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Firearm Microstamping: A “Bullet with a Name On It”¹

David Muradyan

Code Section Affected

Penal Code § 12126 (amended).

AB 1471 (Feuer); 2007 STAT. Ch. 572.

I. INTRODUCTION

The civilization to introduce the earliest form of writing, cuneiform, also introduced the idea of fingerprinting.² Some time between 1792-1750 B.C., scribes in Babylon began pressing their fingerprints into clay tablets to prevent forgeries.³ This early practice laid the foundation for the modern approach to identifying people by the distinct features of their fingerprint.⁴ Like a fingerprint, a microstamp is a distinct identifying mark that can be imprinted on the casing of a bullet.⁵ A microstamp allows a ballistics specialist to match a particular ejected cartridge casing with a particular gun.⁶ Unlike fingerprint technology, however, microstamping has yet to be widely adopted.⁷ Enter Chapter 572.

II. LEGAL BACKGROUND

There are at least 192 million privately-owned firearms in the United States, including sixty-five million handguns.⁸ In all, approximately thirty-five to thirty-

1. *Bullet with a Name On It*, DISCOVER, Nov. 1999, at 27 [hereinafter *Bullet*].

2. DAVID R. ASHBAUGH, ROYAL CANADIAN MOUNTED POLICE, RIDGEOLOGY: MODERN EVALUATIVE FRICTION RIDGE IDENTIFICATION 3 (1991), <http://onin.com/fp/ridgeology.pdf> (on file with the *McGeorge Law Review*).

3. *Id.*

4. *See id.* (discussing the earliest applications of fingerprinting and the spread of these applications from Babylon to China—the first to use friction ridges for personal identification—and Japan, to India, and, finally, to Britain).

5. NanoMark, What is Ballistic Id Tagging?, <http://www.nanomark.com/Ballistic-id-tagging/ballistic-id.htm> (last visited Feb. 28, 2008) [hereinafter NanoMark] (on file with the *McGeorge Law Review*).

6. *Id.*

7. *See* Matthew Yi, *Assembly OKs Micro-Stamp on Some Guns: Bill Would Make State First in Nation to Require Tracking Device in Semiautomatic Pistols*, S.F. CHRON., May 30, 2007, at B1 (noting that California would be the first state to adopt firearm microstamping).

8. PHILIP J. COOK & JENS LUDWIG, U.S. DEP'T JUSTICE, GUNS IN AMERICA: NATIONAL SURVEY ON PRIVATE OWNERSHIP AND USE OF FIREARMS 5 (1997), <http://www.ncjrs.gov/pdffiles/165476.pdf> (on file with the *McGeorge Law Review*); *see also* Laura MacInnis, *U.S. Most Armed County with 90 Guns Per 100 People*, REUTERS, Aug. 28, 2007, <http://www.reuters.com/article/topNews/idUSL2834893820070828> (on file with the *McGeorge Law Review*) (“U.S. citizens own 270 million of the world’s 875 million known firearms, according to the Small Arms Survey 2007 by the Geneva-based Graduate Institute of International Studies.”); U.S. Conference of Mayors, Fact Sheet: Gun Violence in America (Sept. 9, 1999), http://www.usmayors.org/uscm/gun_safety/gunfacts.htm (on file with the *McGeorge Law Review*) (noting that there may be close to 239 million guns in the United States, including about eighty-six million handguns).

six percent of households in America have a gun, and twenty-two percent have a handgun.⁹ In 2004, firearm-related incidents accounted for the deaths of 29,569 people in the United States, including 11,624 homicides, 16,750 suicides, 649 accidental deaths, and 311 justifiable homicides.¹⁰ By contrast, homicides involving firearms took the lives of seventy-three people in England and Wales,¹¹ and 172 people in Canada.¹² Indeed, the firearm death rate in the United States is eight times the “pooled rate” for other high-income countries, and the United States “has the highest overall firearm mortality rate.”¹³ For Americans nineteen years old and younger, firearm homicide was the second leading cause of death, behind only automobile accidents.¹⁴ The “overall firearm-related death rate among U.S. children aged [less than] 15 years was nearly 12 times higher than among children in the other 25 [industrialized] countries combined.”¹⁵ Financially, gun violence costs the nation about \$100 billion a year in direct and indirect costs.¹⁶

9. TOM W. SMITH, U. CHI., 2001 NATIONAL GUN POLICY SURVEY OF THE NATIONAL OPINION RESEARCH CENTER: RESEARCH FINDINGS 6 (2001), <http://mindchanging.com/politics/guncontrolsurvey.pdf> (on file with the *McGeorge Law Review*).

10. Nat'l Ctr. for Injury Prevention & Control, WISQARS Injury Mortality Reports, 1999-2005, http://webapp.cdc.gov/sasweb/ncipc/mortrate10_sy.html (last visited Feb. 1, 2008) (on file with the *McGeorge Law Review*).

11. SIAN NICHOLAS ET AL., CRIME IN ENGLAND AND WALES 2004/2005, at 8, 81 (2005), <http://www.homeoffice.gov.uk/rds/pdfs05/hosb1105.pdf> (on file with the *McGeorge Law Review*).

