

Counting Guns in Early America

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COUNTING GUNS IN EARLY AMERICA

JAMES LINDGREN* & JUSTIN L. HEATHER**

ABSTRACT

Probate inventories, though perhaps the best prevailing source for determining ownership patterns in early America, are incomplete and fallible. In this Article, the authors suggest that inferences about who owned guns can be improved by using multivariate techniques and control variables of other common objects. To determine gun ownership from probate inventories, the authors examine three databases in detail—Alice Hanson Jones's national sample of 919 inventories (1774), 149 inventories from Providence,

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Rhode Island (1679-1726), and Gunston Hall Plantation's sample of 325 inventories from Maryland and Virginia (1740-1810). Also discussed are a sample of 59 probate inventories from Essex County, Massachusetts (1636-1650), Gloria L. Main's study of 604 Maryland estates (1657-1719), Anna Hawley's study of 221 Surry County, Virginia estates (1690-1715), a sample of 289 male inventories from Vermont (1773-1790), and Judith A. McGaw's study of 250 estates in New Jersey and Pennsylvania (1714-1789). Guns are found in 50-73% of the male estates in each of the eight databases and in 6-38% of the female estates in each of the first four databases.

Gun ownership is particularly high compared to other common items. For example, in 813 itemized male inventories from the 1774 Jones national database, guns are listed in 54% of estates, compared to only 30% of estates listing any cash, 14% listing swords or edged weapons, 25% listing Bibles, 62% listing any book, and 79% listing any clothes. Using hierarchical loglinear modeling, the authors show that guns are more common in early American inventories where the decedent was male, Southern, rural, slave-owning, or above the lowest social class—or where the inventories were more detailed.

The picture of gun ownership that emerges from these analyses substantially contradicts the assertions of Michael Bellesiles in *Arming America: The Origins of a National Gun Culture* (*Arming America*). Contrary to *Arming America*'s claims about probate inventories in seventeenth and eighteenth-century America, there were high numbers of guns, guns were much more common than swords or other edged weapons, women in 1774 owned guns at rates (18%) higher than Bellesiles claimed men did in 1765-1790 (14.7%), and 87-91% of gun-owning estates listed at least one gun that was not old or broken.

The authors replicated portions of Bellesiles's published study in which he both counted guns in probate inventories and cited sources containing inventories. They conclude that Bellesiles appears to have substantially misrecorded the seventeenth and eighteenth century probate data he presents. For the Providence probate data (1679-1726), Bellesiles has misclassified over 60% of the inventories he examined. He repeatedly counted women as men, counted about a hundred wills that never existed, and claimed that the inventories evaluated more than half of the guns as old or broken when fewer

than 10% were so listed. Nationally, for the 1765-1790 period, the average percentage of estates listing guns that Bellesiles reports (14.7%) is not mathematically possible, given the regional averages he reports and known minimum sample sizes. Last, an archive of probate inventories from San Francisco in which Bellesiles claims to have counted guns apparently does not exist. By all accounts, the entire archive before 1860 was destroyed in the San Francisco earthquake and subsequent fire of 1906. Neither part of his study of seventeenth and eighteenth-century probate data is replicable, nor is his study of probate data from the 1840s and 1850s.

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INTRODUCTION

Law professors, social scientists, and historians are now trying to answer a question that no one thought to ask before: How widespread was gun ownership in early America? Perhaps the best single source of information about what people owned in seventeenth and eighteenth-century America are appraised lists of assets at death called probate inventories—detailed, yet notoriously incomplete. These inventories were used to disclose property available for creditors, to achieve any necessary title clearing, and to ensure a proper distribution of assets among the members of the large families¹ that prevailed in early America.² Historical economists, such as the late Alice Hanson Jones, pioneered the use of these cold legal records to infer ownership patterns and behavior in early America. We use these records to estimate levels of gun ownership in early America.

This Article has several goals, both factual and methodological. First, we report high levels of gun ownership in every probate database we examined in early America—chiefly Alice Hanson Jones's collection of 919 inventories throughout the American colonies in 1774,³ the probate records of Providence, Rhode Island in 1679-1726,⁴ and the Gunston Hall database of 325 Virginia and Maryland estates, 1740-1810.⁵ These counts of guns are especially high when we compare them to other commonly owned items, such as other weapons and books. For example, in the itemized personal property inventories of white males in the three databases listed, gun ownership ranges from 54% to 73%. Because the Jones database is weighted to match the entire country in 1774, we can

1. The average household size in the 1790 census ranged from 5.7 to 6.2 throughout the Northern states. U.S. Census, 1790.

2. See Judith A. McGaw, "So Much Depends upon a Red Wheelbarrow": *Agricultural Tool Ownership in the Eighteenth Century Mid-Atlantic*, in *EARLY AMERICAN TECHNOLOGY: MAKING AND DOING THINGS FROM THE COLONIAL ERA TO 1850*, at 328, 339-40 (Judith A. McGaw ed., 1994). See generally 3 ALICE HANSON JONES, *AMERICAN COLONIAL WEALTH: DOCUMENTS AND METHODS* (1978).

3. JONES, *supra* note 2.

4. 6, 7, & 16 *EARLY RECORDS OF THE TOWN OF PROVIDENCE* (Horatio Rogers et al. eds., 1894-1901) [hereinafter *PROVIDENCE RECORDS*].

5. Gunston Hall Plantation, Probate Inventory Database, at <http://www.gunstonhall.org/probate/inventory.htm> (last visited Apr. 06, 2002).

estimate that at least 50% of all wealth owners (both males and females) owned guns. We also show that our counts are generally consistent with other published counts of guns, including those of Alice Hanson Jones, Gloria L. Main, Anna Hawley, Judith McGaw, and Harold Gill.

Second, we show how historians and economists using probate records can improve their inferences about who owns guns by using control variables of other commonly owned objects. Because inventories are often incomplete, it makes more sense to compare relative levels of ownership than to note absolute levels of ownership. Here we are explicitly extending the work of Gloria Main and Anna Hawley. In early American probate inventories, guns are much more commonly owned than cash of any kind or Bibles and religious books—and nearly as common as all books combined. Guns are also much more common than swords, cutlasses, spears, tomahawks, or other edged or bladed weapons.

Third, we bring more sophisticated multivariate modeling techniques to our analysis of probate records than have been previously used in this field. Using hierarchical loglinear modeling, we show that guns are more common in early American inventories in which the decedent was male, Southern, rural, slave-owning, or above the lowest social class—or sometimes where the inventories were more detailed.

Fourth, we partially replicate the probate gun study in perhaps the most celebrated American history book of the last year, Michael Bellesiles's *Arming America: The Origins of a National Gun Culture*.⁶ It was welcomed to the cover of the *New York Times* book review section with an enthusiastic review by Northwestern colleague and Pulitzer Prize-winner Garry Wills.⁷ The *Philadelphia Inquirer* chose it as the best nonfiction book of the year.⁸ On April

6. MICHAEL A. BELLESILES, *ARMING AMERICA: THE ORIGINS OF A NATIONAL GUN CULTURE* (2000).

7. Garry Wills, *Spiking the Gun Myth*, N.Y. TIMES, Sept. 10, 2000, § 7, at 5 (book review).

8. Carlin Romano, *The Most Important Books of 2000*, PHILADELPHIA INQUIRER, Dec. 14, 2000 ("In nonfiction, the most important book of the year was Michael A. Bellesiles' 'Arming America: The Origins of a National Gun Culture' (Alfred A. Knopf, \$30). It accomplished the astounding scholarly feat of convincing many experts in American history that a fundamental belief about our country—that the United States began as a land in which most citizens owned guns and used them—is false.").

18, 2001, Columbia University awarded *Arming America* a Bancroft Prize for history.

I. ANNA HAWLEY, GLORIA MAIN, AND JUDITH MCGAW: RESPONSES
TO INCOMPLETENESS IN INVENTORIES

A. Anna Hawley in Virginia

Probate inventories are usually regarded as the best source of information about what items of personal property were owned in early America, but they are incomplete. The problem is how to interpret this incompleteness. One scholar, Anna Hawley, has suggested that guns might have been excluded from inventories by law as well as custom.⁹ She notes that because guns were required by law to be supplied by adult males as part of their militia service, in at least one state's statutes (Virginia's¹⁰), guns were not subject to distress or execution by law. Thus, guns might not have been required to be listed on probate inventories because they were not available to creditors in any event.¹¹

Two other biases in probate records are usually noted—age bias and class bias.¹² Older people die more frequently than younger

9. She states:

Guns, on the other hand, were probably exempt by law rather than custom. . . . All free males from sixteen to sixty years of age were liable for militia duty and required by law to provide themselves with arms, powder, and shot. The act requiring this provision specified that the arms and ammunition were exempt from impressment, "distresse, seizure, attachment or execution." Appraisers in Surry County may have selectively omitted the guns of poor men from their inventories so that their heirs could meet their civic responsibility.

Anna L. Hawley, *The Meaning of Absence: Household Inventories in Surry County, Virginia, 1690-1715*, in *EARLY AMERICAN PROBATE INVENTORIES*, at 27-28 (Peter Benes ed., 1987) [hereinafter *EARLY AMERICAN PROBATE INVENTORIES*]. We do not know whether she is correct about appraisal practices.

10. 3 WALTER WILLIAM HENING, *THE STATUTES AT LARGE, BEING A COLLECTION OF ALL THE LAWS OF VIRGINIA* 13-14, 335-42 (1823).

11. Oddly, Bellesiles notes that guns were not subject to seizure by creditors, but claims that they were nonetheless required to be probated even though the protection of creditors was the main purpose of probate (along with title-clearing and informing legatees and heirs). BELLESILES, *supra* note 6, at 79-80. While it is possible that Bellesiles is correct, his contention is not supported by evidence in the book.

12. See, e.g., Ross W. Beales, Jr., *Literacy and Reading in Eighteenth-Century Westborough, Massachusetts*, in *EARLY AMERICAN PROBATE INVENTORIES*, *supra* note 9, at 41-

adults and may own more and different assets. Richer decedents are more likely to have their estates probated, though even the richest decedents may not have their estates probated or their inventories recorded.

Many researchers, such as Alice Hanson Jones in her study of 919 inventories from 1774, try to minimize these biases by weighting their samples.¹³ Jones weights older estates less than younger estates, and adjusts her weights to try to reflect all wealthholders, not just those likely to be probated.¹⁴ Further, presenting results by social class allows us to understand, at least partially, the influence of wealth on gun ownership. On balance, Jones thinks that inventories understate assets: "I believe that the American colonial inventories, at least in 1774, are more likely under—rather than over—statements of total wealth."¹⁵

42; Lois Green Carr & Lorena S. Walsh, *Inventories and the Analysis of Wealth and Consumption Patterns in St. Mary's County, Maryland, 1658-1777*, HIST. METHODS, Spring 1980; Bruce C. Daniels, *Probate Court Inventories and Colonial American History: Historiography, Problems, and Results*, 9 SOCIAL HISTORY 393-95 (1976) (noting that the biggest problem is to correct for biases—"exclusion bias" and the fact that decedents were older); Peter H. Lindert, *An Algorithm for Probate Sampling*, 11 J. INTERDISC. HIST., 649, 660 (1981) (noting that biased samples overestimate wealth because of underrepresenting the poor); Gary B. Nash, *Urban Wealth and Poverty in Pre-Revolutionary America*, 6 J. INTERDISC. HIST., 545, 548 (1976); Jacob M. Price, *Quantifying Colonial America: A Comment on Nash and Warden*, 6 J. INTERDISC. HIST., 701, 701 (1976) ("Probate inventories do, however, present two basic problems: (1) how complete was the individual inventory and (2) how representative of all estates were the inventories which were recorded and survived."); *id.* at 701-02 ("Completeness is apparently less of a problem in the colonies."); Daniel Scott Smith, *Underregistration and Bias in Probate Records: An Analysis of Data From Eighteenth Century Hingham, Massachusetts*, 32 WM. & MARY Q. 100, 104 (1975) (42% of men inventoried and 4% of women); Kevin M. Sweeney, *Using Tax Lists to Detect Biases in Probate Records*, in EARLY AMERICAN PROBATE INVENTORIES, *supra* note 9, at 32-39. Less frequently noted is gender bias in probate, perhaps because it is too obvious. *See, e.g.*, Beales, *supra*, at 42-44; Smith, *supra*, at 104; Sweeney, *supra*, at 36-37; Barbara McLean Ward, *Women's Property and Family Continuity in Eighteenth Century Connecticut*, in EARLY AMERICAN PROBATE INVENTORIES, *supra* note 9, at 75. The great majority of probated estates are from men, just as the great majority of wealth was owned by men.

13. *See* 1 JONES, *supra* note 2 (preface).

14. She states:

My 1774 study weighted down the influence of the older decedents to estimate patterns for all living probate-type wealthholders, for which the calculation of confidence intervals is appropriate. Further extension to estimates for the living nonprobate-type wealthholders required use of death rates and assumptions about how their wealth differed from that of probate-type living wealthholders.

3 JONES, *supra* note 2, at 282.

15. *Id.* at 280.

An underused approach to assessing the frequency of individual items is to compare them with items known to have been widely owned. This is a partial solution to the problems of undercounting, grouping assets in classes, and assets disappearing from estates before counting. A priori, a substantial majority of propertied white males should have owned most of the following: Bibles, books, cups, chairs,¹⁶ hats, knives, axes, and lighting (candles, candlesticks, or lanterns). Using control variables should allow us to determine if estate inventories are good places to determine ownership during life and to assess what really constitutes a small percentage.

Although Anna Hawley's article is not about guns, she compared the frequency of common items in 221 probate inventories in Surry County, a relatively poor agricultural Virginia county, from 1690 to 1715. She notes that in this county, the staple crops—tobacco and corn—needed to be hoed several times a year,¹⁷ yet only 34% of Surry estates list any hoes.¹⁸ Hawley found that guns were the most commonly listed of the six items she counted. In the middling to affluent groups (the 60% of estates ranked from the 30th to the 90th percentiles), there were the following percentages of these common items:

Guns	(63-69%),
Tables	(50-64%),
Seating furniture	(40-68%),
Hoes	(35-41%),
Axes	(31-33%),
Sharp knives	(18-20%). ¹⁹

Among the wealthiest 10% of estates, only 4% had sharp knives, but 74% had guns. None of the six items she counted were as common as guns, which appear to have been present in 50% or more of estates overall.²⁰

16. There is some uncertainty about how common chairs or stools actually were, especially in earlier periods.

17. T.H. BREEN, *TOBACCO CULTURE: THE MENTALITY OF THE GREAT TIDEWATER PLANTERS ON THE EVE OF THE REVOLUTION* 48 (1985).

18. Hawley, *supra* note 9, at 28-29.

19. Hawley does not indicate what she considered to be a sharp knife. *Id.* at 28 tbl.1.

20. Hawley does not give an overall percentage for any item except hoes, but the number

Anna Hawley points out that guns were probably often left out of Virginia estates both by custom and by law, because by law they were not supposed to be subject to impressment by the militia, the claims of creditors, or the execution of debts.²¹ Nonetheless, in Hawley's rural Virginia county 1690-1715, guns are more commonly listed than chairs, tables, or sharp knives.

As Anna Hawley argues in her analysis of Surry County, it would be a mistake to conclude that eighteenth-century decedents did not own any particular item of property simply from its absence in a probate inventory. To her analysis, we would add that, unless one compares the frequency of guns to other common items, one would confuse the incompleteness of inventories with a lack of ownership. In a general way, guns are very commonly listed in inventories compared to the listing of clothing, money, lighting, chairs, axes, hoes, books, Bibles, swords, and knives.

B. Gloria Main in Maryland

Along similar lines, Gloria L. Main studied the relative frequency with which inventories in six tidewater Maryland counties contained particular items, from 1656 to 1719.²² Most of her data were presented in terms of what 604 younger fathers owned, which she approximately generalizes to 1863 male heads of household.²³ She presents a hierarchy of items of personal property based on how commonly they were listed in the estates of young fathers:

1. Beds	(listed in 97% of estates),
2. Iron cooking utensils	(96%),
3. Pewter	(88%),
4. Arms	(78%),
5. Brass	(70%),
6. Chairs	(63%),
7. Hand Mills	(53%),

of guns (~50%) can be approximated from the numbers she does report. *Id.* at 28. In the poorest 30% of estates, 19% of the estates of poor nonhouseholders list guns, and 32% of the estates of poor householders list guns. *Id.*

21. *See id.* at 27.

22. GLORIA L. MAIN, *TOBACCO COLONY: LIFE IN EARLY MARYLAND, 1650-1720* (1982).

23. *Id.* at 288-89 tbls.C.3, C.4.

8. Books	(40%),
9. Silver	(35%),
10. Warming Pans	(34%),
11. Pictures, Curtains	(24%),
12. Chamber Pots	(22%),
13. Personal Ornaments	(20%). ²⁴

For arms, the approximately poorest 34% of estates show 50-67% arms. The richest 66% of estates list 78-95% arms, averaging over 90% of estates listing guns.²⁵ While Main did not separate out firearms from bladed weapons, we can estimate from the Providence data during a similar period that 90.3% of estates with either guns or bladed weapons have guns. Thus, 78% of the Maryland estates of young fathers list arms, and (adjusting downward) very roughly 71% of the estates of young fathers should list guns.

As Main's work suggests, guns were next in importance after beds, cooking utensils, and pewter—and ahead of chairs and books. This pattern suggests that guns were highly prized, but it does not indicate why. We do not know from these data whether guns were a necessary tool for protection, hunting, or vermin control—or just part of the cultural identity of men.

C. Judith McGaw in Pennsylvania and New Jersey

Unlike Hawley and Main, Judith McGaw²⁶ only casually compares the frequency of guns in probate estates to other common items.²⁷ McGaw, concerned with tools used by farmers, studied 250 estates of farmers with sufficient itemization to list beds in five counties in New Jersey and Pennsylvania in six one-year samples between 1714 and 1789.²⁸ The percentages of guns in probate estates is 60% in the frontier and 50% in more settled regions:

I find, for example, that only a little more than half of farmers or yeomen probably owned plows and that, among farm women,

24. *Id.* at 242 tbl.VII.1.

