

Power and Responsibility: Fourth Amendment Limits on the Use of Molecular Scanners

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Repository Citation

Paul Wolfgramm Jr., *Power and Responsibility: Fourth Amendment Limits on the Use of Molecular Scanners*, 22 Wm. & Mary Bill Rts. J. 243 (2013), <http://scholarship.law.wm.edu/wmborj/vol22/iss1/8>

**POWER AND RESPONSIBILITY: FOURTH AMENDMENT
LIMITS ON THE USE OF MOLECULAR SCANNERS**

Paul Wolfgramm Jr.*

[N]ow the right to life has come to mean the right to enjoy life,—the
right to be let alone

—Samuel Warren and Louis Brandeis¹

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¹ Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193, 193 (1890).

INTRODUCTION

We live in a unique and momentous era of human history. This era will be characterized by future generations as a dialectic struggle between power—the modern technologies that inspire and make possible grand egalitarian achievement—and responsibility—the normative principles that inform how egalitarian ends ought to be defined.² This dialectic is especially pronounced at the intersection of homeland security and constitutional law.³ Although constitutional law has evolved to accommodate a wide diversity of powerful modern technologies, such as nuclear power,⁴ the Internet,⁵ and Global Positioning Systems (GPS),⁶ constitutional law has failed to anticipate adequately advances in molecular spectroscopy⁷ and fiber laser⁸ technology that threaten

² See HANS JONAS, *THE IMPERATIVE OF RESPONSIBILITY: IN SEARCH OF AN ETHICS FOR THE TECHNOLOGICAL AGE* at ix–x (Hans Jonas & David Herr trans., 1984).

³ Modern presidents, as commanders of a technologically advanced military, struggle with this tension every day while in office. See Memorandum from John C. Yoo, Deputy Assistant Attorney Gen., to Alberto R. Gonzales, Counsel to the President, Auth. for Use of Military Force to Combat Terrorist Activities Within the U.S. 4 (Oct. 23, 2001), available at <http://www.justice.gov/olc/docs/memomilitaryforcecombat10232001.pdf> (“The text, structure and history of the Constitution establish that the Founders entrusted the President with the primary responsibility, and therefore the power, to ensure the security of the United States . . .”).

⁴ The Supreme Court has held that Congress and state legislatures, rather than federal courts, are responsible for resolving fundamental policy questions with respect to nuclear energy development. *Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc.*, 435 U.S. 519, 557–58 (1978) (“Congress has made a choice to at least try nuclear energy, establishing a reasonable review process in which courts are to play only a limited role.”).

⁵ The Supreme Court has held that provisions of a statute prohibiting the communication of obscene, indecent, or patently offensive content to minors via the Internet were facially overbroad in violation of the First Amendment. *Reno v. ACLU*, 521 U.S. 844, 878–79 (1997) (“Under the [Communications Decency Act], a parent allowing her 17-year-old to use the family computer to obtain information on the Internet that she, in her parental judgment, deems appropriate could face a lengthy prison term. . . . [W]e are persuaded that the CDA is not narrowly tailored . . .”).

⁶ The Supreme Court has also, poignantly for this Note, held that a “search” within the meaning of the Fourth Amendment occurs when a government agent plants and uses a GPS tracking device to gather intelligence on a person’s vehicle. See *United States v. Jones*, 132 S. Ct. 945, 949 (2012) (“[T]he Government’s installation of a GPS device on a target’s vehicle, and its use of that device to monitor the vehicle’s movements, constitutes a ‘search.’” (footnote omitted)).

⁷ Molecular spectroscopy refers to the technique of measuring the “set of differences between the possible energy levels [of a molecule], which is related to an observed set of resonances in the electromagnetic radiation spectrum . . .” JEFFREY I. STEINFELD, *MOLECULES AND RADIATION: AN INTRODUCTION TO MODERN MOLECULAR SPECTROSCOPY* 1 (2d ed. 1985). In other words, molecular spectroscopy identifies the exact chemical composition of a sample by stimulating the sample with energy and observing the unique behavior of its constituent chemical compounds.

⁸ A fiber laser is a type of Light Amplification by Stimulated Emission of Radiation (LASER) device characterized by, among other things, an active medium composed of glass “doped with rare earth ions.” KARL F. RENK, *BASICS OF LASER PHYSICS* 288 (2012). This active

to overwhelm current privacy doctrine, especially as applied in the context of the War on Terror⁹ and the Drug War.¹⁰

This Note is organized into six parts and proceeds as follows. Part I defines “privacy” and examines the value of privacy as traditionally recognized in the context of identity formation, social cooperation, and law enforcement. Part II discusses the right to privacy historically as developed through the common law, constitutional law, federal legislation, and international law. Part III distinguishes molecular scanners from less powerful scanning technologies by contrasting millimeter wave and back-scatter imaging technology with the picosecond synchronized programmable laser (PSPL), a molecular scanner developed for use by the United States Department of Homeland Security.¹¹ Part IV examines molecular scanning as applied in the context of the War on Terror and the Drug War and analyzes whether molecular scanning constitutes a “search” under the meaning of the Fourth Amendment, whether such a search is reasonable, whether storing molecular scan data is reasonable, and whether molecular scanning violates the Fourth Amendment as constructed with the First Amendment. Part IV also suggests that ambiguities in current Fourth Amendment doctrine and the absence of minimum quantity thresholds for contraband possession could undermine privacy if left unaddressed. Finally, the Conclusion summarizes the arguments of the previous parts and offers a call to action.

I. KNOWLEDGE IS POWER: THE VALUE OF PRIVACY

A. Privacy Defined

The English word “privacy” is derived from the Latin words *privatus*, meaning “withdrawn from public life,” and *privare*, meaning “to bereave or deprive.”¹² Under Roman law, *privatus* referred to “private” ownership, in contradistinction to ownership

medium produces a high-power beam that is capable of maintaining integrity over a long distance and penetrating or cutting solid materials. *See id.*

⁹ The War on Terror refers to the international military campaign by the United States to eliminate al-Qaeda and all other global terrorist networks which was declared by the Bush administration in September 2001 in response to the September 11, 2001 terrorist attacks. *See* Kenneth R. Bazinet, *Fight vs. Evil, Bush & Cabinet Tell America*, N.Y. DAILY NEWS (Sept. 17, 2001), <http://www.nydailynews.com/archives/news/fight-evil-bush-cabinet-america-article-1.933901> (reporting on a “weekend war” council by President Bush mere days after the 9/11 attacks); Alexandra Silver, *How America Became a Surveillance State*, TIME (Mar. 18, 2010), <http://www.time.com/time/nation/article/0,8599,1973131,00.html> (discussing the historical antecedents to the War on Terror).

¹⁰ The Drug War refers to the international military campaign by the United States to reduce the possession, use, and trade of illegal drugs. *See generally* ARTHUR BENAVIDE, *DRUGS: AMERICA’S HOLY WAR* (2009) (arguing for an end to the Drug War); *DRUG WAR AMERICAN STYLE: THE INTERNATIONALIZATION OF FAILED POLICY AND ITS ALTERNATIVES* (Jurg Gerber & Eric L. Jensen eds., 2001) (discussing the historical context of the Drug War).

¹¹ *See infra* note 135 and accompanying text.

¹² RAYMOND WILLIAMS, *KEYWORDS: A VOCABULARY OF CULTURE AND SOCIETY* 242 (rev. ed. 1976).

by the *populus Romanus*, or “people of the republic.”¹³ The word “privacy” is often untranslatable by linguists because many languages lack a specific word to describe the concept of privacy.¹⁴ Although this might suggest that the concept of privacy is particularly modern or regional, ancient traditions, such as covering one’s genitals, evidence a ubiquitous instinct toward privacy.¹⁵

It is difficult to arrive at a consensus definition of privacy as there is frequent disagreement about its component interests.¹⁶ Privacy can be characterized as having the control necessary to exclude information about oneself from others so that one may reveal such information selectively.¹⁷ Privacy is related to the concepts of anonymity, the desire to be nameless or unidentified in public, and pseudonymity, the desire to be known by a false name in public.¹⁸ Bodily integrity may be another interest that comprises privacy.¹⁹ Samuel Warren and Justice Louis Brandeis, who originally described the right to privacy and its importance in modern America, argued for a “general right to privacy for thoughts, emotions, and sensations [that] should receive the same protection, whether expressed in writing, or in conduct, in conversation, in attitudes, or in facial expression.”²⁰

B. *The Value of Privacy*

The value of privacy, like any other value judgment, is subjective and varies between individuals.²¹ The unique cognitive schemas that individuals develop to interpret their experience of reality are responsible for how individuals prioritize, or value, possible future states of being.²² Given that value is not an inherent property of objects

¹³ See ADOLF BERGER, *ENCYCLOPEDIA OF ROMAN LAW* 636, 651 (1953).

¹⁴ TRANSLATION TODAY: TRENDS AND PERSPECTIVES 73 (Gunilla Anderman & Margaret Rogers eds., 2003).

¹⁵ See *Genesis* 3:7; Michael Balter, *Clothes Make the (Hu) Man*, *SCI. MAG.*, Sept. 2009, at 1329, 1329.

¹⁶ See, e.g., Elbert Lin, *Prioritizing Privacy: A Constitutional Response to the Internet*, 17 *BERKELEY TECH. L.J.* 1085, 1093–94 (2002).

¹⁷ See Eric Hughes, *A Cypherpunk’s Manifesto*, *ACTIVISM.NET*, <http://www.activism.net/cypherpunk/manifesto.html> (last visited Oct. 21, 2013); *Private Life*, *CSOMAG.*, Apr. 2003, at 9, 9.

¹⁸ Jillian C. York, *The Right to Anonymity Is a Matter of Privacy*, *ELEC. FRONTIER FOUND.* (Jan. 28, 2012), <https://www.eff.org/deeplinks/2012/01/right-anonymity-matter-privacy>.

¹⁹ ANITA L. ALLEN, *UNEASY ACCESS: PRIVACY FOR WOMEN IN A FREE SOCIETY* 101 (1988).

²⁰ Warren & Brandeis, *supra* note 1, at 206.

²¹ LUDWIG VON MISES, *HUMAN ACTION: A TREATISE ON ECONOMICS* 96 (Ludwig von Mises Inst. 1998) (1949), available at <http://mises.org/document/3250> (“Value is not intrinsic, it is not in things. It is within us; it is the way in which man reacts to the conditions of his environment.”).

²² See *id.* See generally Ronald Chen & Jon Hanson, *Categorically Biased: The Influence of Knowledge Structures on Law and Legal Theory*, 77 *S. CAL. L. REV.* 1103 (2004) (examining the concepts of stereotypes, categories, schemas, and knowledge structures, and their relevance to legal scholarship).

or behavioral norms, generalizations about the value of privacy must accommodate a diverse range of possible perspectives.²³

Privacy can be said to have functional utility because it plays a central role in facilitating identity formation,²⁴ social cooperation,²⁵ and law enforcement,²⁶ among other social processes. Privacy is necessary for identity formation because it provides one the space necessary to explore new interests and activities, commit to a unique set of personal values, and adapt one's values to changing circumstances.²⁷ Privacy is necessary for social cooperation because the individuation that privacy encourages enables economic specialization and demand for a wide diversity of goods and services.²⁸ Finally, privacy is necessary for law enforcement because it provides a critical check to abuses of government authority, especially given the corrupting nature of power and of the vast superiority of the government's resources over those of the average citizen or group.²⁹

²³ See *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J., concurring) (stating that expectations of privacy are "subjective").

²⁴ See Andrik Becht et al., *Relations Between Parental Privacy Invasion and Identity Formation During Adolescence* 12 (June 21, 2011) (unpublished Bachelor thesis, Utrecht University), available at <http://igitur-archive.library.uu.nl/student-theses/2011-1003-200747/UUindex.html> ("For a healthy identity formation it is necessary that the adolescent becomes autonomous, and develops a sense of privacy." (citations omitted)).