12. KWING HUNG, DEP'T JUST. CAN., FIREARM STATISTICS: UPDATED TABLES 12 tbl.10 (2006), <http://canada.justice.gc.ca/en/ps/rs/rep/2006/rr06-2/rr06-2.pdf> (on file with the *McGeorge Law Review*).

13. E.G. Krug, K.E. Powell & L.L. Dahlberg, *Firearm-Related Deaths in the United States and 35 Other High- and Upper-Middle-Income Countries*, 27 INT'L J. EPIDEMIOLOGY 214, 218-19 (1998).

14. Nat'l Ctr. for Injury Prevention & Control, WISQARS Leading Causes of Death Reports, 1999-2004, 10 Leading Causes of Death, United States 2004, All Races, Both Sexes, <http://webapp.cdc.gov/sasweb/ncipc/leadcaus10.html> (last visited Feb. 1, 2008) (on file with the *McGeorge Law Review*).

15. *Rates of Homicide, Suicide, and Firearm-Related Death Among Children—26 Industrialized Countries*, 46 MORBIDITY & MORTALITY WKLY. REP. 101, 101-05 (1997), <ftp://ftp.cdc.gov/pub/Publications/mmwr/wk/mm4605.pdf> (on file with the *McGeorge Law Review*).

16. PHILIP J. COOK & JENS LUDWIG, GUN VIOLENCE: THE REAL COSTS 11 (2000). One study suggested that the public was responsible for eighty percent of firearm-related hospital costs. G. Wintemute & M. Wright, *Initial and Subsequent Hospital Costs of Firearm Injuries*, 33 J. TRAUMA 556 (1992). Although beyond the scope of this article, it should be noted that firearms are used for recreational purposes. See U.S. DEP'T OF THE INTERIOR, U.S. FISH & WILDLIFE SERV. & U.S. DEP'T OF COMMERCE, U.S. CENSUS BUREAU, 2006 NATIONAL SURVEY OF FISHING, HUNTING, AND WILDLIFE-ASSOCIATED RECREATION 22-23 (2006), http://wsfrprograms.fws.gov/Subpages/NationalSurvey/nat_survey2006_final.pdf (on file with the *McGeorge Law Review*) (noting that, in 2006, 12.5 million people sixteen years old and older participated in hunting, spending nearly twenty-three billion dollars on trips, equipment, licenses, and other items to support their hunting activities).

A. *The Problem*

While California already has some of the strictest gun laws in the country,¹⁷ more technologically-advanced tools would aid law enforcement in solving crimes that otherwise would go unsolved.¹⁸ According to the California Department of Justice, roughly 2,400 homicides are committed each year,¹⁹ about sixty percent with a handgun.²⁰ Based on sales data in California, close to seventy percent of handguns sold were semiautomatic pistols, the type of gun affected by Chapter 572.²¹ Unfortunately, about forty-five percent of gun-related crimes in California are “cold cases” because “there are no witnesses and no leads.”²² Further, straw purchasers,²³ a group also affected by Chapter 572, were responsible for “nearly a third of the illegally diverted firearms in all ATF [Bureau of Alcohol, Tobacco and Firearms] investigations initiated” in an approximately two year span.²⁴

B. *Existing Law*

With limited exceptions, existing law prohibits the sale or manufacture of an unsafe handgun.²⁵ An unsafe handgun is defined as “any pistol, revolver, or other

17. NAT’L RIFLE ASS’N INST. FOR LEGISLATIVE ACTION, COMPENDIUM OF STATE LAWS GOVERNING FIREARMS 2-4 (2007), <http://www.nraila.org/media/PDFs/Compendium.pdf> (on file with the *McGeorge Law Review*); Brady Campaign to Prevent Gun Violence, California Gun Laws, Brady State Scorecard 2007, <http://www.bradycampaign.org/legislation/state/viewstate.php?st=ca> (last visited Feb. 25, 2008) (on file with the *McGeorge Law Review*) (ranking California as the state with the strongest gun control laws in the nation).

18. See Letter from Gregory J. Ahern, Sheriff-Coroner, Alameda County Sheriff’s Office, to Assembly Member Mike Feuer, Cal. State Assembly (June 14, 2007) [hereinafter Ahern Letter] (on file with the *McGeorge Law Review*) (“Microstamping makes perfect sense as a cutting edge, fast, and effective way for . . . law enforcement investigators and forensic experts to identify, locate, and convict murderers and violent felons.”).

19. Yi, *supra* note 7.

20. *Id.*

21. VIOLENCE PREVENTION RESEARCH PROGRAM, HANDGUN COMMERCE IN CALIFORNIA 2000, at viii (2004), <http://www.ucdmc.ucdavis.edu/vprp/pdf/gc2000all.pdf> (on file with the *McGeorge Law Review*) (noting sixty-eight percent of handguns sold were semiautomatic pistols).

22. Dave Workman, *California Assembly OKs Microstamping Bill*, GUN WEEK, June 2007, <http://www.gunweek.com/2007/california0615.html> (on file with the *McGeorge Law Review*).

