

1 John W. Dillon (SBN 296788)
2 jdillon@dillonlawgp.com
3 **DILLON LAW GROUP APC**
4 2647 Gateway Road
5 Suite 105, No. 255
6 Carlsbad, California 92009
7 Phone: (760) 642-7150
8 Fax: (760) 642-7151

7 George M. Lee (SBN 172982)
8 gml@seilerepstein.com
9 **SEILER EPSTEIN LLP**
10 275 Battery Street, Suite 1600
11 San Francisco, California 94111
12 Phone: (415) 979-0500
13 Fax: (415) 979-0511

12 *Attorneys for Plaintiffs*

14 **UNITED STATES DISTRICT COURT**

15 **FOR THE SOUTHERN DISTRICT OF CALIFORNIA**

16 JAMES MILLER, an individual, et al.,

17
18 Plaintiffs,

19 vs.

20 ROB BONTA, in his official capacity as
21 Attorney General of California, et al.,

22 Defendants.
23

Case No. 3:19-cv-01537-BEN-JLB

**PLAINTIFFS’ COMPENDIUM OF
WORKS AND ARTICLES CITED
[ECF 138]**

Courtroom 5A
Judge: Hon. Roger T. Benitez

24
25 Pursuant to the Court’s Minute Order of October 14, 2022 [ECF 138], Plaintiffs
26 James Miller, et al. hereby submit the attached compendium of works and articles
27 cited in Plaintiffs’ ADDITIONAL BRIEF RE *NEW YORK STATE RIFLE & PISTOL ASS’N V.*
28 *BRUEN*, submitted on October 13, 2022 [ECF 136] (“Additional Brief”).

1 **COMPENDIUM OF WORKS CITED**

2 **Exhibit A:** Bruce-Briggs, Barry, *The Great American Gun War*, 45 PUB. INTEREST.
3 37 (1976)

4 **Exhibit B:** DiMaio, Vincent J.M., *Gunshot Wounds: Practical Aspects of Firearms,*
5 *Ballistics, and Forensic Techniques* (3d ed. 2016) [Excerpts and
6 submitted as Defense Trial Exhibit DA]

7 _____
8 Additionally, Plaintiffs previously lodged the declarations of Ashley Hlebinsky
9 (Trial Exhibit 002), George Mocsary (Trial Exhibit 003), James Curcuruto (Trial
10 Exhibit 004), Allen Youngman (Trial Exhibit 009), and John Lott (Trial Exhibit 010),
11 and the exhibits they reference therein, with the Court on February 2, 2021 [ECF 93].
12 These declarations are referenced in Plaintiffs’ Additional Brief. If the Court wishes to
13 have additional hard copies of these declarations, and/or deposition transcripts,
14 Plaintiffs will prepare and lodge another set.

15 Dated: October 20, 2022

DILLON LAW GROUP APC

17 /s/ John W. Dillon

18 John W. Dillon

19 Attorneys for Plaintiffs

EXHIBIT A

The great American gun war

B. BRUCE-BRIGGS

FOR over a decade there has been a powerful and vocal push for stricter government regulation of the private possession and use of firearms in the United States—for “gun control.” The reader cannot help being aware of the vigorous, often vociferous debate on this issue. Indeed, judging from the amount of energy devoted to the gun issue—Congress has spent more time on the subject than on all other crime-related measures combined—one might conclude that gun control is the key to the crime problem. Yet it is startling to note that no policy research worthy of the name has been done on the issue of gun control. The few attempts at serious work are of marginal competence at best, and tainted by obvious bias. Indeed, the gun-control debate has been conducted at a level of propaganda more appropriate to social warfare than to democratic discourse.

No one disagrees that there is a real problem: Firearms are too often used for nefarious purposes in America. In 1974, according to the FBI’s Uniform Crime Reports, 10,000 people were illegally put to death with guns, and firearms were reportedly used in 200,000 robberies and 120,000 assaults, as well as in a small number of rapes, prison escapes, and other crimes. There is universal agreement that it would be desirable, to say the least, that these num-

bers be substantially reduced. So everybody favors gun control. But there is wide disagreement about how it can be achieved. Two principal strategies are promoted. To use the military terminology now creeping into criminology, they can be called “interdiction” and “deterrence.”

Advocates of deterrence recommend the establishment of stricter penalties to discourage individuals from using firearms in crimes. But “gun control” is usually identified with interdiction—that is, the reduction of the criminal use of firearms by controlling the access of all citizens to firearms. The interdictionist position is promoted by a growing lobby, supported by an impressive alliance of reputable organizations, and sympathetically publicized by most of the national media. Every commission or major study of crime and violence has advocated much stricter gun-control laws. The only reason that this pressure has failed to produce much tighter controls of firearms is a powerful and well-organized lobby of gun owners, most notably the National Rifle Association (NRA), which has maintained that improved interdiction will have no effect on crime, but will merely strip away the rights and privileges of Americans—and perhaps even irreparably damage the Republic. The organized gun owners advocate reliance on deterrence.

The debate between the “gun controllers” (as the interdictionists are generally identified) and the “gun lobby” (as the organized gun owners have been labeled by a hostile media) has been incredibly virulent. In addition to the usual political charges of self-interest and stupidity, participants in the gun-control struggle have resorted to implications or downright accusations of mental illness, moral turpitude, and sedition. The level of debate has been so debased that even the most elementary methods of cost-benefit analysis have not been employed. One expects advocates to disregard the costs of their programs, but in this case they have even failed to calculate the benefits.

