Cyberspace, General Searches, and Digital Contraband: The Fourth Amendment and the Net-Wide Search*, 105 YALE L.J. 1093, 1097-100 (1996).

254. Roy Furchgott, *Computer Virus Scouts for Child Pornography*, N.Y. TIMES (June 11, 2001), <https://nyti.ms/2lFFX9Q>.

255. MacDonnell, *supra* note 2, at 345-47 (discussing the possible use of a government-created "Trojan horse" to detect child pornography); *id.* at 352-53 (concluding that the contraband-only doctrine poses too great a risk of bringing about an Orwellian "surveillance state").

256. 133 S. Ct. 1409, 1417 (2013).

257. *Viruses Use Sony Anti-Piracy CDs*, BBC NEWS (Nov. 11, 2005, 11:11 AM GMT), <http://news.bbc.co.uk/2/hi/technology/4427606.stm>.

the Sony-made vulnerability to evade detection by antivirus programs.<sup>258</sup> Law enforcement has no way of ensuring that a computer virus—designed specifically to subvert computer security—could avoid a similar problem. As a result, conducting a hash search via some Internet-wide virus should not be covered by the contraband-only doctrine.

That said, there may be circumstances under which the problems of access and intrusion are not present. For instance, in a case like *United States v. Mann*, the police already had a copy of a particular hard drive as a result of a warrant to search for evidence that the defendant was secretly filming women in the shower.<sup>259</sup> To carry out the search, law enforcement officers used software known as a forensic tool kit (FTK).<sup>260</sup> In addition to indexing and cataloging all of the files on the drive, the FTK used a “Known File Filter” to flag “files identifiable from a library of known files previously submitted by law enforcement—most of which are images of child pornography.”<sup>261</sup> The Seventh Circuit did not squarely address whether the use of an FTK constituted a search under the Fourth Amendment because the officer executing the search went on to open the “flagged” files without a warrant, which constituted a search regardless of the use of the software.<sup>262</sup>

Looking at just the use of the hash algorithm itself, however, all three prongs of the *Place/Jacobsen* framework were met in *Mann*. Because of the warrant, the police had lawful access to the hard drive in question; the search did not intrude on the defendant’s physical property or other security interests; and the hash algorithm did no more than reveal the existence of child pornography, in which the defendant could have no legitimate privacy interest. Thus, even though the warrant was directed toward evidence of secret filming, the expanded use of a child pornography filter was not a “search” within the meaning of the Fourth Amendment under an anticipatory contraband theory.

A more troublesome case arises when one considers a vast class of devices to which the police have physical access: mobile devices seized incident to an arrest. In *Riley v. California*, the Court ruled that the search-incident-to-arrest doctrine, which generally permits officers to seize and search items found on an arrestee, did not apply to digital data stored on cell phones.<sup>263</sup> As a result, the

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258. *Id.*

259. 592 F.3d 779, 780-81 (7th Cir. 2010).

260. *Id.* at 781.

261. *Id.*

262. *See id.* at 781-82.

263. 134 S. Ct. 2473, 2484-85, 2494 (2014).

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Fourth Amendment prevents the police from “rummag[ing]” through the contents of a cell phone or other electronic device that they have seized.<sup>264</sup>

Even after *Riley*, however, the Fourth Amendment allows the police to *seize* a phone possessed by an arrestee and “examine the physical aspects of [the] phone to ensure that it will not be used as a weapon.”<sup>265</sup> And as the Court was careful to note in *Riley*, “even though the search incident to arrest exception does not apply to cell phones, other case-specific exceptions may still justify a warrantless search of a particular phone.”<sup>266</sup>

One could argue that having physical custody of the phone provides the police with lawful “access” to that phone for the purposes of the contraband-only doctrine. If that were true, the police could copy the contents of a phone and, without actually looking at any of the contents, run a forensic analysis to look for the hash signatures of known instances of digital contraband like child pornography. All three prongs of the *Place/Jacobsen* test would arguably be fulfilled: the police would have lawful physical access to the phone, there would be no bodily intrusion or physical trespass, and the police would know in advance that the only thing the forensic tool will reveal is whether the phone contains any known instances of child pornography—which “Congress has decided” there is no legitimate right to possess.<sup>267</sup>