23. BUREAU OF ALCOHOL, TOBACCO & FIREARMS, DEP’T OF TREASURY, FOLLOWING THE GUN: ENFORCING FEDERAL LAWS AGAINST FIREARMS TRAFFICKERS 1 (2000), http://www.atf.treas.gov/pub/fire-explo_pub/pdf/followingthegun_internet.pdf [hereinafter FOLLOWING THE GUN] (on file with the *McGeorge Law Review*) (“[S]traw purchasers . . . buy guns for other unlicensed sellers, criminals, and juveniles.”).

Under current law, a “straw purchase” occurs when the actual buyer of a firearm uses another person, the “straw purchaser,” to execute the paperwork necessary to purchase a firearm from an FFL [federal firearms licensee]. The “straw purchaser” violates the GCA [Gun Control Act of 1968] by making a false statement with respect to information required to be kept in the FFL’s records.
Id. at n.4.

24. *Id.* at 18.

25. CAL. PENAL CODE § 12125(a) (West 2000 & Supp. 2007); see also *id.* § 12125(b) (discussing exceptions, including, among other things, the sale of firearms to any police department).

firearm capable of being concealed upon the person” which does not meet certain safety requirements.²⁶ For example, a pistol is an “unsafe handgun” if, among other things, it does not meet the firing and drop safety requirements and does not include “a positive manually operated safety device.”²⁷ The California Department of Justice compiles, publishes, and maintains a listing of all handguns that “have been determined not to be unsafe handguns, and [therefore] may be sold in this state.”²⁸ In addition, the state maintains a “complete record,” which tracks, among other things, the “dealers’ records of sales of firearms.”²⁹ The Attorney General also keeps and maintains a handgun registry with identifying information about firearms and their registered owner.³⁰

C. The Solution

Microstamping technology was “[d]eveloped in the 1990s by New Hampshire inventor Todd Lizotte,” who is also a board member of NanoMark, the company that owns the patent to the “ballistic tagging technology.”³¹ This technology allows gun manufacturers to place “an identification mark on each cartridge casing ejected from a properly outfitted firearm at the moment of firing each bullet” and is an alternative to ballistic fingerprinting.³² Unlike microstamping, with “current ballistics [fingerprinting] technology, detectives must recover a weapon to link an owner to a crime scene or must compare markings on shell casings with bullets fired from guns recovered later.”³³

Initially, microstamping was utilized in the medical and computer technology fields.³⁴ After the Beltway sniper attacks in 2002, gun control advocates insisted on implementing this technology inside firearms to match shell casings to their owners.³⁵ Microstamping technology imprints microscopic identifying information, such as the make, model, and serial number, onto the cartridge casing when a firearm is discharged.³⁶

26. *Id.* § 12126.

27. *Id.* § 12126(b).

28. *Id.* § 12131(a).

29. *Id.* § 11106(a) (West 2000 & Supp. 2008).

30. *Id.* § 11106(c).

31. SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at I, M (June 26, 2007); Jason Tsai, *Etched Bullets Interest Law Enforcement: Laser Tagging May Help Solve Gun Crimes*, RECORD (Bergen County, N.J.), Sep. 25, 2006, at A1; NanoMark, *supra* note 5.

32. NanoMark, *supra* note 5 (“[B]allistic fingerprinting’ technology is the computer automation of the science practiced by Forensic Firearms Examiners.”).

33. Suzanne Smalley, *City Seeks Safeguards on Sale of Bullets*, BOSTON GLOBE, Feb. 13, 2006, at A1.

34. Tsai, *supra* note 31.

35. *Id.*

36. Erica Werner, *Bullet Cartridges Could ID Criminals*, WASH. POST, May 18, 2007, <http://www.washingtonpost.com/wp-dyn/content/article/2007/05/18/AR2007051801335.html?tid=informbox> (on file with the *McGeorge Law Review*).

III. CHAPTER 572

Beginning January 1, 2010, the definition of “unsafe-handgun”³⁷ will include any semiautomatic pistol without a microstamping feature.³⁸ Chapter 572 requires all new models of semiautomatic pistols to be

designed and equipped with a microscopic array of characters that identify the make, model, and serial number of the pistol, etched or otherwise imprinted in two or more places on the interior surface or internal working parts of the pistol, and that are transferred by imprinting on each cartridge case when the firearm is fired.³⁹

Chapter 572 also contains provisions regarding the method and technology used to microstamp, requiring the California Department of Justice to certify that the authorized microstamping method is available to more than one manufacturer and is not restricted by patent.⁴⁰ Alternatively, the Attorney General may approve a microstamping method different than that set forth in Chapter 572, provided the new method is at least as reliable and effective “in identifying the specific serial number of a firearm from spent cartridge casing discharged by that firearm” and is likewise not burdened by patent.⁴¹

IV. ANALYSIS

Prior to 2007, no state had taken the step of requiring semiautomatic pistols to include microstamping technology.⁴² Chapter 572 makes California the first state to require gun manufacturers to develop semiautomatic handguns that leave an identifying mark (e.g., microstamp) on each bullet fired.⁴³ Prior to Chapter 572’s enactment, ballistics experts could match bullets with the corresponding guns only if they had a weapon for comparison.⁴⁴ Chapter 572 enjoyed tremendous support from various organizations and groups.⁴⁵ Perhaps the strongest

37. CAL. PENAL CODE § 12126 (amended by Chapter 572) (stating that “‘unsafe handgun’ means any pistol, revolver, or other firearm capable of being concealed upon the person” that, among other things, fails to meet certain safety requirements).