The prevalence of firearms

While estimates vary widely, it can be credibly argued that there are at least 140 million firearms in private hands in the United States today. This number has been expanding rapidly in recent years.¹ Since 1968, 40 million firearms have been produced and

¹ One obvious reason for the growing gun sales is that the prices of firearms, like most mass-produced goods, have not risen as fast as incomes. The classic deer rifle, the Winchester 94, in production since 1894, cost 250 per cent of an average worker’s weekly take-home salary in 1900, 91 per cent in 1960,

sold. And these counts do not include the millions of guns brought back from the wars and/or stolen from military stocks. These figures are usually cited by advocates of interdiction as demonstrative of the enormity of the problem and as implying the dire necessity for swift and positive action. But they also demonstrate the incredible difficulty of dealing with the problem.

In the gun-control debate, the most outlandishly paranoid theories of gun ownership have appeared. Some people seem to believe that private arsenals exist primarily for political purposes—to kill blacks, whites, or liberals. But of course, the majority of firearms in this country are rifles and shotguns used primarily for hunting. A secondary purpose of these “long guns” is target and skeet shooting. Millions of gun owners are also collectors, in the broad sense of gaining satisfaction from the mere possession of firearms, but even the serious collectors who hold them as historical or aesthetic artifacts number in the hundreds of thousands.

The above uses account for the majority of firearms owned by Americans. Weapons for those purposes are not intended for use against people. But there is another major purpose of firearms—self-defense. In poll data, some 35 per cent of gun owners, especially handgun owners, indicated that at least one reason they had for possessing their weapons was self-defense. A Harris poll found two thirds of these people willing to grant that they would, under certain circumstances, kill someone with their weapon. This sounds very ominous, but it is such a widespread phenomenon that interdictionists have felt obliged to conduct studies demonstrating that the chance of being hurt with one’s own weapon is greater than the chance of inflicting harm upon an assailant. The studies making this point are so ingeniously specious that they are worth expanding upon.

For example, the calculation is made that within a given jurisdiction more people are killed by family and friends, accidents, and sometimes suicide, than burglars are killed by homeowners. In a Midwestern county it was found that dead gun owners outnumbered dead burglars by six to one. Both sides of that ratio are fallacious. People do not have “house guns” to kill burglars but to prevent burglaries. The measure of the effectiveness of self-defense is not in the number of bodies piled up on doorsteps, but in the property that is protected. We have no idea how many

and 75 per cent in 1970. The relationship to annual median family income has been even more favorable—from 2.8 per cent in 1900 to 1.4 per cent in 1960 and 1.0 per cent in 1970. More important, increased competition during the past decade has lowered the absolute price of handguns.

burglars are challenged and frightened off by armed householders. And, of course, there is no way to measure the deterrent effect on burglars who know that homeowners may be armed. Though the statistics by themselves are not particularly meaningful, it is true that the burglary rate is very low in Southern and Southwestern cities with high rates of gun ownership. Burglary in Texas would seem a risky business.

The calculation of family homicides and accidents as costs of gun ownership is equally false. The great majority of these killings are among poor, restless, alcoholic, troubled people, usually with long criminal records. Applying the domestic homicide rate of these people to the presumably upstanding citizens whom they prey upon is seriously misleading.

Other studies claim to indicate that there is little chance of defending oneself with a weapon against street crime or other assaults. But almost without exception, such studies have been held in cities with strict gun-control laws. My favorite study was the one purporting to show that it was very dangerous to attempt to defend yourself with a gun because the likelihood of suffering harm in a mugging was considerably higher if you resisted. But the data indicated only that you got hurt if you yelled, kicked, or screamed—but not if you used a gun.

Gun owners versus interdiction

All this, of course, is begging the question. Why do people feel it necessary to obtain firearms to defend themselves? The rising crime rates would suggest it is not lunacy. But the data are improperly understood. Despite the high crime rates, there is a very small chance of being attacked or robbed in one's home, or even during any given excursion into the highest crime area. But the average citizen does not make such calculations and certainly would not have much faith in them if he did. He is scared. The gun, if it does nothing else, gives the citizen reassurance.

This last is a reason for large numbers of guns being owned—not quite defense, but insurance. Many people have weapons tucked away with no explicit idea of how they might be used except “you never know when you might need one.” No violent intent is implied, any more than a purchaser of life insurance intends to die that year. It is pure contingency.

Apparently most owners care little about their firearms *per se*, considering them as mere tools, to be properly cared for—and,

because they are potentially deadly, to be handled with caution. Yet within the ranks of the gun owners is a hard core of “gun nuts” (they sometimes call themselves “gunnies”) for whom firearms are a fanatic hobby. To them, the possession, handling, and use of guns are a central part of life. They not only accumulate guns, but also read books and magazines about firearms and socialize with kindred spirits in gun clubs and gun stores. Many such people combine business with pleasure as gun dealers, gunsmiths, soldiers, policemen, and officials of gun owners’ organizations. All this is symptomatic of the earnest devotees of any hobby—there are similar ski nuts, car nuts, boat nuts, radio nuts, dog nuts, even book nuts. In this case, however, the “nuts” have political importance because they are the core of the organized gun owners, easily aroused and mobilized to thwart the enemies of their passion.

Polls are unreliable on this point, because internal inconsistencies in the data and common sense suggest that many respondents won’t admit to gun ownership, but it appears that at least one half of all American households are armed. They own guns for recreation or self-protection. The principal form of recreation, hunting, has deep cultural roots. In rural areas and small towns, a boy’s introduction to guns and hunting is an important rite of passage. The first gun at puberty is the *bar mitzvah* of the rural WASP. Possession of a gun for self-protection is based upon a perception of a real or potential threat to personal, family, or home security that is beyond the control of the police. Very rarely is there criminal or seditious intent. Yet these people are told by the interdictionists that their possession of weapons is a threat to public safety and order, that they must obtain permits, fill out forms, pay taxes and fees, and keep and bear arms only by leave of the state. Inevitably, some of them have organized themselves against such interdiction. With a million members, the NRA is the largest and most effective consumer lobby in America. It maintains its morale and membership by broadcasting the statements in favor of “domestic disarmament” by extreme and loose-mouthed interdictionists and by publicizing the legislative attempts to restrict gun ownership as merely part of a fabian strategy—to use the interdictionists’ code words, a “step in the right direction”—toward liquidating the private ownership and use of firearms in America.