²⁵ JAMES E. CÔTÉ & CHARLES G. LEVINE, *IDENTITY FORMATION, AGENCY, AND CULTURE: A SOCIAL PSYCHOLOGICAL SYNTHESIS* 130 (2002) ("[P]revious types of societies presented their own difficulties that many of those accustomed to late modern society would likely have found unbearable (e.g., a lack of privacy, close informal social control, low levels of intellectual development, [and] few opportunities for creativity and self-actualization"); see Sheldon Richman, *Social Cooperation, Part 2*, FOUND. FOR ECON. EDUC. (Nov. 30, 2011), http://www.fee.org/the_freeman/detail/social-cooperation-part-2#ixzz2J8POERID (quoting HERBERT SPENCER, *SOCIAL STATICS* 482–83 (1850)) ("Paradoxical though the assertion looks, the progress is at once toward complete separateness and complete union. But the separateness is of a kind consistent with the most complex combinations for fulfilling social wants; and the union is of a kind that does not hinder entire development of each personality. . . . [This will eventuate in producing] at once perfect individuation and perfect mutual dependence.").

²⁶ See Paul De Hert & Serge Gutwirth, *Privacy, Data Protection and Law Enforcement. Opacity of the Individual and Transparency of Power*, in *PRIVACY AND THE CRIMINAL LAW* 71–74 (Erik Claes et al. eds., 2006) ("[P]rivacy in a constitutional democratic state represents a legal weapon against the development of absolute balances of power").

²⁷ *United States v. White*, 401 U.S. 745, 763 (1971) (Douglas, J., dissenting) ("Privacy is the basis of individuality." (quoting R. CLARK, *CRIME IN AMERICA* 287 (1970)) (internal quotation marks omitted)); see Becht et al., *supra* note 24, at 4.

²⁸ CÔTÉ & LEVINE, *supra* note 25, at 130; see Richman, *supra* note 25.

²⁹ See De Hert & Gutwirth, *supra* note 26, at 13 ("[P]rivacy is the legal recognition of the resistance or reticence to behaviour steered or induced by power."); see also Barton Gellman & Greg Miller, *U.S. Spy Network's Successes, Failures and Objectives Detailed in 'Black Budget' Summary* (Aug. 29, 2013), http://articles.washingtonpost.com/2013-08-29/world/41709796_1_intelligence-community-intelligence-spending-national-intelligence-program (describing a portion of the extensive resources employed by the National Security Agency (NSA) to conduct foreign and domestic surveillance).

C. The Coercive Power of Knowledge

The fundamental role that privacy plays in facilitating human social processes creates a powerful incentive to manipulate the economic, social, and political environment.³⁰ Not surprisingly, then, the public policy debate over privacy has been characterized as a struggle of control between private actors and government actors.³¹ The interrelatedness of privacy and control is reflected in the Latin proverb, “[*Q*]uis custodiet ipsos [*c*]ustodes?,”³² which means, “Who watches the watchers?,” as well as in the English phrase, “Power tends to corrupt, and absolute power corrupts absolutely.”³³

Approaches to privacy rights can generally be characterized as either free market³⁴ or protectionist.³⁵ In a free market, defined by strict adherence to individual property and contracting rights, standards of privacy are determined through market competition, with consumers choosing to do business with those corporations that offer the desired level of privacy protection.³⁶ Those corporations that do not respect the privacy of their

³⁰ E.C. Pasour, Jr., *Rent Seeking: Some Conceptual Problems and Implications*, REV. OF AUSTRIAN ECON., Mar. 1987, at 127 (quoting Dwight R. Lee, *Reverse Revenue Sharing: The Importance of Process in Controlling Government* (Mar. 24–26, 1983) (paper presented at Public Choice Meetings, Savannah, Georgia)), available at http://www.mises.org/journals/rae/pdf/rae1_1_8.pdf (“[T]he existence of political power, even when restrained, establishes potential opportunities for some to benefit at the expense of others that will never be completely ignored There can be no reasonable doubt that there has been a dramatic expansion in the range of activities that have been subjected to government control over the last century.”); see also Jonathan Watts, *NSA Accused of Spying on Brazilian Oil Company Petrobras* (Sept. 9, 2013, 11:55 PM), <http://www.theguardian.com/world/2013/sep/09/nsa-spying-brazil-oil-petrobras> (reporting on “accusations that [the] NSA is conducting intelligence-gathering operations that go beyond its core mission of national security”).

³¹ See, e.g., Lillian R. BeVier, *Information About Individuals in the Hands of Government: Some Reflections on Mechanisms for Privacy Protection*, 4 WM. & MARY BILL RTS. J. 455, 457 (1995) (characterizing privacy as “being able to control the use or dissemination—within the government itself or to outsiders—of personal information from or about them that the government has collected from them in pursuit of one facet or another of its vast and multifarious substantive mission”).

³² Juvenal, *Satire VI*, in THE SATIRES OF JUVENAL 92, 118 (G. Lowes Dickinson & H. O. Meredith eds., J. M. Dent & Co. 1906); Bruce Schneier, *The Eternal Value of Privacy*, WIRED (May 18, 2006), <http://www.wired.com/politics/security/commentary/securitymatters/2006/05/70886>.

³³ Schneier, *supra* note 32 (quoting Letter from John Emerich Edward Dalberg Acton to Mandell Creighton (Apr. 5, 1887), in HISTORICAL ESSAYS AND STUDIES 504, 504 (John Neville Figgis & Reginald Vere Laurence eds., 1907)).

³⁴ COMM. ON PRIVACY IN THE INFO. AGE, NAT’L RESEARCH COUNCIL, ENGAGING PRIVACY & INFORMATION TECHNOLOGY IN A DIGITAL AGE 67–68 (James Wald et al. eds., 2007), available at http://www.nap.edu/openbook.php?record_id=11896&page=67.

³⁵ *Id.* at 73–74.

³⁶ See Peter P. Swire, *Markets, Self-Regulation, and Government Enforcement in the Protection of Personal Information*, in PRIVACY AND SELF-REGULATION IN THE INFORMATION AGE 2 (1997), available at <http://www.ntia.doc.gov/report/1997/privacy-and-self-regulation-information-age>.

customers risk losing market share to those corporations that do.³⁷ If, however, market competition is distorted, perhaps by state grants of privilege to certain corporations over others, then corporations may offer inferior privacy policies or inferior transparency about privacy practices relative to consumer demand.³⁸ A protectionist approach, in contrast, acknowledges that consumer demand for privacy, as well as the level of privacy protection offered by corporations, is constrained by information asymmetry and other possible market failures.³⁹ To compensate for those failures, therefore, a protectionist approach advocates that privacy standards be engineered top-down and enforced by a central government.⁴⁰ Studies demonstrating that commercial privacy policies are often above the reading level of the average person support a more protectionist approach.⁴¹

Political privacy concerns the fairness of election procedures and has been a concern since the emergence of democratic forms of governance.⁴² Secret balloting, a method developed to protect political privacy, helps to ensure that votes are not obtained through force or the threat of force because voters preserve their anonymity while casting ballots in secure voting booths.⁴³ Despite the inevitability of some fraudulent votes entering the system, secret balloting is widely used to combat voter fraud and is considered a basic right of citizenship in many modern democracies.⁴⁴

II. THE RIGHT TO PRIVACY HISTORICALLY

A. Common Law

In a memorandum to the European Commission, the U.S. Department of Commerce stated, “The right to recover damages for invasion of personal privacy is

³⁷ *See id.*

³⁸ *See id.* at 5–7.

³⁹ *See id.* at 5.

⁴⁰ *See id.* at 4.

⁴¹ Carlos Jensen & Colin Potts, *Privacy Policies as Decision-Making Tools: An Evaluation of Online Privacy Notices*, in PROCEEDINGS OF THE SIGCHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS 471, 475 (2004).

⁴² *See NAACP v. Alabama ex rel. Patterson*, 357 U.S. 449, 462 (1958) (“It is hardly a novel perception that compelled disclosure of affiliation with groups engaged in advocacy may constitute [an] effective . . . restraint on freedom of association . . .”); Thomas Saalfeld, *On Dogs and Whips: Recorded Votes*, in PARLIAMENTS AND MAJORITY RULE IN WESTERN EUROPE 531 (Herbert Döring ed., 1995) (noting the use of secret ballots in ancient Greece).

⁴³ *See Anderson v. Mills*, 664 F.2d 600, 608 (6th Cir. 1981) (citing *Detroit v. Rush*, 46 N.W. 951 (Mich. 1890)) (emphasizing the importance of secret ballots in safeguarding “the purity of our election process by eliminating the fear of scorn and ridicule, as well as lessening the evils of violence, intimidation, bribery and other corrupt practices which can be incumbent in non-secret elections”).

⁴⁴ *Id.* (“[The right to a secret ballot] has been recognized as one of the fundamental civil liberties of our democracy.” (citations omitted)).

well established under U.S. common law.”⁴⁵ Indeed, the right of privacy entered the common law after Louis Brandeis and Samuel Warren published *The Right to Privacy* in 1890, in which they argued for more extensive legal protection for “the right to be let alone” under the common law.⁴⁶ In 1960, William Prosser helped formalize the common law right of privacy by describing four distinct privacy-based torts: (1) intrusion upon the plaintiff’s seclusion, solitude, or private affairs; (2) public disclosure of private facts which would be highly offensive to a reasonable person; (3) publicity which places the plaintiff in a false light in the public eye; and (4) appropriation of the plaintiff’s name or likeness for the defendant’s advantage.⁴⁷ While the common law, historically, gave definition and protection to various privacy rights, the modern trend is toward greater interpretation based on the will of the Supreme Court and the legislature.⁴⁸

B. Constitutional Doctrine

1. Fourth Amendment Text and Original Intent

The Bill of Rights was ratified on December 15, 1791.⁴⁹ The Fourth Amendment, specifically, was written in response to Writs of Assistance, that is, general warrants issued by the British government that granted general search powers to British law enforcement officials.⁵⁰ Those general search powers allowed such officials to search any home, at any time, for any reason, or for no reason at all.⁵¹ This was an especially unpopular concept in the colonies because many of the Sons of Liberty, including many of the Founding Fathers, were smugglers.⁵² The text of the Fourth Amendment reads:

⁴⁵ Memorandum from U.S. Dep’t of Commerce to European Comm’n, Damages for Breaches of Privacy, Legal Authorizations, Mergers and Takeovers in U.S. Law (July 14, 2000), available at <http://www.ita.doc.gov/td/ecom/PRIVACYDAMAGESFINAL.htm>.

⁴⁶ Warren & Brandeis, *supra* note 1, at 193.

⁴⁷ *Kapellas v. Kofman*, 459 P.2d 912, 921 n.16 (Cal. 1969) (citing WILLIAM L. PROSSER, HANDBOOK OF THE LAW OF TORTS 829–51 (3d ed. 1964)); see also William L. Prosser, *Privacy*, 48 CALIF. L. REV. 383, 389 (1960).

⁴⁸ Stephan Kinsella, *Legislation and Law in a Free Society*, MISES DAILY (Feb. 25, 2010), <http://mises.org/daily/4147> (“Historically, in the common law of England, Roman law, and the Law Merchant, law was formed in large part in thousands of judicial decisions. In these so-called ‘decentralized law-finding systems,’ . . . statutes, or centralized law, played a relatively minor role. Today, however, statutes passed by the legislature are becoming the primary source of law . . .”).

⁴⁹ George Anastaplo, *Amendments to the Constitution of the United States: A Commentary*, 23 LOY. U. CHI. L.J. 631, 636 n.10 (1992).

⁵⁰ See Thomas K. Clancy, *The Framers’ Intent: John Adams, His Era, and the Fourth Amendment*, 86 IND. L.J. 979, 991 (2011).

⁵¹ FATHER OF CANDOR (PSEUDONYM), A LETTER CONCERNING LIBELS, WARRANTS, AND THE SEIZURE OF PAPERS 45 (London 1764) (complaining that general warrants permitted arrests or searches to be made at discretion by “any common fellows . . . upon their own imaginations, or the surmises of their acquaintance, or upon other worse and more dangerous intimations . . .”).