25. *Id.*

26. McGaw, *supra* note 2, at 328.

27. *Id.* at 332.

28. *Id.* at 343-44.

about 20 percent made do without either a pot or kettle. . . . The artifact we most often envision in early American hands—the gun—actually existed in only about half of households. And frontiersmen were only slightly more likely to own firearms: about 60 percent versus about 50 percent for inhabitants of longer-settled regions. Nonetheless, early Americans were far more likely to own guns than to possess that other icon of early American life—the Bible—although, surprisingly, frontier households came closest to owning Bibles as often as guns.²⁹

McGaw's percentages are slightly higher than the percentages we found for 1774 in the Middle colonies (41%), but they are much higher than the 14.2-14.9% frequencies found in *Arming America*,³⁰ even though Bellesiles's sample partially overlapped with McGaw's. Note that among farmers, McGaw finds as many guns as plows and that she considers a 60% level of frontier gun ownership (more than 4 times larger than Bellesiles's 14.2%) to be a smaller than expected percentage.

II. COUNTING GUNS IN PROVIDENCE PROBATE RECORDS

A. Widespread Ownership of Guns in Providence

Three volumes of Providence probate records are part of a 21-volume set of *Early Records of the Town of Providence* published from 1892 to 1915.³¹ They are transcribed into typeset with most inconsistent and archaic spellings apparently intact and interlineations marked. As was the pattern in historical transcriptions a century ago, they are meticulously indexed at the end of each volume, including a good list of estates³² and their contents and a good index of items mentioned, including books, knives, and guns. It would have taken a researcher only a few minutes to discover that guns were more common in the inventories than Bibles or knives or any other item primarily used as a weapon.³³ The

29. *Id.* at 332.

30. BELLESILES, *supra* note 6, at 445 tbl.1.

31. PROVIDENCE RECORDS, *supra* note 4.

32. The names are sometimes spelled a bit differently in the appendices.

33. *Id.* The Providence records are now available on CD-ROM from HeritageBooks.com for slightly more than the cost of Bellesiles's book, making our claims (and his) easy to check.

Providence probate records are in three volumes (6, 7, and 16) starting in 1679³⁴ and ending in 1729, though the last inventory is for a man who died in 1726.³⁵

Besides some guardianships and miscellaneous matters, there are about 186 decedents' estates. How many there are depends on what is required to be in them to count as an estate. Of these estates, 17 of the decedents leaving inventories are female³⁶ (only one of whom owned guns³⁷). Over a dozen decedents' estates contain no inventory at all or no personal property inventory. One reason for having only a real estate inventory,³⁸ besides bad record-keeping or inconsistent law enforcement, is what today is called ancillary probate. If you die as a resident of another state but still own real estate in your former town, you would probate your personal assets in your new home state, but still need ancillary probate of your real estate in your former home. It would have been a mistake to list guns on real estate inventories and none are in Providence.

There were actually only 153 male estates with personal property inventories (not 186).³⁹ One of these is explicitly listed as incomplete, since the estate was looted by the father-in-law of the

34. In *Arming America* Bellesiles reports them as running from 1680-1730, but the last inventory in volume 16 was from 1726, although the records go through 1729. We think he was just giving the approximate dates for the records that he examined. In addition, the Providence town council in 1683 asked that one earlier estate, that of Resolved Waterman who died in 1670, be added to the record book in the 1680s, which it subsequently was, 6 PROVIDENCE RECORDS, *supra* note 4, at 105-07.

There are also a few probate records scattered throughout the other 18 volumes in the series, but we found only one full inventory in those other volumes, an inventory without a gun that we included in our analyses (but that was not in Bellesiles's study). 13 PROVIDENCE RECORDS, *supra* note 4, at 32 (Estate of John Mathuson).

35. As Bellesiles probably did, we also include the Waterman inventory from 1670. See *supra* note 34.

36. *E.g.*, 16 PROVIDENCE RECORDS, *supra* note 4, at 60 (Mary Borden); *id.* at 420 (Sarah Clemance); *id.* at 410 (Abigail Hopkins); *id.* at 236 (Joanna Inman); *id.* at 146 (Mary Inman); *id.* at 238 (Tabitha Inman); *id.* at 429 (Ann Lewes); *id.* at 346 (Rachal Potter); *id.* at 278 (Elizabeth Towers); *id.* at 165 (Hannah Wailes); *id.* at 370 (Anna Whipple); *id.* at 174 (Susanna Whipple); *id.* at 70 (Mary Whiteman); *id.* at 341 (Lydia Williams).

37. 7 *id.* at 117-20 (Estate of Frelove Crawford).

38. *E.g.*, 16 *id.* at 322 (J. Crawford); *id.* at 126-27 (R. Waterman); 6 *id.* at 31 (T. Suckling); *id.* at 30 (W. Fenner).

39. We excluded a fragment of an inventory and a few cases missing inventories, which had some form of partial property list such as a property distribution or account. *E.g.*, 16 *id.* at 421 (a second R. Waterman); *id.* at 128 (J. Dexter).

decedent.⁴⁰ Three others do not have any substantial itemization of personal household goods.⁴¹ Thus, of the 153 adult males' estates with personal property inventories, 149 had usable responses—all adult males with inventories purporting to be (nearly) complete itemized lists of personal property.⁴²

Counting only guns, there are 94 estates (63%) out of 149 that have guns of some kind. If we included gun parts, such as "a peice of a Gun Barrill," the numbers would not change—still 94 of 149 estates have guns. Only nine estates have any guns listed as old or in poor condition; one of those estates also has four apparently working guns.⁴³ Thus, fully 91% of the estates with guns and 58% of the 149 estates have guns that are not listed in pejorative terms. Of course, that does not mean that these guns were actually in good working condition, only that they were not listed as old or broken.

Contrary to *Arming America's* interpretation, gun ownership drops slightly over the period of the Providence records.⁴⁴ As Chart 1 shows, guns are more common in the earlier years of the period (63-71% of estates) than in the later years. Only 52% of the 50 estates after 1720 list guns.

Using exploratory data analysis to determine preliminarily which wealth levels were associated with owning guns, we determined that estates under £50 (the smallest 19% of estates) had fewer guns, but

40. *Id.* at 359-60 (Estate of Jonathan Randall).

41. One does not itemize any personal property beyond cattle, corn, and feed, using only general language for three rooms of household goods. 6 *Id.* at 70-71 (Estate of James Mathuson). In its first inventory, another estate itemizes a few pieces of agricultural business property, but not any household property, using the broad general language—"household goods." In a supplemental inventory, a gun was added. 7 *id.* at 93 (Estate of Benjamin Hearnden). Even though that estate listed one gun, the estate lacked sufficient itemization to include it in our study. Another lists land, bonds, and "apparrill," but has no itemized personal estate. 16 *id.* at 367 (Estate of John Steere).

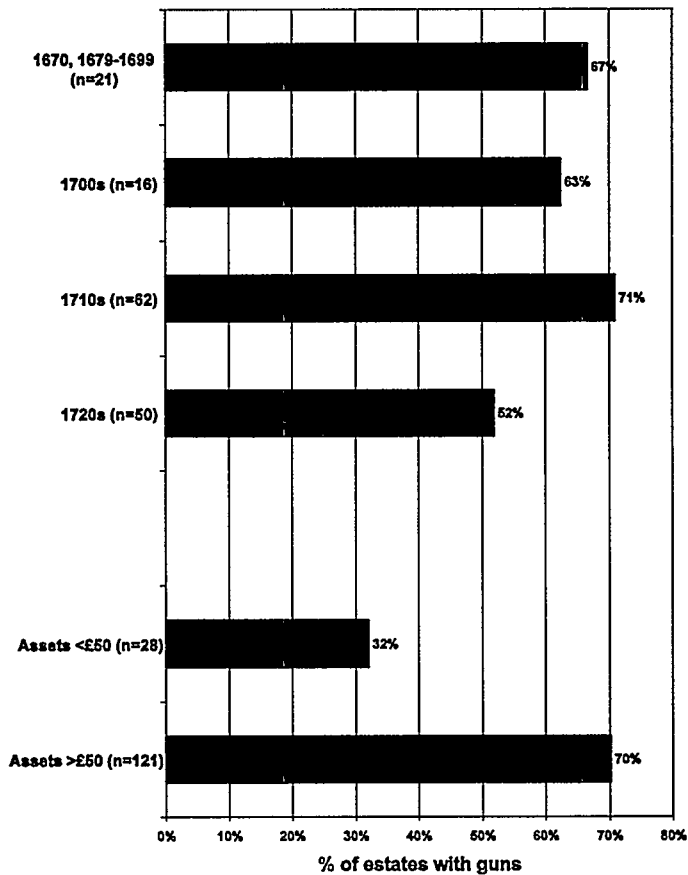
42. We included the Estate of Toleration Harris, 6 *id.* at 38-39, 95-96, in which not all the personal property had been collected or valued, but they did attempt to itemize it; further, although one might rationally doubt the completeness of such an estate, there is no actual statement that the property listed is incomplete, just not yet collected, viewed, or appraised.

43. Nearly 10% of estates have any guns listed as old or broken; about 9% of total guns were so listed.

44. BELLESILES, *supra* note 6, at 109-10 ("Two-thirds of those inventories containing guns fall into the last twenty years of this fifty-year period, after the distribution of firearms by the British government to the New England militia in Queen Anne's War."). Compared to the earlier period, gun ownership drops significantly in the last 20 years (1707-1726) of inventories (from 66% of estates to 62% of estates). The two decades from 1711 to 1730 show an insignificant 1% drop in guns from the earlier period.

**Chart 1: Frequency of Estates Listing Guns by
Time Period and by Value of Estate**

149 Providence Itemized Male Inventories, 1670 & 1679-1726



wealth had no large effect above that low threshold level.⁴⁵ We then recoded all Providence estates into two groups—those with less than £50 in assets and those with more.

Chart 1 also shows that only 32% of inventories for the poorest fifth of estates listed guns among the assets.⁴⁶ Among the other four-fifths of estates, 70% listed guns. This suggests that gun ownership among the poorest property-owners was moderate, while guns were extremely common among the bulk of Providence estates. These data are consistent with an interpretation that guns were not a luxury good, but rather a relatively expensive staple that only a third of the poorest estates could afford, but that a solid majority (70%) of middle and upper class estates owned.

The average household size in the 1790 census in Providence was 6.1 people and it ranged from 5.7 to 6.2 throughout the Northern states in 1790.⁴⁷ Thus, in Providence there were many more white males over the age of 15 than there were families. If white males were evenly distributed among families, the average household would have three white males, half of them over the age of 15. If at least 63% of adult white males owned guns and they were distributed about evenly across households (which they would not be), nearly all families in Providence had guns, since very few people lived in families of one (less than 1% of people in 1790 Providence). Further, most adult females and most children of both sexes lived in households with adult white males.

The fact that a typical Providence household had three white males may also explain why these probate records show as few guns, knives, chairs, candles, candlesticks, and Bibles as they do.

45. For this analysis, we used the totals in the inventories themselves, recoding them into five groups. Where it could be easily done, we totaled short lists of assets and added assets in supplementary inventories. We did not total long inventories, where the inventories themselves did not do so. Because of supplementary inventories, probable inconsistencies in adding real estate assets to estate totals, and the confusion of subtotals in their texts, our exploratory analysis should not be considered reliable. Once the decision was made to dichotomize the asset variable, all estates were fairly reliably assigned into the two groups, notwithstanding the classification problems mentioned.

46. Actually, it is the poorest 19% of such estates—with assets below £50 in value.

47. U.S. Census, 1790. It appears that family sizes were even larger early in the eighteenth century. Duane E. Ball, *Dynamics of Population and Wealth in Eighteenth-Century Chester County, Pennsylvania*, 6 J. INTERDISC. HIST. 621, 633 (1976) (noting that in Chester County, Pennsylvania, average family size declined by more than two persons from the beginning of the eighteenth to the end of the eighteenth century).

Why not treat some of these things as belonging to the family or household, rather than to the decedent? A possible partial corrective for this problem, using controls, is explored in the next section.

B. Introducing Control Variables: Other Common Items

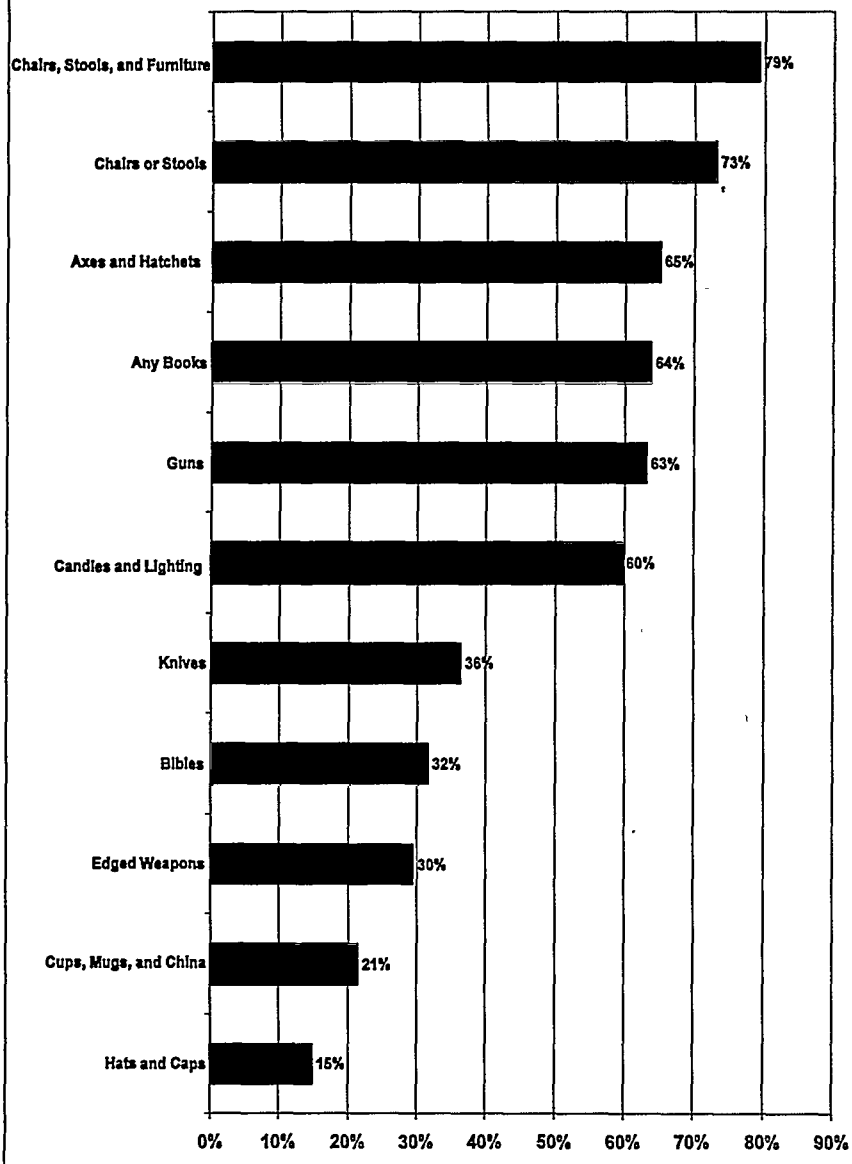
As historical economists using probate records have often noted, probate inventories are incomplete. Quite aggressively, Bellesiles claims that items were not often removed from estates after death; that people made few lifetime gifts not mentioned in wills or inventories; that inventories itemized each item of personal property; and that early Americans owned axes, knives, and books, but few guns.⁴⁸ These claims can be explored by comparing gun ownership to that of other commonly owned items. It is widely believed that many propertied white males were religious and could read, especially in the later colonial period,⁴⁹ so Bibles should be common and other books even more common, though not necessarily as universal as the other items. Also, Bibles have the heirloom quality that pro-gun scholars sometimes claim that guns had. Thus, if Bibles are much more common than guns in these probate inventories, the heirloom explanation for the absence of guns would be unsupported. To examine whether early Americans used knives, swords, and axes as weapons because they owned few guns, it is instructive to look at swords and rapiers, as well as knives, axes, and hatchets.

As Chart 2 shows, guns are extremely likely to be listed in Providence estates (63% of itemized male inventories list them), compared to other commonly owned objects. Thus if axe and knife ownership was near universal in Providence, then gun ownership was probably near universal as well, since guns are as commonly listed as axes (65%) and more commonly listed than knives of all kinds (36%), including table knives. If one compares gun ownership

48. See *infra* text accompanying notes 119-37.

49. Jon Butler and others have inquired just how religious Americans were. See JON BUTLER, *BECOMING AMERICA: THE REVOLUTION BEFORE 1776* (2000); JON BUTLER, *RELIGION IN COLONIAL AMERICA* (2000); see also FRANK LAMBERT, *INVENTING THE "GREAT AWAKENING"* (1999) (discussing the extent of religious boom in America in the 1740s). The classic work on the acquisition of literacy in the late eighteenth century is WILLIAM GILMORE, *READING BECOMES A NECESSITY OF LIFE: MATERIAL AND CULTURAL LIFE IN RURAL NEW ENGLAND, 1780-1835* (1989).

Chart 2: Frequency of Estates Listing Various Items
149 Providence Itemized Male Inventories, 1670 & 1679-1726



(63%) with the ownership of swords, cutlasses, bayonets, and other edged weapons (30%),⁵⁰ the difference is particularly striking. Indeed, the odds of finding a gun in a colonial Providence inventory are 4.1 times as high as the odds of finding a sword or other edged weapon.⁵¹

Guns were as commonly listed in Providence estates (63%) as all lighting items combined (60%): candles, tallow, candlesticks, oil, lamps, and lanterns. Gun ownership is as common as book ownership (62%) and much more common than the ownership of Bibles (32%). It should be noted that the low totals for hats and caps (15%) are mostly the result of the very common use of general language (e.g., wearing apparel) in describing clothes. As for chairs and stools, even when we include the general language "furniture," the percentages remain lower than expected (79%).