The interdictionist position rests on the self-evident proposition that if there were no guns, there would be no crimes committed with guns. But few are sanguine about achieving that situation. Instead, their argument is that if there were fewer guns and/or

if gun ownership were better controlled by the government, there would be fewer crimes with guns.

Can interdiction work? Let us examine what is proposed. Guns and control are subdivided in several ways. Usually there is an attempt to distinguish between mere possession and use. Furthermore, different controls are suggested for different types of weapons—"heavy stuff" (machine guns and cannon); long guns (rifles and shotguns); handguns (revolvers and pistols); and "Saturday night specials" (cheap handguns). The levels of possible control can be roughly ranked by degree of severity: market restrictions, registration, permissive licensing, restrictive licensing, prohibition.

Market restrictions seek to limit the number of manufacturers, importers, or retailers of firearms, in order to keep better track of them. As in all areas of economic regulation, a principal effect is to promote the interests of the favored outlets, at the cost of the consumer. They do not deny anyone access to guns, but push up the cost—both the money cost and the personal inconvenience—thereby presumably discouraging some marginal purchasers, but surely few criminals, lunatics, and terrorists.

"Registration" is widely discussed, but no one is really advocating it. To register is merely to enroll, as a birth is registered. Merely to enroll weapons would be costly, to little or no purpose. What goes by the label of registration is actually "permissive licensing" whereby anyone may obtain a firearm except certain designated classes—minors, convicted criminals, certified lunatics.

"Restrictive licensing," such as New York's Sullivan Law, permits only people with a legitimate purpose to own a firearm. Police, security guards, hunters, target shooters, and collectors are obliged to demonstrate their bona fides to the licensing authorities. Typically, personal or home defense is not ordinarily considered a legitimate purpose for gaining a license.

Prohibition is self-defined. If there were no or few firearms already in circulation, a simple ban would be sufficient. But with tens of millions out there, prohibition would require buying or collecting existing weapons or some more complicated policy intended to make them useless.

The preferred program of most interdictionists today contains four elements, most of which have been attempted one way or another in one jurisdiction or another: 1) continuing and tightening all existing laws, 2) permissive licensing for long guns, 3) restrictive licensing for all handguns, and 4) prohibition of cheap handguns, the so-called "Saturday night specials."

The third element is currently considered most important. Because the great majority of gun crimes are committed with handguns, control of them would presumably promote domestic tranquility. Concentration on handguns is also politically useful. Relatively few of them are used for recreation, so this would seem to outflank the objection of sportsmen to restrictions.

Existing gun control

There are reportedly some 20,000 gun-control ordinances in the various jurisdictions of the United States. Most are prohibitions against discharging a weapon in urban areas or against children carrying weapons, and are trivial, reasonable, and uncontroversial. Most states and large cities have laws against carrying concealed weapons, the rationale being that no person has a legitimate reason to do so. In a few large cities and states, particularly in the Northeast, a license is required to buy or possess a handgun, and in a very few but growing number of Northeastern cities and states a permit or license is required to possess any sort of firearm.

At first sight, licensing seems eminently reasonable. Dangerous criminals should not have weapons, nor should the mentally disturbed. But the administrative “details” of licensing become incredibly difficult. It is fairly easy to check out an applicant for a criminal record, which can be a legitimate reason for denying a license. But many criminals, judging from the comparison between reported crime and conviction rates, are not convicted of crimes, especially violent crimes, so the difficulty exists of whether to deny people the privilege of purchasing weapons if they have merely been arrested, but then set free or acquitted. Civil libertarians should be taken aback by this prospect. The question of mental competence is even nastier to handle. Is someone to be denied a firearm because he sought psychiatric help when his wife died?

From the point of view of the organized gun owners, licensing is intolerable because of the way that it has been enforced in the past. One of the peculiarities of most local licensing is the lack of reciprocity; unlike marriage licensing, what is recognized in one jurisdiction is not in another. In the Eastern states it is nearly impossible to travel with a firearm without committing a felony (not, of course, that this troubles many people). Also many police agencies, particularly in the Northeastern states with restrictive licensing, have engaged in some extremely annoying practices. Not

only do they load up questionnaires with many superfluous personal questions, but they also require character witnesses to provide intimate information. When the police wish to restrict privately owned firearms, they resort to all manner of subterfuge. In a test of the local licensing procedure some years ago, the Hudson Institute sent several female staff members to try to make the necessary application. The forms were not available and the people responsible for the forms were absent.

Even when the applications are submitted, the waiting period is often deliberately and inordinately long. I have a friend on Long Island who spent three years getting a pistol permit for target shooting. Influence is useful, but even it is not necessarily sufficient. A staff aide to a leading New York politician who has frequently been threatened applied for a permit to carry a handgun as his boss's bodyguard. Even a letter to the Police Commissioner of New York City on the gentleman's stationery was inadequate; a personal phone call had to be made—and that has not speeded up the process very much. The system is not much better with long guns and sympathetic police. Immediately after New Jersey required the licensing of rifles, I happened to be in a police station in a suburb of Philadelphia when a young man came in to get his license. The process had taken six weeks. He commented bitterly, "It's a good thing that I planned well in advance for my Maine hunting trip." (By the way, if he had lost or damaged his weapon during a hunting trip, the Federal Gun Control Act of 1968 would have made it extremely difficult for him to get a replacement out of state).