⁵² Joseph C. Sweeney, *The Silver Oar and Other Maces of the Admiralty: Admiralty Jurisdiction in America and the British Empire*, 38 J. MAR. L. & COM. 159, 166 (2007).

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.⁵³

According to Robert Bork, “[The Fourth Amendment’s framers] had a specific principle of privacy at work in the Fourth Amendment. It was privacy in your home and in your office from search by the government. That is not just a broad ranging right of privacy you can apply anywhere.”⁵⁴

In the twentieth century, however, Justice Douglas, delivering the opinion of the Supreme Court in *Griswold v. Connecticut*,⁵⁵ summarized some other textual bases within the Bill of Rights that support an expanded right to privacy:

Various guarantees create zones of privacy. The right of association contained in the penumbra of the First Amendment is one, as we have seen. The Third Amendment in its prohibition against the quartering of soldiers ‘in any house’ in time of peace without the consent of the owner is another facet of that privacy. The Fourth Amendment explicitly affirms the “right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures.” The Fifth Amendment in its Self-Incrimination Clause enables the citizen to create a zone of privacy which government may not force him to surrender to his detriment. The Ninth Amendment provides: “The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.”⁵⁶

Justice Douglas’s opinion in *Griswold* foreshadowed the opinion by Justice Blackmun in *Roe v. Wade*,⁵⁷ which found yet another textual home for the right to privacy, now as a fundamental liberty incorporated through the Due Process Clause of the Fourteenth Amendment.⁵⁸

⁵³ U.S. CONST. amend. IV.

⁵⁴ *Robert’s Rules of Order: A Conversation with Robert Bork*, HOOVER INST. (July 16, 2003), <http://www.hoover.org/multimedia/uncommon-knowledge/27065>.

⁵⁵ 381 U.S. 479 (1965).

⁵⁶ *Id.* at 484–85 (“[T]he zone of privacy [is] created by several *fundamental constitutional guarantees*.” (emphasis added)).

⁵⁷ 410 U.S. 113 (1973), *modified by* Planned Parenthood of Se. Pa. v. Casey, 505 U.S. 833 (1992).

⁵⁸ U.S. CONST. amend. XIV, § 2 (“No State shall . . . deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.”); *Roe*, 410 U.S. at 152, *modified by* Planned Parenthood of Se. Pa. v.

Although constitutional law scholars will disagree about the appropriate textual home for the right of privacy, the right of privacy has ultimately been given definition by judges through case law and legislators through statutes, as explored below.

2. Cases

Fourth Amendment jurisprudence has been shaped by diverse and fairly modern case law. The following brief timeline of significant Supreme Court holdings will help define the spectrum of cases in which the right of privacy has been invoked and will reinforce that a right to privacy is essential to managing increasingly intrusive practices by law enforcement.

The Fourth Amendment was an ineffective judicial tool prior to 1914.⁵⁹ In 1914, the U.S. Supreme Court in *Weeks v. United States* established the exclusionary rule, which states that evidence obtained through unconstitutional means is inadmissible in court and cannot be used against a defendant as part of the prosecution's case.⁶⁰ Prior to the Court's ruling in *Weeks*, law enforcement officials could secure evidence in violation of the Fourth Amendment and use that evidence at trial without fear of punishment.⁶¹ Later, in 1961, the Supreme Court in *Mapp v. Ohio* held that an individual's Fourth Amendment right to privacy is enforceable against the states "in the same manner and to like effect as other basic rights secured by the Due Process Clause."⁶² In 2001, the Supreme Court in *Atwater v. City of Lago Vista*⁶³ held that arrests and searches are only to be performed without a warrant if the officer personally witnesses or has reasonable cause to believe that the suspect has committed a specific misdemeanor or felony.⁶⁴

In 1923, the Supreme Court in *Meyer v. Nebraska*⁶⁵ held that the liberties protected under the Due Process Clause of the Fourteenth Amendment include more than

merely freedom from bodily restraint but also the right of the individual to contract, to engage in any of the common occupations of

Casey, 505 U.S. 833 (1992) ("In varying contexts, the Court or individual Justices have, indeed, found at least the roots of that right . . . in the concept of liberty guaranteed by the first section of the Fourteenth Amendment." (citations omitted)).

⁵⁹ See *Weeks v. United States*, 232 U.S. 383, 393 (1914), *overruled by* *Mapp v. Ohio*, 367 U.S. 643 (1961) ("If letters and private documents can thus be seized and held and used in evidence against a citizen accused of an offense, the protection of the Fourth Amendment declaring his right to be secure against such searches and seizures is of no value, and . . . might as well be stricken from the Constitution.").

⁶⁰ *Id.* at 392 ("The tendency of those who execute the criminal laws of the country to obtain conviction by means of unlawful seizures and enforced confessions . . . should find no sanction in the judgments of the courts . . .").

⁶¹ See *id.*

⁶² *Mapp*, 367 U.S. at 660.

⁶³ 532 U.S. 318 (2001).

⁶⁴ See *id.* at 354.

⁶⁵ 262 U.S. 390 (1923).

life, to acquire useful knowledge, to marry, establish a home and bring up children, to worship God according to the dictates of his own conscience, and generally to enjoy those privileges long recognized at common law as essential to the orderly pursuit of happiness by free men.⁶⁶

This holding later influenced the reasoning of Justice Douglas in *Griswold v. Connecticut* in finding an expanded right to privacy in the “penumbras” of the Constitution.⁶⁷

In 1925, the Supreme Court in *Pierce v. Society of Sisters*⁶⁸ ruled that an Oregon law requiring that children attend public schools violated the constitutionally protected right of “parents and guardians to direct the upbringing and education of children under their control.”⁶⁹ The choice of where a parent should send his or her child to school falls within a zone of privacy that is fundamentally protected from government interference.⁷⁰

In 1965, the Supreme Court in *Griswold v. Connecticut* struck down a Connecticut law that prohibited the use of contraceptives in violation of the “right of marital privacy.”⁷¹ Later, in 1972, the Supreme Court in *Eisenstadt v. Baird*⁷² extended the same privacy right protecting access to contraception to single persons.⁷³

In 1967, the Supreme Court in *Katz v. United States* held that the protections of the Fourth Amendment apply to wiretapping and that no police or other government agent can tap a public phone without first obtaining a warrant.⁷⁴ Emphasizing that the Fourth Amendment protects people in addition to places, Justice Stewart wrote that the Fourth Amendment guarantees protection for individual privacy in any context where the individual has a reasonable expectation of privacy.⁷⁵ In a concurring opinion, Justice John Marshall Harlan added:

As the Court’s opinion states, “the Fourth Amendment protects people, not places.” The question, however, is what protection it

⁶⁶ *Id.* at 399.

⁶⁷ *See* 381 U.S. 479, 484 (1965).

⁶⁸ 268 U.S. 510 (1925).

⁶⁹ *Id.* at 534–35.

⁷⁰ *Id.*

⁷¹ *Griswold*, 381 U.S. at 485–86 (“Would we allow the police to search the sacred precincts of marital bedrooms for telltale signs of the use of contraceptives? The very idea is repulsive to the notions of privacy surrounding the marriage relationship.”).

⁷² 405 U.S. 438 (1972).

⁷³ *Id.* at 453–54.

⁷⁴ *Katz v. United States*, 389 U.S. 347, 358 (1967) (“The Government . . . argues that surveillance of a telephone booth should be exempted from the usual requirement of advance authorization by a magistrate upon a showing of probable cause. We cannot agree.”).

⁷⁵ *Id.* at 351–52 (“[T]he Fourth Amendment protects people, not places. What a person knowingly exposes to the public . . . is not a subject of Fourth Amendment protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected.” (citations omitted)).

affords to those people. Generally, as here, the answer to that question requires reference to a “place.” My understanding of the rule that has emerged from prior decisions is that there is a twofold requirement, first that a person have exhibited an actual (subjective) expectation of privacy and, second, that the expectation be one that society is prepared to recognize as “reasonable.”⁷⁶

Contemporary Fourth Amendment analysis applies the same two-fold requirement, although there has been much scholarly debate over the reasoning of both Justice Stewart and Justice Harlan.⁷⁷

In 1968, the Supreme Court in *Terry v. Ohio*⁷⁸ held that a police officer who had a reasonable belief that the defendant was contemplating robbery, an offense often requiring the use of a weapon, did not exceed the scope of a reasonable search in patting down the defendant’s outer clothing and disarming him.⁷⁹

In 1973, the Supreme Court in *Roe v. Wade* held that the constitutionally protected right to privacy was “broad enough to encompass a woman’s decision whether or not to terminate her pregnancy.”⁸⁰ Although Justice Blackmun does not specifically apply Fourth Amendment doctrine in his opinion, his opinion serves as a powerful endorsement for privacy as a fundamental right that protects basic and intimately personal activities, like childbirth.⁸¹

In 1985, the Supreme Court in *Winston v. Lee*⁸² held that surgical intrusion into an attempted robbery suspect’s chest to recover a bullet fired by his victim was unreasonable under the Fourth Amendment where such surgery required non-trivial medical risks and where there was no compelling need to recover the bullet in light of other available evidence.⁸³ Also, Justice Brennan, in delivering the opinion of the Court, characterized privacy as “the most comprehensive of rights and the right most valued by civilized men.”⁸⁴

In 1985, the Supreme Court in *New Jersey v. T.L.O.*⁸⁵ held that teachers and administrators do not need probable cause that a crime has been committed before conducting

⁷⁶ *Id.* at 361 (Harlan, J., concurring).

⁷⁷ See Afsheen John Radsan, *The Case for Stewart Over Harlan on 24/7 Physical Surveillance*, 88 TEX. L. REV. 1475, 1493 n.123 (2010).

⁷⁸ 392 U.S. 1 (1968).

⁷⁹ See *id.* at 30.

⁸⁰ *Roe v. Wade*, 410 U.S. 113, 153 (1973), modified by *Planned Parenthood of Se. Pa. v. Casey*, 505 U.S. 833 (1992).

⁸¹ See generally *id.*

⁸² 470 U.S. 753 (1985).

⁸³ *Id.* at 766.

⁸⁴ *Id.* at 758–59 (citing *Olmstead v. United States*, 277 U.S. 438, 478 (1928) (Brandeis, J., dissenting)).

⁸⁵ 469 U.S. 325 (1985).

a search of students.⁸⁶ Instead, such a search must only meet a standard of “reasonableness, under all the circumstances.”⁸⁷ Under that standard, school officials may conduct a search only if they have a reasonable suspicion that a school rule or law has been broken, and only if the search itself is conducted in a reasonable manner.⁸⁸

In 1995, the Supreme Court in *Vernonia School District v. Acton*⁸⁹ held that the district’s mandatory drug testing program for student athletes did not violate students’ Fourth Amendment rights and that such a test was not unreasonably invasive of students’ privacy.⁹⁰ The Court held that the drug testing program met the standard of reasonableness established in *New Jersey v. T.L.O.*, citing the school’s history of drug problems, the failure of past attempted corrective policies, and the environment of peer pressure on student athletes as compelling reasons to allow such searches.⁹¹ The Court argued that student athletes are accustomed to less privacy than other students because they shower and dress in a common locker room, evidencing the Court’s willingness to find different reasonable expectations of privacy even between students of the same school.⁹²

In 2001, the Supreme Court in *Kyllo v. United States*⁹³ held that the use of sense-enhancing technology not in use by the general public, in this case thermal imaging technology, to obtain information about the interior of a home that could only have otherwise been obtained by physical intrusion into that home constitutes a search and is presumptively unreasonable without a warrant.⁹⁴ The Court also gave an uncharacteristically strong endorsement of the Constitution’s original intent by stating that courts must “assure[] preservation of that degree of privacy against government that existed when the Fourth Amendment was adopted.”⁹⁵

Recently, in 2012, the Supreme Court in *United States v. Jones* held that a “search” within the meaning of the Fourth Amendment occurs when a government agent plants and uses a GPS tracking device to gather intelligence on a person’s vehicle.⁹⁶ According to the Court, vehicles are an “effect” that deserve protection under the Fourth Amendment, which protects the “right of the people to be secure in their persons, houses, papers, and *effects*.”⁹⁷ The Court goes on to distinguish “searches” from

⁸⁶ *Id.* at 341.