The high, but far from universal, itemization of most of these extremely common items of personal property suggests that Providence probate inventories probably do not accurately reflect the actual ownership patterns of decedents, at least without using control variables. Untethered, free-floating estimates of the ownership of particular items are (in our opinion) a misuse of this fallible source. Only relative numbers make much sense. The idea that people in early America used knives because they had few guns is

50. Here we are treating axes, hatchets (which were much less common than axes), and knives, not as edged weapons because this was not their primary purpose. Bellesiles presents a small amount of evidence to support his conclusion that axes were very frequently used as weapons. After checking the sources he cites, we determined that they do not support his conclusion. Unlike hatchets, which can be wielded with one hand and thrown, axes required two hands and were generally used for attacking stationary targets, such as trees and logs. Our classification of axes, hatchets, and knives is the conventional one, since neither Alice Hanson Jones nor the Gunston Hall database classify them as weapons. (Very few knives are listed in terms suggesting that they were used for hunting.) Tomahawks, of course, are always treated as weapons. We might be wrong to follow the conventional classification of experts on colonial property items. Yet most of the sources Bellesiles cites in his book do not support his claim that people favored axes over guns for hunting and battle or treated them as the equal of guns.

51. Odds-ratios (and log odds-ratios) are the staple of categorical data analysis in the social sciences—being the heart of both logistic regression analysis and of more sophisticated categorical techniques, such as hierarchical loglinear analysis. Although less intuitive than percentages for all but frequent gamblers, odds-ratios and log odds-ratios have more powerful statistical properties for modeling ratios. Computing the odds-ratio expressing the ratio between 63% gun ownership (1.7 to 1 odds) and 30% edged-weapon ownership (.42 to 1 odds) reveals an odds-ratio of $((.63/(1-.63))/(.30/(1-.30)))=1.7/.42=4.1$.

undercut by our finding that, at least in Providence, only 36% of the records show knives.

We then performed multivariate analyses to determine which variables predicted listing guns in probate inventories. Tables 1 and 2 show the results of loglinear modeling with nested models. In both tables, the first model includes all main variable effects for six explanatory variables of possible theoretical interest. The second model in each table is the result of hierarchical loglinear analysis. This is a sophisticated modeling technique that tries to fit the simplest model accounting for almost all of the variation shown between variables. It involves fitting a model with hundreds of interactions between all levels of all variables in the model and then backing out the insignificant and meaningless interactions. All variables of theoretical interest remain in all models, just most of the interactions are removed.

This technique has several advantages, even compared to most other multivariate techniques (such as logistic regression).⁵² First, it can be used to test all interactions at all levels of all variables, not just a defined set of two-way interactions between predictors. Second, with hierarchical loglinear modeling, researchers often use a Bayesian criterion (BIC) to inform the decision to eliminate statistically significant but weak relationships from any particular model. Since statistical significance is so dependent on sample sizes, it is good to have an objective criterion (BIC) to aid researchers in their ultimate (nonstatistical) task of assessing theoretical importance. Third, highly complex models can be expressed in extremely simple notation.⁵³ Like the cruder technique of logistic regression analysis, hierarchical loglinear modeling predicts log odds, but with the small sets of variables of theoretical interest here, this technique can explore much more complex models than is practically feasible with logistic regression.

52. In sophisticated demographic research, loglinear analysis has become more common than regression analysis.

53. Although simple, the notation can be daunting to the uninitiated. For example, consider the model: [YF][YA][FEDCBA]. Although the specification of this model is brief, it actually specifies one dependent variable Y, two main effects (one between Y and A and one between Y and F), and dozens of two-way, three-way, four-way, five-way, and six-way interaction variables between the six possible predictor variables A, B, C, D, E, and F. A model that would normally take a full page to list all its dozens of interactions takes only 10 letters and 6 brackets to specify.

Table 1
Hierarchical Loglinear Modeling
Providence Male Itemized Estates

Sample: N=149 males, 1670, 1679-1726

Dependent Variable:

Y: gun (None, Listed)

Independent Variables:

A: years (<1700,1700s,1710s,1720s)

B: value of assets (<£50, >£50)

C: axe or hatchet (None, Listed)

D: chair or stool (None, Listed)

E: cup, mug, or china (None, Listed)

F: edge weapon (None, Listed)

Model (with 6 main effects):

[YA][YB][YC][YD][YE][YF][FEDCBA] $G^2=56.9$, 119 df, $p<1.00$

	Log-odds		Exponent	Exponent of
	Ratio	s.d.	(Relat. Odds)	Absolute Value
YA (gun-years)				
<1700, 1700s	-.18	.69	.83	1.2
1700s, 1710s	.38	.59	1.5	1.5
1710s, 1720s	-.81	.40	.44	2.2
YB (gun-assets)	1.60	.45	5.0	5.0
YC (gun-axe)	.98	.36	2.7	2.7
YD (gun-chair)	1.18	.38	3.3	3.3
YE (gun-cup)	1.13	.49	3.1	3.1
YF (gun-edge w.)	.93	.41	2.5	2.5

Most Parsimonious Model Fitting the Data:

[YB][FEDCBA] $G^2=74.4$, 126 df, $p<1.00$

	Log-odds		Exponent	Exponent of
	Ratio	s.d.	(Relat. Odds)	Absolute Value
YB (gun-assets)	1.61	.45	5.0	5.0

Table 2
Hierarchical Loglinear Modeling
Providence Male Itemized Estates

Sample: N=149 males, 1670, 1679-1726

Dependent Variable:

Y: gun (None, Listed)

Independent Variables:

A: years (<1720, 1720s)

B: value of assets (<£50, >£50)

C: axe or hatchet (None, Listed)

D: chair or stool (None, Listed)

E: cup, mug, or china (None, Listed)

F: edge weapon (None, Listed)

Model (with 6 main effects):

[YA][YB][YC][YD][YE][YF][FEDCBA] $G^2=29.6$, 57 df, $p<.99$

	Log-odds		Exponent	Exponent of
	Ratio	s.d.	(Relat. Odds)	Absolute Value
YA (gun x years)	-.71	.36	.49	2.0
YB (gun x assets)	1.61	.45	5.0	5.0
YC (gun x axe)	.98	.36	2.7	2.7
YD (gun x chair)	1.18	.38	3.3	3.3
YE (gun x cup)	1.14	.49	3.1	3.1
YB (gun x edge w.)	.93	.41	2.5	2.5

Most Parsimonious Model Fitting the Data:

[YA][YB][FEDCBA] $G^2=37.9$, 61 df, $p<.99$

	Log-odds		Exponent	Exponent of
	Ratio	s.d.	(Relat. Odds)	Absolute Value
YA (gun x years)	-.71	.36	.49	2.0
YB (gun x assets)	1.60	.45	5.0	5.0

Both tables report results of models predicting whether an itemized male inventory in Providence contains a gun. Table 1 shows that, controlling for all interactions between the predictor variables, the odds of listing a gun in the richest 81% of estates (those with assets exceeding £50) is five times as high as the odds of the lowest 19% of estates listing a gun (controlling for all interactions between the predictor variables). The second model includes all interactions between the six predictor variables and the two main effects that meet the BIC criterion. None of the other variables make a meaningful direct contribution to accounting for the variance in the data.

In Table 2 we convert the year variable from four categories to two. The odds of having a gun are five times as high if an estate has more than minimal assets (>£50) than if it does not and about two times as high⁵⁴ if an estate is from the decades before the 1720s rather than during the 1720s. None of the other variables make a meaningful direct contribution to accounting for the variance, thus failing to meet the BIC criterion.

III. COUNTING GUNS IN 1774 COLONIAL AMERICA

While the Providence data are excellent for showing high levels of gun ownership in one New England town in one period, the more relevant question is: What was the pattern of gun ownership throughout the country? Fortunately, we can build on the extraordinary collection of 919 probate inventories from 1774 (a few were from 1773 and early 1775)⁵⁵ that Alice Hanson Jones published in 1978. Not only is this a large collection of published inventories transcribed from handwritten records, but Jones took extraordinary steps to achieve a representative sample of the entire wealth-holding population of the country in 1774. She then weighted each inventory to account for her sampling design, the age distribution of the population, and the likelihood of being probated. This allowed

54. This is actually based on the exponent of the absolute value of the result for being from the 1720s. Thus, it is approximate. More precisely, based on the model actually fit, the relative odds of a 1720s estate listing a gun are only 49% as high as the odds for earlier estates.

55. JONES, *supra* note 2. For some counties with fewer than twenty-five estates from 1774, Jones's sample includes some inventories from 1773 and early 1775 (and in New York, 1772), but the overwhelming majority come from 1774. 1 *id.* (preface).

her to generate wealth and property ownership estimates for the wealth-holding population and the probate-type wealth-holding population.

Because the entire wealth-holding population is a larger part of the U.S. population than the probate-type wealth-holding population, we have used weights for the wealth-holding population (even though this results in about 2% lower gun ownership than if we used the probate-type population). The counts and percentages in our charts are weighted to match the wealth-holding population of the Thirteen Colonies in 1774. These weights affect the levels of guns only slightly; thus, compared to the raw, unweighted percentages, the weighted frequencies of guns differ by only a few percentage points.

In *Arming America*, Bellesiles cites Jones's book⁵⁶ but does not disclose that he included her data in his totals in his Table 1 for 1765-1790.⁵⁷ In his 1996 *Journal of American History* article,⁵⁸ however, he gives exactly the same percentages in each cell for the 1765-1790 period as he republished in his book, saying in the 1996 article that he included the Jones data,⁵⁹ as well as data from other unnamed sources. Also, for most states in his probate study, Bellesiles used only the counties that Jones used,⁶⁰ relying on exactly the same twenty-five counties as Jones did for every state.⁶¹

56. BELLESILES, *supra* note 6, at 530 n.16.

57. *See id.* at 445.

58. Michael A. Bellesiles, *The Origins of Gun Culture in the United States, 1760-1865*, 83 J. AM. HIST. 425, 427-28 (1996).

59. *Id.* at 428 ("Integrating Alice Hanson Jones's valuable probate compilation into this general study and examining counties in sample periods during the eighty-five years from 1765 to 1850 reveals a startling distribution of guns in early America."). This is the only sentence in the article disclosing the sources of his 1765-1790 data.

60. *See* BELLESILES, *supra* note 6, at 445 tbl.1.

61. He added a few counties from other states (some presumably for years beyond the 1765-1790 period): Vermont, Georgia, Ohio, Indiana, California, and two additional counties in Pennsylvania. *Id.* The only part of Jones's study that he appeared to exclude is one set of twenty-three estates in Jones's database, her small sample from the entire state of New York. *Id.*; JONES, *supra* note 2. Since reading a draft of this paper, Bellesiles has recanted his 1996 claim, *see supra* note 59, that he integrated Jones's compilation of inventories into his probate study. Michael Bellesiles, *Arms and the Ancestors*, WALL ST. J., Apr. 24, 2001, at A25 (speaking of "published sample sets I did not use, those of Alice Hanson Jones (919 inventories, 1774-1775)"). While the Jones data would provide enough Southern cases to falsify *Arming America's* 14.7% mean as mathematically impossible, there are more than enough other cases to do so in the rest of Bellesiles's sample. *See infra* notes 107-13 and accompanying text.

Guns were common in 1774 estates, even in admittedly incomplete probate records—overall, 50% of all wealthholders in the Thirteen Colonies in 1774 owned guns.⁶² Among male probate-type wealthholders, 54% owned guns listed in their estates. Moreover, guns were mostly in good condition. About 87% of itemized male estates with guns listed at least one gun that was not listed as old or in poor working condition.

Not all of these estates have itemized inventories of personal property including household property. For example, an estate that lists only real estate or “house and its contents,” or only crops and farm implements, is not sufficiently complete to count as an itemized estate. If one sets aside just these thirty estates without substantial itemization and the eighty-one female estates,⁶³ that leaves 813 itemized male estates.⁶⁴ Charts 3 through 5 set out characteristics⁶⁵ of these itemized male estates.

As Chart 3 shows, 54% of itemized male estates in 1774 had guns; 47% of estates had guns not listed as old or in poor condition. This compares with a higher rate of books (62%) and much lower percentages of Bibles or religious books (27%). Almost as interesting as the high level of gun ownership is the low level of swords, cutlasses, bayonets, and other blade or edged weapons (14% of estates). Indeed, based on probate records, in colonial America in

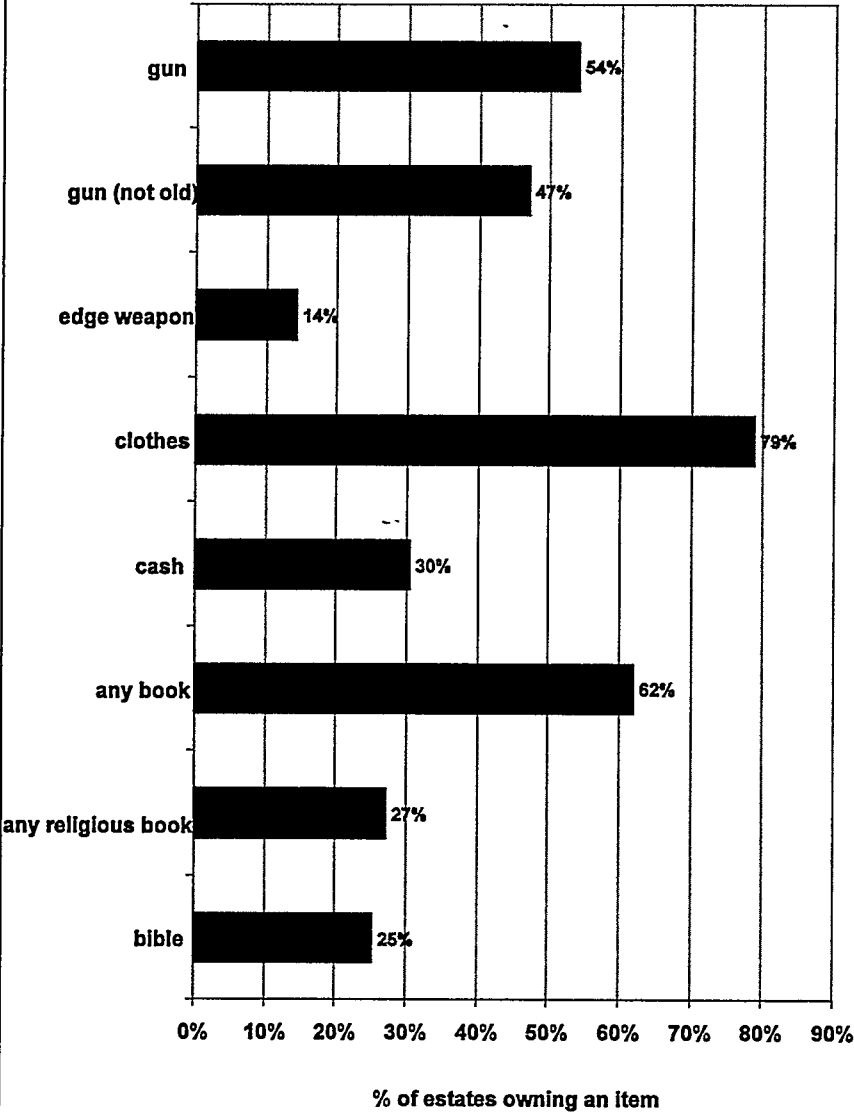
62. In all, 52% of male colonial wealthholders in 1774 had guns, while 18% of female wealthholders had guns. If we exclude estates that have no significant itemization of personal property, 54% of male wealthholders' estates have guns, and 19% of female wealthholders' estates have guns.

63. Five of these eighty-one female estates are unitemized.

64. This includes one free African-American who owned slaves but not a gun. 1 JONES, *supra* note 2, at 7; 3 *id.* at 1499-1500.

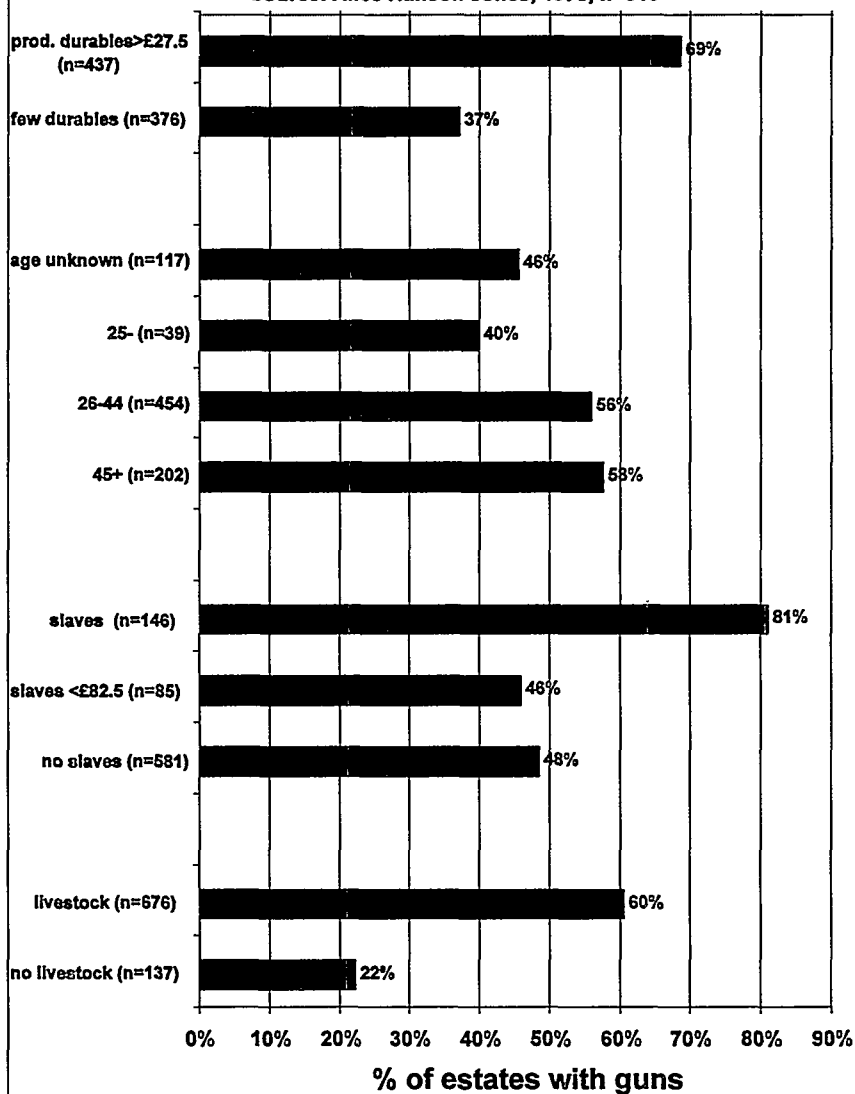
65. Jones coded each item in the Middle colonies (except New York) in one database and the general characteristics of each estate from all regions in several other databases (including gender, apparel, and wealth). We further coded the individual items (guns, edged weapons, etc.) from the inventories of New England, New York, and the South ourselves, but used Jones's coding and description of individual items (including guns) for the Middle colonies from her itemized database. We then combined these data into a single database, using her weights for each estate as well as her data. Our statistics assume that her stratified probability sample was as effective as a simple random sample (SRS) since no design effect was noted, but our hierarchical loglinear modeling applies a higher test (BIC) for effects large enough to be meaningful. Because her sample is certainly less effective than a SRS (especially for the estimates of wealthholders rather than probate-type wealthholders), one should look more at the strength of relationships than at statistical significance.