This sort of anecdotal evidence can be continued almost indefinitely. It suggests to the organized gun owners that licensing systems are a screen not against criminals but against honest citizens, and that licensing authorities are not to be trusted with any sort of discretionary power. It is certainly an inefficient system that dribbles out gun permits and refuses to recognize self-defense as a legitimate reason for owning a gun, while muggers operate with impunity, illicit pistols are exchanged openly on the streets, and penalties for gun-law violations—even by people with criminal records—are very rarely imposed.²

Among the most unproductive local gun-control measures are

² The Police Foundation is currently engaged in a study of the details of local handgun-law enforcement. Unfortunately, because its head is known as a vocal interdictionist, the credibility of its results will necessarily be somewhat compromised.

the moratoria permitting individuals to surrender their firearms without fear of prosecution. The police will then investigate such people to make sure they are not wanted by some other agency, and they are then entered in police files. (Obviously, if you really wish to dispose of an illegal weapon, you merely disassemble it and throw the parts from a bridge.) The number of weapons delivered under such programs is infinitesimal. An extension of such programs is the buying of weapons by police departments. This was attempted in Baltimore and obtained a substantial number of guns. But the total collected is a matter of simple economics: Large numbers of guns worth much less than the price offered will be obtained. Few valuable weapons will be turned in—and it is perhaps needless to note that there has been no perceptible effect on the crime rate.

The latest innovation in local gun control is a sort of interdiction through deterrence. Massachusetts recently passed a law mandating a minimum jail term of one year for possession of an unlicensed weapon. This reflects an interesting set of social values, because there are no such mandated sentences for burglary, armed robbery, rape, or even murder in Massachusetts. Every hunter who passes through the state on the way to Maine is risking a year in prison. What is happening is predictable: The law is not enforced.

The Massachusetts experience is both a caution to the interdictionists and a reassurance to the organized gun owners. If restrictive gun legislation is passed, the police will be hesitant to arrest ordinary citizens, prosecutors will be loathe to prosecute, juries will be unwilling to convict, and judges will devise ingenious loopholes.

Most of the existing interdiction laws have been in effect for many years, yet it is not possible to make any sort of estimate as to whether they do any good in reducing crime. Attempts have been made to correlate gun ownership and/or gun-control laws with gun-related crimes, but they are singularly unconvincing for the very simple reason that the data are so miserable—we have no firm estimate even of the number of guns available nationwide, much less in any given community, and it seems that the gun laws now on the books are rarely enforced. Some ingenious attempts to use regression analyses are easy to demolish.

In any event, no serious student of the subject would disagree that regional, racial, and cultural factors completely swamp the effects of gun-control laws. It is true that places with gun-control laws tend to have lower violent crime rates, but it happens that

these are Northern communities with a long tradition of relative nonviolence, and the existence of gun-control laws on the statute books is merely evidence of the same relative peaceableness that is also reflected in the low rates of violent crime. The gun-toting states are also the gun-using states and the violent states, mostly in the South. And where Southerners or ex-Southerners are in the North, there are high violence rates regardless of laws. In recent years a few Northern states have imposed stricter licensing and use laws, with no perceptible effect on the crime rate. As with so many things, the laws on the books don't matter as much as their application. People in these states claim that any effects of their laws are spoiled by the spillover of easily available weapons from outside the state, which certainly sounds eminently reasonable. But if the economists are right, the gun-control laws should at least increase the cost or the inconvenience of getting guns, and therefore discourage their use. Retail handgun price differentials between open sources in the South and the black market in New York prove that the Sullivan law does pass the cost of a less efficient transportation system onto the consumer. But we have no idea of the effect of these increased costs upon the demand for guns. Presumably, those who want to buy guns for illicit purposes are not likely to be much affected by an extra \$25 or \$100 on the price tag.

The spillover effect has led many public officials in the gun controlling states to advocate essentially the extension of their systems of licensing to the entire nation. It is easy to sneer at this approach as the characteristic reflex of failed government programs—X didn't work, so let's try 10X. But the thesis seems plausible. If one could cut off the supply of guns from, say, South Carolina, they would be more difficult to obtain in, say, New York; that is, they would be more difficult to obtain *casually*. So the principal interest of gun controllers is in national legislation.

Federal firearms control

National firearms control legislation is a relative innovation. The first important law passed was the Federal Firearms Act of 1934, which was allegedly a response to the wave of gangsterism that swept the country in the depths of the Depression. Originally the Roosevelt Administration attempted to require national licensing of all weapons, but it was thwarted by a previously quiescent organization, the NRA. The watered-down version that passed

Congress effectively prohibited (through punitive taxes) the private possession of submachine guns, silencers, sawed-off rifles and shotguns, and other weapons presumably of use only to gangsters. While there appears to be no information whatever on the effectiveness of this law, it seems to have been reasonably successful. Submachine guns are rarely used in crimes. That success, however, may simply reflect the fact that very few such weapons were in circulation, and their rarity gives them too much value to be risked in crime. (We know, of course, that there certainly are tens of thousands of unregistered automatic weapons in the United States, largely war souvenirs. Vietnam veterans brought back thousands of M-16's and Kalchnikov assault rifles in their duffel bags. But most of these gun owners have no criminal intent or any intention of selling such weapons to criminals.) Sawed-off shotguns and rifles may be made illegal, but they are impossible to prohibit; all that is needed is a hacksaw and a few minutes' time.

The second federal effort was the National Firearms Act of 1938. Again, this took the form of a revenue measure, requiring the licensing of firearms manufacturers and dealers. The law requires the firearms trade to keep records of the purchasers of weapons, and prohibits sales to known criminals. But only a simple declaration on the part of the buyer is required. These records are useful for tracing firearms. If a weapon needs checking, it is merely necessary to go back to the original manufacturer or importer and trace it through the serial number to the dealer. Although these records are not yet centralized, *in effect there has been registration of every new weapon sold in the United States since 1938*. How many crimes have been solved through this means, or how it has otherwise been effective to law enforcement, is by no means clear. It would not be difficult to find out, but no one has really tried to. Presumably, such registration is of some help to the police—though it seems to have had no effect on the crime rate or the conviction rates.