38. *Id.* § 12126(b)(7) (amended by Chapter 572); SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at K (June 26, 2007).

39. CAL. PENAL CODE § 12126(b)(7) (amended by Chapter 572) (“The microscopic array of characters . . . shall not [include] the name of the maker, model, manufacturer’s number, or other mark of identification . . .”); SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at K (June 26, 2007).

40. CAL. PENAL CODE § 12126(b)(7) (amended by Chapter 572).

41. *Id.* (amended by Chapter 572) (“Approval by the Attorney General shall include notice of that fact via regulations adopted by the Attorney General for purposes of implementing that method . . .”).

42. Yi, *supra* note 7.

43. Demian Bulwa, *Governor OKs, Vetoes a Passel of Legislation*, S.F. CHRON., Oct. 15, 2007, at B1.

44. *Bullet*, *supra* note 1.

45. *See, e.g.*, Letter from Marc Lerner, Chair, Am. Acad. of Pediatrics-Cal. Comm. on State Gov’t

support came from law enforcement organizations, including support from many city police chiefs and county sheriffs.⁴⁶ All told, more than sixty-five police chiefs and sheriffs supported the bill, along with law enforcement associations such as the Peace Officers Research Association of California.⁴⁷

Affairs, to Assembly Member Mike Feuer, Cal. State Assembly (May 17, 2007) (on file with the *McGeorge Law Review*) (supporting firearm microstamping technology because it “offers needed protection against firearm violence by aiding law enforcement in solving and reducing crimes”); Letter from Jim Lindburg, Legislative Dir., Friends Comm. on Legislation of Cal., to Assembly Member Jose Solorio, Cal. State Assembly (Apr. 4, 2007) (on file with the *McGeorge Law Review*) (noting that AB 1471 (Chapter 572) would deter illegal gun sales because law enforcement could trace the gun to its original owner); Letter from Jack O’Connell, State Superintendent of Pub. Instruction, Cal. Dep’t of Educ., to Assembly Member Mike Feuer, Cal. State Assembly (July 2, 2007) (on file with the *McGeorge Law Review*) (noting that law enforcement can use the expelled cartridge casings, which will contain the firearm’s imprinted serial number, to access California’s already-existing gun database to make a match with the weapon’s owner); Letter from Christine F. Robinson, Executive Dir., Women Against Gun Violence, to Assembly Member Mike Feuer, Cal. State Assembly (May 18, 2007) (on file with the *McGeorge Law Review*) (“[AB 1471 (Chapter 572) may] help curb the epidemic that has become the leading killer of children in our state.”).

46. See, e.g., Ahern Letter, *supra* note 18 (thanking Mike Feuer for authoring AB 1471); Letter from Leroy D. Baca, Sheriff, County of Los Angeles, to Assembly Member Mike Feuer, Cal. State Assembly (Apr. 18, 2007) (on file with the *McGeorge Law Review*) (explaining that, because in many cases of murder in Los Angeles County “the only evidence left at the scene were expended cartridge casings,” AB 1471 (Chapter 572) would increase the probability of investigators solving heinous murders and finding the perpetrator); Letter from William M. Lansdowne, Chief of Police, City of San Diego, to Assembly Member Mike Feuer, Cal. State Assembly (June 18, 2007) (on file with the *McGeorge Law Review*) (“[Firearm microstamping] technology will provide law enforcement with a critical lead in finding armed criminals or ‘straw buyers’ who illegally traffic weapons to prohibited purchasers.”); Letter from Wayne G. Tucker, Chief of Police, City of Oakland, to Assembly Member Mike Feuer, Cal. State Assembly (Apr. 11, 2007) (on file with the *McGeorge Law Review*) (discussing, among other things, that firearm microstamping technology “does not require any new databases or additional information from gun purchaser and will be virtually cost-free for law enforcement”). *But see* Letter from Barbara Ferguson, Lieutenant, Legislative Liaison to Gary S. Penrod, Sheriff-Coroner, County of San Bernardino, to Assembly Member Mike Feuer, Cal. State Assembly (June 21, 2007) (on file with the *McGeorge Law Review*) (“Handgun micro stamping will increase the potential civil liability for law enforcement and government agencies.”); Letter from Margaret Mims, Sheriff, Fresno County Sheriff’s Dep’t, to Assembly Member Mike Feuer, Cal. State Assembly (July 2, 2007) (on file with the *McGeorge Law Review*) (questioning AB 1471’s (Chapter 572) effectiveness in tracing crime scene bullet casings back to the criminal because “criminals will go to any lengths to illegally obtain handguns and use them in the commission of their crimes”).