**Chart 3: Frequency of Various Items
in Itemized Male Estates, 1774**
Source: Alice Hanson Jones, 1978, n=813

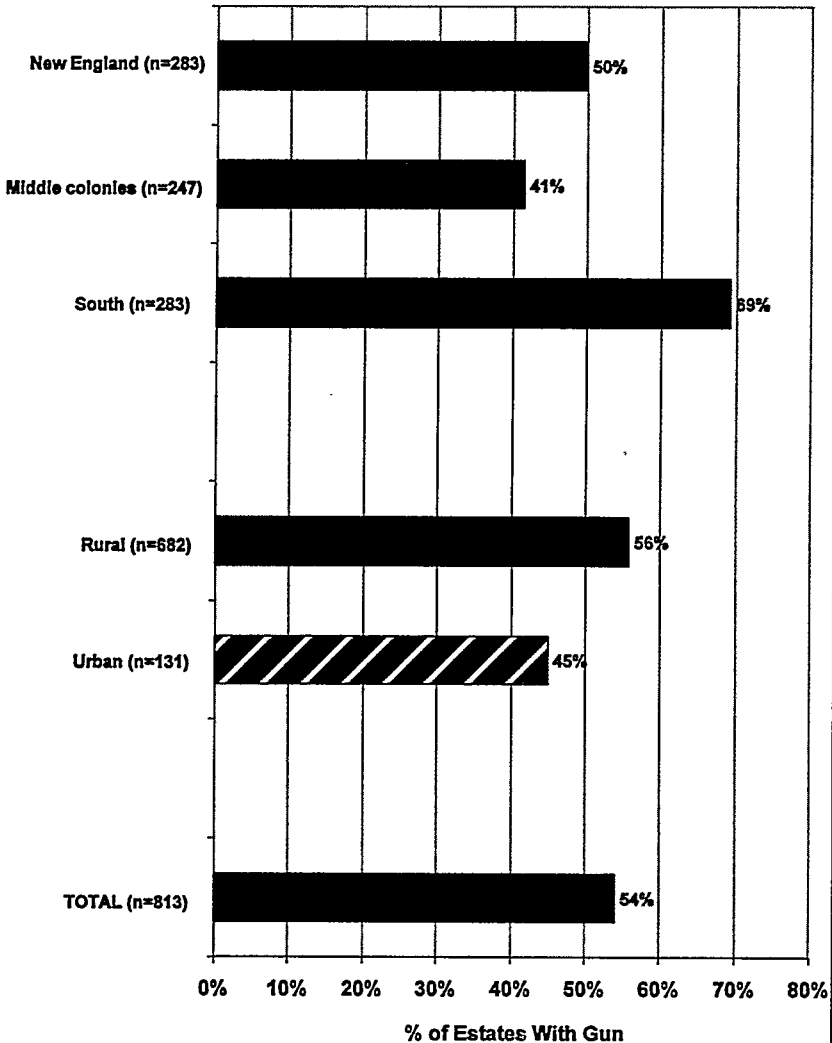


**Chart 4: Frequency of Guns in Itemized Male Estates
by Various Characteristics, 1774**

Source: Alice Hanson Jones, 1978, n=813

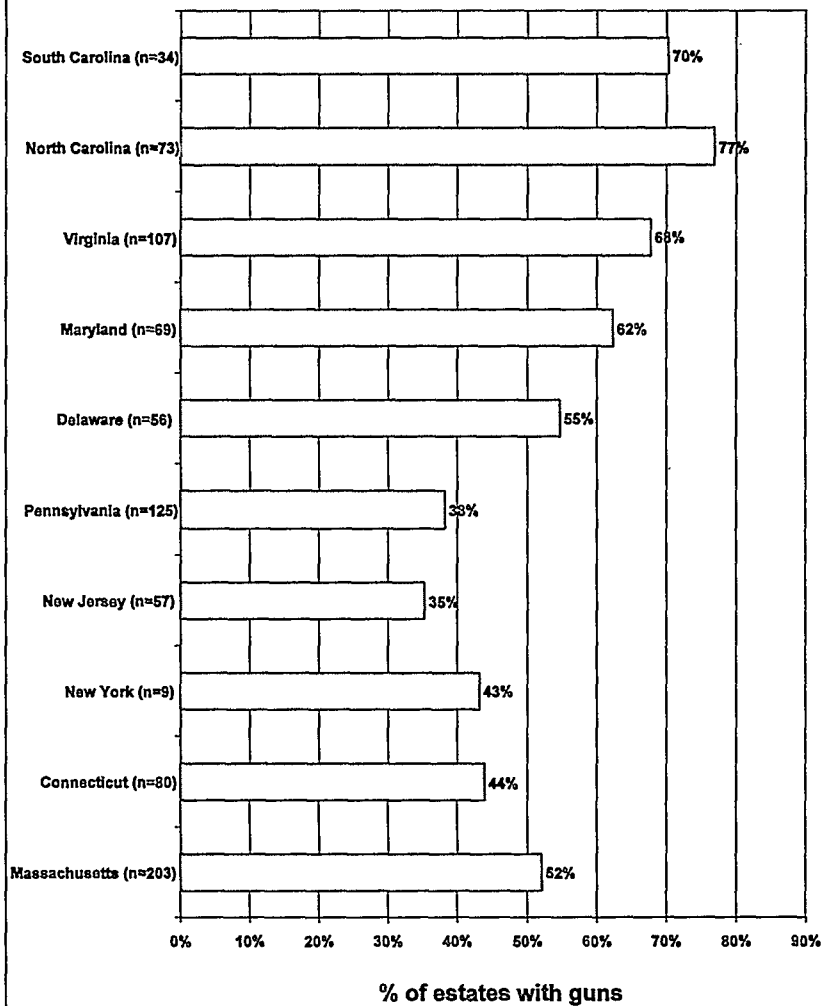


**Chart 5: Frequency of Gun Ownership in Itemized
Male Estates by Region and Urban/Rural, 1774**
Source: Alice Hanson Jones, 1978, n=813

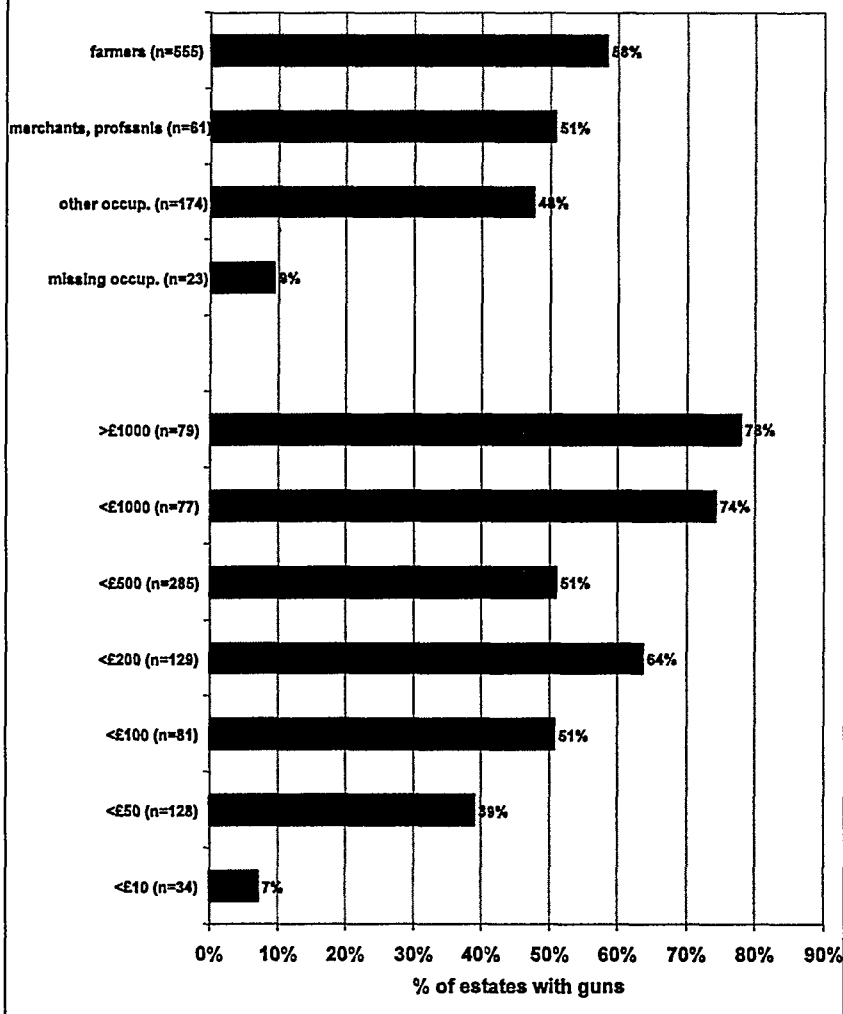


**Chart 6: Frequency of Gun Ownership in
Itemized Male Estates by Colony, 1774**

Source: Alice Hanson Jones, 1978, n=813



**Chart 7: Frequency of Guns in Itemized Male Estates
by Occupation and Physical Wealth, 1774**
Source: Alice Hanson Jones, 1978



1774, the relative odds of a male wealthholder owning a gun were seven times as high as the odds of him owning an edged weapon.

In early America, gun ownership was higher in rural areas than in urban areas (56% to 45%). Moreover, 60% of estates that list livestock also list guns, compared to only 22% of estates not owning livestock—owning livestock being a strong indicator of current (rather than past) farming activity. Although estates with few slaves owned no more guns (46%) than estates without slaves (48%), gun ownership among the bulk of slave-owning estates (with slaves valued >£82.5) was very high—81%. Indeed, the odds that large slaveholders would own guns is 4.3 times as high as the odds of gun ownership for estates without large numbers of slaves.

There are some differences between colonies and regions (Charts 5-6). Southern estates have many more guns than other regions (69%). The lowest gun ownership was observed in a string of states from Connecticut and New York⁶⁶ to New Jersey and Pennsylvania, only 35-44% of whose estates had guns (Chart 6).

Among occupations (Chart 7), farmers have slightly more guns (58%) than other occupations. Those with missing occupations have many fewer guns (only 9%), suggesting that incompleteness of probate inventories is an important possible reason for an inventory lacking guns, even among male estates with itemized inventories. Total physical wealth is related to gun ownership, with 74-78% of the most elite estates having guns and only 7% of the poorest probate estates owning guns.

Next, we used hierarchical loglinear modeling to predict whether an estate would list a gun. In Table 3, we used all estates, including female estates and those without itemized inventories. In Table 3, the most parsimonious model that fits the data suggests strong relationships between gun ownership and several predictors. Men have about 5 times as high odds of owning a gun as women. Large slave-owners have 4.3 times as high odds of owning a gun as small slave-owners or those who own no slaves. Those who own livestock have odds of gun-owning 6.7 times as high as those who do not. Active farming and large slave-owning are good predictors of owning guns. Inventories with no itemization have no guns. Physical wealth

66. There were twenty-three New York estates, all male. Because of the small sample size for New York, Jones reduced the weighting of those cases, thus yielding a weighted *n* shown in Chart 6 of only nine estates.

and region are not meaningful direct predictors of guns in this model.

Tables 4 and 5 show models for 813 male itemized estates, excluding female estates and those without itemization. Both tables show high odds of gun ownership for Southerners, livestock owners, and those whose estates contain substantial amounts of producer durables. Producer durables include livestock, guns,⁶⁷ other weapons, wagons, wheelbarrows, harnesses, plows, hoes, shovels, sickles, axes, saws, hatchets, mills, grindstones, bags, buckets, bushels, spinning wheels, tools, lumber, nails, and fishing equipment. The odds that inventories contain guns are 11.6-11.7 times as high if they record an occupation as when they do not. Physical wealth and slaveholding are statistically significant in this modeling, but not meaningful main predictors of guns using the BIC criterion.

In Table 5, controlling for all interactions between the predictor variables, the odds of having a gun are several times higher for Southerners, those who own livestock, and those whose physical wealth exceeds £10. Inventories are much more likely to contain guns if they record an occupation and list more than small amounts of producer durables (valued at £27.5 or greater). The main effect between large slaveholding and guns is statistically significant, but not meaningful using the BIC criterion.

Table 3
Hierarchical Loglinear Modeling
1774 Colonial Estates

Sample: N=919 (including 81 female estates and 31 estates without itemized personal property)

Dependent Variable:

Y: gun (None, Listed)

Independent Variables:

A: gender (Male, Female)

67. One reason for dichotomizing a level of producer durables larger than the value of guns in virtually all estates is so that the same gun data are not both a predictor variable and the dependent variable.

B: itemization of personal household property (Some, Almost none)

C: physical wealth (<£10, £10-49, £50-99, £100-199, £200-499, £500-999, >£1,000)

D: livestock (None, Livestock)

E: slaves (None or slaves valued at <£82.5, Slaves valued at >£82.5)

F: region (South, New England, Middle Colonies)

Model With 6 Main Effects: [FEDCBA][YB][YD][YA][YE] $G^2=117.2$, 323 df, $p<1.00$

	Log-odds		Exponent	Exponent
	Ratio	s.d.	(Relat. Odds)	(of Abs. Value)
YA (gun x gender):	-1.60	.34	.20	5.0
YB (gun x itemization):	-5.31	2.45	.005	202.4
YC (gun x wealth):				
<£10, £10-49	2.47	.73	11.8	11.8
£10-49, £50-99	.48	.27	1.6	1.6
£50-99, £100-199	.72	.27	2.1	2.1
£100-199, £200-499	-.65	.21	.52	1.9
£200-499, £500-999	.89	.26	2.4	2.4
£500-999, >£1,000	.28	.34	1.3	1.3
YD (gun x livestock):	1.90	.21	6.7	6.7
YE (gun x slaves):	1.46	.20	4.3	4.3
YB (gun x south/new eng.):	-.77	.16	.46	2.2
(gun x new eng./middle):	-.22	.17	.80	1.2
(gun x south/middle):	-.99	~ .17	.37	2.7

Most Parsimonious Model Fitting the Data:

[FEDCBA][YB][YD][YA][YE] $G^2=165.6$, 331 df, $p<1.00$

	Log-odds		Exponent	Exponent
	Ratio	s.d.	(Relat. Odds)	(of Abs. Value)
YA (gun-gender):	-1.59	.34	.20	4.9
YB (gun-itemization):	-5.31	2.45	.005	202.4
YD (gun-livestock):	1.90	.21	6.7	6.7
YE (gun-slaves):	1.46	.20	4.3	4.3

Table 4
Hierarchical Loglinear Modeling
1774 Colonial Male Estates

Sample: N=813 (male estates with itemized personal property)

Dependent Variable:

Y: gun (None, Listed)

Independent Variables:

A: physical wealth (<£10, £10-49, £50-99, £100-199, £200-499, £500-999, >£1,000)

B: region (South, New England, Middle Colonies)

C: slaves (None or slaves valued at <£82.5, Slaves valued at >£82.5)

D: livestock (None, Livestock)

E: producer durables (None or <£27.5, Producer durables >£27.5)

F: occupation missing (Unknown, Occupation known)

Model With 6 Main Effects: [FEDCBA][YD][YF][YE][YB]

G²=133.2, 323 df, p<1.00

	Log-odds Ratio	s.d.	Exponent (Relat. Odds)	Exponent (of Abs. Value)
YA (gun x wealth)				
<£10, £10-49	2.30	.75	10.0	10.0
£10-49, £50-99	.51	.28	1.7	1.7
£50-99, £100-199	.54	.29	1.7	1.7
£100-199, £200-499	-.55	.22	.58	1.7
£200-499, £500-999	1.03	.29	2.8	2.8
£500-999, >£1,000	.17	.38	1.2	1.2
YB (gun x south/new eng.):	-.82	.18	.44	2.3
(gun x new eng./middle):	-.31	.17	.73	1.4
(gun x south/middle):	-1.13	~ .18	.32	3.1
YC (gun x slaves):	1.55	.23	4.7	4.7
YD (gun-livestock):	1.79	.23	6.0	6.0
YE (gun-durables):	1.29	.15	3.6	3.6
YF (gun-occup. missing):	-2.46	.72	.09	11.7

Most Parsimonious Model Fitting the Data:[FEDCBA][YD][YF][YE][YB] $G^2=162.6$, 330 df, $p<1.00$

	Log-odds Ratio	s.d.	Exponent (Relat. Odds)	Exponent (of Abs. Value)
YB (gun-south/new eng.):	-.82	.18	.44	2.3
(gun-new eng./middle):	-.31	.17	.73	1.4
(gun-south/middle):	-1.13	~ .18	.32	3.1
YD (gun-livestock):	1.79	.23	5.99	6.0
YE (gun-durables):	1.29	.15	3.63	3.6
YF (gun-occup. missing):	-2.45	.72	.09	11.6

Table 5
Hierarchical Loglinear Modeling
1774 Colonial Male Estates

Sample: N=813 (male estates with itemized personal property)**Dependent Variable:****Y: gun (None, Listed)****Independent Variables:****A: livestock (None, Livestock)****B: occupation missing (Unknown, Occupation known)****C: slaves (None or slaves valued at <£82.5, Slaves valued at >£82.5)****D: producer durables (None or <£27.5, Producer durables >£27.5)****E: physical wealth (<£10, >£10)****F: south (New England or Middle Colonies, South)****Most Parsimonious Model Fitting the Data:**[FEDCBA][YA][YE][YB][YD][YF] $G^2=30.1$, 58 df, $p<1.00$

	Log-odds Ratio	s.d.	Exponent (Relat. Odds)	Exponent (of Abs. Value)
YA (gun-livestock):	1.72	.22	5.6	5.6

YB (gun-occup. missing):	-2.50	.75	.08	12.2
YD (gun-durables):	1.31	.15	3.7	3.7
YE (gun-physical wealth):	-3.00	.73	.05	20.1
YF (gun-south region):	.96	.16	2.6	2.6

Thus, the picture that emerges from a careful analysis of the 1774 Jones database is directly contrary to the picture that *Arming America* paints for the larger 1765-1790 period. In the Jones database, guns are common (not rare). Guns are apparently in good condition (not usually listed as old or damaged). Women own guns at higher rates (18%⁶⁸) than Bellesiles says men own guns (as opposed to his claim that no women owned guns⁶⁹). In rural areas, guns are more common. Edged weapons are much less common than guns (not more common).