⁸⁷ *Id.*

⁸⁸ *Id.* at 341–42.

⁸⁹ 515 U.S. 646 (1995).

⁹⁰ *Id.* at 660–61.

⁹¹ *Id.* at 662–63.

⁹² *Id.* at 657.

⁹³ 533 U.S. 27 (2001).

⁹⁴ *Id.* at 40.

⁹⁵ *Id.* at 34.

⁹⁶ *United States v. Jones*, 132 S. Ct. 945, 949 (2012).

⁹⁷ *Id.* at 946–47 (emphasis added).

“seizures” by stating that a “physical intrusion” by a government agent on a constitutionally protected area for the purpose of obtaining information constitutes a search within the original meaning of the Fourth Amendment.⁹⁸ Seizure of property, on the other hand, is not characterized by mere trespass, but by “some meaningful interference with an individual’s possessory interests in [] property.”⁹⁹ The Court also reaffirmed its holding in *United States v. Knotts*¹⁰⁰ by stating that open fields, like public thoroughfares, are not one of the protected areas enumerated in the Fourth Amendment.¹⁰¹ The Court did not reach the question of whether searches by GPS tracking devices are themselves reasonable, only that a search within the meaning of the Fourth Amendment protection had indeed occurred in this case.¹⁰²

In assessing the salient points of the foregoing case law, consider that this Note is concerned primarily with outlining the outer boundary of when the use of molecular scanners, an advanced imaging technology, constitutes a Fourth Amendment violation.¹⁰³ To assess, on the merits, whether a Fourth Amendment violation has occurred, it must be determined whether the Fourth Amendment is applicable, whether a search or seizure did in fact occur, and whether the Fourth Amendment requirements of probable cause, warrant, and reasonableness are satisfied.¹⁰⁴ Part IV analyzes how the use of molecular scanners in the context of the War on Terror and the Drug War specifically implicates this and other Fourth Amendment doctrine.

Before exploring the advanced capabilities of molecular scanning technology in Part III, this Note will examine a selection of federal and international legislation to give a better sense of how the right to privacy has evolved over the last century to accommodate the increasing need for responsible information management.

C. Federal Legislation

Several pieces of federal legislation were introduced in the twentieth century to expand government control over domestic information monitoring, including the

⁹⁸ *Id.* at 949.

⁹⁹ *Id.* at 958 (citing *United States v. Jacobsen*, 466 U.S. 109, 113 (1984)).

¹⁰⁰ 460 U.S. 276 (1983).

¹⁰¹ *Jones*, 132 S. Ct. at 948; see *Knotts*, 460 U.S. at 282.

¹⁰² *Jones*, 132 S. Ct. at 954.

¹⁰³ Accordingly, this Note does not consider preliminary questions, such as whether the court has jurisdiction, whether the claim is justiciable, and whether government action caused the harm. Questions regarding the remedies for a Fourth Amendment violation, which would implicate extended discussion of the exclusionary rule, the harmless error rule, and civil damages, are similarly outside the scope of this Note. See Russell W. Galloway Jr., *Basic Fourth Amendment Analysis*, 32 SANTA CLARA L. REV. 737, 739 (1992).

¹⁰⁴ See *id.* at 738–39.

Communications Act,¹⁰⁵ the National Security Act,¹⁰⁶ Title III of the Omnibus Crime Control and Safe Streets Act (Wiretap Act),¹⁰⁷ the Privacy Act,¹⁰⁸ the Foreign Intelligence Surveillance Act (FISA),¹⁰⁹ the Computer Matching and Privacy Act (amending the Privacy Act),¹¹⁰ the Electronic Communications Privacy Act (ECPA),¹¹¹ and the Paperwork Reduction Act.¹¹²

¹⁰⁵ Communications Act of 1934, 48 Stat. 1064 (codified as amended at 47 U.S.C. §§ 151–615 (2006)) (creating the Federal Communications Commission “[f]or the purpose of regulating interstate and foreign commerce in communication by wire and radio so as to make available . . . a rapid, efficient, Nation-wide, and world-wide wire and radio communication service with adequate facilities at reasonable charges, for the purpose of the national defense, [and] for the purpose of promoting safety of life and property through the use of wire and radio communications”).

¹⁰⁶ National Security Act of 1947, Pub. L. No. 80-253, 61 Stat. 495 (codified as amended at 50 U.S.C. §§ 401–442a (2006)) (establishing and empowering Congress with oversight power over the Department of Defense (DoD), the Department of the Army, the Department of the Navy, the Department of the Air Force, the Central Intelligence Agency (CIA), and the National Security Council (NSC)).

¹⁰⁷ Omnibus Crime Control and Safe Streets Act of 1968, Pub. L. No. 90-351, tit. III, 82 Stat. 197, 212 (codified as amended at 18 U.S.C. §§ 2510–22 (2006)) (creating the Law Enforcement Assistance Administration (LEAA), altering the admissibility criteria for confessions in criminal trials, establishing procedures to allow wiretapping by law enforcement authorities, and regulating firearm sales and possession).

¹⁰⁸ Privacy Act of 1974, Pub. L. No. 93-579, 88 Stat. 1896 (codified at 5 U.S.C. § 552a (2006)) (requiring government agencies to share any records kept about an individual with another agency upon request, requiring agencies to follow “fair information practices” that restrict how personal information is acquired and shared, and creating a judicial remedy against the government for violation of the Act); *see also* Julianne M. Sullivan, *Will the Privacy Act of 1974 Still Hold Up in 2004? How Advancing Technology Has Created A Need for Change in the “System of Records” Analysis*, 39 CAL. W. L. REV. 395, 395 n.1 (2003); *The Privacy Act of 1974*, ELEC. PRIVACY INFO. CTR., <http://epic.org/privacy/1974act/> (last visited Oct. 21, 2013).

¹⁰⁹ Foreign Intelligence Surveillance Act of 1978, Pub. L. No. 95-511, 92 Stat. 1783 (codified as amended in scattered sections of 18 and 50 U.S.C.) (empowering the President to authorize the physical and electronic surveillance of “foreign powers” and “agents of foreign powers” for the purpose of obtaining “foreign intelligence information,” so long as information on U.S. citizens is not collected, with a court order, without a court order, and in times of war).

¹¹⁰ Computer Matching and Privacy Protection Act of 1988, Pub. L. No. 100-503, 102 Stat. 2507 (codified as amended at 5 U.S.C. § 552a (2006)) (institutionalizing data sharing among federal government agencies).

¹¹¹ Electronic Communications Privacy Act of 1986, Pub. L. No. 99-508, 100 Stat. 1848 (codified as amended at 18 U.S.C. §§ 2510–22, 2701–11, 3121–27 (2006)) (increasing protection for wire, oral, and electronic communications, including those stored on computers; strengthening certain search warrant requirements; and prohibiting the use of pen registers and certain recording devices without first obtaining a court order).

¹¹² Paperwork Reduction Act of 1995, Pub. L. No. 104-13, 109 Stat. 163 (codified at 44 U.S.C. §§ 3501–20 (2006)) (instructing the Office of Management and Budget (OMB) to manage the information activities of federal agencies such that they comply with the requirements

Following the September 11, 2001 (9/11) terrorist attacks on the United States,¹¹³ several new pieces of legislation were introduced that expanded the power of the federal government to guard against domestic acts of terror. The most prominent piece of such legislation was the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act (USA PATRIOT Act).¹¹⁴ Other legislation that has supplemented the power of the federal government following 9/11 and consequently weakened privacy protections includes the Intelligence Reform and Terrorism Prevention Act (IRTPA)¹¹⁵ and the Implementing Recommendations of the 9/11 Commission Act (9/11 Commission Act).¹¹⁶

U.S. federal legislation following the 9/11 terrorist attacks that empowered law enforcement officials with greater search powers indicates a global trend toward sacrificing privacy in favor of greater security, despite long-standing international law recognizing privacy as a universal right.

D. International Law

Article 8 of the European Convention on Human Rights, which was adopted in 1950 by the Council of Europe, protects the right to a private life for all Europeans,

of the Freedom of Information Act (FOIA), the Privacy Act, and the Computer Security Act of 1987).

¹¹³ *In re* Terrorist Attacks on September 11, 2001, 349 F. Supp. 2d 765 (S.D.N.Y. 2005); see NAT'L COMM'N ON TERRORIST ATTACKS, THE 9/11 COMMISSION REPORT: FINAL REPORT OF THE NATIONAL COMMISSION ON TERRORIST ATTACKS UPON THE UNITED STATES (2004), available at <http://www.9-11commission.gov/report/911Report.pdf>.

¹¹⁴ Uniting and Strengthening America By Providing Appropriate Tools Required To Intercept And Obstruct Terrorism Act (USA PATRIOT Act) of 2001, Pub. L. No. 107-56, 115 Stat. 272 (codified as amended in scattered sections of 8, 15, 18, 22, 31, 42, 49, and 50 U.S.C. (2006)) (targeting domestic terrorism by, among other things, easing electronic surveillance restrictions on law enforcement agencies attempting to collect voice and data communications of Americans suspected of terrorist activities, expanding the authority of the Secretary of the Treasury, and increasing the power of immigration authorities to detain and deport immigrants suspected of terrorism); see Susan N. Herman, *The USA PATRIOT Act and the Submajoritarian Fourth Amendment*, 41 HARV. C.R.—C.L. L. REV. 67 (2006); Ronald J. Sievert, *Patriot 2005–2007: Truth, Controversy, and Consequences*, 11 TEX. REV. L. & POL. 319 (2007); *USA Patriot Act*, ELEC. PRIVACY INFO. CTR., <http://epic.org/privacy/terrorism/usapatriot/> (last visited Oct. 21, 2013).

¹¹⁵ Intelligence Reform and Terrorism Prevention Act of 2004, Pub. L. No. 108-458, 118 Stat. 3638 (codified as amended in scattered sections of 6, 8, 18, 22, 42, 49, and 50 U.S.C. (2006)) (appointing a Director of National Intelligence (DNI) and creating the National Counterterrorism Center (NCTC) and the Privacy and Civil Liberties Oversight Board).

¹¹⁶ Implementing Recommendations of the 9/11 Commission Act of 2007, Pub. L. No. 110-53, 121 Stat. 266 (codified as amended in scattered sections of 6, 8, 22, 42, 49, and 50 U.S.C. (2009)) (implementing recommendations from the 9/11 Commission, including inspecting all cargo entering the United States by air or sea and creating multijurisdictional information sharing centers known as Fusion Centers).

except for citizens of Belarus and Kosovo, stating: “Everyone has the right to respect for his private and family life, his home and his correspondence.”¹¹⁷ Additionally, the European Court of Human Rights in Strasbourg has declared privacy a positive right of all people.¹¹⁸

Article 17 of the International Covenant on Civil and Political Rights of the United Nations, which was adopted in 1966, also protects privacy, stating: “No one shall be subjected to arbitrary or unlawful interference with his privacy, family, home or correspondence, nor to unlawful attacks on his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.”¹¹⁹

Now that some of the history of the right to privacy has been laid bare, let us examine in detail molecular spectroscopy and fiber laser technology and how these scientific achievements will impact law enforcement and Fourth Amendment jurisprudence in the twenty-first century.

III. DISTINGUISHING MOLECULAR SCANNERS FROM SIMILAR TECHNOLOGIES

A. “Molecular Scanner” Defined

“Molecular scanner” is a colloquialism that refers to advanced imaging technology capable of penetrating, among other materials, biological tissues at short-to-medium range through a process of fiber laser-induced molecular resonance, and a combination of mid-IR spectroscopy, coherent anti-Stokes Raman scattering (CARS), and terahertz spectroscopy.¹²⁰ This subsection will briefly explain fiber laser technology and some of the spectroscopic techniques that may be applied during a “molecular scan.”