This argument, however, overstates the case for lawful police “access.” The search-incident-to-arrest doctrine allows the police to seize and examine the property of arrestees for two relatively narrow purposes: preventing harm to officers and preserving evidence.<sup>268</sup> A hash analysis does not facilitate either of those purposes. While *Riley* allows police officers to take steps to prevent loss of evidence on the phone—like removing the battery or placing the phone inside an enclosure that isolates phones from radio waves—contraband-only investigation would require the police to go beyond those purposes, accessing the memory of the phone and running analysis on the data, the precise result that *Riley* seems to reject.<sup>269</sup>

In that sense, use of a hash algorithm on a cell phone seized incident to arrest starts to look like the dog sniff in *Jardines*. Even though police officers have a limited license to trespass on private property to approach the front door of a home, their use of a drug-sniffing dog exceeds that license and violates the Fourth Amendment.<sup>270</sup> By analogy, the “license” granted to police

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264. *Id.* at 2494.

265. *Id.* at 2485.

266. *Id.* at 2494.

267. *United States v. Jacobsen*, 466 U.S. 109, 123 (1984).

268. *See Riley*, 134 S. Ct. at 2483 (citing *Chimel v. California*, 395 U.S. 752, 763 (1969)).

269. *See id.* at 2487, 2493.

270. *Florida v. Jardines*, 133 S. Ct. 1409, 1416-17 (2013).

officers when they seize a phone is limited to preventing its use as a weapon and preventing its destruction and excludes access to any of the data on the phone.<sup>271</sup> As a result, the police should not be able to use hash algorithms to indiscriminately search for child pornography on electronic devices seized incident to arrest.

#### D. Derivative Contraband and Stolen Property Detection Technologies

In contrast to the “pure” contraband discussed above, stolen property and “derivative” contraband items are illegal to possess either because the material was obtained illegally or because “a wrongdoer has used [the item] in the commission of a crime.”<sup>272</sup> The obvious challenge for this kind of contraband, however, is that a stolen object or instrumentality has no readily distinguishable physical characteristic. A stolen cell phone looks, feels, and smells the same as one purchased from the store. Thus, it is difficult to imagine an investigative technique that effectively reveals some large *class* of derivative contraband in the same way as a drug-detecting dog. It is not, however, impossible. Stolen goods, for instance, might have certain unique characteristics or signatures that could be reliably identified in advance and thereby satisfy a theory of anticipatory contraband.

##### 1. Wardriving

Though it has yet to be tested in the courts, police officers have started to engage in a practice colloquially known as “wardriving” to locate stolen electronic devices.<sup>273</sup> Wardriving occurs when a person in a moving vehicle uses an electronic device to search for accessible wireless signals—in other words, driving up and down a city street with a laptop and an antenna, analyzing wireless signals.<sup>274</sup>

To determine whether those signals originate from a stolen device, the police can use software that analyzes signals and “works by searching for media control access, or MAC, addresses from a database of known stolen items.”<sup>275</sup> MAC addresses are nominally unique identifiers assigned to hardware devices

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271. *Cf. Riley*, 134 S. Ct. at 2485-93.

272. *See Bennis v. Michigan*, 516 U.S. 442, 459-60 (1996) (Stevens, J., dissenting) (quoting *One 1958 Plymouth Sedan v. Pennsylvania*, 380 U.S. 693, 699 (1965)); *Contraband*, BLACK’S LAW DICTIONARY (10th ed. 2014).

273. Hermiston, *supra* note 8. For a discussion of the term “wardriving,” see Patrick S. Ryan, *War, Peace, or Stalemate: Wargames, Wardialing, Wardriving, and the Emerging Market for Hacker Ethics*, 9 VA. J.L. & TECH. 1, 3-5, 22-24 (2004).

274. *See* Ryan, *supra* note 273, at 22-24.

275. Hermiston, *supra* note 8.

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capable of network communication.<sup>276</sup> A police officer can take the signal being broadcast by a device in the area and compare the MAC address with the MAC addresses of devices known to have been stolen.<sup>277</sup>

This technology fits under the contraband-only doctrine, provided that the database of known stolen devices is properly maintained and populated. The police officer drives only on public streets, reading data that are publicly broadcast without interfering with the operation of the device. And unless a stolen device is detected, none of the content of the broadcast is revealed to the police.