IV. MARYLAND AND VIRGINIA, 1740-1810—THE GUNSTON HALL PROBATE INVENTORY DATABASE

At George Mason's home, Gunston Hall Plantation in rural Virginia, the museum's staff has collected and analyzed a database of 325 estate inventories from selected counties in Virginia and Maryland.⁷⁰ For these 325 inventories, they catalogued over 65,000 individual objects named in the inventories, a database that we analyzed statistically. Michael Bellesiles did not analyze this database.

The staff of Gunston Hall originally started this enterprise because they had no probate inventory for George Mason himself. Thus, they collected records for counties in the two states in which Mason did business. Nothing about the selection process was directly concerned with guns, so there should be no bias for or against estates with guns, except as gun ownership is related to other criteria for selection (which it probably is). These 325 estates, nonetheless, are far from a random sample. The process of selection

68. This is the weighted average of all women. If one excludes women without itemized inventories, the percentage of female wealthholders with guns would be 19%.

69. See BELLESILES, *supra* note 6, at 267. We also counted substantial percentages of guns in female estates in 1765-1766 in Charleston, South Carolina.

70. Gunston Hall Plantation, Probate Inventory Database, (CD-ROM, 2000) (325 individual inventories are available for downloading at gunstonhall.com, where you can purchase a CD-ROM of the coded database and the inventories); see also *supra* note 5.

was purposely weighted in favor of estates with food service items, particularly forks. The process was also weighted in favor of more detailed inventories, particularly ones listing items room by room. That these are highly detailed inventories is evidenced by the extremely high percentage (97%) of estates listing some goods related to lighting, such as candles, candlesticks, lanterns, and so forth.

The User's Manual for the database explains the selection process⁷¹ and their division into social classes, based mostly on food service items. They classified the four social classes from "Old-Fashioned" (having no forks⁷²) through "Decent" and "Aspiring" to "Elite" (dinner service for 20 guests).⁷³

The subtext of the modern historical inquiry into the frequency of gun ownership is the original meaning of the Second Amendment, which recognizes the right to bear arms. The Gunston Hall database may be relatively unimportant for determining the absolute level of gun ownership in eighteenth-century America, although it is still relevant for determining the ownership of guns relative to other weapons.

While this database might not particularly interest cultural historians, it is of special interest to intellectual and legal historians.⁷⁴

71. See Gunston Hall Plantation, Probate Inventory Database User's Manual, at 2 (2000) ("For further details on the criteria for inclusion see Barbara Carson, *Ambitious Appetites: Dining, Behavior, and Patterns of Consumption in Federal Washington* (Washington, D.C.: The American Institute of Architects Press, 1990, particularly pages 30-52.)").

72. Forks were important markers of social status. See generally NORBERT ELIAS, *THE CIVILIZING PROCESS* 103-05 (Edmund Jephcott trans., 1994).

73. The User's Manual states:

Classifications used in the Gunston Hall Inventory Database are: . . .

E: (Elite) The economic designation for inventories of the wealthiest decedents which exceed in quantity and quality all the criteria of the "Aspiring" classification. These inventories contain sufficient knives, forks, spoons, and other accouterments to serve twenty guests at a seated dinner.

A: (Aspiring) Economic designation for inventories deemed to have extensive households that include spoons, knives, and forks, as well as enough equipage to entertain and give dinner parties for ten or more people.

D: (Decent) The economic designation for inventories that include spoons, knives, and forks, but without enough equipage to seat a dinner party for ten persons. It is more likely that these people would have entertained at tea.

OF: (Old Fashioned) The economic designation for inventories that lack forks, some of which might otherwise be considered aspiring or elite.

User's Manual, *supra* note 71, at 2-3, 7-8.

74. For example, one intellectual historian (Saul Cornell) thought that this was the most

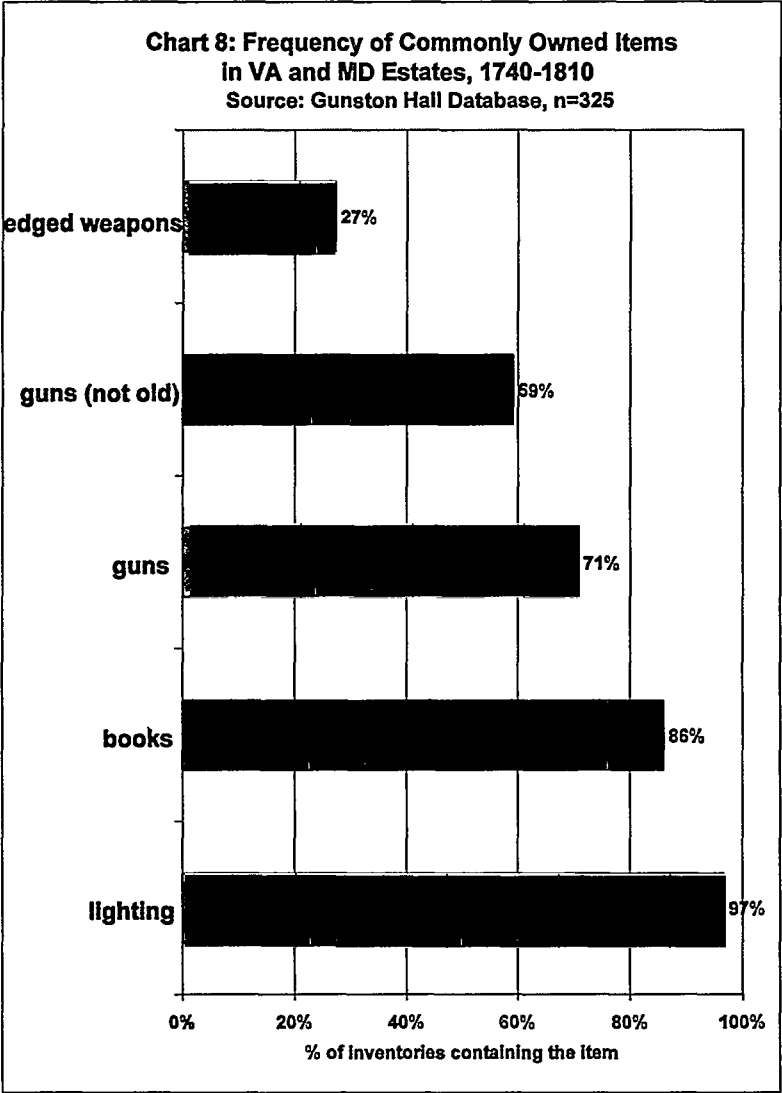
This database might be good for determining the experience of constitutional Framers and the prominent anti-federalists who gave rise to the Bill of Rights. The estates were selected to reflect the experience of a particular prominent politician and theorist—to reflect in part his world. Thus, to the extent that probate records can be assumed to reflect the world that at least some prominent Framers walked around in, this is a good database to explore—better for that limited purpose than databases more representative of the general public. Most estates in the Gunston Hall database are from social classes below the presumably elite class of George Mason, although these lower classes in the database would have included many free white males from social classes with whom he interacted.

Overall, 71% of the Maryland and Virginia estate inventories in the Gunston Hall database listed guns (Chart 8). Fully 73% of the 304 male estates listed guns. Of the 21 female estates, 8 (38%) owned guns, higher than the 18% of 1774 female estates in the Jones database that owned guns and the one gun-owning female estate in Providence. Only 27% of the Gunston Hall estate inventories included swords, cutlasses, bayonets or other edged weapons. The odds of an estate inventory containing a gun are 6.4 times as high as the odds of having an edged weapon.⁷⁵ A quarter of the estates (25%) include an old or broken gun, but half of those also include a gun that is not listed as old or broken. Thus 59% of estates had a gun that was not listed as being old or in poor working condition.

The distribution of gun ownership by year of estate and social class is shown in Chart 9. Chart 10 displays the distribution of gun ownership for several demographic and inventory characteristics. As Chart 9 shows, in the Gunston Hall database social class is not meaningfully related to gun ownership. There are only insignificant differences between estates from the lowest social class, those with no forks (called “Old-Fashioned”), and the higher social classes who had forks. There is slightly falling gun ownership from the 1750s

interesting database in the article because of the light it shed on what George Mason might have been thinking when he assumed an armed citizenry.

75. The odds-ratio expressing the ratio between 71% gun ownership (2.4 to 1 odds) and 27% edged weapon ownership (.38 to 1 odds) is $((.71/(1-.71)) / (.27/(1-.27)))$ or 6.4.



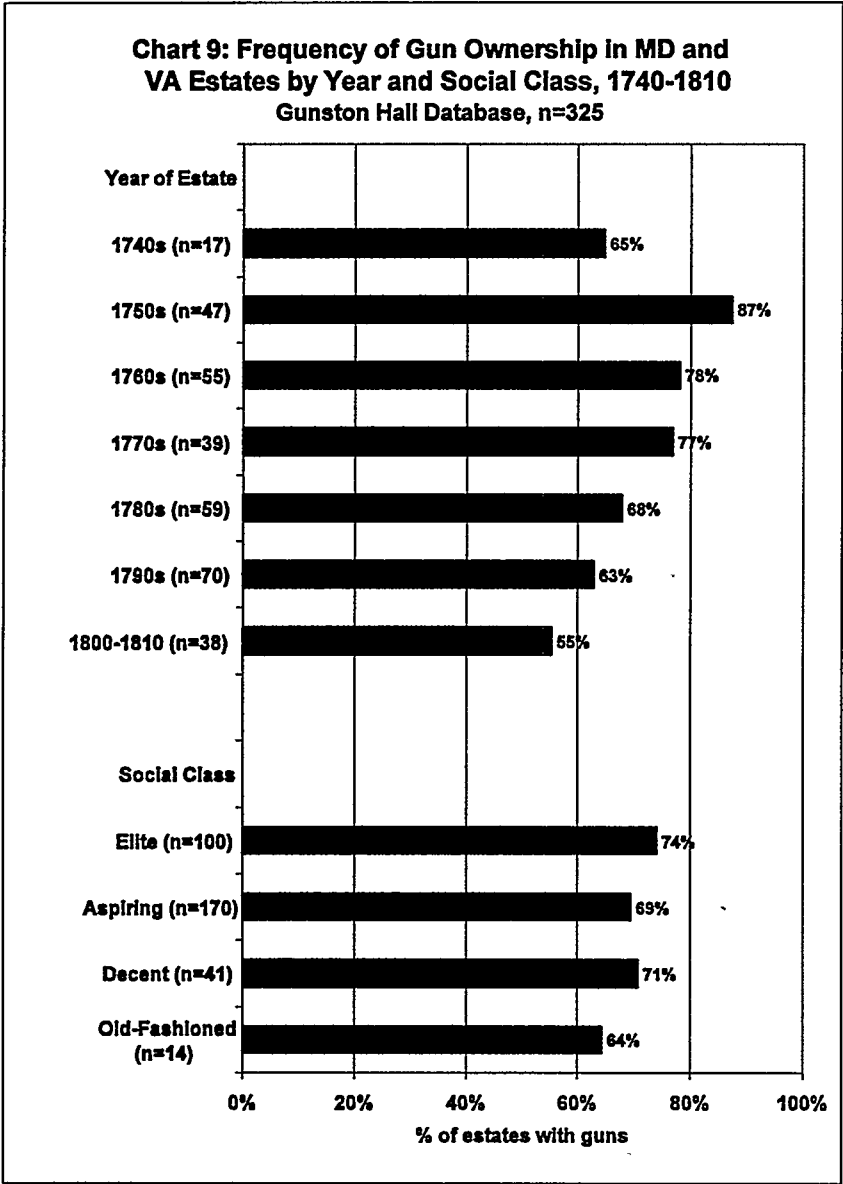
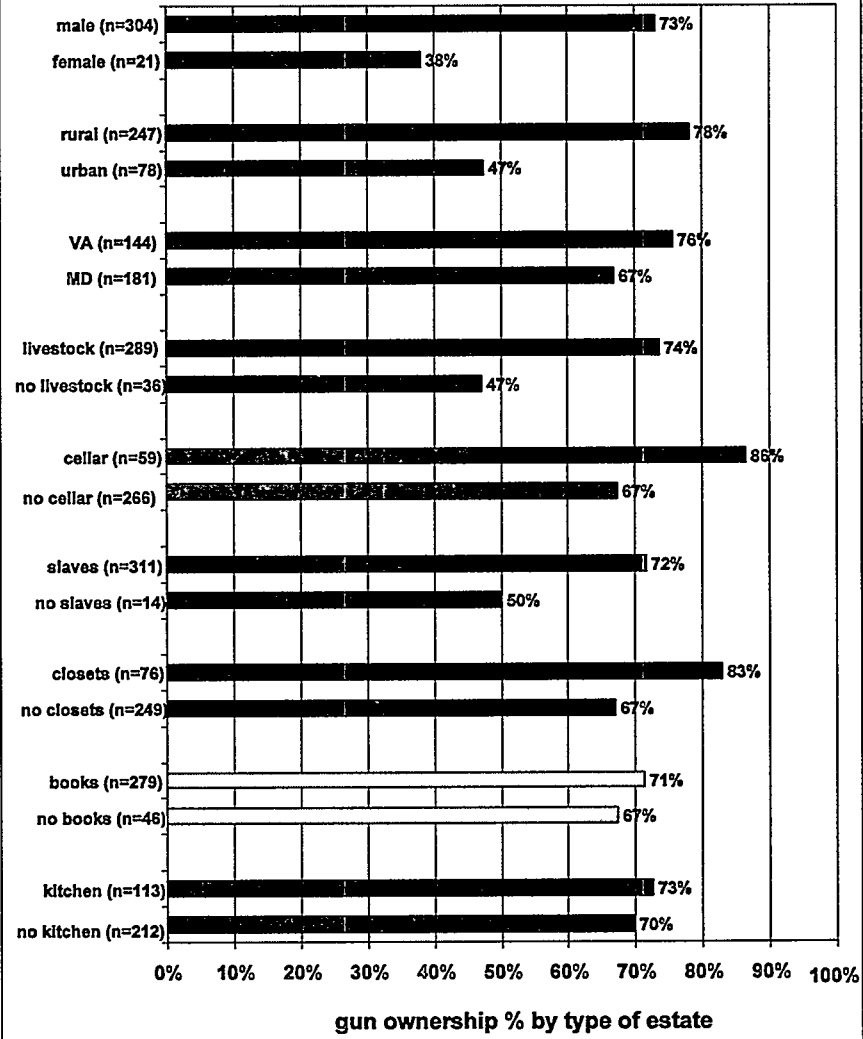


Chart 10: Frequency of Gun Ownership in MD and VA Estates by Various Characteristics, 1740-1810
Source: Gunston Hall Database, n=325



through the early 1800s, which might reflect the relative development of Virginia and Maryland and the reduction of physical threats.⁷⁶

In the Gunston Hall database, the best predictors of gun ownership are whether the decedent was male or lived in a rural area (Chart 10). Although it might seem obvious that rural estates would have more guns, Bellesiles implies the opposite.⁷⁷ What seems important here is not how wealthy the estates were, but how detailed the inventories were. Thus, other predictors (besides rural/urban) of listing guns are whether the contents of a cellar or closet⁷⁸ are listed. Also, slave-owning estates are more likely to have guns.

Table 6 shows the results of hierarchical loglinear modeling. It reports on models for the entire database of 325 estates, including 21 females. Controlling for all interactions between the predictor variables, the odds of listing a gun are about 4.4 times as high⁷⁹ if an estate is male as when it is female, 3.9-4.0 times as high if it is a rural estate as when it is not, and 3.1 times as high if the estate has an itemized cellar as when it does not. In the Gunston Hall database, 38% of women own guns, and rural estates are much more likely to have guns than urban estates.

Table 6
Hierarchical Loglinear Modeling
All Gunston Hall Estates

Sample: N=325 (304 males and 21 females)

Dependent Variable:

Y: gun (None, Listed)

76. Both the Gunston Hall and the Providence databases show slight drops in gun ownership over time (though the latter is meaningless using the BIC criterion). Bellesiles, on the other hand, shows growing gun ownership from the 1765-1790 period through the Civil War. BELLESILES, *supra* note 6, at 445 tbl.1. We do not have data from enough areas in enough periods to make generalizations on whether gun ownership was growing or declining in the eighteenth century.

77. *Id.* at 109.

78. Models with itemized closets show similar patterns to models with itemized cellars, suggesting that both variables are measuring the same thing—itemization.

79. This is actually based on the exponent of the absolute value of the result for being female. Thus, it is approximate. More precisely, based on the model actually fit, the relative odds of female estates listing guns are only 23% as high as the odds for male estates.