A fiber laser is a type of LASER device containing a dichroitic end mirror, an output coupling mirror, and an active medium composed of glass “doped with rare earth

¹¹⁷ Council of Europe, European Convention on Human Rights art. 8, Nov. 4, 1950, 213 U.N.T.S. 221, available at http://www.echr.coe.int/documents/convention_ENG.pdf.

¹¹⁸ See *id.*

¹¹⁹ International Covenant on Civil and Political Rights art. 17, Dec. 19, 1966, 999 U.N.T.S. 14668.

¹²⁰ See *Hidden Government Scanners Will Instantly Know Everything About You From 164 Feet Away*, GIZMODO (July 10, 2012, 9:40 AM), <http://gizmodo.com/5923980/the-secret-government-laser-that-instantly-knows-everything-about-you> [hereinafter *Government Scanners*] (“[A] new laser-based *molecular scanner*.” (emphasis added)); see also *How Tunable Lasers Are Revolutionizing Spectroscopy*, GENIA PHOTONICS (Oct. 29, 2012), <http://www.geniaphotonics.com/publications/technical-notes/2012/10/how-tunable-lasers-are-revolutionizing-spectroscopy/> (discussing spectroscopic applications of fiber-based tunable laser sources); Youngjae Kim et al., *Lasers and Optics Interface: Multiphoton Spectroscopy*, GENIA PHOTONICS (Jan. 6, 2012), <http://www.geniaphotonics.com/publications/technical-notes/2012/01/multiphoton-spectroscopy/> (differentiating various “multiphoton” spectroscopy techniques). See generally B. J. Orr et al., *Spectroscopic Applications of Tunable Optical Parametric Oscillators*, in *TUNABLE LASER APPLICATIONS* 15–95 (F. J. Duarte ed., 2d ed. 2009).

ions.”¹²¹ Fiber lasers obtain high optical gain by channeling photons through long, yet compact, coils of flexible glass fiber.¹²² This fiber produces a high-quality optical beam and supports high levels of continuous output power by cooling efficiently.¹²³ Fiber lasers are often used to cut, weld, and fold metals and polymers.¹²⁴ When used for spectroscopy, multiple fiber lasers may be synchronized and pulsed to obtain a multi- or hyper-spectral image of a target.¹²⁵

Molecular spectroscopy refers to the technique of measuring the “set of differences between the possible energy levels [of a molecule], which is related to an observed set of resonances in the electromagnetic radiation spectrum”¹²⁶ Every molecule with a unique chemical composition emits a unique spectrum of electromagnetic radiation when excited.¹²⁷ By utilizing spectrographic techniques to observe this spectrum, one can identify the exact chemical composition of a target substance.¹²⁸

Mid-IR spectroscopy, CARS, and terahertz spectroscopy are three particularly powerful spectroscopy techniques that are rapidly becoming popular in the chemical, pharmaceutical, biomedical, defense, security, environmental protection, and communications industries, among others.¹²⁹ These techniques are highly sensitive to molecular vibrations and achieve a higher signal yield than other spectroscopy techniques.¹³⁰ Real-time imaging with these techniques is possible given that spectroscopic readings can be processed in mere “picoseconds.”¹³¹ Virtually any type of substance can be identified with these techniques.¹³² Terahertz waves, in particular, can penetrate a wide variety of materials, including clothing, paper, plastics, leather, wood, and ceramics.¹³³ Terahertz radiation can also penetrate biological tissues without causing harmful photoionization.¹³⁴

¹²¹ RENK, *supra* note 8, at 288.

¹²² See C. BRECK HITZ ET AL., INTRODUCTION TO LASER TECHNOLOGY 201 (4th ed. 2012); RARE EARTH DOPED FIBER LASERS AND AMPLIFIERS 255 (Michel J. F. Digonnet ed., 2001).

¹²³ *How Fibre Lasers Work*, UNIV. OF SOUTHAMPTON OPTOELECTRONICS RESEARCH CTR. (2006), <http://www.orc.soton.ac.uk/61.html>.

¹²⁴ Patrick Waurzyniak, *Lasers Cut Medical Devices with Precision, Speed*, MANUFACTURING ENGINEERING, May 2012, at 69, available at <http://www.sme.org/MEMagazine/Article.aspx?id=50906>.

¹²⁵ See *Chemical Detection and Sensing*, GENIA PHOTONICS, <http://www.geniaphotonics.com/business-markets/defense-and-security/ds-chemical-detection-sensing/> (last visited Oct. 21, 2013); Kim et al., *supra* note 120, at 2.

¹²⁶ STEINFELD, *supra* note 7, at 1.

¹²⁷ See *id.*

¹²⁸ *Chemical Detection and Sensing*, *supra* note 125; see also STEINFELD, *supra* note 7, at 1.

¹²⁹ See Kim et al., *supra* note 120, at 3; *Terahertz Spectroscopy*, GENIA PHOTONICS, <http://www.geniaphotonics.com/business-markets/defense-and-security/terahertz-spectroscopy/> (last visited Oct. 21, 2013).

¹³⁰ *Chemical Detection and Sensing*, *supra* note 125, at 1; Kim et al., *supra* note 120, at 2.

¹³¹ See Kim et al., *supra* note 120, at 3.

¹³² See *Terahertz Spectroscopy*, *supra* note 129, at 1.

¹³³ *Id.*; Kim et al., *supra* note 120, at 2.

¹³⁴ *Terahertz Spectroscopy*, *supra* note 129, at 1.

B. Comparison to Backscatter and Millimeter Wave Technology

According to public testimony by the Honorable Tara O'Toole, Undersecretary for Science and Technology at the U.S. Department of Homeland Security (DHS), DHS will deploy new molecular scanning technology at security checkpoints around the country as soon as this year (2013).¹³⁵ The scanners will have an effective range of 164 feet (50 meters) and will allow security agents to detect anything from “traces of drugs or gun powder on your clothes to what you had for breakfast to the adrenaline level in your body.”¹³⁶ Not only is the scan non-invasive, but it is also undetectable to unsuspecting targets of the scan.¹³⁷ Variants of this technology have been deployed in the Middle East for detecting improvised explosive devices (IEDs).¹³⁸

Technology like the picosecond synchronized programmable laser (PSPL) developed by Genia Photonics will slowly replace older backscatter X-ray and millimeter wave technologies over the next few years.¹³⁹ Backscatter X-ray technology generates a target's image by directing X-rays (electromagnetic radiation with a wavelength between 0.01 to 10 *nanometers*) toward the target and measuring the pattern of X-rays absorbed and scattered by that target.¹⁴⁰ Millimeter wave technology, similarly, generates a target's image by directing microwaves (electromagnetic radiation with a wavelength between 1 to 10 *millimeters*) toward the target and measuring the pattern of microwaves absorbed and scattered by that target.¹⁴¹ Unlike PSPLs, backscatter X-ray scanners and millimeter wave scanners are bulky, immobile, short-range, and, while capable of penetrating clothing, are limited to scanning the surface of a target.¹⁴²

¹³⁵ Testimony of Honorable Tara O'Toole, M.D., MPH Under Secretary for Science and Technology, U.S. Department of Homeland Security, Before the Committee on Homeland Security Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies (Nov. 16, 2011), <http://www.dhs.gov/news/2011/11/16/testimony-honorable-tara-otoole-md-mph-under-secretary-science-and-technology-us> (“[Science and Technology Directorate] (S&T) is investigating the feasibility of [Genia Photonics' PSPL] to perform non-contact, trace explosives detection . . . *All of these projects are expected to produce transition-ready technologies in the next 12 to 24 months . . .* In-Q-Tel reports that \$1 of government investment can attract \$10 in private sector funding.” (emphasis added)).

¹³⁶ *Government Scanners*, *supra* note 120.

¹³⁷ *Id.*

¹³⁸ See *Standoff Explosive Detection*, 3 *IQT Q.*, no. 4, 2012, at 30, 31, available at <http://geniaphotonics.com/wp-content/uploads/2012/04/Standoff-Explosive-Detection.pdf>.

¹³⁹ See Joshua Freed, *TSA: X-Ray Scanners To Be Removed Over Privacy Issues*, HUFFPOST POL. (Jan. 19, 2013, 1:19 AM), http://www.huffingtonpost.com/2013/01/19/tsa-x-ray-scanners_n_2511947.html; Kim et al., *supra* note 120, at 4.

¹⁴⁰ See BART ELIAS, CONG. RESEARCH SERV., R40543, AIRPORT PASSENGER SCREENING: BACKGROUND AND ISSUES FOR CONGRESS 30–33 (2010); William Harris, *What's the Difference Between Backscatter Machines and Millimeter Wave Scanners?*, HOWSTUFFWORKS (Nov. 28, 2012), <http://science.howstuffworks.com/backscatter-machines-vs-millimeter-wave-scanners.htm>.

¹⁴¹ See ELIAS, *supra* note 140, at 33; Harris, *supra* note 140.

¹⁴² See ELIAS, *supra* note 140, at 32; Harris, *supra* note 140.

The emergence of resourceful organized crime and terrorist groups has urged the transition to technology that is more effective at detecting concealed weapons, explosives, chemical and biological warfare agents, and drug mixtures.¹⁴³ Correspondingly, molecular scanning technology, such as that developed by Genia Photonics, is “ten million times faster” and “one million times more sensitive than any currently available system.”¹⁴⁴ Also, as opposed to other techniques that require personnel and complex instruments to come in contact with hazardous samples during field scanning, fiber laser-based scanners scan safely from a distance.¹⁴⁵

The value of powerful scanning technology to the U.S. Department of Homeland Security and other security agencies is obvious. Implementation of this technology could eliminate waiting times at security checkpoints, eliminate the need for selective screening procedures, and provide a degree of thoroughness and reliability that was unimaginable with previous scanning technologies or even physical searches. The technology news website *Gizmodo*, however, concluded its news release about the PSPL with a warning against the possible misuse of this technology:

Going well beyond eavesdropping, it seems quite possible that [the] U.S. government plans on recording molecular data on travelers without their consent, or even knowledge that it’s possible—a scary thought. While . . . any technology that could replace an aggressive pat-down is tempting, there’s a potential dark side to [the PSPL], and we need to shine some light on it before it’s implemented.¹⁴⁶

Indeed, let us temper our enthusiasm for the indisputably vast potential applications for molecular spectroscopy and fiber laser technology as we proceed to examine whether certain uses of molecular scanners constitute a violation of the Fourth Amendment.

IV. MOLECULAR SCANNING UNDER CURRENT LAW

Now that we have explored the meaning of privacy, the value of privacy, and some of the diverse ways that the right to privacy has entered the law, let us focus on how molecular scanners implicate specific Fourth Amendment doctrines.¹⁴⁷ Part IV.A analyzes, in the context of the War on Terror, whether a molecular scan by the

¹⁴³ *Chemical Detection and Sensing*, *supra* note 125.

¹⁴⁴ *Government Scanners*, *supra* note 120.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ For a Fourth Amendment analysis of the TSA’s use of another advanced screening technology, MALINTENT, which monitors travelers’ biometrics, see Lindsey Gil, Note, *Bad Intent or Just A Bad Day? Fourth Amendment Implications Raised by Technological Advances in Security Screening*, 16 B.U. J. SCI. & TECH. L. 231 (2010).