Like the hash algorithm discussed above, this argument depends on the assumption that human view, and not computer analysis, is what makes something a search for purposes of the Fourth Amendment.<sup>278</sup> To make comparisons of MAC addresses, the software used by the police must analyze every signal it detects. The vast majority of these signals will be broadcast from lawfully possessed devices. As long as the laptop does not log or otherwise expose the MAC address (or any other information gathered) to human view, however, the Fourth Amendment is not implicated. As long as the laptop used in wardriving is programmed to “alert” only when it detects a stolen device, the police officer using the device knows in advance that the only MAC addresses the laptop will show him belong to stolen devices in which there is no legitimate right of privacy.

While courts have not yet had the opportunity to consider wardriving of the type discussed above, a similar technology was used in *United States v. Stanley*, in which the police traced the download of child pornography on a peer-to-peer file-sharing service to a particular Internet subscriber.<sup>279</sup> When police officers executed a search warrant on the home of the subscriber, they discovered no child pornography and found that the home’s wireless router was unsecured and thus accessible without a password.<sup>280</sup> With the consent of the homeowner, the police began monitoring the router and soon discovered that a device on the wireless network with a particular MAC address was downloading child pornography.<sup>281</sup> The police were able to use a laptop, an antenna, and software known as “MoochHunter” to zero in on the physical

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276. See *FAQs: The Registration Authority*, INST. ELECTRICAL & ELECTRONICS ENGINEERS STANDARDS ASS’N, <http://standards.ieee.org/faqs/regauth.html> (last visited Apr. 4, 2017) (describing the process for obtaining a block of MAC addresses).

277. See Hermiston, *supra* note 8.

278. See Kerr, *supra* note 183, at 548; see also Johnson, *supra* note 245, at 874 n.30 (making this assumption in the context of cloud storage); *supra* note 183 (collecting cases adopting this approach).

279. 753 F.3d 114, 115 (3d Cir. 2014).

280. *Id.* at 116.

281. *Id.*

location of the wireless signal corresponding to that MAC address.<sup>282</sup> The police used the result to obtain a search warrant for the home, after which the occupant was arrested and a laptop containing child pornography was seized.<sup>283</sup>

The Third Circuit held that the police's use of MoochHunter did not constitute a search under the Fourth Amendment.<sup>284</sup> Citing *Place* and *Caballes*, the court reasoned that use of the device was "akin to a drug sniffing dog in that it was only able to detect a signal that was itself unauthorized and likely illegal."<sup>285</sup> The MoochHunter device only worked because the defendant was connecting to his neighbor's wireless router "without [the neighbor's] knowledge or consent," and it revealed "only the path of the signal establishing this connection" without revealing "the content of the data carried by that signal."<sup>286</sup> As a result, the defendant's expectations of privacy in an illicit signal originating from his computer were "categorically distinguishable" from those in "a lawful, legitimate signal."<sup>287</sup>

The argument with respect to wardriving for stolen cell phones is quite similar. In that situation, the device itself is being operated without the knowledge or consent of the lawful owner, and the wardriving process reveals only the path of the signal originating from that device without revealing any of the content carried by the signal. The contraband-only doctrine applies, and wardriving for signals originating from stolen devices should not be considered a search under the Fourth Amendment.

## 2. Credit card swipes

The next potential contraband-only search technology for derivative contraband concerns the "swipe" of credit cards suspected of using stolen or counterfeit account information. If the police have physical custody of a particular credit card, they already have access to the name, credit card number, and expiration date embossed on the card itself. Criminals who steal credit card information, however, can create fake cards where the information embossed on the front of the card does not match the (stolen) information stored on the magnetic strip.<sup>288</sup> As a result, a police officer who seizes or

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282. *Id.* at 116-17.

283. *Id.* at 117.

284. *See id.* at 124.

285. *Id.* at 121.

286. *Id.* at 122.

287. *Id.* (quoting *Illinois v. Caballes*, 543 U.S. 405, 410 (2005)).