Independent Variables:**A: room by room itemization (None, Itemized by Room)****B: years (1740s,1750s,1760s,1770s,1780s,1790s,1800-10)****C: state (VA, MD)****D: gender (Male, Female)****E: rural (Urban, Rural)****F: cellar (None, Contents Listed)****Model With All 6 Main Effects (and 1 significant interaction term):****[YCA][YB][YD][YE][YF][FEDCBA] $G^2=78.8$, 211 df, $p<1.00$**

	Log-odds Ratio	s.d.	Exponent (Relat. Odds)	Exponent (Absol. Value)
YAC				
(gun x item., in VA)	1.66	.43	5.3	5.3
(gun x item., in MD)	-.94	.35	.39	2.6
(gun x state, no room)	.64	.33	1.9	1.9
(gun x state, room)	-1.95	.44	.14	7.0
YB (gun x years)				
(1740s x 1750s*)	1.31	.67	3.7	3.7
YD (gun x female)	-1.48	.46	.23	4.4
YE (gun x rural)	1.38	.27	4.0	4.0
YF (gun x cellar)	1.12	.40	3.1	3.1

other (smaller) decade-by-decade comparisons omitted from the table*Most Parsimonious Model (5 main effects and 1 interaction term):****[YCA][YB][YD][YE][YF][FEDCBA] $G^2=95.1$, 217 df, $p<1.00$**

	Log-odds Ratio	s.d.	Exponent (Relat. Odds)	Exponent (of Absol. Value)
YAC				
(gun x item., in VA)	1.66	.43	5.3	5.3
(gun x item., in MD)	-.94	.35	.39	2.6
(gun x state, no item.)	.64	.33	1.9	1.9
(gun x state, item.)	-1.96	.44	.14	7.1
YD (gun x female)	-1.48	.46	.23	4.4
YE (gun x rural)	1.37	.27	3.9	3.9
YF (gun x cellar)	1.12	.40	3.1	3.1

There was one meaningful, statistically significant interaction. As might be expected, in Virginia, if the inventory itemized property room by room, there was a 5.3 times higher odds of finding a gun. Yet inexplicably, in Maryland room by room itemization actually led to 2.6 times lower odds of finding a gun in the estate. Among the variables that do not make a meaningful contribution to any of the models explored are county, social class, livestock ownership, book ownership, and time period (decade) of the estate.

V. *ARMING AMERICA*'S STUDY OF GUNS IN PROBATE RECORDS

A. *The Providence Claims*

In *Arming America*, Michael Bellesiles argues that America in the 1700s and early 1800s had relatively few guns, and what few guns existed were in mostly poor working condition. Expanding on these claims, he argues that America did not have a "gun culture," notwithstanding what he acknowledges were the comments of some prominent constitutional Framers. His sources are varied: contemporary accounts, probate records, gun censuses, manufacturing records, and homicide counts. Researchers have found a large number of problems in Bellesiles's use of these sources (especially in the travel accounts, gun censuses, gunsmith counts, hunting reports, militia reports, and homicide counts), but deficiencies in these areas are not a subject of this Article.

The most interesting claim of *Arming America*—and the most persuasive if true—is that gun ownership was rare in early America, even among propertied males in their probate inventories. In a quick count of articles on *Arming America* in both law reviews and the popular press, Bellesiles's evidence from probate records is the most commonly mentioned quantitative evidence supporting his thesis.⁸⁰

As Jacob Price has argued: "Probate records are the most valuable single source we have for the economic and social history of extended communities."⁸¹ One run of probate records that Bellesiles cites as a source of his data is a published set of about 186

80. See *infra* notes 145-46 and accompanying text.

81. Price, *supra* note 12, at 701.

decedents' estates⁸² in colonial Providence from 1679 to 1729.⁸³ Even though he finds high gun ownership in Providence in this period (48%), he substantially undercounts the percentage of itemized male estates listing guns. According to our careful count, 63% of adult male estates with itemized personal property inventories had guns.

In the Providence probate records that Bellesiles discusses in his book, he has done the following:

- He claims that all 186 estates had both wills and itemized inventories when less than half did. Indeed, intestacy was common then⁸⁴ and was frequently noted in the records.⁸⁵ He thus counted about a hundred wills that are not there and never were.⁸⁶

82. BELLESILES, *supra* note 6, at 109. Precisely how many decedents' estates there are depends on how you count them—that is, how much has to be in a record to count it. Nonetheless, there are *not* 186 probate records for adult males containing inventories itemizing all types of property (which is what Bellesiles says that he analyzed in his *Arming America*). There are only 149 (or a few more if one uses even looser standards for itemization than we did). In a recount of the Providence records on his website in the late spring and early summer of 2001, Bellesiles's report came up with 184 inventories. Michael A. Bellesiles, *Probate Inventories: Providence, R.I., 1670-1730*, at <http://www.emory.edu/HISTORY/BELLESILES/Rhodeisland.htm> (last visited Apr. 06, 2002).

83. PROVIDENCE RECORDS, *supra* note 4 (these records include one inventory from 1670 and no inventories from the last three years of records—1727-1729).

84. 3 JONES, *supra* note 2, at 1933 tbl.7.1 (an unweighted 494 of the 919 decedents died intestate); see also Alice Hanson Jones, *Estimating Wealth of the Living from a Probate Sample*, 13 J. INTERDISC. HIST. 273, 280 (1982) ("There is not a will for every inventory; inventories were made for many intestates as well as testates.").

85. Less than half of the Providence inventories were accompanied by wills. *E.g.*, 16 PROVIDENCE RECORDS, *supra* note 4 (most of the first few estates); *id.* at 12 ("John Mathewson . . . Dyed Intestate"); *id.* at 14 ("Stephen Arnold, Jr. [sic] . . . dyed Intestate"); *id.* at 17 ("James Appleby . . . Died Intestate"); *id.* at 28 ("Jonathan Knight . . . Dyed Intestate"); *id.* at 31 ("Thomas Field . . . Dyed Intestate"); *id.* at 33 ("Richard Lewes . . . Dyed Intestate"). For other estates of people dying intestate see, for example, 7 *id.* at 32, 53, 45, 65, 69, 106, 109, 112, 139, 142, 145, 152, 157, 179, 205; 16 *id.* at 9, 37, 45, 62, 63, 73, 92, 97, 120, 121, 124, 156, 159, 167, 175, 197, 199, 228, 241, 246, 248, 279, 286, 312, 316, 332, 343, 358, 366, 373, 377, 380, 425, 428, 430, 441, 446, 448, 457, 462, 467, 468.

86. See *supra* note 85. Only about 86 estates even mention both a will and an inventory in the indices to the three volumes. Both wills and itemized inventories appear in about 81 estates, of which eight are female, leaving about 73 estates (out of 149) with both wills and male-itemized inventories. Whatever the count, it is fewer than 90 estates, not 186, as Bellesiles contends in *Arming America*. BELLESILES, *supra* note 6, at 109.

- He claims that he included only males in his 186 Providence estates when he apparently included seventeen women.⁸⁷ Thus, he repeatedly counted women as men.
- He claims that most of the guns in the (approximately) 90 Providence inventories listing guns⁸⁸ "are evaluated as old and of poor quality"⁸⁹ when only about 9% of the guns are so listed.⁹⁰
- By counting female estates in his male estate totals and counting estates with no itemized personal property inventories as having inventories, and double-counting estates with two inventories,⁹¹ he undercounted the percentage of guns in male estates with itemized personal property inventories.
- He claims that "a great many inventories"⁹² list "one of ye Queens Armes," another name for a military weapon, when only one inventory did.⁹³

87. See *infra* notes 95-97 and accompanying text.

88. Our count is 94 itemized male inventories listing guns. There is another gun in a male estate without a sufficiently itemized inventory and a female estate with five guns (thus 96 estates had guns). Our count of 94 estates includes two estates in which the only weapons are "armes," valued high enough to be reasonably likely to include guns. At the time, as in the Second Amendment, arms often (but not always) referred to firearms; furthermore, edged weapons were less common than guns. One estate included a carbine (indexed as a carbine, but spelled unconventionally), which referred to a short rifle or a musket.

89. BELLESILES, *supra* note 6, at 109; see *supra* note 43 and accompanying text.

90. Here we are referring to the number of guns, not the number of estates with guns. For most purposes, we count the number of estates with guns, not the number of guns. The count of the number of guns is greatly hampered because some inventories list "guns" without enumerating how many. Does this refer to two guns or three guns? We counted them as two guns and suspect that Bellesiles did as well. It is also unclear how Bellesiles counted gun parts. We counted a "gun without a lock" as a gun and a "gun lock" or a "gun barrel" not as a gun. Although Bellesiles's count of 90 estates with guns is close to ours, Bellesiles's gun counts in those 90 estates appear too small to have included gun parts. If we had included gun parts in our counts, the percentage of estates with old or broken guns would have been a few percentage points higher, but nothing even close to the majority reported by Bellesiles. Further, every estate with a gun part also included a gun.

91. This overcounting comes despite the claim immediately preceding his Providence counts "It is vital to emphasize that these probate inventories scrupulously recorded every item in an estate, from broken glasses to speculative land titles to which the deceased claimed title." BELLESILES, *supra* note 6, at 109.

92. *Id.* (Bellesiles claims: "A great many inventories explicitly list 'one of ye Queens armes,' which officially still belonged to the government.")

93. 6 PROVIDENCE RECORDS, *supra* note 4, at 188 (O. Browne). Browne's estate also included three other guns. *Id.*

In all, Bellesiles misclassified over 60% of the estates on these criteria that he thought important enough to mention. It is hard to see how Bellesiles could have counted so many wills that are not there. Bellesiles's mistakes go, not only to trivialities, but to the very heart of the matter—the frequency and condition of guns and the sorts of people who owned them.⁹⁴

It would take anyone less than an hour in a good university library to be reasonably certain that several of *Arming America's* claims about probate records were false. For example, Bellesiles asserts: "These 186 [Providence] probate inventories from 1680 to 1730 are all for property-owning adult males . . ." ⁹⁵ Yet volume 16 of the Providence Records alone contains the inventories of Mary Borden, Sarah Clemance, Abigail Hopkins, Joanna Inman, Mary Inman, Tabitha Inman, Ann Lewes, Rachal Potter, Elizabeth Towers, Hannah Wailes, Anna Whipple, Susanna Whipple, Mary Whiteman, and Lydia Williams.⁹⁶ Bellesiles counts all these women in his total of "186 men."⁹⁷

B. Arming America's National Claims—The 1765-1790 Data

The Providence data are only part of *Arming America's* argument about probate records. The book's much more dramatic claim is made in its table 1—it asserts that probate inventories in the 1765-1790 period had only 14.7% gun ownership nationally and only 14.2% ownership in frontier counties.⁹⁸ Bellesiles also claims that 53% of guns in 1200 frontier probate inventories during the 1765-1790 period are listed as being old or in poor condition⁹⁹ and that rifles are extremely rare.¹⁰⁰ Bellesiles concludes that guns rose to

94. The only significant thing he got right about Providence is that there are about 90 estates with guns in the records. BELLESILES, *supra* note 6, at 109.

95. *Id.*

96. 16 PROVIDENCE RECORDS, *supra* note 4, at 60, 70, 146, 165, 174, 236, 238, 278, 341, 346, 370, 410, 420, 429. Even including all these female estates, the personal property inventories in the Providence Records number fewer than 186.

97. BELLESILES, *supra* note 6, at 110.

98. *Id.* at 445 tbl.1.

99. *Id.* at 13, 266-67. This statement appears to be false. A preliminary analysis of complete data from four of six frontier counties and partial data from the other two counties suggests that fewer than 15% of 1765-1790 frontier estates list old or broken guns.

100. *Id.* (claiming that there are only three rifles in 1200 records in frontier counties during 1765-1790). In fact, we have found many more than three rifles in just a few of those years

just 17% of probate records in 1819-1821 and 20.7% in 1830-1832.¹⁰¹ He argues that, as the gun culture begins to take hold, guns in probate records rise to 27.6% in 1849-1850 and 32.5% in 1858-1859.¹⁰²

Bellesiles's main probate data are in his table 1 in both *Arming America*¹⁰³ and in his 1996 *Journal of American History* article.¹⁰⁴ Here are the first four columns of identical data from table 1 in both the 1996 article and the book:

Table One
Percentage of Probate Inventories Listing Firearms

	1765-90	1808-11	1819-21	1830-32
Frontier	14.2	15.8	16.9	20.4
Northern coast:				
urban	16.1	16.6	17.3	20.8
rural	14.9	13.1	13.8	14.3
South	18.3	17.6	20.2	21.6
NATIONAL AVERAGE:	14.7	16.1	17.0	20.7

Bellesiles presents no regional sample sizes or cell counts for this table—and has provided none after repeated requests. To work with multiple samples and not disclose sample sizes is unusual in academics. In text,¹⁰⁵ he gives a count of 1200 inventories for the first cell—frontier inventories from 1765 to 1790.¹⁰⁶ In the first column, the 1765-1790 period, note that only the frontier region

in the Pennsylvania counties of Washington and Westmoreland, two of the six frontier counties in his sample. See 1 JONES, *supra* note 2, at 107-17 (Westmoreland County inventories); Washington County (Pennsylvania) Recorder of Deeds, *Inventories of Estates (1776-1781) and Record of Marks, Receipts, and Certificates of Freedom (1789-1790)* (Family History Library US/CAN Film 1449139 Item 1).

101. BELLESILES, *supra* note 6, at 445 tbl.1.

102. *Id.*

103. *Id.*

104. Bellesiles, *supra* note 58, at 427 tbl. 1.

105. BELLESILES, *supra* note 6, at 266-67.

106. *Id.* at 13, 266-67. He discloses that all these frontier counties in 1765-1790 were in western Pennsylvania and northern New England. *Id.* at 266. Only two Pennsylvania and four Vermont counties fit this description. *Id.* at 445 tbl.1 ("sources" note includes many other counties than these six).

(14.2% of inventories list guns) is below the "National Average" of 14.7%. Accepting Bellesiles's regional averages in the first column above (1765-1790) and known minimum sample sizes, his 14.7% national average is mathematically impossible. Given the 1200 inventories he reports¹⁰⁷ for the frontier's 14.2% mean, any number of Southern inventories greater than 185 at the South's mean of 18.3% puts the national mean above the 14.7% that Bellesiles reports.¹⁰⁸

It is a simple sixth-grade arithmetic problem of finding a mean:

$$((N^{\text{frontier}} * 14.2\%) + (N^{\text{south}} * 18.3\%) + (N^{\text{no.-urban}} * 16.1\%) + (N^{\text{no.-rural}} * 14.9\%)) \\ \div N^{\text{total}} = 14.7\%.$$

Plugging in just the 1200 frontier inventories and 186 Southern inventories, the equation yields a mean above 14.7%:

$$((1200 * 14.2\%) + (186 * 18.3\%) + (N^{\text{no.-urban}} * 16.1\%) + (N^{\text{no.-rural}} * 14.9\%)) \\ \div N^{\text{total}} > 14.7\%.$$

Or plug in just the 1200 frontier inventories and 489 Northern urban inventories; the equation again yields a mean above 14.7%:

$$((1200 * 14.2\%) + (N^{\text{south}} * 18.3\%) + (489 * 16.1\%) + (N^{\text{no.-rural}} * 14.9\%)) \\ \div N^{\text{total}} > 14.7\%.$$

Adding any estates from the other regions above the mean only makes it easier to falsify his data.

107. *Id.* at 266-67.

108. We also did counts with the most extreme rounding in Bellesiles's favor (1249 frontier inventories rounded down to 1200; 14.15001% frontier guns rounded up to 14.2%, etc.). With extreme rounding, any number of Southern inventories greater than 214 would make the 14.7% mean impossible. Further, with extreme rounding, any number of Northern urban inventories greater than 634 would make the 14.7% mean impossible, even if there were no Southern inventories.

Bellesiles says that his method was just to do simple counts. See Correspondence from Michael A. Bellesiles to James Lindgren, *infra* note 109. He says nothing about the national mean being population weighted, which would be almost impossible with the method he used—just a running tally. Since the six frontier counties Bellesiles examines are small compared to the rest of the country, a population-weighted or wealth-weighted national mean would only make things worse for his 14.7% mean.

So how many surviving inventories are there in the twenty-six years (1765-1790) supposedly in Bellesiles's sample? Philadelphia alone has well over 4000 estates. Remember, in *Arming America*, Bellesiles claimed to have counted over 30 counties for twenty-six years.¹⁰⁹ There should be many more estates in just one year of probate records in his sample counties than would be needed to falsify his 14.7% mean. His sixteen Southern counties alone should generate more than 300 estates a year, falsifying his mean in less than one year's data. Philadelphia (a Northern urban county) averaged roughly 160 inventories a year, thus falsifying his 14.7% mean in just three years of data from only one county. His two Maryland counties (Anne Arundel and Queen Anne) average about 70 inventories a year in the late 1760s, thus falsifying his 14.7% national mean in fewer than three years with just the data from these two counties. This is not speculation; we have counted the number of inventories (215) in the two Maryland counties in the three years 1765-1767. We can report conclusively that the 14.7% national mean that Bellesiles has twice published¹¹⁰ is false (because it is mathematically impossible given the regional averages and the more than 214 Maryland estates in 1765-1767).

There is another way to falsify *Arming America's* 14.7% mean using simple arithmetic. If there are at least 34 Southern inventories with guns, there must be at least 186 Southern estates to generate a mean of 18.3% in the South ($34 \div 186 = 18.3\%$). Yet (as we have shown) to support the 14.7% national mean, there must be fewer than 186 estates from the South. It is therefore impossible to have simultaneously 34 or more Southern estates with guns, 18.3% guns in the South, and 185 or fewer Southern estates with guns.