The most important national measure is the Gun Control Act of 1968, the immediate result of the disturbances in the 1960's and the assassinations of Robert Kennedy and Martin Luther King, Jr. The Act raised the taxes on firearms dealers, added cannon to the list of weapons subject to punitive taxes, prohibited the importation of surplus military firearms and "Saturday night specials," and prohibited the interstate retailing of all firearms. The last provision is the most important. The purpose was to prevent individuals like Lee Harvey Oswald from ordering weapons by

mail under phony names. But it also has more annoying side effects. For example, if you live in Kansas City, Kansas, and wish to give your brother, who lives in Kansas City, Missouri, a .22 caliber rifle for his birthday, it is illegal for you to do so. If you are traveling in another state and see a weapon you wish to buy, you must go through the rigamarole of having it sent to a dealer in your own state. So far as one can determine, the law has had no perceptible effect in slowing down the interstate sale of arms.

Enforcement of federal firearms laws was given to what is now the Bureau of Alcohol, Tobacco, and Firearms (BATF) of the Department of the Treasury. These are the famous "revenueurs" whose most important function was stamping out moonshining. But for economic and social reasons, the illicit liquor trade is fading and the BATF needs other things to do than break up stills. Since 1968 they have rapidly expanded their funding and activity in firearms control and now devote about half their personnel and budget to that function. BATF seems to be a crude and unsophisticated police agency, more like the Bureau of Narcotics and Dangerous Drugs or the Border Patrol than the FBI or the Secret Service. For example, it says it has no idea how many of the 250,000 licensed Title II firearms (i.e., machine guns, cannon, etc.) are held by police or other public agencies and how many by private citizens; nor has it any information on how many unlicensed Title II firearms were used for criminal purposes. Some of its methods of operating have been irritating to legitimate gun owners.³ The Gun Control Act of 1968 says that BATF shall have access to the premises of a gun dealer during normal business hours, which BATF interprets to mean that there must be a business premises separate from, for example, a private residence, and that there shall be ordinary posted business hours. BATF also took upon itself the enforcement of local zoning laws. This problem arises because many gun owners have taken advantage of simple and cheap licensing procedures to obtain dealer licenses so they

³ The BATF also made the grave error of providing the organized gun owners with their first martyr. In Maryland, in 1971, a local pillar of the community—a boy scout leader, volunteer fireman, and gun collector—was in his bathtub when a group of armed men in beards and rough clothes—BATF agents—broke through the door. Understandably, he reached for a handy antique cap-and-ball pistol and was shot four times and left on the floor while his wife, still in her underwear, was dragged screaming from the apartment. What had happened was that a local boy reported a hand grenade in the apartment. There was, but it was only the shell of a hand grenade. A simple records check would have been adequate to establish the resident's bona fides, and if there was an interest in following up the matter, someone might have come and knocked on his door. He is now crippled for life.

can buy firearms wholesale. The majority of the nearly 150,000 dealers operate from their homes.

The organized gun owners see the activities of the BATF as a plot against them, not realizing that its habits and state of mind are not much different from other regulatory agencies. Once an activity is licensed, it becomes a privilege; a citizen is obliged meekly to petition the regulator for the boon and to modify his behavior to suit the needs of the bureaucracy. At the present time, the Department of the Treasury is asking for a large increase in the licensing fee of gun dealers in order to reduce the number of license holders—not for any public benefit, but because it will make the job of regulation easier for BATF.

“Saturday night specials”

The “Saturday night special” is the latest target of the interdictionist. It is identified as a cheap, unreliable, inaccurate, and easily concealed handgun, allegedly employed for large numbers of “street crimes.” Because it is impossible to define a “Saturday night special” precisely, the NRA claims that the concept is fraudulent—but any definition in practice or law is necessarily arbitrary. Concentration on the “Saturday night special” has definite political advantages. Firearms enthusiasts scorn it as sleazy junk quite unsuited for serious work. Nevertheless, the organized gun owners are making an effective fight against banning the “Saturday night special.” They were unable to block prohibition of its importation in 1968, but have resisted attempts to ban domestic manufacture and the assembly of imported parts.

It has been said against the “Saturday night special” that it is employed to commit a disproportionately large number of street crimes, and that getting rid of it would cut substantially into those crimes. A BATF study claimed that 65 per cent of “crime guns” used for street crimes in 16 major cities were cheap “Saturday night specials.” Unfortunately, the text of the report reveals that these weapons were *not* those used in crimes but all those handguns collected by police, and anyone who knows anything about how reliable the police are in handling contraband knows that the chances of a quality firearm like a good Smith and Wesson finding its way into the reporting system are infinitesimal. Because the principal sanction against the illegal carrying of guns is on-the-spot seizure by the police, it stands to reason that individuals would pack the cheapest effective gun.

But even if “Saturday night specials” are used for some half of crimes with handguns, their elimination is hardly likely to reduce handgun crime by that much. People buy them because they are cheap. If people want a weapon, and if their demand for handguns is highly inelastic, this only means that whatever guns fell outside of whatever arbitrary definition of a “Saturday night special” that was adopted would sell more. Perhaps this is recognized by the proponents of banning the “Saturday night special,” because they have written bills to give the Secretary of the Treasury sufficient discretion to ban all handguns.

Actually, neither side cares much about the “Saturday night special” one way or another. The interdictionists advocate its regulation as a stepping stone toward tight licensing of handguns or the licensing of all guns, while the organized gun owners fear it as a camel’s nose in the tent. It is difficult to escape the conclusion that the “Saturday night special” is emphasized because it is cheap and is being sold to a particular class of people. The name is sufficient evidence—the reference is to “nigger-town Saturday night.”