47. James P. Sweeney & Michael Gardner, *Handgun Tracking Law Gets Approved: State Will Be First to Use Ammo-Stamp Technology*, SAN DIEGO UNION-TRIB., Oct. 14, 2007, at A1 (noting that over sixty-five sheriffs and police chiefs supported this measure); Press Release, Brady Campaign to Prevent Gun Violence, California Legislature Sends Landmark Crime-Fighting Bill to the Governor (Sept. 10, 2007), <http://www.bradiycampaign.org/media/release.php?release=928> (on file with the *McGeorge Law Review*) (noting support from multiple law enforcement associations, including the Peace Officers Research Association of California); see also Letter from Jim Hudson, Chief, L.A. County Police Chiefs’ Ass’n, to Assembly Member Mike Feuer, Cal. State Assembly (June 26, 2007) (on file with the *McGeorge Law Review*); Letter from David L. Maggard, Jr., President, Orange County Chiefs’ & Sheriff’s Ass’n, to Assembly Member Mike Feuer, Cal. State Assembly (May 3, 2007) (on file with the *McGeorge Law Review*) (“[Microstamping technology would] enable law enforcement to rapidly link shell casings found at a crime scene to the individual semi-automatic handgun from which they were fired, and then to the last lawful possessor.”).

A number of different organizations and groups opposed Chapter 572.⁴⁸ Chapter 572's most notable opponents, including gun rights advocates like the National Rifle Association (NRA) and the National Shooting Sports Foundation (NSSF), relied heavily on a UC Davis study in arguing that the technology used in Chapter 572 is flawed.⁴⁹ According to the study, the engraved codes on the firing pin, which create the microstamp, can easily be altered with household tools.⁵⁰

Supporters of Chapter 572, however, noted that the study utilized "vintage" firearms, which were at least ten to fifty years old, yet Chapter 572 requires manufacturers to microstamp only new models of semiautomatic pistols.⁵¹ According to Paul Hemke, President of the Brady Campaign to Prevent Gun Violence, recent models of firearms used in the study perform better, showing "remarkable results."⁵² The UC Davis study also tested handguns, rifles, and shotguns;⁵³ however, Chapter 572 only adds the microstamping requirement to semiautomatic pistols.⁵⁴ Another criticism of the study was that it used firing pins

48. See, e.g., Letter from Marc Halcon, President, Cal. Ass'n of Firearm Retailers, to Assembly Member Mike Feuer, Cal. State Assembly (Apr. 2, 2007) (on file with the *McGeorge Law Review*) (opposing AB 1471 (Chapter 572) because it would place an unrealistic and heavy burden on firearm retailers and gun purchasers); Letter from Jason Rhine, Dir. of Advocacy, Cal. Outdoor Heritage Alliance, to Assembly Member Mike Feuer, Cal. State Assembly (June 18, 2007) (on file with the *McGeorge Law Review*) (opposing AB 1471 (Chapter 572) primarily because it would target innocent owners, considering "90% of all traced crime guns changed hands at least once," and "80% of firearms used by criminals had moved through illegal, untraceable channels prior to their illicit use"); Letter from Bob Templeton, President, Crossroads of the West Gun Shows, to Assembly Member Mike Feuer, Cal. State Assembly (Apr. 2, 2007) (on file with the *McGeorge Law Review*) (expressing concern over liabilities for gun show operators); Letter from Gerald H. Upholt, Legislative Liaison, Cal. Rifle & Pistol Ass'n, Inc., to Assembly Member Mike Feuer, Cal. State Assembly (Mar. 29, 2007) (on file with the *McGeorge Law Review*) (urging the state to wait until a recently passed state law revision commission reorganizes the state's "voluminous and complex" firearms law before enacting any new firearm legislation).

49. Press Release, Nat'l Rifle Ass'n Inst. for Legislative Action, NRA Urges California Lawmakers to Vote "NO" on AB 1471 and AB 334 (May 23, 2007), <http://www.nraila.org/News/Read/NewsReleases.aspx?ID=9500> [hereinafter NRA Press Release] (on file with the *McGeorge Law Review*) ("In 2006, the Legislature requested a state-funded study of micro-stamping technology . . ."); see also Press Release, Nat'l Shooting Sports Found., California Assembly Passes Microstamping Bill Despite 'Flawed' Technology (May 30, 2007), <http://www.nssf.org/common/PR/053007.cfm?wTPL=X&print=X&PR=X&PR=X> (on file with the *McGeorge Law Review*) (noting that the Assembly passed a bill after rejecting the "results of a study it requested").

50. Press Release, UC Davis, Microstamping Guns Feasible But Flawed, Study Finds (May 3, 2007), http://www.news.ucdavis.edu/search/printable_news.lasso?id=8148&table=news (on file with the *McGeorge Law Review*).

51. CAL. PENAL CODE § 12126(b)(7) (amended by Chapter 572); Press Release, Educ. Fund to Stop Gun Violence, Recent Study on Microstamping Draws Flawed Conclusions: New Ballistics Technology Enjoys High Rate of Success with Current Generation of Firearms (May 8, 2007), <http://www.csgv.org/site/c.muLYJ7MMKrH/b.2700149/apps/s/content.asp?ct=3913623> [hereinafter EFSGV Press Release] (on file with the *McGeorge Law Review*).