288. *See* Mark Zimmerman, Reg'l Organized Crime Info. Ctr., Credit Card Crime: From Opelika to Odessa, Thieves Turn to Plastic 6 (2014), [http://www.vanderbilt.edu/olli/class-materials/Credit\\_Card\\_Crime.pdf](http://www.vanderbilt.edu/olli/class-materials/Credit_Card_Crime.pdf).

discovers a cache of credit cards will not necessarily be able to tell just by looking whether those cards are the result of illegal activity. Instead, police must swipe the magnetic strips of the suspected stolen cards through a machine reader to examine the information contained on the strip.<sup>289</sup>

A number of courts have analyzed such swipes and concluded that they are not “searches” under the Fourth Amendment.<sup>290</sup> These courts have generally followed something similar to the *Place/Jacobsen* framework described above, analyzing whether the police lawfully seized the cards to be swiped and noting that the swipe of a credit card strip is an entirely nondestructive process.<sup>291</sup> With those questions satisfactorily resolved, the only question remaining is whether the police know before conducting the swipe that no legitimate information will be exposed.

Each court to address the issue has relied on the idea that a credit card swipe can only have one of two possible outcomes: either the information on the strip matches the information embossed on the card (in which case the card is legitimate but the police have learned nothing new) or it does not (in which case the card is counterfeit and thus contraband). As the district court in *DE L’Isle* argued, a swipe of a credit card sits at the intersection of the “principle that there is no legitimate privacy interest in already-known information” and the principle “that there is no legitimate privacy interest in contraband.”<sup>292</sup>

One possible objection to this result is that it assumes that the magnetic strip on a piece of plastic that looks like a credit card will be used to store credit card information and nothing else.<sup>293</sup> And if that were true, the courts’ logic

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289. *See id.*

290. *See, e.g.,* *United States v. Bah*, 794 F.3d 617, 631-32 (6th Cir.) (summarizing previous court rulings with respect to credit card swipes and holding that there is no legitimate “privacy interest in the magnetic strip beyond that in the cards themselves”), *cert. denied*, 136 S. Ct. 561 (2015); *United States v. DE L’Isle*, No. 4:14-CR-3089, 2014 WL 5431349, at \*2-4 (D. Neb. Oct. 24, 2014) (analyzing swipes under the contraband-only doctrine and holding that the swipe of a card lawfully in police possession is not a search under the Fourth Amendment), *aff’d*, 825 F.3d 426 (8th Cir. 2016); *United States v. Alabi*, 943 F. Supp. 2d 1201, 1285 (D.N.M. 2013) (holding that the defendants’ “subjective expectation of privacy in the electronic information stored on their credit and debit cards’ magnetic strips, separate from and additional to the credit and debit cards themselves,” was “not a privacy expectation that society is prepared to recognize as legitimate” and thus “objectively unreasonable”), *aff’d on other grounds*, 597 F. App’x 991 (10th Cir. 2015).

291. *See, e.g., Alabi*, 943 F. Supp. 2d at 1265 (holding that the swipe of a credit card was not a physical intrusion and thus not a search under the Fourth Amendment’s “trespass-based search analysis”).

292. 2014 WL 5431349, at \*3.

293. *See* Orin Kerr, *Is Credit Card Skimming a Fourth Amendment Search?*, WASH. POST: VOLOKH CONSPIRACY (July 29, 2015), <https://wpo.st/5Cte2>.

would be sound: the swipe will reveal “either the account information already known by viewing the exterior of the cards, or else ‘contraband.’”<sup>294</sup>

But a magnetic strip is just a way of storing information. While the use of plastic cards with magnetic strips to make commercial transactions is nearly ubiquitous, it is not inevitable, and it is not universal. More importantly, it is not mandated by law. If people decided on a whim to exchange secret messages using magnetic strips on realistic-looking credit cards, they would have violated no law. Though that may seem unlikely, the police have no way of knowing in advance what a swipe of a card will reveal.

The result, then, turns on how the information obtained from the swipe is used and presented to the police. If information from the swiped credit card strip is displayed to the police officer and then compared *by the officer* to the numbers on the front of the card, the contraband-only doctrine would likely not apply because potentially legitimate private information (like a hypothetical secret message) has been exposed to police view.