Crackpot schemes

Some other suggestions for gun control are simply silly. One idea is to have all weapons locked up in armories of various sorts, to be drawn by hunters or target shooters when they are needed. But most hunters and gun owners perform ordinary maintenance on their own weapons, so that a storage facility would have to provide room for that. The most overwhelming drawback against the idea is the enormous cost of providing such facilities—no one has calculated how much, and they would, of course, be targets for anyone who wished to obtain illicit firearms.

Another crackpot scheme is to record the ballistics of all weapons, rather like finger prints. This would not be enormously expensive, costing only a few million a year for new weapons only. But it is physically impossible. The pattern that the rifling of a barrel imprints on a bullet is not consistent and can be simply modified by changing the barrel. Ballistics is excellent at a one-to-one comparison between bullets, but cannot be employed for a general identification search.

Perhaps the most peculiar gun-control proposal to date was made by the Department of Justice in 1975. It recommended that, when the “violent crime rate has reached the critical level,” possession

of handguns outside the home or place of business be banned altogether. This assumes that those areas where law enforcement is least efficient could enforce a handgun ban, and that where the forces of public order are weakest citizens should be denied the means to defend themselves. In almost all high-crime areas the carrying—or at least the concealed carrying—of handguns is already illegal. (Hard data are necessarily spotty, but it now appears likely that the widespread private ownership of handguns for self-protection among crime-labile populations leads to some transfer to criminals, principally by theft. If this is true, it would not seem unreasonable to dry up the demand for guns by providing security to these people.)

The limits to interdiction

So the utility of interdiction has not and perhaps cannot be demonstrated. While the lack of evidence that a policy can be effective should make prudent men wary of promoting it, that does not mean the policy is necessarily without merit. Nevertheless, in the case of gun control it is possible to identify some weaknesses in the principles behind the policy.

To begin with, gun control as a general anti-crime strategy is flawed because most crimes, including many of the crimes most feared, are not committed with guns. Firearms are rarely employed for rape, home burglary, or street muggings. On the other hand, a good portion of the most heinous crime, murder, is not a serious source of social fear. The majority of murders are the result of passionate argument, and although personal tragedies, are not a social concern—ditto for crimes committed by criminals against one another. Furthermore, the worst crimes, involving the most dangerous and vicious criminals, will not be affected by gun control. No serious person believes that an interdiction program will be effective enough to keep guns out of the hands of organized crime, professional criminals, or well connected terrorists and assassins. And almost all the widely publicized mass murderers were eligible for licensed guns.

Gun-control advocates grant this, and emphasize the need to limit spontaneous murders among “family and friends” that are made possible by the availability of firearms. But the commonly used phrase “family and friends” is misleading. The FBI’s Uniform Crime Reports classify relationships between murderers and victims as “relative killings,” “lovers’ quarrels,” and “other arguments.” The

last can be among criminal associates, as can the others. Nor can we necessarily conclude that such murders are spontaneous. The legal distinction between premeditated and non-premeditated murder prompts killers (and their lawyers) to present murders as unplanned.

The very nature of interdiction suggests other weakness. It is a military term used to describe attempts, usually by aerial bombing, to impede, not halt, the flow of enemy supplies to the battlefield. Interdiction has been the principal strategy used in drug control; it works only when pressure is being applied at the street level at the same time that imports and production are being squeezed. If there are 140 million privately owned firearms in the United States and guns can last centuries with minimum maintenance, merely cutting off the supply will have little or no effect for generations, and if the supply is not cut off entirely (which no serious person believes it can be), an interdiction policy is hardly likely to have a major effect even over the very long run. To my knowledge, no interdiction advocate has given a plausible answer to the very simple question of how to get 140 million firearms out of the hands of the American people.

Even more to the point, is it cost-effective to try to deal with 140 million weapons when you are presumably concerned with a maximum at the outside of 350,000 weapons used in violent crimes? The odds of any gun being criminally used are roughly on the order of one in 400. For handguns the rate is considerably higher; for rifles and shotguns considerably lower. I estimate that in 1974, roughly one of every 4,000 handguns was employed in a homicide, compared with one in 30,000 shotguns and one in 40,000 rifles. There are probably more privately owned guns in America than there are privately owned cars, and with the obvious exception of murder, the rate of criminal use of firearms is almost certainly less than the rate of criminal use of automobiles. How are we to control the 400 guns to prevent the one being used for crime? And if we decide the only way is to reduce the 400, to what must we reduce it? It must be assumed that the one gun used for crime will be the 400th.

Moreover, interdiction is a countermeasure against crime. Countermeasures provoke counter-countermeasures: Substitution is the most obvious strategy. If guns cannot be bought legally, they can be obtained illegally—organized crime is ready to cater to any illicit demand. If cheap handguns are unobtainable, expensive handguns will be used. If snub-nosed pistols and revolvers are

banned, long-barreled weapons will be cut down. If the 40-million-odd handguns disappear, sawed-off rifles and shotguns are excellent substitutes. If all domestic production is halted, we will fall back on our tradition of smuggling. If all manufactured weapons vanish, anyone with a lathe and a hacksaw can make a serviceable firearm. In the 1950's, city punks produced zip guns from automobile aerials. A shotgun is easily made from a piece of pipe, a block of wood, several rubber bands, and a nail.

A more promising variation is to go after the ammunition rather than the gun. Whereas firearms are easily manufactured and last indefinitely, modern ammunition requires sophisticated manufacturing facilities and has a shorter shelf life. Recently the interdictioinists attempted to get the Consumer Product Safety Commission (CPSC) to prohibit the sale of handguns on the basis of their being inherently unsafe. This was certainly the most intelligent gun-control tactic attempted so far; yet it failed because Congress explicitly prohibited CPSC from meddling in firearm matters. But a strategy directed against ammunition is also flawed. Hundreds of thousands of Americans "hand load" ammunition at home from commercially purchased shells, powder, and bullets in order to obtain substantial cost savings and to get precisely the sort of load they desire. Shell cartridges last forever and there are untold billions in circulation. Lead and steel bullets can be made by anyone with a stove or a file. So it would be necessary to close off powder sales as well. Smokeless powder would be extremely difficult to make at home, but the old-style black powder that fired weapons for 500 years can be manufactured by any kid with a chemistry set. Besides, any ammunition cutoff would be preceded by a long debate and bitter fight—during which time everyone would stock up. Also, thefts from the military, National Guard, and police would continue to be a major source of ammunition.