52. EFSGV Press Release, *supra* note 51.

53. Press Release, Assembly Member Mike Feuer (May 15, 2007) [hereinafter Feuer Press Release] (on file with the *McGeorge Law Review*).

54. CAL. PENAL CODE § 12126(b)(7) (amended by Chapter 572).

which were not optimized,⁵⁵ something required by Chapter 572.⁵⁶ Firearms that utilize an optimization protocol produce accurate and reliable microstamps.⁵⁷

Opponents of Chapter 572 also expressed concern that the new law requires gun manufacturers to completely reconfigure the manufacturing and assembly processes,⁵⁸ which could increase the price of handguns.⁵⁹ According to experts, this technology would cost manufacturers somewhere between fifty cents and eight dollars per gun to implement.⁶⁰ Some opponents of the law even suggested that manufacturers would stop selling new semiautomatic handguns in California.⁶¹ In fact, since Chapter 572's enactment into law, at least one manufacturer has stopped firearm sales in California.⁶²

In addition, opponents argued that criminals could alter a firearm with a microstamping feature by removing, defacing, or replacing the firing pin.⁶³ Chapter 572, however, requires etching to occur in at least two different places inside the pistol, which presumably would make it more difficult for a criminal to alter.⁶⁴ Further, according to supporters, "firing pins equipped with

55. EFSGV Press Release, *supra* note 51; Feuer Press Release, *supra* note 53.

56. Feuer Press Release, *supra* note 53; *see also* Press Release, NanoMark Technologies, New Test Affirms Validity of Microstamping Technology (May 24, 2007), <http://www.csgv.org/atf/cf/%7B23E96A35-4C75-41EE-BDDD-4BD3A3B59010%7D/Lizotte%20Test%20Release%205-25-07.pdf> [hereinafter NanoMark Press Release] (on file with the *McGeorge Law Review*) (noting that the success of microstamping, in part, depends on whether the firearm's firing pins have been optimized to the "dynamic behavior of the firearm").

57. MicroStamping Network, What is Microstamping?, <http://www.microstamping.net/what.html> (last visited Feb. 22, 2008) (on file with the *McGeorge Law Review*) ("The optimization protocol identifies the ideal character geometry, location, size and placement to match the firearm's dynamics that reliably transfer in the identical way as the unintentional microstructures.").

58. *See, e.g.*, Press Release, Nat'l Shooting Sports Found., Firearms Industry Warns: Passage of Microstamping Bill is Tantamount to Gun Ban (June 25, 2007), http://www.nssf.org/news/PR_idx.cfm?AoI=generic&PRloc=common/PR/&PR=062507a.cfm (on file with the *McGeorge Law Review*) ("Many manufacturers will choose to abandon the California market rather than incur substantial costs associated with complying with microstamping legislation, which would include purchasing (at monopolistic prices) very expensive equipment and patented technology and completely redesigning their manufacturing processes, plant and equipment." (quoting Lawrence G. Keane, NSSF Senior Vice President and General Counsel)); NRA Press Release, *supra* note 49 (noting that Chapter 572 would require a complete redesign of the manufacturing process).

59. Tsai, *supra* note 31 (noting that the technology "could cost up to \$150 per firearm").

60. Tiffany Hsu, *Gun ID Bill Takes a Shot at Illegal Weapons Market: Proposed State Legislation Would Require New Handguns to Imprint Information on Shell Casings*, L.A. TIMES, Aug. 15, 2007, at B6.

61. Sweeney & Gardner, *supra* note 47 (quoting Sam Paredes of Gun Owners of California as saying manufacturers "are simply going to stop selling any new semiautomatics in the state"); *see also* Kenneth J. St. Onge, *Number One With A Bullet: West Coast Law Change Could Stamp Out Gunmakers' Profits*, HARTFORD BUS. J., Aug. 27, 2007, <http://www.hartfordbusiness.com/news2610.html> (on file with the *McGeorge Law Review*) (noting that this measure may force gun manufacturers to simply not sell guns in California due to high costs).

62. Susan Jones, *Gun Control Advocates Introduce "Microstamping" Bill*, CNSNEWS.COM, Feb. 13, 2008, <http://www.cnsnews.com/ViewNation.asp?Page=/Nation/archive/200802/NAT20080213a.html> (on file with the *McGeorge Law Review*) (noting that STI International, a gun manufacturer, stopped selling firearms in California as soon as the bill became law).