On the other hand, if the information on the card is compared by a computer program to a list of known stolen credit card numbers without revealing the information itself to police, then the swipe starts to resemble the hash algorithms discussed above: the investigator is only alerted when contraband is detected. If the investigator swipes the card and the information on the card does not match a known stolen card number, the program would simply return a negative result, and no legitimate private information would be exposed to police eyes.<sup>295</sup>

Alternatively, the investigator might manually input the information printed on the front of the card, and the magnetic reader might be programmed to indicate whether the information on the strip matches. If the information contained on the strip does not match the information on the front of the card, that fact alone is likely enough to create probable cause for a warrant and further investigation, notwithstanding the minuscule chance the

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294. *Alabi*, 943 F. Supp. 2d at 1282 (quoting *Illinois v. Caballes*, 543 U.S. 405, 409 (2005)); see also *DE L’Isle*, 2014 WL 5431349, at \*3 (“[T]he only time the account-holder’s information (as opposed to such details as the lender’s routing information) would not also be revealed by a cursory examination of the surface of the card would be when it was inconsistent—that is, when the card was counterfeit and contraband.”); *United States v. Medina*, No. 09-20717-CR, 2009 WL 3669636, at \*10 (S.D. Fla. Oct. 24, 2009) (“The magnetic strip on the back of a credit card, unlike a hard drive or an external electronic storage device, is designed simply to record the same information that is embossed on the front of the card. On a legitimate card the information will match.”), *report and recommendation adopted in part and rejected in part* by *United States v. Duarte*, No. 09-20717, 2009 WL 3669537 (S.D. Fla. Nov. 4, 2009).

295. As with the discussion of electronic sniffers above, this conclusion rests on Orin Kerr’s argument that the Fourth Amendment is not implicated until private information is exposed to human (as opposed to machine) view. See *supra* note 183 and accompanying text.

strip is being used to store some other legitimate piece of information. Armed with a warrant, the police could then expose the actual numbers to human view and confirm that the cards are in fact counterfeit or stolen.

#### E. Alcohol Detection Technologies

As discussed in Part I.D.2 above, the Supreme Court has examined breathalyzers, blood tests, and urine tests through the lens of the contraband-only doctrine and come to the conclusion that at least under certain circumstances, there is no legitimate right of privacy in the presence of drugs or alcohol in the bloodstream.<sup>296</sup> However, the Court has concluded that such tests are nonetheless searches because of their impact on bodily integrity.<sup>297</sup> In other words, they fail at the “intrusion” step of the *Place/Jacobsen* framework.

So-called “passive” alcohol sensors, however, sidestep this issue. This sort of device “samples exhaled breath as the driver speaks, analyzing it for the presence of alcohol.”<sup>298</sup> These sensors never make contact with the driver. Indeed, they are often placed inside a flashlight similar to one that a police officer might use to conduct a stop in any case, and the driver might be entirely unaware that any detection of alcohol is even occurring.<sup>299</sup>

And with the problem of bodily intrusion out of the way, *Skinner*’s logic argues in favor of applying the contraband-only doctrine to the use of passive alcohol sensors. While not contraband, there is arguably no legitimate right to privacy in the blood alcohol content of a driver on a public roadway.<sup>300</sup> Thus, the passive alcohol sensor looks essentially like the drug-sniffing dogs the Court held did not implicate the Fourth Amendment in *Illinois v. Caballes*, where during an otherwise lawful traffic stop a nonintrusive technology was used to detect the scent of contraband in a vehicle.<sup>301</sup>

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296. *Cf., e.g., Skinner v. Ry. Labor Execs.’ Ass’n*, 489 U.S. 602, 626 (1989) (concluding that blood and breath testing procedures, “which can be used only to ascertain the presence of alcohol or controlled substances in the bloodstream,” cannot reveal “other facts in which the employee has a substantial privacy interest”).

297. *See, e.g., id.* at 616-17.

298. Jennifer Hartunian, Comment, *To Breathe, or Not to Breathe: Passive Alcohol Sensors and the Fourth Amendment*, 39 SAN DIEGO L. REV. 563, 564 (2002).

299. *Id.; see, e.g., PAS IV Flashlight Passive Alcohol Tester*, ALCOPRO, <http://www.alcopro.com/product/pas-iv-flashlight> (last visited Apr. 4, 2017) (“The PAS IV is designed to detect alcohol with or without the subjects [sic] participation.”).

300. *Cf. Skinner*, 489 U.S. at 625-26 (observing that in the context of the Federal Railroad Safety Act of 1970, “breath tests reveal the level of alcohol in the employee’s bloodstream and nothing more” and stating that because “breath tests reveal no other facts in which the employee has a substantial privacy interest . . . [.] we cannot conclude that the administration of a breath test implicates significant privacy concerns”).