The costs of interdiction

Against the unconvincing or unsupported benefits of any interdiction law, one must count the costs; practically no attention has been paid to them. BATF is now expending \$50 million per annum on enforcement of federal laws. Local police, court, and corrections expenditures are buried in budgets. The only serious accounting of costs was prepared for the Violence Commission of 1968 and was downplayed in the final report. New York's Sullivan Law licensing cost about \$75 per permit in 1968; double that for

current levels of expenditure; assume that a maximum of half the households in the country will register their weapons; the cost is therefore in excess of \$5 billion—or more than one third of the present cost of the entire criminal justice system, from police to prisons. Simple “registration” on the model of auto registration would cost proportionately less, but the numbers are always in the hundreds of millions of dollars.

The financial costs do not exhaust the potential expense of gun-control laws. It is too much to expect government to count as a cost the time and trouble to a citizen of registering a gun, but we might look at the price of diverting police and other law-enforcement officials from potentially more rewarding activities.

But the worst cost is that of widespread flouting of the law. Existing gun controls are now being disobeyed by millions. More severe restrictions will be widely disregarded by tens of millions, including a huge group of stalwart citizens whose loyalty and lawfulness we now take for granted. Needless to say, the organized gun owners cite the Prohibition experience.

The limits to deterrence

Organized gun owners, on the other side of the issue, advocate enforcing the existing gun-control laws. I suggest that they do not take this recommendation seriously; the existing laws are not enforceable. Another suggestion would appear to be more credible at first glance—to employ deterrence by having add-on sentences for the use of guns in crime. But such laws are on the books in several states and are not enforced, for a fairly obvious reason: Americans are not concerned with the use of a gun in a crime, but with the crime itself. The murder or armed robbery is objectionable, not the gun. *Illegal gun ownership is a victimless crime.*

Several practical problems make a deterrence strategy extremely difficult. There is trouble putting anyone away these days, and enforcement of existing gun laws or of new laws would add to the overload of an already jammed criminal-justice system. Perhaps most important of all, when the effective sentence for premeditated murder is 7 or 8 years in a penitentiary,⁴ how much leeway is there to add to sentences for lesser crimes? Given the advantages of a firearm to a robber, a few more weeks or months of jail is hardly likely to deter him from using it.

⁴ The assassin of George Lincoln Rockwell was released from prison last year.

The organized gun owners also claim that the widespread possession of firearms in itself deters crime; criminals are likely to be restrained by an armed citizenry. Perhaps—but consideration of criminal tactics suggests the idea is limited in application. Take burglars—by definition they prefer stealth, choosing unoccupied houses. If the owner is at home it is unlikely that he will awaken. A noise that arouses him will also alert the burglar. Should the householder awake, the burglar will probably hear him—especially if he is fumbling for a gun that is, as it should be, secured. In a confrontation, the burglar is alert, while the householder is sleepy-eyed. It is far more likely that a gun will be stolen than that it could be used against a burglar.

In store robberies, the robber also has the advantage. Guns are clearly not a deterrent, since the armed stores are those most often hit—because, to use Willie Sutton's phrase, "that's where the money is." Arming stores will certainly dissuade non-gun robberies, obliging robbers to escalate to firearms. Street robberies offer a similar tactical imbalance: The mugger has the initiative. It is not unknown for even police to be disarmed by criminals. It is true that areas with high gun ownership tend to have less crime against property, but this is probably largely the result of cultural factors. In any event the low quality of data on crime rates and gun ownership makes rigorous examination impossible.

International experience

Many peripheral arguments used in the gun control debate have little relevance to the issue, but must be addressed. Both sides will deploy the testimony of police chiefs on the desirability or futility of gun-control laws. Liberal interdictionists often cite the testimony of those gentlemen who have most illiberal views on most other law-enforcement matters. Most, but not all, big-city chiefs favor interdiction, while small-town chiefs generally oppose it, both nicely reflecting the views of their political superiors. But, for what it is worth, one can cite the Sheriff of Los Angeles County staunchly demanding stricter gun control laws and the Chief of Police of Los Angeles City saying that public order has broken down so far that only a fool would not arm himself. The gun owners gained strong reinforcement when the Superintendent of Scotland Yard recently pointed out that the number of guns available in America makes an interdiction strategy impossible.

A surprising amount of attention has been paid in the gun-control

debate to international experience. In the world of gun control there seem to be only three foreign countries: Great Britain, Japan, and Switzerland. British gun control is taken by the interdictionists as the model of a desirable system. Guns are tightly regulated in the United Kingdom, violent crime is trivial by United States standards, and even the police are unarmed. But, as James Q. Wilson recently pointed out in this journal, the English situation is slowly eroding. The key to the low rates of personal violence in England is not in rigorous gun-control laws (which only date from 1920), but in the generally deferential and docile character of the populace. Perhaps it is significant that interdictionists point to "Great Britain" as their model; gun-control laws are even stricter in the other part of the United Kingdom, Northern Ireland.

Japan is an even more gun-free country. Not only does it restrict the ownership of weapons, but it has prohibited the ownership of handguns altogether, and the rates of violent crime are so low as to be hardly credible to Americans. To which the organized gun owners reply that Japanese-Americans have even lower rates of violence than Japanese in Japan.