63. Yi, *supra* note 7.

64. *Id.*; CAL. PENAL CODE § 12126(b)(7) (amended by Chapter 572).

microstamping technology” would be difficult to alter as they “are nearly as hard as diamonds.”⁶⁵ Therefore, even if criminal were to successfully file the pin down, it would effectively prevent the gun from firing.⁶⁶

However, at least one independent peer-reviewed study from a professional society of firearm examiners found that microstamp markings could be removed without rendering the firearm inoperable.⁶⁷ The study also found the technology unreliable, concluding that the implementation of the technology will be complicated.⁶⁸ But, according to the co-inventor of the technology, the reason that this test produced poor results and markings not “fully legible” was because the study did not use a more sophisticated method to “read the markings[,] known as, ‘Scanning Electron Microscopy.’”⁶⁹

The most recent test conducted by NanoMark Technologies, the manufacturer of the microstamping technology, showed tremendous success and accuracy.⁷⁰ The co-inventor of the technology credited the success to several factors, including “optimizing the technology to the dynamic behavior of the firearm and the use of appropriate imaging technology to extract the code data off the cartridges.”⁷¹

Perhaps Chapter 572’s biggest challenge will be dealing with the fact that “a large number of crimes are committed with stolen guns.”⁷² This can result in innocent people, who had their guns stolen, being implicated for crimes they did not commit.⁷³ Opponents also claim that innocent people can be framed or implicated if a criminal collects microstamped cartridge casings from abandoned shooting ranges and “seeds” the crime scene with evidence.⁷⁴ However, when investigating a gun crime, ballistics examiners can differentiate between new and recycled cartridges.⁷⁵ Still, such planting of evidence could present potential

65. Tsai, *supra* note 31.

66. *Id.*

67. George G. Krivosta, *NanoTag Markings From Another Perspective*, 38 AFTE J. 41, 43-44 (2006).

68. *Id.*

69. SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at M (June 26, 2007) (noting that the Krivosta study used a less sophisticated method known as “Optical Microscopy Stereo with Polarization”); *see also* Iowa State Univ. Materials Sci. & Eng’g Dep’t, What is the S.E.M.?, <http://mse.iastate.edu/microscopy/whatsem.html> (last visited Feb. 22, 2008) (on file with the *McGeorge Law Review*) (discussing the many advantages of “scanning electron microscope,” including “higher magnification, larger depth of focus, [and] greater resolution”).

70. NanoMark Press Release, *supra* note 56.

71. *Id.*

72. Tsai, *supra* note 31.

73. Yi, *supra* note 7.

74. NRA Press Release, *supra* note 49. *But see* COAL. TO STOP GUN VIOLENCE & EDUC. FUND TO STOP GUN VIOLENCE, MICROSTAMPING TECHNOLOGY: PRECISE AND PROVEN 6 (2008), <http://www.csgv.org/atf/cf/%7B23E96A35-4C75-41EE-BDDD4BD3A3B59010%7D/CSGV%20Microstamping%20Memo%20Jan%202008.pdf> [hereinafter MICROSTAMPING TECHNOLOGY] (on file with the *McGeorge Law Review*) (noting that reports of “seeding” are rare, especially since “most criminals fail to do things as simple as wearing gloves to hide fingerprints”).

75. MICROSTAMPING TECHNOLOGY, *supra* note 74, at 6 (“There is a standardized procedure for identifying the characteristics of a recycled cartridge, which include the orientation of ballistics markings, the

chain-of-custody⁷⁶ evidentiary issues because, as with ballistics imaging, “any information derived from the technology [is] essentially worthless.”⁷⁷ Acknowledging that Chapter 572 raises chain-of-custody issues, the law’s author contends that information acquired from the discharged casing would still “provide an extremely useful lead for investigators to follow in their attempts to solve gun-related crimes.”⁷⁸

Despite some of Chapter 572’s shortcomings, the value of the legislation is clear. In 2004, “of the more than 1,400 homicides committed with handguns in California,” forty-five percent of the cases went cold and no arrests were ever made.⁷⁹ Often the only evidence left at crime scenes are bullet cartridge casings.⁸⁰ For example, in drive-by shootings, where the only evidence at the crime scene is usually the spent cartridge, Chapter 572 provides law enforcement with a valuable evidentiary tool to help solve crimes.⁸¹ Microstamping should also help reduce gun trafficking through straw purchasers, who are responsible for nearly one-third of the firearms illegally diverted to felons.⁸² Because the casings found at crime scenes can be traced back to guns purchased by a straw purchaser, the straw purchaser is far less likely to risk criminal penalties by selling to felons.⁸³ Moreover, since California already has an existing gun database,⁸⁴ the state would have “no extra administrative responsibilities” in implementing Chapter 572.⁸⁵

use of reload primers, and mismatched bullets/projectiles and powder residue.”).

76. BLACK’S LAW DICTIONARY 244 (8th ed. 2004) (defining “chain-of-custody” as “[t]he movement and location of real evidence, and the history of those persons who had it in their custody, from the time it is obtained to the time it is presented in court”).

Chain of custody requires testimony of continuous possession by each individual having possession, together with testimony by each that the object remained in substantially the same condition during its presence in his possession. All possibility of alteration, substitution or change of condition need not be eliminated. For example, normally an object may be placed in a safe to which more than one person had access without each such person being produced. However the more authentication is genuinely in issue, the greater the need to negate the possibility of alteration or substitution.

Id. (quoting MICHAEL H. GRAHAM, FEDERAL RULES OF EVIDENCE IN A NUTSHELL 402 (3d ed. 1992)).