301. 543 U.S. 405, 408-10 (2005) (“[T]he dog sniff was performed on the exterior of respondent’s car while he was lawfully seized for a traffic violation. Any intrusion on  
*footnote continued on next page*

#### IV. Implications and Unresolved Questions

What the foregoing analysis and examples reveal is that courts must be vigilant when considering novel contraband-only technologies. A device that appears to reveal only contraband may in fact carry the possibility of revealing legitimate, private information. A device may reveal only contraband but only under particular circumstances. And a device that reveals only contraband may violate the Fourth Amendment for other reasons, either because the police must trespass on private property to employ the device or because the device itself intrudes on Fourth Amendment interests other than privacy.

For all that, the contraband doctrine is still relatively undeveloped, and there remain unanswered questions that courts will have to grapple with as new technologies are introduced and novel forms of contraband are susceptible to remote detection. First, who has the authority to decide whether a particular material is contraband? And second, to what extent can state law impact the definition of contraband?

##### A. Who Decides When Something Is Contraband?

One of the major unresolved questions in the contraband-only doctrine is: Who has the authority to decide whether a particular piece of property is contraband? Because while Congress can pass statutes declaring certain materials illegal to possess, the level of detail in defining that material might vary across classes of contraband and certain questions of definition may be left for the executive branch or courts to resolve. As one commentator observed, “[i]t is one thing to conclude that child pornography is contraband; it is quite another to conclude that a particular image to be included in a hash set is child pornography.”<sup>302</sup>

Even in the paradigmatic case of narcotics, where contraband can be predefined by a chemical formula, there is at least some room for ambiguity. The Court in *United States v. Jacobsen* observed that any privacy interest in possessing cocaine had been deemed “illegitimate” by Congress and was thus not subject to Fourth Amendment protection.<sup>303</sup> As far as cocaine is concerned, this is accurate because possession of that drug has been deemed illegal by explicit statutory text.<sup>304</sup> But the federal Controlled Substances Act allows the Attorney General to supplement the list of controlled substances, subject to

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respondent’s privacy expectations does not rise to the level of a constitutionally cognizable infringement.”).

302. Salgado, *supra* note 245, at 45-46.

303. 466 U.S. 109, 123 (1984).

304. See 21 U.S.C. §§ 812, 844 (2015).

notice-and-comment procedures.<sup>305</sup> For certain substances, then, like anabolic steroids or ketamine, the “legitimacy” determination has been made at least in part by the executive branch, not Congress.<sup>306</sup> Though it is difficult to imagine the Court distinguishing Attorney General-designated drugs from statutorily defined drugs in this narrow context, this observation nonetheless undermines the declaration that “Congress has decided” what is and is not legitimate to possess.<sup>307</sup>

Even leaving aside the relatively narrow issue of congressional delegation, it will not always be possible to determine in advance whether a particular item “fits” within the statutory definition of narcotics. Federal law bans the possession of substances that are “substantially similar” to Schedule I and II narcotics.<sup>308</sup> These materials, known as “analogues,” are not necessarily defined in advance (either by Congress or the executive branch) and are often determined to be contraband only after the fact.<sup>309</sup>

These issues are compounded further when considering a type of contraband like child pornography, which cannot be defined by any chemical formula.<sup>310</sup> The forensic tools currently in existence use databases maintained by the NCMEC, a private organization. It is up to courts to determine whether a database of that kind is sufficient to guarantee that a purported image of child pornography is in fact contraband.

These databases, however, may not always be perfect. If the set of known child pornography images contains files other than child pornography—in other words, if the known file set contains items *that are not contraband*—then the use of a hash runs the same risk as employing a dog that can detect the presence of both street drugs and Tylenol. An alert *might* indicate the presence

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305. *Id.* § 811.

306. *See, e.g.*, Classification of Three Steroids as Schedule III Anabolic Steroids Under the Controlled Substances Act, 74 Fed. Reg. 63,603, 63,608-09 (Dec. 4, 2009) (codified at 21 C.F.R. pt. 1300 (2016)); Placement of Ketamine into Schedule III, 64 Fed. Reg. 37,673, 37,675 (July 13, 1999) (codified at 21 C.F.R. pt. 1308). For a current listing of “scheduled” controlled substances, see Drug Enf’t Admin., U.S. Dep’t of Justice, Controlled Substances: Alphabetical Order (2016), [http://www.deadiversion.usdoj.gov/schedules/orangebook/c\\_cs\\_alpha.pdf](http://www.deadiversion.usdoj.gov/schedules/orangebook/c_cs_alpha.pdf).