Transportation Security Administration (TSA)¹⁴⁸ constitutes a “search” within the meaning of the Fourth Amendment, whether such a search is reasonable, whether storing molecular scan data is reasonable, and whether molecular scanning imposes a chilling effect on personal activity in violation of the First Amendment. Part IV.B analyzes, in the context of the Drug War, the plain view doctrine, contraband possession thresholds, and how twenty-first century imaging could open the door to serious abuses of individual privacy.¹⁴⁹

A. The War on Terror and Warrantless Searches

1. Molecular Scanning as a “Search”

Generally, a search under the Fourth Amendment only “occurs when an expectation of privacy that society is prepared to consider reasonable is infringed.”¹⁵⁰ This rule holds true when applied in the context of an administrative search involving the use of advanced imaging technology (AIT),¹⁵¹ like the picosecond synchronized programmable laser (PSPL). In *Electronic Privacy Information Center v. United States Department of Homeland Security*, the non-profit organization Electronic Privacy Information Center, which reviews federal activities and policies to determine the impact on civil liberties and privacy interests, petitioned to review a decision by the TSA to screen airline passengers via AIT.¹⁵² In this case the TSA used backscatter X-ray and millimeter wave scanners, instead of magnetometers, which are limited to scanning for metallic objects.¹⁵³ The D.C. Circuit Court of Appeals held that the TSA rule governing passenger searches with AIT is a substantive legislative rule and thus required notice-and-comment by the TSA.¹⁵⁴ The court also held that, because the use of AIT is motivated by a legitimate government purpose, namely, to ensure traveler safety, the use of AIT

¹⁴⁸ *About TSA*, TSA, <http://www.tsa.gov/about-tsa> (last visited Oct. 21, 2013) (“Following September 11, 2001, the [TSA] was created to strengthen the security of the nation’s transportation systems and ensure the freedom of movement for people and commerce. Today, TSA secures the nation’s airports and screens all commercial airline passengers and baggage.”).

¹⁴⁹ This Note suggests that molecular scanning, in conjunction with ambiguous or unsettled Fourth Amendment doctrine, could undermine individual privacy if left unaddressed. For a detailed exploration of alternative Fourth Amendment models, see Orin S. Kerr, *Four Models of Fourth Amendment Protection*, 60 STAN. L. REV. 503 (2007), and Orin S. Kerr, *Searches and Seizures in a Digital World*, 119 HARV. L. REV. 531, 565–84 (2005).

¹⁵⁰ See, e.g., *United States v. Jacobsen*, 466 U.S. 109, 113 (1984).

¹⁵¹ *Elec. Privacy Info. Ctr. v. Dep’t of Homeland Sec.*, 653 F.3d 1, 10 (D.C. Cir. 2011).

¹⁵² *Id.*

¹⁵³ *Id.* at 2–3; see Tobias W. Mock, *The TSA’s New X-Ray Vision: The Fourth Amendment Implications of “Body-Scan” Searches at Domestic Airport Security Checkpoints*, 49 SANTA CLARA L. REV. 213, 226 (2009) (“The non-metallic properties of these emerging threats have rendered magnetometers obsolete and left the TSA scrambling for answers.”).

¹⁵⁴ *Elec. Privacy Info. Ctr.*, 653 F.3d at 7–8.

by the TSA constitutes a search that does not violate the Fourth Amendment.¹⁵⁵ While travelers passing through a TSA security checkpoint may have a subjective expectation of privacy that is violated by an AIT scan, such travelers do not possess an objective expectation of privacy. That is, they do not possess an expectation of privacy that society is prepared to consider reasonable given the need to ensure domestic security.¹⁵⁶ Under this rationale, then, a scan by the TSA for the purpose of ensuring traveler safety via a PSPL, like a scan via traditional AIT, constitutes a legal search under the meaning of the Fourth Amendment.

Although a PSPL scan can be justified as a search by analogy to the less advanced AIT, another theory, based on trespass, may also establish that a search occurs during a PSPL scan. In *United States v. Knotts*,¹⁵⁷ Justice Brennan explained in his concurring opinion that when a government agent physically intrudes into “a constitutionally protected area in order to obtain information, that intrusion may constitute a violation of the Fourth Amendment.”¹⁵⁸ Recently, in *United States v. Jones*, the Supreme Court clarified the relationship between physical intrusions and searches by holding that an attempt to discover information accompanied by a trespass qualifies as a search under the Fourth Amendment.¹⁵⁹

Even in the absence of an actual physical intrusion, the Supreme Court has protected the expectation of privacy that one has over details usually only discoverable by a close physical inspection. In *Kyllo v. United States*, the Court held that the government’s use of surveillance technology not in use by the general public to explore the details of a home constitutes a search if those details would have been otherwise unknowable without a physical intrusion into the home.¹⁶⁰ Although *Jones* dealt with a trespass against a suspect’s car,¹⁶¹ and *Kyllo* dealt with an act that was analogous to a trespass against a suspect’s home,¹⁶² these cases suggest that a trespass against a suspect’s body may also be considered a search and thus trigger Fourth Amendment protections.

A scan by PSPL may arguably constitute an intangible trespass against real or personal property¹⁶³ because such a molecular scan uses electromagnetic radiation to

¹⁵⁵ *Id.* at 10.

¹⁵⁶ *Id.*

¹⁵⁷ 460 U.S. 276 (1983).

¹⁵⁸ *Id.* at 286 (Brennan, J., concurring).

¹⁵⁹ *United States v. Jones*, 132 S. Ct. 945, 951 (2012).

¹⁶⁰ *Kyllo v. United States*, 533 U.S. 27, 40 (2001).

¹⁶¹ *Jones*, 132 S. Ct. at 948.

¹⁶² *See Kyllo*, 533 U.S. at 40.

¹⁶³ Intangible intrusions by noise, odor, or light are usually treated as nuisances rather than trespasses. *See, e.g.*, *Wendinger v. Forst Farms, Inc.*, 662 N.W.2d 546, 550–51 (Minn. Ct. App. 2003) (holding that invasive odors did not give rise to action for trespass because the odors interfered with the use and enjoyment of property rather than with the exclusive possession of property).

penetrate a target's skin and excite its molecules.¹⁶⁴ According to *American Jurisprudence*, trespass requires an intentional act that is reasonably foreseeable to result in an invasion affecting a property interest held in exclusive possession, an actual invasion affecting that interest, and substantial damage to the interest.¹⁶⁵ A molecular scan by the TSA influences the motion and vibrations of a target's molecules,¹⁶⁶ which are otherwise held in exclusive possession by the target. Such a scan is intentional, and understood by the TSA to manipulate the motion of a target in a definite, though perhaps inconspicuous, manner.¹⁶⁷ Finally, unlike cases involving an intangible trespass against real or personal property, where it can sometimes be difficult to prove damages,¹⁶⁸ an intangible intrusion that appropriates a target's bodily information injures by compromising the target's ability to selectively reveal that closely held information.¹⁶⁹ The injury, however, is not to the target's molecules, but to the value of the information about the molecules. A molecular scan by the TSA, therefore, likely fails the final prong of the test for trespass, which requires damage to the property interest itself, and thus does not constitute a search under *Jones*.

A court could still apply an analysis based on physical intrusion to justify molecular scanning as a search, however, by extending to the body the same constitutional protection extended to the home in *Kyllo*. Molecular scanners are a cutting-edge technology not in use by the general public,¹⁷⁰ and a molecular scan reveals more information about a target's body chemistry than could be acquired by the naked eye even during a physically invasive autopsy.¹⁷¹ It would seem, then, that if the body is as deserving of Fourth Amendment protections as the home, courts should extend the holding in *Kyllo* to find that a search occurs during a bodily scan that penetrates below the surface of a target's skin.

2. The Reasonableness of Molecular Scanning

Warrantless searches are ordinarily unreasonable in the absence of an "individualized suspicion of wrongdoing."¹⁷² Administrative searches are unique, however, because they do not require any such suspicion.¹⁷³ In *United States v. Aukai*,¹⁷⁴ the Ninth

¹⁶⁴ *Imaging*, GENIA PHOTONICS, <http://www.geniaphotonics.com/business-markets/life-sciences/imaging/> (last visited Oct. 21, 2013).

¹⁶⁵ 75 AM. JUR. 2D *Trespass* § 27 (2013).

¹⁶⁶ See *Imaging*, *supra* note 164.

¹⁶⁷ *Id.*

¹⁶⁸ See, e.g., *In re WorldCom, Inc.*, 320 B.R. 772 (Bankr. S.D.N.Y. 2005), *aff'd*, 339 B.R. 836 (S.D.N.Y. 2006), *aff'd*, 546 F.3d 211 (2d Cir. 2008) (holding that light signals transmitted by means of fiber optic cable did not constitute a continuing trespass).

¹⁶⁹ See *supra* text accompanying note 17.

¹⁷⁰ See *Distributors*, GENIA PHOTONICS, <http://www.geniaphotonics.com/distributors/> (last visited Oct. 21, 2013) (offering PSPLs exclusively through distributors located outside of the U.S.).

¹⁷¹ See *Imaging*, *supra* note 164.

¹⁷² *Chandler v. Miller*, 520 U.S. 305, 313 (1997).

¹⁷³ *Id.* at 323.

¹⁷⁴ 497 F.3d 955 (9th Cir. 2007).

Circuit Court of Appeals reaffirmed its previous holding that warrantless and suspicionless administrative searches by the TSA are reasonable under the Fourth Amendment only if “conducted as part of a general regulatory scheme in furtherance of an administrative purpose, namely, to prevent the carrying of weapons or explosives aboard aircraft, and thereby to prevent hijackings.”¹⁷⁵ Also, the search must be confined in good faith to that administrative purpose and be “no more . . . intensive than necessary, in light of current technology”¹⁷⁶ Although the Supreme Court has not commented specifically on the reasonableness of using AIT to facilitate an administrative search, it is clear that conducting such a search for the purpose of identifying contraband that does not pose a danger to the safety of travelers falls outside of the permissible scope of the search.¹⁷⁷

Although the D.C. Circuit Court of Appeals, in *Electronic Privacy Information Center v. Department of Homeland Security*, attempted to balance privacy with security by holding that any traveler subject to an administrative search by the TSA could choose between receiving a pat-down or an AIT scan,¹⁷⁸ such a choice between invasive screening techniques may soon become unnecessary. A PSPL can deliver real-time body imaging over a large area and without the knowledge of targets, thus mitigating the need for random or selective screening at security checkpoints.¹⁷⁹ Travelers, then, will be forced to undergo a scan that is far more detailed and invasive than necessary, especially relative to traditional AIT scans, and will have no option to opt out. Unless the TSA develops strict definitions for the chemical compounds that give rise to added suspicion, as well as a graphical interface that eliminates from view chemical information wholly unrelated to identifying weapons and explosives, the use of molecular scanning technology, like the PSPL, will unreasonably exceed the permissible scope of an administrative search.¹⁸⁰

Also, unlike a search via traditional scanning technology, which is limited to scanning the surface of a target,¹⁸¹ a molecular scan by a PSPL is arguably unreasonable, because it violates bodily integrity.¹⁸² In *Winston v. Lee*, the Supreme Court held that

¹⁷⁵ *Id.* at 960 (quoting *United States v. Davis*, 482 F.2d 893, 908 (9th Cir. 1973) (internal quotation marks omitted)).

¹⁷⁶ *Id.* at 962 (internal quotations omitted).

¹⁷⁷ *See id.*; *United States v. Davis*, 482 F.2d 893, 908 (9th Cir. 1973). While certain government agencies, such as the Drug Enforcement Administration (DEA), have an interest in preventing illicit drugs from being flown across the country and around the world, the TSA is limited by its administrative purpose of protecting traveler safety and may not conduct a search solely for the purpose of uncovering nonhazardous contraband. *See About TSA*, TSA, <http://www.tsa.gov/about-tsa> (last visited Oct. 21, 2013).

¹⁷⁸ 653 F.3d 1, 10 (D.C. Cir. 2011).

¹⁷⁹ *Government Scanners*, *supra* note 120.

¹⁸⁰ *See Freed*, *supra* note 139 (“Congress ordered that the [backscatter X-ray] scanners either produce a more generic image or be removed . . .”).

¹⁸¹ *See ELIAS*, *supra* note 140, at 30–33; *Harris*, *supra* note 140.

¹⁸² *See Terahertz Spectroscopy*, *supra* note 129.

the reasonableness of surgical intrusions beneath the skin must weigh an individual's interest in privacy and security against society's interests in conducting the procedure.¹⁸³ Similarly, in *United States v. Husband*,¹⁸⁴ the court held that the Fourth Amendment protects against damage to the individual's sense of personal privacy and security, including the individual's fundamental interest in maintaining bodily integrity and control, regardless of whether a search involves bodily injury.¹⁸⁵ While the question of reasonableness still comes down to balancing individual privacy with the government's legitimate interest in providing security, the threat posed by permitting government agents to beam strange penetrative radiation through the bodies of travelers weighs in favor of PSPL scans being unreasonable.