77. Nat’l Shooting Sports Found., Inc., Micro-stamping Firearms Will Not Reduce Crime, <http://www.nssf.org/share/legal/docs/microstamping/Microstamping-Crime.pdf> (last visited Feb. 22, 2008) (on file with the *McGeorge Law Review*).

78. SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at K-L (June 26, 2007); see also Samantha Young, *Lawmakers Approve Bills Related to Bullets, Gas Prices*, S.F. CHRON., Sept. 10, 2007, <http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2007/09/10/state/n191427D10.DTL&type=politics> (on file with the *McGeorge Law Review*) (“Even if the owner did not commit a crime, at least this bill would provide law enforcement with one more lead in determining who did commit the crime.” (quoting Assembly Member Lloyd Levin, a Democrat representing Van Nuys)).

79. Editorial, *Bullets Can Tell Tales: New Technology Can Tie Spent Casings to Guns and Help Solve Crimes*, L.A. TIMES, May 24, 2007, at A24.

80. Jenny O’Mara, *Lawmakers Look to New Technology to Curb Gun Violence* (Capital Public Radio broadcast May 28, 2007), <http://www.kpbs.org/news/local?id=8465> (on file with the *McGeorge Law Review*).

81. SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at I (June 26, 2007).

82. FOLLOWING THE GUN, *supra* note 23, at 18.

83. Letter from Suzanne Verge, President, L.A. Chapter, Brady Campaign to Prevent Gun Violence, to Assembly Member Mike Feuer, Cal. State Assembly (Apr. 2, 2007) (on file with the *McGeorge Law Review*); see also Hsu, *supra* note 60 (“[AB 1471 (Chapter 572)] would deter gun owners and retailers from selling to unlicensed purchasers for fear of being tracked by police.”).

84. See CAL. PENAL CODE § 11106(c) (West 2000 & Supp. 2007) (discussing California’s requirement

Some in the gun industry are concerned that other jurisdictions will follow California's lead.⁸⁶ Indeed, some cities are considering requiring use of this technology, hoping to stem a recent tide of firearm violence.⁸⁷ States such as Massachusetts and Rhode Island have also introduced similar legislation,⁸⁸ and microstamping legislation patterned after the California law has been introduced at the federal level.⁸⁹

V. CONCLUSION

Chapter 572 makes California the first state to utilize microstamping technology.⁹⁰ Starting in 2010, the law requires new semiautomatic pistols to imprint microscopic characters identifying its make, model, and serial number onto each cartridge casing when the gun is fired.⁹¹ Although there are legitimate concerns regarding Chapter 572's effectiveness, such as whether criminals will circumvent the microstamping technology by altering their weapon or stealing another's,⁹² microstamping will give law enforcement an additional tool to solve the large number of homicides committed with semiautomatic handguns each year in California.⁹³ Specifically, microstamping will enable law enforcement to accurately link spent cartridge casings found at the crime scene to a particular handgun, just like a fingerprint.⁹⁴

for a registry which would contain, among other things, information about registered owners of firearms and the firearms themselves).

85. Smalley, *supra* note 33 (noting that for states that already have gun databases with the buyers' names and the serial numbers of the weapons they are purchasing, there would be no additional administrative responsibilities).

86. Yi, *supra* note 7 (noting concerns from the California Association of Firearms Retailers).

87. Smalley, *supra* note 33 (noting that the City of Boston is also considering implementing microstamping technology in response to an increase in firearm violence); Fran Spielman, *Daley Gun Control Plan Has New Twists: Mayor Wants Trigger Locks, Various Bans*, CHI. SUN-TIMES, Feb. 20, 2008, at N12.

88. Young, *supra* note 78.

89. Press Release, Kennedy, Becerra Introduce Gun Microstamping Legislation, Office of Senator Edward M. Kennedy, Feb. 7, 2008, http://kennedy.senate.gov/newsroom/press_release.cfm?id=ac9073e4-cb6a-45bb-99e3-32326375aa19 (on file with the *McGeorge Law Review*) ("Senator Edward M. Kennedy and Congressman Xavier Becerra introduced the National Crime Gun Identification Act of 2007."); Werner, *supra* note 36 (noting efforts by Representative Xavier Becerra, a Democrat from Los Angeles, and Senator Edward Kennedy, a Democrat from Massachusetts, to introduce a federal microstamping bill modeled after Chapter 572).

90. Yi, *supra* note 7.

91. See CAL PENAL CODE § 12126(b)(7) (amended by Chapter 572). A handgun is defined as "unsafe" if it is not designed and equipped with a microscopic array of characters that identify the make, model, and serial number of the pistol, etched or otherwise imprinted in two or more places on the interior surface or internal working parts of the pistol, and that are transferred by imprinting on each cartridge case when the firearm is fired.

Id. (amended by Chapter 572)

92. Yi, *supra* note 7 (explaining that opponents argued "that the firing pin can be removed and defaced, or simply replaced").

93. SENATE COMMITTEE ON PUBLIC SAFETY, COMMITTEE ANALYSIS OF AB 1471, at H (June 26, 2007).

94. *Id.* at R.