307. *See Jacobsen*, 466 U.S. at 123.

308. *See* 21 U.S.C. §§ 802(32)(A), 813.

309. *See, e.g.*, *McFadden v. United States*, 135 S. Ct. 2298, 2303-05 (2015) (discussing a prosecution for possession of “3,4-Methylenedioxypropylvalerone” and holding that 21 U.S.C. § 841(a)(1) requires the government to show that a defendant had knowledge that the substance in question was a controlled substance “even if he did not know its legal status as an analogue”).

310. *Cf. Jacobellis v. Ohio*, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) (“I shall not today attempt further to define [hard-core pornography] . . . . But I know it when I see it . . .”).

of contraband, but it might also indicate some noncontraband file in which the owner of the drive has a right to privacy.

Police might avoid this problem by populating the set of known files with only images that contain a previously identified victim or files that have been the subject of formal adjudication in a previous criminal trial.<sup>311</sup> Congress could further strengthen this decision by explicitly authorizing the Attorney General or some other official to designate images as unlawful given certain preconditions (for instance, a judicially confirmed criminal conviction based on possession of the particular image). This would put at least some child pornography in essentially the same position as narcotics, where specific statutory authority could be cited for the proposition that the privacy interest in a specific image is “illegitimate.”

The same solution would not apply, however, to devices designed to detect derivative contraband like stolen cell phones or counterfeit credit cards. In that instance, the list of contraband known to the police would shift constantly as thefts are reported and data breaches are discovered. It would behoove the police, however, to keep accurate records of what stolen materials are used as a comparison set for any particular search. Otherwise, the police will be unable to demonstrate that they were assured in advance that the search technique could not reveal noncontraband information. By understanding and applying a theory of “anticipatory” contraband, police can ensure that detection technologies in fact detect “only contraband.”

#### B. State Versus Federal

Complicating the “who decides?” question is the distinction between state and federal law. Thus far, the Court’s jurisprudence (and this Note) has focused on items recognized as contraband under federal law. The question remains whether and when a state law declaring a particular item contraband could be used to justify a contraband-only search technique within that state.

On the one hand, the Court has been resistant to the importation of substantive state law in defining the boundaries of Fourth Amendment protections.<sup>312</sup> In *Florida v. Jardines*, Justice Scalia relied exclusively on

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311. See Salgado, *supra* note 245, at 46.

312. See, e.g., *California v. Greenwood*, 486 U.S. 35, 43 (1988) (“We have never intimated . . . that whether or not a search is reasonable within the meaning of the Fourth Amendment depends on the law of the particular State in which the search occurs.”); *Dow Chem. Co. v. United States*, 476 U.S. 227, 232 (1986) (“State tort law governing unfair competition does not define the limits of the Fourth Amendment.”); *Silverman v. United States*, 365 U.S. 505, 511 (1961) (“[W]e need not pause to consider whether or not there was a technical trespass under the local property law relating to party walls. Inherent Fourth Amendment rights are not inevitably measurable in terms of ancient niceties of tort or real property law.” (footnote omitted)).

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preconstitutional and English common law to determine whether use of a drug-sniffing dog on the curtilage of a home constitutes trespass for the purposes of the Fourth Amendment.<sup>313</sup> Allowing states to declare whether there is a legitimate right to privacy in a particular item means that the Fourth Amendment's protections are at the whims of state legislatures, and the protections of the federal Constitution would become inconsistent across state boundaries.

On the other hand, the underlying logic of the contraband-only doctrine seems to apply to state law every bit as much as it does to federal law. When a good is illegal to possess under the laws of a particular state, it is hard to see how one's expectation of privacy in that good is legitimate any more than if the good were made illegal to possess by federal statute instead. And the contours of the Fourth Amendment are always determined in at least some sense by the substantive criminal laws of a state: if an item is illegal to possess in California but not in New York, then police officers with probable cause can obtain a warrant to search for that item in California but not in New York. Courts may have to address this issue soon as the police deploy new technologies capable of detecting a wider variety of potentially contraband materials.