109. In a letter to the *Wall Street Journal* in April 2001, Bellesiles claimed for the first time that he excluded the years 1774-1775 because there were too many guns that he wanted to exclude on account of supposed evidence that some were government-owned. Bellesiles, *supra* note 61, at A25. Scholars call this "the suppression of contrary evidence." This claim is in direct contradiction to his 1996 claim to have included Alice Hanson Jones's data (from 1773-1775) in the very percentages reprinted in *Arming America*. See *supra* note 59. Nor did he disclose this restriction of his published sample set in response to our replication requests in August and September of 2000. On the contrary, he claimed: "My sample set is listed in the note on table one," which presents the sample as "1765-90." Correspondence from Michael Bellesiles to James Lindgren (Sept. 19, 2000) (on file with author).

110. BELLESILES, *supra* note 6, at 445 tbl.1; Bellesiles, *supra* note 58, at 428 tbl.1.

In other words, all we have to do to falsify the 14.7% national mean is to discover 34 Southern inventories with guns in his sample. Since there are roughly 200 Southern inventories with guns in Bellesiles's sample each year, this is an easy task. It would take about two months of data (out of a supposed twenty-six years of data for 16 counties) to find the 34 Southern inventories with guns needed to falsify Bellesiles's 14.7% mean. In a recorded interview with a reporter in April 2001, Bellesiles disclosed that among the years he counted were 1765-1766.¹¹¹ There are more than 100 estates with guns in just two years (1765-1766) in one Southern county in his sample—Charleston, South Carolina. Indeed, there are more than 34 estates with guns in just the first six months of the 1765 Charleston records. Bellesiles's national mean is thus easily falsified by looking at just six months of data in one South Carolina county in his sample, given the regional means he reports and the 1200 frontier estates.

One can be absolutely certain that his data are false because they are mathematically impossible by two related methods. No fancy computations are involved—just sixth-grade arithmetic, finding a mean. There are no regional sample sizes for 1765-1790 that Bellesiles could report that would support his national average, based on what he said he counted in *Arming America*, or in his 1996 *Journal of American History* article,¹¹² or in an April 2001 press interview.¹¹³ If his regional means are true, his claim of a 14.7% national average is false with absolute mathematical certainty.

Without a database, without counts, mostly without sources, Bellesiles has not done a "study" of probate records in the conventional sense. Our futile efforts to get Bellesiles to release his data and sample sizes resulted in several friendly responses, some quite lengthy, describing how he kept no database, how he recorded his data as tick marks on legal pads, and how the sheets got flooded and were in his attic, still wet, months later.¹¹⁴

111. Audio tape: Interview with Michael Bellesiles by John Lofton (Apr. 18, 2001) (excerpts on file with author).

112. Bellesiles, *supra* note 58, at 428.

113. Interview with Michael Bellesiles by John Lofton, *supra* note 111 (including Bellesiles's claims that he counted 1765-1766).

114. Correspondence from Michael Bellesiles to James Lindgren, *supra* note 109.

C. Confirmations of Our Criticisms

One oddity about the dispute over Bellesiles's probate data is that our main claims have never been specifically disputed by Bellesiles or anyone else; he has made only vague general denials that his critics are wrong. On the contrary, Bellesiles himself has stated to the press that our counts are accurate for the main published sources we used in this Article.¹¹⁵ As for our counts of the Jones database, he confirmed that our numbers are accurate counts of the source.¹¹⁶

No one has tried to show that Bellesiles's 1765-1790 national mean of 14.7% of estates with guns is mathematically possible. Bellesiles has never commented on this issue except to express puzzlement about it, despite vigorously expressed unhappiness with our study since January 2001. Nor has anyone ever disputed any of our main claims about his miscount of the earlier Providence data (i.e., that he counted about a hundred wills that never existed, repeatedly counted women as men, and claimed that the inventories evaluated most guns as old or broken when fewer than 10% were so listed).

115. Interview with Michael Bellesiles by John Lofton, *supra* note 111; *Odyssey*, available at <http://www.wbez.org/services/ram/od/od-010116.ram> (last visited Apr. 06, 2002) (WBEZ public radio broadcast, Jan. 16, 2001) (audio archive of *Odyssey* broadcasts on WBEZ).

116. *Odyssey*, *supra* note 115. The only arguments that Bellesiles has "refuted" are ones that he previously made himself. For example, he recanted his published claim to have used the Jones database, partly recanted his published claim that his sample set was the 1765-1790 period (saying now that he excluded the 1774-1775 years), and recanted his twice-written claim to have done most of his probate research on microfilm in one federal depository library in Georgia (rather than with paper records in thirty or more county or state archives around the country). Bellesiles, *supra* note 61, at A25 ("I conducted my research from the source documents on site in the archives, not from published compilations."); *see also supra* notes 59-61. Each recantation was preceded by our reports of discrepancies between his prior claims and the evidence in those sources.

On whether he used the published volumes of Providence records, he twice has written clearly that he did, then suggested on public radio that he didn't, and recently apparently conceded that he did by using the published volumes for recounting those records. BELLESILES, *supra* note 6, at 485 n.133 ("This data is drawn from Horatio Rogers et al., eds., *The Early Records of the Town of Providence*, 21 vols. (Providence, RI, 1892-1915), vols. 6, 7, 16."); Correspondence from Michael Bellesiles to James Lindgren, *supra* note 109 ("Finally, I am sorry to hear that you come up with different numbers from Horatio Rogers, et al., eds., *The Early Records of the Town of Providence* (21 vols. Providence, R.I., 1892-1915). I used these books at the Huntington Library [in California] six years ago and have not yet come across my notes."); *Odyssey*, *supra* note 115.

If Bellesiles had discovered any significant mistakes in our discussion of Providence, it is likely that he would have pointed them out, since he recently posted a partial report of his recent recount of the Providence data on his website. There he admits no errors, but provides information directly supporting our claims that only a small percentage of Providence gun estates are listed as old or broken (not “[m]ore than half” of the guns as he claims in *Arming America*¹¹⁷), that only one estate lists a Queen’s Arm (not a “great many”¹¹⁸), and that edged weapons are relatively less common than guns. He is entirely silent about the rest of our claims and still has failed to comply with our November 2000 request for a list of the Providence cases that he used to determine his denominator.

D. Views on the Incompleteness of Probate Records

Bellesiles is virtually alone among historians who work with probate records in thinking that they are more or less complete. “It is vital to emphasize that these probate inventories scrupulously recorded every item in an estate, from broken glasses to speculative land titles to which the deceased claimed title, including those that had already been passed on as bequests before death.”¹¹⁹ “Probate records list every piece of personal property, from acreage to broken cups. . . . Obviously guns could have been passed on to heirs before the death of the original owner. Yet wills generally mention previous bequests, even of minor items, and only four mentioned firearms.”¹²⁰ “Some inventories are more meticulous than others, though they all reported each and every object, piece of property, debt, and credit belonging to the deceased.”¹²¹

117. BELLESILES, *supra* note 6, at 109. He has added a new false claim that the guns, while not evaluated as old or broken by the appraisers who saw and valued them, should have been listed as old or broken because of their valuation. Unfortunately, to meet the level of dysfunctional guns that Bellesiles claimed in *Arming America*, he has to reappraise as old or broken all guns specifically valued at the median and below most of which were valued so highly that it was highly unlikely that they were old or broken.

118. *Id.* (Bellesiles claimed: “A great many inventories explicitly list ‘one of ye Queens armes,’ which officially still belonged to the government.”).

119. *Id.* In *Arming America*, as you can see from the quotations in the text, he raises few hints that probate inventories are not complete. There is an eloquent general comment about the limitations in using quantitative records. *Id.* at 262.

120. *Id.* at 13.

121. *Id.* at 266. As this quotation suggests, this discussion in his book includes some

In response to critics of his extreme position on the completeness of probate inventories, Bellesiles argues:

One critic explained the paucity of firearms in probate inventories by stating that “it is well known that the inventory of an estate is what is left after family members pick over the items.” Maybe that is the way people behave in his family, but it was and remains highly illegal to ransack an estate before a court-appointed executor can conduct an inventory. Anyone who works with the probate court records from this early, perhaps more honest, period knows that exact reference was made to every item, no matter how trivial, that has been passed on to a friend or family member before the death of the testator.¹²²

The New York Times described a similar response to a critic of Bellesiles’s heavy reliance on the completeness of probate inventories: “As for Mr. Kleck’s criticism, Mr. Bellesiles said, the probate records he examined appear to record every bequest and gift of value, including those made during the life of the deceased.”¹²³

Commenting on his public exchange with NRA President Charlton Heston, Bellesiles told *Salon Magazine*:

When someone died, every single item owned—everything, even broken things—was recorded. Guns had to be listed. So unless Charlton Heston can come up with evidence that they made an exception for guns, he should keep quiet. . . . There was actually greater value placed on recording firearms than any other single item.¹²⁴

qualifications about probate inventories, but they appear to refer to how meticulously the inventories describe the condition of the goods, not the existence of goods.

122. *Id.* at 484-85 n.132.

123. Anthony Ramirez, *The Lock and Load Myth: A Disarming Heritage*, N.Y. TIMES, Apr. 23, 2000, § 4, at 3.

124. David Bowman, *The reasonable gun nut*, (Sept. 7, 2000), at 2, at <http://www.salon.com/books/feature/2000/09/07/bellesiles/index.html> (last visited Apr. 06, 2002).

Bellesiles is mistaken.¹²⁵ First, land (or "acreage") was so rarely included in inventories in the South and Middle colonies that some experts claim that it was almost never included.¹²⁶ The general absence of land from inventories in the South and Middle colonies has been widely noted by historians¹²⁷ and should be obvious to anyone who has read a substantial number of inventories.

Second, inventories are far from complete lists of property owned at death, a fact noted by every historian we have read who works in the area¹²⁸—and again obvious to anyone who has read a substantial number of inventories. For example, 23% of the inventories in the leading colonial database of 919 inventories include no clothes of any kind.¹²⁹ Unless, at their deaths, 23% of the wealthholding males and females in colonial America were nudists every day, all day long, inventories do not scrupulously record "every item in an estate."¹³⁰ Further, it is not that estates without clothes were too poor to own them, because estates without clothes are wealthier on average than those with clothes listed.

Third, although inventories occasionally list assets no longer in the estate, there is no reason to suppose that inventories or wills mention even a substantial percentage of lifetime gifts, let alone most of them. Bellesiles offers no support for his odd supposition. Most inventories do not even list all assets in an estate; why would they list most of the assets no longer in an estate? Similarly, since most wills do not even itemize all the assets being conveyed by will, why would they list most of the lifetime gifts given before making

125. His misuse of the words "personal property" and "bequests" is not significant to our inquiry. The only significant qualification he makes is one about source material generally: "Unarguably we can never be certain how accurate or thorough are any of the records upon which we draw, no matter what the agency or its province and level of authority." BELLESILES, *supra* note 6, at 262. When challenged specifically on the completeness of probate records, however, Bellesiles responded by claiming that "exact reference was made to every item."

126. Jones, *supra* note 84, at 278 ("Real estate is not shown in the inventories of the Middle Colonies or the South.")

127. *Id.*; Lindert, *supra* note 12, at 657.

128. See, e.g., 3 JONES, *supra* note 2, at 280; Beales, *supra* note 12, at 41; Carr & Walsh, *supra* note 12, at 81; Daniels, *supra* note 12, at 387; Hawley, *supra* note 9, at 23; Lindert, *supra* note 12, at 657-58; Nash, *supra* note 12, at 545; Smith, *supra* note 12, at 100; Price, *supra* note 12, at 701; Sweeney, *supra* note 12, at 32; Ward, *supra* note 12, at 74-76.

129. Lindert, *supra* note 12, at 657 (incorrectly claiming that 28% do not have clothes). The unweighted number of estates without clothes is actually 22%. The weighted percentage of all wealthholders is 23% without clothes and 21% of itemized male estates without clothes.

130. *Id.* (making a similar comment on nudism, though his percentage is incorrect).

the will? Bellesiles offers no support for his farfetched ideas about what inventories and wills contain. As Peter Lindert noted:

Faced with the impressive detail of many inventories, one might be tempted to think that decedents' assets and liabilities have been well covered. They have not. Not only is real estate missing from most inventories, but there is also good evidence that the appraisers missed or misleadingly labeled significant parts of personal estate (i.e. total estate minus land and buildings) and most debts owed by the deceased.¹³¹

Appraisers might miss property, exclude it as not worth listing, or lump it with other items.¹³²

Families might treat some items as family heirlooms or family property. Some items might be removed from the estate after death but before appraisal.¹³³ Indeed, 70% of estates in 1774 had no cash at all, not even one penny.¹³⁴ Since very few farms were really self-sufficient, at least some cash must have been owned by most estates. Even considering poverty and a well-known shortage of money in circulation, Lindert speculates: "This probably reflected not so much the chronic colonial shortage of specie as the frequency with which cash was simply allocated informally among survivors even before probate took place."¹³⁵

Last, Bellesiles does not indicate the source of his idea that guns were especially likely to be listed in probate inventories. In a symposium he cites in *Arming America*,¹³⁶ Anna Hawley says the opposite.¹³⁷ He may well have some reason to believe that guns were especially likely to be listed, yet here, as elsewhere, Bellesiles offers no support for his unlikely beliefs about what inventories and wills contain.

131. *Id.* at 657.

132. See Hawley, *supra* note 9, at 28 (discussing the possibility of collusion with appraisers).

133. See *id.* at 28 (discussing criminal concealment). But see Lindert, *supra* note 12, at 658 (downplaying criminal concealment and arguing that cash was allocated "among survivors before probate took place").

134. Lindert, *supra* note 12, at 658.

135. *Id.*

136. EARLY AMERICAN PROBATE INVENTORIES, *supra* note 9.

137. See Hawley, *supra* note 9.

E. How Important are the Probate Records?

What would happen to the rest of *Arming America* if Bellesiles were to delete his entire discussion of probate data? In terms of pages, the probate study is only a small part of the book.¹³⁸ Yet it is the most dramatic and potentially persuasive evidence he offers. The probate data are the only data purporting to show systematic changes in gun ownership over long periods of time (1765-1859), a crucial part of *Arming America*'s central claim that gun ownership was very low in the seventeenth and eighteenth-centuries and grew suddenly in the few decades before the Civil War. Further, the probate data are by far the most important evidence purporting to show that guns in private hands were mostly in poor working condition—a claim that now seems questionable given the actual probate data.

Moreover, it would not be proper just to omit a discussion of probate data now that it is clear that they undercut the conclusion of *Arming America*—that would amount to the suppression of contrary evidence. One might wistfully speculate what the book might have been without the probate data, but one cannot turn back the clock. The patterns in the actual probate data from colonial America are potentially devastating to *Arming America*'s central arguments. That gun ownership was much higher in the seventeenth and eighteenth-centuries than Bellesiles claims it was on the eve of the Civil War renders the main story in *Arming America* incoherent. If guns were already more common in the eighteenth century than Bellesiles says they were on the eve of the Civil War, then his narrative of how the country changed from low gun ownership to high gun ownership collapses into the opposite story of going from high gun ownership to somewhat lower gun ownership.

Also potentially devastating to the arguments in *Arming America* is the condition of guns in probate records. In every database we have looked at (including the ones Bellesiles cites in *Arming America*), at least 87% of estates with guns have guns that are not listed as old or in poor working condition. A more coherent story

138. Probate records are discussed on at least thirteen pages in the book, plus textual discussions in footnotes. BELLESILES, *supra* note 6, at 13, 74, 79-80, 109-10, 148-49, 262, 266-67, 386, 445 tbl.1.

would have been that America went from fairly ineffective guns to fairly effective mass-produced guns, but that is not Bellesiles's main story; more to the point, such a story would have been largely uncontroversial.

The importance of the probate data is suggested in the reviews and press accounts. In a favorable article on the book, Anthony Ramirez of *The New York Times* calls probate records "Mr. Bellesiles's principal evidence."¹³⁹ John Chambers, in his *Washington Post* review of *Arming America*, called probate records Bellesiles's "freshest and most interesting source."¹⁴⁰ Edmund Morgan in his *New York Review of Books* review asserted: "The evidence is overwhelming. First of all are probate records."¹⁴¹ In his *New Republic* review, Jackson Lears comments: "Despite his wide range, the core of his argument depends on statistics: government censuses of militia members and a sample of probate records."¹⁴² Joyce Malcolm's review in *Reason* states: "Bellesiles' main proof for the absence of firearms is his analysis of more than 11,000 probate inventories from 1765 through 1859."¹⁴³ A review in the *Minneapolis Star Tribune* summarizes, "Using probate records from the colonial period to 1859, Bellesiles explodes many myths about gun ownership in America."¹⁴⁴

Bellesiles himself emphasized probate records when he summarized his argument in a November 3, 1997, interview with the *Emory Record*. "Contrary to the popular image, few people in the United States owned guns prior to the 1850s," Bellesiles said. "Probate and militia records make clear that only between a tenth and a quarter of adult white males owned firearms."¹⁴⁵ In articles on *Arming America* in both law reviews and especially in the popular press, Bellesiles's evidence from probate records was the

139. Ramirez, *supra* note 123, at 3.

140. John Whiteclay Chambers II, *Lock and Load*, WASH. POST, Oct. 29, 2000, (Book World) at 2.

141. Edmund S. Morgan, *In Love with Guns*, N.Y. REV. BOOKS, Oct. 19, 2000, at 30.

142. Jackson Lears, *The Shooting Game*, NEW REPUBLIC, Jan. 22, 2001, at 32.

143. Joyce Lee Malcolm, *Concealed Weapons*, REASON, Jan. 2001, at 48.

144. Randolph Delehanty, *Bang! Historian Explodes American Gun Myths*, MINNEAPOLIS STAR TRIB., Sept. 24, 2000, at 16F.

145. Michael Terrazas, *Bellesiles Lays Blame for U.S. Gun Culture at the Feet of Samuel Colt*, EMORY REC., Nov. 3, 1997 (quoting Michael Bellesiles, Great Teachers Lecture Series, Oct. 7, 1997), at http://www.emory.edu/EMORY_REPORT/erarchive/1997/November/ernovember.3/11_3_97Bellesiles.html (last visited Apr. 06, 2002).

single most commonly mentioned source of quantitative evidence supporting his thesis. Scholars have quickly made use of Bellesiles's undercounts of guns in probate records to support their views of the Second Amendment.¹⁴⁶

Thus, while the probate data represent only a small part of the book in pages, they are the heart of the book—recognized by some reviewers as the single most important class of evidence among the many classes of evidence that Bellesiles discusses.¹⁴⁷ Admittedly, others put more weight on this evidence than Bellesiles does. Not

146. *E.g.*, Michael C. Dorf, *What Does The Second Amendment Mean Today?*, 76 CHL.-KENT L. REV. 291, 312 (2000) (footnotes omitted):

What of Madison's assumption that the people would have arms? The short answer is that the assumption was inaccurate. Historian Michael Bellesiles has discovered that fewer than seven percent of white males in western New England and Pennsylvania owned working guns upon their deaths. As Garry Wills effectively argues, Bellesiles's discovery is consistent with other evidence tending to show that the notion of founding-era militias comprising nearly all able-bodied adult white males was never more than a myth. The romantic attachment to the militia arose, Wills contends, because of their role in keeping order on the home front—protecting against, among other things, Indian attacks and slave revolts—while the Continental army won the war against the British;

Robert E. Shalhope, *To Keep and Bear Arms in the Early Republic*, 16 CONST. COMMENT. 269, 274 (1999) (footnotes omitted):

In another essay Bellesiles explodes the myth of near universal gun ownership and the skilled usage of firearms in the late eighteenth and early nineteenth centuries, a myth so important to Standard Modelers in their efforts to protect a "traditional" right. In fact, during an investigation of late eighteenth-century probate records and militia archives extending into the early nineteenth century, Bellesiles discovered that only fourteen percent of probate inventories exhibited any type of gun within frontier households of northern New England and western Pennsylvania.;

Koren Wai Wong-Ervin, *The Second Amendment and the Incorporation Conundrum: Towards a Workable Jurisprudence*, 50 HASTINGS L.J. 177, 184-85 (1998) (quoting BELLESILES, *supra* note 6, at 426, 427 (footnotes omitted):

Bellesiles notes that county probate records (inventories of property after a death) show that gun ownership was the exception in the eighteenth and early nineteenth centuries and that gun ownership did not become common until industrialization, and even then ownership was prevalent only in urban areas. Bellesiles admits that he was "puzzled by the absence of what [he] assumed would be found in every record: guns." In other words, contrary to the picture painted by the National Rifle Association and others who favor an individual rights reading of the amendment, gun ownership was not universal, or even close to universal, in the eighteenth century. Bellesiles argues that the common belief that guns are deeply rooted in our nation's history and psyche is an erroneous belief and that history indicates that "[t]he gun culture grew with the gun industry.").