3. The Reasonableness of Storing Molecular Scan Data

There are additional Fourth Amendment reasonableness concerns regarding the storage of molecular scan data for later mining. The Electronic Privacy Center states that sensitive data about one's body "could provide the basis for a database of air traveler profiles."¹⁸⁶ This means that the government could begin charting every subtle change in a traveler's body chemistry. In 2010, the U.S. Marshals Service was caught storing "tens of thousands of images recorded with a millimeter wave system" without the knowledge or consent of those scanned.¹⁸⁷ The fear that the sensitive data gathered by AIT devices will be made public is very real, given that massive leaks of AIT images have already occurred.¹⁸⁸ Social networking pioneer Mark Zuckerberg is bullish on the trend toward a lower objective expectation of privacy and projects that the rate of personal data voluntarily shared will continue to double every ten years, such that "10 years from now, people will be sharing about 1,000 times as many things as they do today."¹⁸⁹ Despite the trend toward greater data sharing, however, the value of privacy to any individual is subjective, and care should be taken not to curtail the rights of minorities simply because of the demonstrated preferences of the majority.

¹⁸³ 470 U.S. 753, 760 (1985).

¹⁸⁴ 226 F.3d 626 (7th Cir. 2000).

¹⁸⁵ *Id.* at 632.

¹⁸⁶ *Whole Body Imaging Technology and Body Scanners ("Backscatter" X-Ray and Millimeter Wave Screening)*, ELEC. PRIVACY INFO. CTR., <http://epic.org/privacy/airtravel/backscatter/> (last visited Oct. 21, 2013).

¹⁸⁷ Declan McCullagh, *Feds Admit Storing Checkpoint Body Scan Images*, CNET NEWS (Aug. 4, 2010, 4:00 AM), http://news.cnet.com/8301-31921_3-20012583-281.html.

¹⁸⁸ Joel Johnson, *One Hundred Naked Citizens: One Hundred Leaked Body Scans*, GIZMODO (Nov. 16, 2010, 11:00 AM), <http://gizmodo.com/5690749/these-are-the-first-100-leaked-body-scans> ("That we can see these images today almost guarantees that others will be seeing similar images in the future.").

¹⁸⁹ Paul Sloan, *Zuckerberg: In 10 Years, Folks Will Share 1,000 Times What They Do Now*, CNET NEWS (Oct. 20, 2012, 1:24 PM), http://news.cnet.com/8301-1023_3-57536659-93/zuckerberg-in-10-years-folks-will-share-1000-times-what-they-do-now/ (citations omitted) (internal quotation marks omitted).

The reasonableness requirement applies to both searches and seizures.¹⁹⁰ A “seizure” under the Fourth Amendment, in distinction to a “search,” occurs when there is “meaningful interference with an individual’s possessory interests in . . . property.”¹⁹¹ Some seizures are unreasonable even if supported by a warrant or probable cause and limited in scope,¹⁹² such as seizures that are “prolonged beyond the time reasonably required.”¹⁹³

Acquiring data from a molecular scan or generating an image based on that data arguably does not constitute a seizure of information under existing case law.¹⁹⁴ The concept of seizure is generally thought of as requiring a “taking” in which an owner is deprived of the thing being seized.¹⁹⁵ Unlike with physical evidence, however, information is nonrivalrous, such that “investigators can obtain a perfect copy without depriving the owner of the original.”¹⁹⁶ While at least one court has approved a warrant for seizing intangible information,¹⁹⁷ most courts have found that no seizure occurs when the government copies or reproduces data.

In *United States v. Jacobsen*, the Supreme Court held that a seizure of property occurs when “there is some meaningful interference with an individual’s possessory interests in that property.”¹⁹⁸ It seems, then, if copying information about the chemical makeup of a person’s blood or brain “meaningfully interferes” with the person’s possessory interest in that information, then creating the copy constitutes a seizure. In *Arizona v. Hicks*,¹⁹⁹ however, the Supreme Court held that a police officer who copied the serial number information of a stereo system that he suspected was stolen “did not ‘meaningfully interfere’ with respondent’s possessory interest in either the serial numbers or the equipment, and therefore did not amount to a seizure.”²⁰⁰ In *United States v. Thomas*,²⁰¹ the Tenth Circuit Court of Appeals held that a search, but not a seizure, occurred when

¹⁹⁰ See *Tennessee v. Garner*, 471 U.S. 1, 7–8 (1985).

¹⁹¹ *United States v. Jacobsen*, 466 U.S. 109, 113 (1984).

¹⁹² *Warden v. Hayden*, 387 U.S. 294, 303 (1967) (suggesting there are “items of evidential value whose very nature precludes them from being the object of a reasonable search and seizure,” but failing to provide specific examples).

¹⁹³ *Illinois v. Caballes*, 543 U.S. 405, 407 (2005).

¹⁹⁴ For a discussion on seizures of information stored in computer memory, see Kerr, *Searches And Seizures in a Digital World*, *supra* note 149, at 557–65 (“Creating a bitstream copy should require a warrant or an exception because of the way it manipulates the machine . . .”).

¹⁹⁵ See *Jacobsen*, 466 U.S. at 113; Kerr, *Searches And Seizures in a Digital World*, *supra* note 149, at 537.

¹⁹⁶ Kerr, *Searches And Seizures in a Digital World*, *supra* note 149, at 560.

¹⁹⁷ *United States v. Freitas*, 800 F.2d 1451, 1457 (9th Cir. 1986) (upholding a warrant that authorized seizure of intangible property in the form of information regarding the status of a place).

¹⁹⁸ *Jacobsen*, 466 U.S. at 113.

¹⁹⁹ 480 U.S. 321 (1987).

²⁰⁰ *Id.* at 324 (holding, however, that by moving the equipment, the police did meaningfully interfere with Hicks’ possessory interest in the equipment).

²⁰¹ 613 F.2d 787 (10th Cir. 1980).

an FBI agent photocopied obscene materials that had escaped from a package during transit for the purpose of proving a warrant affidavit.²⁰² Similarly, in *Bills v. Aseltine*,²⁰³ the Sixth Circuit relied on *Hicks* and held that a seizure did not occur when police officers took photographs of a home during the execution of a search warrant.²⁰⁴ The court stated, “the recording of visual images of a scene by means of photography does not amount to a seizure because it does not ‘meaningfully interfere’ with any possessory interest.”²⁰⁵ Also, in *United States v. Gorshkov*,²⁰⁶ a Washington federal district court relied on *Hicks* and held that a search, but not a seizure, occurred when FBI agents accessed the Internet account of a suspect and downloaded his files without obtaining a warrant because the data remained intact, unaltered, and accessible in the same manner as before the download.²⁰⁷

The weak precedent regarding information as a seizable property interest makes it all the more important to consider scans in public by AIT, like the PSPL, a search.²⁰⁸ If such scans are not considered a search and thus trigger no Fourth Amendment protections, then a suspect subject to an AIT scan will have no way of controlling the access to or use of incredibly detailed personal information. Given that scan data is stored on government machines, it would be impossible to know whether the acquired data is being used for a limited purpose under current procedures.²⁰⁹ Control over the distribution of personal information is the hallmark of privacy, and any judicial regime that respects privacy must responsibly limit downstream access to such information.²¹⁰

4. The Intersection of Privacy and Free Speech

Consider the “chilling effect” on behavior that could be caused by allowing the government to have unrestricted access to information regarding the body chemistry of

²⁰² *Id.* at 793.

²⁰³ 958 F.2d 697 (6th Cir. 1992).

²⁰⁴ *Id.* at 707.

²⁰⁵ *Id.*

²⁰⁶ No. CR00-550C, 2001 WL 1024026 (W.D. Wash. May 23, 2001).

²⁰⁷ *Id.* at *3.

²⁰⁸ See Kerr, *Searches And Seizures in a Digital World*, *supra* note 149, at 560 (“The idea that the government could freely generate copies of our hard drives and indefinitely retain them in government storage seems too Orwellian . . . to be embraced as a Fourth Amendment rule.”).

²⁰⁹ *Id.* at 561. Agencies could adopt new procedures that allow a target to review the data obtained from a body scan, but that would not assuage fears of scan data being later transferred and mined for an illegitimate purpose.

²¹⁰ See Robert Kirk Walker, Note, *The Right to Be Forgotten*, 64 HASTINGS L.J. 257, 285–86 (2012) (“If an individual no longer wants his personal data to be . . . stored by a data controller, and if there is no legitimate reason for keeping it, the data should be removed . . .” (quoting Press Release, Viviane Reding, Vice President of the European Comm’n & E.U. Justice Comm’r, The EU Data Protection Reform 2012: Making Europe the Standard Setter for Modern Data Protection Rules in the Digital Age (Jan. 24, 2012), <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/12/26> (internal quotation marks omitted)).

citizens.²¹¹ If citizens believe that their body chemistry is being meticulously tracked, they are not only less likely to be active in their daily lives, but they are also less likely to be creative in the activities that they pursue.²¹² The First and Fourth Amendments are sometimes thought of as protecting complementary rights—the right to speak publicly, on one hand, and the right to speak privately, on the other—but courts have considered the close interplay of those rights in several cases.²¹³

The close relationship between privacy and free expression is discussed in *Stanford v. Texas*,²¹⁴ which characterizes the inspiration of the Fourth Amendment as stemming from the historical “conflict between the Crown and the press.”²¹⁵ In *Stanford v. Texas*, the Supreme Court invalidated a warrant authorizing the search of a private home for all books, records, and other materials relating to the Communist Party on the ground that whether or not the warrant would have been sufficient in other contexts, it authorized the searchers with the functional equivalent of a general warrant in contravention of the Fourth Amendment.²¹⁶ The Court’s opinion held that the Fourth Amendment requires that warrants and reasonable searches be defined with “scrupulous exactitude,” especially when targeted materials may implicate the First Amendment.²¹⁷ The opinion in *Roaden v. Kentucky*²¹⁸ distinguished this requirement, stating, “A seizure reasonable as to one type of material in one setting may be unreasonable in a different setting or with respect to another kind of material.”²¹⁹ Given the diversity of personal information exposed by a search via PSPL, including information about the current hormone and adrenaline levels of a target, molecular scanning will likely become useful in a variety of areas of law enforcement, and the reasonableness of such scans will vary in different circumstances. Where presumptively protected materials are the intended objects of a search and seizure, “the warrant requirement should be administered to leave as little as possible to the discretion or whim of the officer in the field.”²²⁰ These Supreme Court

²¹¹ See *United States v. White*, 401 U.S. 745, 763–65 (1971) (Douglas, J., dissenting) (“[M]ust everyone live in fear that every word he speaks may be transmitted or recorded and later repeated to the entire world? I can imagine nothing that has a more chilling effect on people speaking their minds and expressing their views on important matters.”).

²¹² See *Marcus v. Search Warrant*, 367 U.S. 717, 729 (1961) (“[U]nrestricted power of search and seizure could also be an instrument for stifling liberty of expression.”); *Promote Creativity: Let Customers Decide How To Use and Discuss Your Product*, ACLU, <http://www.dotrights.org/business/primer/free-speech/promote-creativity> (last visited Oct. 21, 2013).

²¹³ Most cases that discuss the Fourth Amendment as constructed with the First Amendment involve laws that prohibit recording phone calls or other conduct without the subject of the recording’s permission. See, e.g., *Laird v. Tatum*, 408 U.S. 1, 1 (1972).

²¹⁴ 379 U.S. 476 (1965).

²¹⁵ *Id.* at 482.

²¹⁶ *Id.* at 485–86.

²¹⁷ *Id.* at 485.

²¹⁸ 413 U.S. 496 (1973).

²¹⁹ *Id.* at 501.