The difference between state and federal law becomes all the more potent when an item is lawful to possess under state law but unlawful to possess under federal law (or vice versa). Most notably, marijuana is illegal to possess under federal law<sup>314</sup> but lawful to possess under the laws of several states for either medicinal or recreational use.<sup>315</sup> One can imagine at least three different resolutions of this conflict. First, courts could decide that the federal Constitution's requirements are dictated solely by federal law and that as a result there is no legitimate right to possess marijuana for the purposes of the Fourth Amendment. In that event, state legalization of marijuana would have little effect on contraband-only jurisprudence.

Second, courts could decide that the question turns on the identity of the law enforcement officer. A citizen in, say, Colorado might have a legitimate expectation that his marijuana usage remains private from agents of the state of Colorado but not from federal agents.<sup>316</sup> Finally, courts could decide that the

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313. 133 S. Ct. 1409, 1414-15 (2013).

314. 21 U.S.C. §§ 812(c), 844(a).

315. *See, e.g.*, COLO. CONST. art. XVIII, § 16 (permitting possession of marijuana for recreational use); CAL. HEALTH & SAFETY CODE §§ 11362.1, .5 (West 2016) (permitting recreational and medicinal marijuana use); WASH. REV. CODE § 69.50.4013 (2016) (permitting marijuana possession in small amounts for designated uses).

316. State courts could also decide that state law provides a layer of protection from police intrusion separate from that provided by the Fourth Amendment. *See, e.g.*, COLO. CONST. art. II, § 7 (protecting against "unreasonable searches and seizures").

“legitimization” of marijuana under state law serves to take the substance out of the contraband category altogether. These issues have begun to develop in states where marijuana has been legalized, but no clear consensus has developed.<sup>317</sup>

If marijuana becomes legitimate to possess (either because of a change in federal law or an adoption of the third position articulated above), police departments will be faced with a difficult challenge. Police dogs already trained to detect marijuana will have to be either retrained or replaced because the police would no longer be assured in advance that an alert from those dogs indicates only contraband.

### Conclusion

Despite its forty-year history, the contraband-only doctrine is only in its infancy. It has so far been applied only to one type of contraband (drugs) and two different technologies (dog sniffs and chemical tests). While the Court has used cases like *Jardines* and *Kyllo* to draw some lines in the sand with respect to the framework *Place* and *Jacobsen* erected, burning questions remain about how the doctrine will apply to new forms of contraband.

As courts are confronted with new contraband-only detection technologies, the three-part test articulated above will help guide their inquiry. Courts must look not only at the information exposed by a technology but also at the equally important questions of access and intrusion.

Furthermore, the theory of anticipatory contraband can aid courts and law enforcement officials in evaluating and articulating whether the information exposed by those new technologies is within the limits of the Fourth Amendment. For courts, recognizing that contraband must be defined in advance helps to distinguish true contraband-only detection devices from those that risk exposing legitimately private information, like a prescription drug-sniffing dog or a gun detector used indiscriminately. This theory can aid police officers in the development of these technologies so that they pass constitutional muster. For many technologies, such as electronic sniffers, hash searches for child pornography, and wardriving laptops, a crucial aspect of design is programming the device to avoid exposure of noncontraband items. Finally, recognizing that circumstances can dictate whether and when a material is contraband, the police can take steps to ensure that devices are

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317. Cf. *People v. Zuniga*, 372 P.3d 1052, 1063-64 (Colo. 2016) (Hood, J., dissenting) (discussing whether an alert from a dog trained to detect marijuana can provide probable cause in a state where marijuana possession can be lawful); *State v. Wells*, No. 46818-2-II, 2016 WL 365587, at \*3 n.7 (Wash. Ct. App. Jan. 26, 2016) (noting the trial court’s conclusion that the drug-sniffing dog’s alert “did not establish probable cause”), *review denied*, 377 P.3d 767 (Wash. 2016).

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employed only when investigators are assured that the material is in fact contraband.

Contraband-only detection technologies do not need to be either a one-size-fits-all solution to crime or an Orwellian nightmare. If courts impose reasonable limits on the use of such technology and ensure that the police employ contraband-only detection methods only when there is no risk of exposing legitimate private facts, contraband-only detection techniques can remain a valuable part of the police toolkit without risk to crucial Fourth Amendment values.