147. *See, e.g.*, Chambers, *supra* note 140, at 2.

surprisingly, his supporters are now claiming that the probate data are relatively unimportant. Yet without the probate data, his book runs the risk of falling into the genre that Bellesiles has called "dueling quotations."¹⁴⁸ One cannot just wish the probate data away; it points strongly against the main narrative of *Arming America*.

Indeed, the evidence that colonial America did not have a gun culture is questionable on the evidence of gun ownership alone. Compared to the seventeenth and eighteenth centuries, guns are not as widely owned today. Whereas individual gun ownership in every published study of early probate records that we have located (except Bellesiles's) ranges from 50% to 79%, only 32.5% of households today own a gun.¹⁴⁹ This appears to be a much smaller percentage than in early America—in part because the mean household size in the late eighteenth century was six people,¹⁵⁰ whereas today it is just under two people.¹⁵¹

CONCLUSION

Our hope here is to do much more than explode recently created myths about gun ownership in probate records. As we show, in probate inventories (1) there were high numbers of guns in early America;¹⁵² (2) guns were much more common than swords or other edged weapons;¹⁵³ (3) women owned guns;¹⁵⁴ and (4) the great majority of gun-owning estates listed no old or broken guns.¹⁵⁵ Our estimates that at least 50% of male and female wealthholders owned guns in 1774 colonial America are the first carefully weighted national probate-based estimates for gun ownership in eighteenth-century America. If we exclude estates that have no

148. BELLESILES, *supra* note 6, at 262 ("Without such efforts at quantification, we are left to repeat the unverifiable assertions of other historians, or to descend into a pointless game of dueling quotations—matching one literary allusion against another.").

149. This results from my analysis of the March 2001 release of the 2000 NORC General Social Survey. Household gun ownership breaks down as follows: any gun (32.5%), rifle (19.7%), shotgun (18.6%), pistol or revolver (19.7%). Only 1.2% of respondents refused to respond to the question.

150. U.S. Census, 1790.

151. 2000 NORC GSS, *supra* note 149.

152. See *supra* notes 55-67 and accompanying text.

153. *Id.*

154. *Id.*

155. *Id.*

significant itemization of personal property, 54% of male wealth-holders have guns, as do 19% of female wealthholders. We also provide the first weighted regional estimates of colonial gun ownership: 69% in the South, 50% in New England, and 41% in the Middle colonies. Given that these counts are based on incomplete probate inventories, unless nudity was also widely practiced,¹⁵⁶ these gun counts are likely to be substantial underestimates.

As for the methodology of drawing inferences from probate records, we suggest that the ownership of any item of interest should be compared to the ownership of other commonly owned items, since probate inventories are inherently and differentially incomplete. For example, guns are more common than Bibles or religious books in both the Providence and the national Jones database.¹⁵⁷ Further, guns are found in nearly as many probate estates as books of any kind, a finding suggesting that guns, like books, were commonly owned by early American families.¹⁵⁸ Based on 1774 probate records, the frequency of gun ownership (50%) was roughly midway between the ownership of any coins or other money (about 30%) and the ownership of clothes (about 77%).¹⁵⁹ If gun ownership really was about two-thirds of the level of clothes ownership (and about five-thirds of the level of cash ownership), then gun ownership was roughly as common as one should have expected before this debate took its recent revisionist turn.

Using hierarchical loglinear modeling, we show that guns are more common in early American inventories where the decedent was male, Southern, rural, slave-owning, or above the lowest social class—or where the inventories were more detailed.¹⁶⁰ In 1774, large slave-owners have 4.3 times as high odds of owning a gun as small slave-owners or those who owned no slaves.¹⁶¹ Those who owned livestock have odds of gun-owning that are 6.7 times as high as

156. A weighted average of 23% of the estates in Jones's 1774 database did not include any clothes. See *supra* text accompanying notes 129-30.

157. See *supra* text accompanying notes 50-51, 65-67.

158. See *supra* notes 50-51 and accompanying text.

159. See *supra* text accompanying notes 129-30; see also *supra* text accompanying notes 9-24 (showing more guns in Surry County, Virginia than axes, knives, hoes, or chairs and more guns in Maryland than books or chairs).

160. See *supra* notes 65-79 and accompanying text.

161. See *supra* notes 65-67 and accompanying text.

those who do not.¹⁶² This suggests that active farming and large slave-owning are good predictors of owning guns.

There are some indications in the data that incompleteness is correlated with fewer guns. In the 1774 national data, the odds that men with an occupation listed in the inventory will own a gun are about 12 times as high as the odds that men missing occupational information will own a gun.¹⁶³ In the Gunston Hall database, those estates listing the contents of closets and cellars have 2.4 to 3.1 times as high odds of also listing guns as estates without such lists.¹⁶⁴ One finds more guns when the inventories are more complete, even controlling for social class. Unless one compares the frequency of guns to other common items, one would confuse the incompleteness of inventories with a lack of ownership.¹⁶⁵

Further, bladed weapons were much rarer than guns in probate records.¹⁶⁶ In the male estates in Jones's 1774 database, the odds of finding a gun are 7 times as high as the odds of finding a bladed weapon.¹⁶⁷ For the Gunston Hall database, the odds of finding a gun are 6.4 times as high as finding a bladed weapon,¹⁶⁸ for the Providence database, the odds of finding a gun are 4.1 times as high as finding a bladed weapon.¹⁶⁹

That guns would be so widely owned once men could afford them is consistent with the view that gun ownership was an important tool—and perhaps part of male identity at the time. As Gloria Main's work suggests, in the late seventeenth and early eighteenth centuries, guns were next in importance after beds, cooking utensils, and pewter—and ahead of chairs and books.¹⁷⁰ Anna Hawley found that guns were more common than chairs or hoes in a poor agricultural county.¹⁷¹ Judith McGaw found that among eighteenth century mid-Atlantic farmers, guns were as common as plows.¹⁷²

162. *Id.*

163. *See* text accompanying *supra* note 67.

164. *See supra* note 78 and accompanying text.

165. *See supra* notes 48-51 and accompanying text.

166. *See supra* notes 65-69 and accompanying text.

167. *Id.*

168. *See supra* note 75 and accompanying text.

169. *See supra* note 51 and accompanying text.

170. *See* MAIN, *supra* note 22, at 169-70, 176 tbls.V.1 to V.3. In the Northern data we have examined, books are roughly as common (or slightly more common) than guns.

171. Hawley, *supra* note 9, at 28 tbl.1.

172. McGaw, *supra* note 2, at 332.

Guns appear to have been highly desired and an important part of the culture of the day. If guns were merely a luxury or a relatively useless tool, one would not expect to find roughly as many or more guns than chairs, but that is precisely what those of us who count items in probate inventories find. Further, if guns were not useful, one might expect to find most guns listed as old or in poor working condition, but fully 87-91% of gun estates in the three databases we examined at length here listed at least one gun that was not pejoratively described as old or broken.¹⁷³

As our comparative analyses suggest, our data are consistent with other published counts of guns in probate estates, such as Jones's,¹⁷⁴ Main's,¹⁷⁵ Hawley's,¹⁷⁶ and McGaw's.¹⁷⁷ Indeed, this high level of gun ownership shows up in the earliest large set of transcribed American probate inventories, George Dow's from Essex County, Massachusetts. In the 1636-1650 period in Essex, gun ownership in probate estates was 71% for men and 25% for women.¹⁷⁸ We have examined thousands of unpublished handwritten inventories, which are roughly consistent with the published inventories we analyze here.

Thus, everywhere and in every time period from 1636 through 1810, we found high percentages of gun ownership in probate inventories. Approximately 50-79% of itemized male inventories contained guns in all eight databases we discuss here—Jones (National, mostly 1774), Providence (Rhode Island, 1670, 1679-1726), Gunston Hall (Maryland & Virginia, 1740-1810), Essex County (Massachusetts, 1636-1650), Hawley (Virginia, 1690-1715), Main (Maryland, 1657-1719), McGaw (New Jersey & Pennsylvania, 1714-1789), and Gill (colonial Virginia). Outside of Bellesiles's

173. See *supra* notes 31-79 and accompanying text.

174. See 3 JONES, *supra* note 2, at 1651. Jones has itemized tables only for the Middle Colonies. Tables for the Middle colonies—the region with the lowest gun ownership—appear to show that guns are the most common weapon, that 66 of 217 estates have guns, and that another 31 estates might have both a gun and another weapon. See *id.*

175. MAIN, *supra* note 22.

176. Hawley, *supra* note 9.

177. McGaw, *supra* note 2.

178. 1 PROBATE RECORDS OF ESSEX COUNTY, MASSACHUSETTS, 1635-1664, at 3-130 (George Dow ed., 1916). In the earliest years of those estates, 1636-1650, we count 61 probate inventories—all but two of which were sufficiently itemized to be used. Fully 25% of the 8 female inventories had guns. Among the 51 itemized male inventories, 71% contained guns. *Id.*

counts, these studies include all the published counts of guns in early probate records that we located. Guns are found in 6-38% of the female estates in each of the first four databases. We and five other historians and economists working independently over the last twenty-five years (Alice Jones, Anna Hawley, Gloria Main, Judith McGaw, and Harold Gill¹⁷⁹) have now analyzed and reported on guns in a total of over 5000 early probate inventories and nowhere do we report the patterns Bellesiles describes as being pervasive. Moreover, as we have shown here using simple arithmetic, Bellesiles's 1765-1790 data are mathematically impossible.¹⁸⁰

We have analyzed part of Bellesiles's nineteenth-century probate data and are finding the same disturbing pattern as for the prior two centuries. In particular, in his table 1 Bellesiles reports gun counts for forty counties, including San Francisco County.¹⁸¹ In correspondence with us¹⁸² and in a report on his website from February through early September 2001, Bellesiles embellished his story by adding the detail of having examined the San Francisco probate records at the San Francisco Superior Court.¹⁸³ Repeated inquiries to the San Francisco Superior Court all have yielded a version of the same answer: they do not have the probate records that Bellesiles claimed to count because they were destroyed in the 1906 San Francisco earthquake and fire. Representatives of the History Center at the San Francisco Public Library, the Bancroft Library of the University of California, the Sutro Library, the Family History Center Libraries, and the California Genealogical Society agree that they know of no surviving runs of San Francisco

179. Joyce Malcolm reports that in 572 colonial Virginia inventories examined by the historian Harold Gill, guns are present in about 79% of the male estates and about 25% of the female estates. Joyce Lee Malcolm, *Review: Arming America*, 79 TEX. L. REV. 1657, 1672 (2001) (book review). The samples are drawn from York and Louisa Counties, as well as room-by-room inventories from throughout Virginia. *Id.* at 1672 n.121. These are probably skewed somewhat in favor of greater itemization or greater wealth, which may explain the slightly higher percentages.

180. See *supra* notes 188-14 and accompanying text.

181. *Id.*

182. Correspondence from Michael Bellesiles, Professor of History, Emory University, to James Lindgren (Nov. 30, 2000) (stating that he examined the records for San Francisco at the San Francisco Superior Court) (on file with author).

183. Michael A. Bellesiles, *Probate records as an historical source* (Jan. 31, 2001), available at <http://www.emory.edu/HISTORY/BELLESILES/probateweb.pdf> (on file with author). The current version may be found at <http://www.emory.edu/HISTORY/BELLESILES/webprobate.update1.html> (last visited Apr. 06, 2002).

probate inventories for the years Bellesiles claimed to have counted: 1849-1850 and 1858-1859—because (as most note) they all were destroyed in 1906.¹⁸⁴ Kathy Beals, an author who has cowritten a book on pre-1906 San Francisco probate records,¹⁸⁵ reports that a list of the names of those who left wills from the 1850s exists, but no known runs of inventories or property lists remain.¹⁸⁶ Moreover, a few scraps of other probate records exist from 1880 through 1905, but nothing of substance before 1880.¹⁸⁷ Rick Sherman, the Research Director of the California Genealogical Society in Oakland, California, confirmed the unanimous belief that such records do not exist. About Bellesiles's claim to have read San Francisco inventories from 1849-1850 and 1858-1859, Sherman wrote: "If this involves an out-of-body experience, I'd like to know how to pull it off."¹⁸⁸ Bellesiles has repeatedly stated that he used only complete runs of inventories, not a few inventories discovered here or there, as Alice Hanson Jones did for New York.¹⁸⁹

Accordingly, an archive of probate inventories from San Francisco in which Bellesiles claims to have counted guns apparently does not exist. By all accounts, the entire archive before 1860 was destroyed in the San Francisco earthquake and fire. Thus, the three columns of data in Table 1 that we have examined so far—1765-1790, 1849-1850, and 1858-1859—are not only false, they are impossible.

We are not writing on a clean slate; good researchers before us have counted guns and come up with totals that roughly match ours. Gun owning was so common in colonial America (especially in comparison with other commonly owned items) that any claim that eighteenth-century America did not have a "gun culture" is

184. Telephone Interviews with various librarians at the History Center at the San Francisco Public Library, the Bancroft Library of the University of California, the Sutro Library, and the Family History Center Libraries (July 7, 2001 through Sept. 10, 2001); Correspondence from and Telephone Interviews with Rick Sherman, California Genealogical Society to James Lindgren (July 9, 2001 through Sept. 7, 2001).

185. KATHY C. BEALS & ERIC R. BEALS, *SAN FRANCISCO PROBATE INDEX, 1880-1906: A PARTIAL RECONSTRUCTION* (1996).

186. Correspondence from Kathy Beals to James Lindgren (July 11, 2001) (on file with author).

187. *Id.*

188. Correspondence from Rick Sherman, Research Director, California Genealogical Society, to James Lindgren (July 9, 2001) (on file with author).

189. *Odyssey*, *supra* note 115.

implausible, just as one could not plausibly claim that early Americans did not have a culture of reading or wearing clothes.

We have good evidence from the probate records that many, if not most, of his major claims about the absence of a "gun culture" in early America are false. These involve not only the frequency of gun ownership and the absence of a trend over time, but the condition of guns, their cost, where they were stored, who wanted to own them, and—perhaps most important—how highly they were desired compared to other common objects once families could afford them. These problems involve not just simple facts but the role of guns in early America and their social meaning.

Everybody makes mistakes (certainly we do). What we urge here is open research standards, replicability of results, citations to sources, and a little common sense. When someone makes unlikely statistical claims about something, provides no sample sizes or cell counts, does not cite the sources used, and makes one implausible statement after another about the completeness of archival records, scholars should point this out, not climb over one another to jump on the bandwagon. Skepticism should deepen when the scholar discloses that he never had a database and that his original "data" consisted of just thousands of tick marks on legal pads (and that he discarded even these records because they got wet).

The Bellesiles scandal illustrates that history still fits more within the humanities than within the social sciences. Once a field gets sufficiently unmoored from what happened (as both law and history often do), the assessment of reality is treated not as a matter of evidence, but rather as one of narrative, taste, and politics. We may ultimately learn more from considering why many historians and law professors suspended their critical judgment than from guessing precisely how and why Michael Bellesiles published mistaken data.

Something good may yet come from this unfortunate episode, apart from inspiring more careful counts of guns in early America. The reluctance of major segments of the legal history community to spot or even believe the book's obvious and easily checked deficiencies might lead to reforms in legal history—wider training in quantitative methods, a commitment to reproducible results (rather than idiosyncratic ones), a general reduction in the unconscious use of politics as a substitute for evidence, and a greater

respect and generosity of spirit toward expertise in other fields. Most of all, legal history and social history need to show the same healthy skepticism about highly implausible work that the social sciences and hard sciences usually do. Last, a little common sense might help.