²²⁰ *Zurcher v. Stanford Daily*, 436 U.S. 547, 564 (1978).

holdings are consistent with and make urgent the adoption of limited and racially neutral definitions for the chemical signatures that give rise to added suspicion or probable cause for each situation in which a molecular scanner may be used.

Surveillance evidence will usually be admitted if it comports with the Fourth Amendment alone; thus, the First Amendment argument is rarely raised in criminal cases.²²¹ Nevertheless, the Supreme Court has held that constitutional violations may arise from governmental action that creates a “chilling effect” but “falls short of a direct prohibition against the exercise of First Amendment rights.”²²² Still, most such claims fail as a result of lack of standing caused by the inability to articulate an injury that is more than remote and speculative. In *ACLU v. NSA*,²²³ the Sixth Circuit Court of Appeals held:

[T]o the extent the plaintiffs claim that they are prevented, required, compelled, or coerced in their actions, it is due not to any direct and immediate order or regulation by the government, but to circumstances stemming from the plaintiffs’ own subjective apprehension that (1) their communications will be intercepted by the NSA and (2) that interception will be detrimental to their overseas contacts. This is not a concrete, actual, and imminent injury for purposes of establishing standing.²²⁴

It should not be underestimated, however, how revealing a scan by AIT, like the PSPL, is relative to a scan by the technologies dealt with in previous cases. The unique detail achieved by a PSPL scan and the gross amount of personal information derivable from such a scan weigh in favor of reconsidering existing doctrine and establishing a Fourth Amendment violation as constructed with the First Amendment in future cases. In the end, firmly establishing a policy of not monitoring the chemical history of citizens’ bodies would encourage a more robust and expressive marketplace.²²⁵ At the very least, legislators and law enforcement need to develop narrowly tailored definitions for what chemical tags give rise to heightened scrutiny or added suspicion, thus limiting the degree to which individual privacy is invaded.

²²¹ See *Gordon v. Warren Consol. Bd. of Educ.*, 706 F.2d 778, 781 n.3 (6th Cir. 1983) (“Courts have recognized that physical surveillance consistent with Fourth Amendment protections in connection with a good faith law enforcement investigation does not violate First Amendment rights, even though it may be directed at communicative or associative activities.”).

²²² *Reporters Comm. for Freedom of Press v. Am. Tel. & Tel. Co.*, 593 F.2d 1030, 1052 (D.C. Cir. 1978).

²²³ 493 F.3d 644 (6th Cir. 2007).

²²⁴ *Id.* at 663–64 (citing *Laird v. Tatum*, 408 U.S. 1, 11 (1972) and *United Presbyterian Church v. Reagan*, 738 F.2d 1375, 1378–80 (D.C. Cir. 1984)).

²²⁵ See *Encourage Users to Speak Freely: Establish Policies that Promote Speech in Every Form*, ACLU, <http://www.dotrights.org/business/primer/free-speech/encourage-speech> (last visited Oct. 21, 2013).

B. The Drug War: No Minimum Threshold for Drug Possession

This Part will explore how the use of molecular scanners implicates Fourth Amendment doctrine in the context of the Drug War. Unlike Part IV.A, this Part will focus on nonadministrative searches that are performed in public and will examine plain view doctrine and the need for minimum contraband possession thresholds.

1. Plain View Doctrine and Twenty-First Century Imaging

The Supreme Court first articulated the plain view doctrine in *Coolidge v. New Hampshire*²²⁶:

What the “plain view” cases have in common is that the police officer in each of them had a prior justification for an intrusion in the course of which he came inadvertently across a piece of evidence incriminating the accused. The doctrine serves to supplement the prior justification—whether it be a warrant for another object, hot pursuit, search incident to lawful arrest, or some other legitimate reason for being present unconnected with a search directed against the accused—and permits the warrantless seizure. Of course, the extension of the original justification is legitimate only where it is immediately apparent to the police that they have evidence before them; the “plain view” doctrine may not be used to extend a general exploratory search from one object to another until something incriminating at last emerges.²²⁷

In *Horton v. California*,²²⁸ the Supreme Court rejected the idea that evidence needs to be “inadvertently” discovered under the plain view doctrine and held that so long as the officer is engaged in lawful Fourth Amendment conduct at the time that the evidence is located, “the legality of its seizure will not be effected by whether or not he hoped or expected to find it.”²²⁹

In *Arizona v. Hicks*, the Supreme Court held that a standard less than probable cause could not justify a seizure under the plain view doctrine.²³⁰ This is not a demanding threshold to meet given the accuracy of molecular scanners, but the question still remains whether the data acquired by a molecular scan is left in plain view and thus subject to the plain view doctrine. In *United States v. Bustos-Torres*,²³¹ the Eighth

²²⁶ 403 U.S. 443 (1971).

²²⁷ *Id.* at 466.

²²⁸ 496 U.S. 128 (1990).

²²⁹ WARRANTLESS SEARCH LAW DESKBOOK § 17:3 (citing *Horton*, 496 U.S. at 138).

²³⁰ 480 U.S. 321, 327 (1987).

²³¹ 396 F.3d 935 (8th Cir. 2005).

Circuit Court of Appeals held that an “officer conducting a pat-down search [must] have probable cause to believe the item in plain touch is incriminating evidence To give rise to probable cause the incriminating character of the object must be immediately identifiable [T]he object must be one ‘whose contour or mass makes its identity immediately apparent.’”²³² Accordingly, by analogy from “plain touch” to “plain view,” information regarding the subtle vibration and electromagnetic emissions of molecules, which is only made apparent by the aid of an advanced scan technology, cannot reasonably be construed as “immediately apparent” to the officer conducting the search. Molecular scan data, as acquired with technology like the PSPL, then, should not be made admissible under the plain view doctrine. If an individual cannot rely on his skin to hide from plain view intimate details regarding body chemistry, and instead must don a special scan-proof shielding to do so, then the “plainness” of the doctrine will have lost all meaning.

2. Contraband Possession Thresholds and the Door to Dystopia

Foreign customs officials in nations such as England and Dubai have already begun detaining international travelers in airports for possession of negligible quantities of drugs, forecasting the “Orwellian future” that awaits the United States if minimum thresholds for contraband possession are not established soon.²³³

There is no minimum quantity needed to establish criminal possession of a drug under federal statute. Under 21 U.S.C. § 844(a), which makes “it unlawful to possess a controlled substance without a valid prescription or order from a practitioner, it has been found that the *quantity of the substance is not an element of simple possession.*”²³⁴ State courts are mixed as to whether a minimum quantity is needed to establish criminal possession, but most states impose no such threshold:

²³² *Id.* at 944–45 (citing *Minnesota v. Dickerson*, 508 U.S. 366, 376 (1993)).

²³³ Beth Hale, *Briton Jailed for Four Years in Dubai After Customs Find Cannabis Weighing Less Than a Grain of Sugar Under His Shoe*, MAIL ONLINE (Feb. 8, 2008), <http://www.dailymail.co.uk/news/article-512815/Briton-jailed-years-Dubai-customs-cannabis-weighing-grain-sugar-shoe.html> (“Customs authorities are using highly sensitive new equipment to conduct extremely thorough searches on travellers and if they find any amount—no matter how minute—it will be enough to attract a mandatory four-year prison sentence We even have reports of the imprisonment of a Swiss man for ‘possession’ of three poppy seeds on his clothing after he ate a bread roll at Heathrow.” (citation omitted)).

²³⁴ 25 AM. JUR. 2D *Drugs and Controlled Substances* § 160 (2004) (emphasis added) (citing *United States v. Smith*, 34 F.3d 514 (7th Cir. 1994)); see 21 U.S.C. § 844(a) (2006). *But see* *United States v. Sharp*, 12 F.3d 605, 608 (6th Cir. 1993) (“[T]he factor at issue (here the quantity of crack cocaine possessed by the defendant) does not merely affect the length of the defendant’s sentence, but determines whether he is guilty of a felony or a misdemeanor.”); *United States v. Puryear*, 940 F.2d 602, 604 (10th Cir. 1991) (“Absent a jury finding as to the amount of cocaine, the trial court may not decide of its own accord to enter a felony conviction and sentence, instead of a misdemeanor conviction and sentence, by resolving the crucial element of the amount of cocaine against the defendant.”).

All states have statutory provisions regarding prohibited drugs, but courts discussing the minimum quantity of a drug necessary to support a conviction for its possession have reached disparate conclusions, even when construing substantially similar statutes. While many courts have determined that *the possession of any quantity of a drug is sufficient to support a conviction*, other courts . . . have held that the possession of less than a usable amount is not prohibited.²³⁵

Given the lack of federal threshold quantities for contraband possession, it is important that a scan via technology like the PSPL constitutes a search, thus triggering Fourth Amendment protections. All that the government must show to prove that an arrest by police was justified is that a reasonable person would have believed that the suspect had committed or was committing an offense given the totality of the facts and circumstances at the time of arrest.²³⁶ This is a low standard given the high resolution and reliability of the PSPL and the multiplicity of possible possession offenses. The search leading to the incriminating evidence must be proper, however, as fruits of an unlawful search cannot provide probable cause for an arrest.²³⁷ If molecular scanning is justified either as not a search or as falling under the plain view doctrine, then any microscopic amount of contraband carried by a person's shoes, hair, car tires, or otherwise will give cause to police to arrest the suspect and seize all of the suspect's tainted property. The inevitability of excessive detainments and arrests for harmless or unusable quantities of contraband suggests that minimum thresholds for contraband possession need to be firmly established at the federal and state levels as soon as possible.²³⁸

CONCLUSION

In summary, we have explored the definition of "privacy," the value of privacy, and the right to privacy historically.²³⁹ We have also examined the superior capabilities of molecular scanners relative to traditional scanning technologies, and discussed how

²³⁵ *Minimum Quantity of Drug Required to Support Claim that Defendant is Guilty of Criminal "Possession" of Drug Under State Law*, 4 A.L.R. 5TH 1 (1992) (emphasis added).

²³⁶ *United States v. McCarty*, 648 F.3d 820, 839 (9th Cir. 2011).

²³⁷ *Id.*

²³⁸ Threshold quantities for contraband possession are commonly assessed for the purpose of determining minimum and maximum sentences, but negligible or unusable amounts of contraband still trigger criminal liability in most cases. *Compare* *United States v. Richards*, 87 F.3d 1152, 1158 (10th Cir. 1996) (emphasizing that the detectable amount of drugs, rather than the usable, marketable, or consumable amount of drugs, determines sentencing), *with* *United States v. Stewart*, 361 F.3d 373, 382 (7th Cir. 2004) ("[O]nly usable or consumable mixtures or substances can be used in determining drug quantity . . .").

²³⁹ *See supra* Parts I and II.

molecular scanning in the context of the War on Terror and the Drug War implicates certain Fourth Amendment doctrines.²⁴⁰ Specifically, we determined that the use of a molecular scanner by law enforcement to obtain information on a target constitutes a “search” under the meaning of the Fourth Amendment, that such a search is reasonable only if narrowly tailored, that the storing of molecular scan data is arguably unreasonable, that molecular scanning arguably violates the Fourth Amendment as constructed with the First Amendment, and that an absence of contraband possession thresholds could lead to privacy abuses.²⁴¹ These conclusions suggest that it would be prudent to proactively clarify Fourth Amendment doctrine in favor of greater privacy protection before the proliferation of molecular scanning devices and prudent to adopt minimum quantity thresholds for contraband substances.

It may be impossible to fully anticipate the consequences of an emerging technology like molecular scanners. How a new technology will be practically used, and abused, is something that the law can usually only discover in hindsight. When a new technology emerges to obviously threaten a fundamental right, such as the right of privacy, scholars and the public must actively dialogue about the value of that right and remain vigilant of court holdings that threaten to undermine constitutional protection for that right. Hopefully the attention that has recently been paid by the Supreme Court to advanced surveillance techniques will inspire an enthusiastic generation of constitutional scholarship about responsible strategies for preserving individual privacy amid the constantly evolving landscape of security technologies.

²⁴⁰ See *supra* Parts III and IV.

²⁴¹ See *supra* Part IV.