The third international comparison is used by the organized gun owners. Switzerland has a militia system: 600,000 assault rifles with two magazines of ammo each are sitting at this moment in Swiss homes. Yet Switzerland's murder rate is 15 per cent of ours. To which the interdictionists respond that the Swiss have strict licensing of weapons, though this would seem to have very little to do with the thesis that the mere availability of weapons provokes murder and other crimes with guns.

It is not entirely clear what these very different countries—with very different histories, political systems, and national character—have to do with the United States. Those interdictionists who defend civil liberties would be appalled at the suggestion that even the English system of justice be applied to the United States, much less the Swiss civil law or the authoritarian Japanese judicial system—none of which provides the criminal with the rights and privileges he has in the United States.

But let me muddy these waters by introducing two other countries of great interest. Israel is mostly inhabited by a people who have no tradition whatever of using firearms in self-defense and whose compatriots in America are for the most part unarmed and have little taste for hunting. But the objective political conditions of Israel have required them to arm in self-defense and the country bristles with public and private weapons. In addition to the armed

forces, soldiers on pass or in casual transit in border areas carry their small arms with them. There is a civil guard in the tens of thousands. Every settlement has an arsenal, and individual Israelis are armed. The government requires registration of all weapons, but the system is very lenient on handguns (for Jews, of course; considerably tighter for Arabs) and very tough on rifles and shotguns, which might be used for military purposes. Israeli gun-control policy is directed toward internal security, not against crime. But despite these restrictions, the Israelis have accumulated huge numbers of privately owned military weapons, including automatics, in various wars and raids. These are held "just in case" they may be needed. But strangely, hunting is on the increase in Israel, as are target shooting and gun collecting, and there is talk of forming an Israeli national rifle association. Needless to say, the crime rate in Israel is much lower than in the United States.

The special conditions of Israel are too obvious to note, but Canada is closer to home, and it is odd that so little attention has been paid it. Since the early 1920's, Canada has registered all pistols on what is essentially the same basis as New York's Sullivan Law. Rifles and shotguns are sold freely, even through mail order. Canada's crime rate is much lower than the United States'. Here, too, cultural factors seem to predominate. It is not usually observed that without the South and Southerners (black and white) transplanted to the North, the United States would have crime rates comparable to other industrial nations. In fact, there is no appreciable difference in murder rates for "Yankee" whites in states and provinces on either side of the 49th parallel.

The best point of the interdictionists is that America is an exception to the international system of strict restrictive licensing. To which the "gunnies" reply that our ancestors came here to free themselves and us from the tyrannies of the Old World.

The Second Amendment

One reason the organized gun owners have had bad public relations is that they take an absolutist position regarding the Constitution, relying on the Second Amendment of the Bill of Rights: "A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed."

To the NRA and other organizations this is an unqualified right, like the freedom of the press, not to be compromised on any

grounds. To the interdictionists, the amendment merely guarantees the right of the states to maintain what is now called the National Guard. Actually, the status and meaning of the Second Amendment can be the subject of debate among reasonable men. It is certainly true that the original intention of the Second Amendment was that there be an armed citizenry. A "militia" as understood in the 18th century was indeed the people armed with their own weapons, and the inclusion of the Second Amendment in the Bill of Rights was meant to protect the independence of the states and the people against the threat of the central government's employing the standard instrument of baroque tyranny, the standing army. However, there was no intention of the Founding Fathers to guarantee the use of firearms for recreation, nor for self-defense against criminals (although of the 38 states that have similar "right to bear arms" provisions in their constitutions, 18 specifically provide for personal defense, and one, New Mexico, for recreation).

The supreme arbiter of the Constitution has never ruled directly on the matter. The four cases that have come before the Supreme Court have been decided on narrow technical issues. Three 19th-century cases seem to support the view that states have the right to regulate firearms, and the one 20th-century case, which rose out of the Federal Firearms Act of 1934, was decided on the very narrow ground of whether a sawed-off shotgun was a weapon suitable for a well regulated militia.

Gun-owning lawyers claim that the doctrine of "incorporation" to the states of Bill-of-Rights restraints protects gun owners from state controls. This is reasonable on the face of it. However, the Supreme Court, as it was intended to do, applies the standards of an enlightened public opinion to the law. If the dominant elements in the country favor gun control, it is to be expected that the courts will rule accordingly.

The organized gun owners also see the armed citizenry as a last line of defense against insurrection. This idea has roots in the disturbances of the 1960's. While many Americans viewed the urban riots as the inevitable outcome of centuries of repression, many more merely saw police standing aside while looters cleaned out stores and homes, then envisioned the same happening to *their* stores and homes, and armed themselves. They did not understand that the looting was permitted only so long as it was contained to black neighborhoods; any attempted "breakout" would have roused the forces of public order from their lethargy. Indeed, the contingency plans have been prepared.

The gun owners claim that any registration lists would be used by a conqueror or tyrant to disarm the potential resistance. A minor debate has grown up over what the Nazis did in occupied Europe, especially in Norway. A source in the Norwegian Defense Ministry says the Nazis did not make use of registration lists but rather offered to shoot anyone who failed to turn in his weapons.

But there are examples of the use of registration lists to disarm the public. All handguns were called in following the assassination of the Governor of Bermuda a few years ago. And the late, unlamented regime of the Greek colonels ordered the registration of all hunting weapons, followed by their confiscation, in order to disarm the royalists. Although the guns were later returned by the colonels, the present republican regime is continuing the control apparatus, presumably "just in case." When the IRA began its offensive in Ulster earlier in the decade, the Irish Republic used registration lists to confiscate all privately owned firearms in the South.

Phallic narcissism

A common assertion in the dispute is that gun owners are somehow mentally disturbed. The weapon is said to be a phallic symbol substituting for real masculinity, for "machismo." The historian Arthur Schlesinger, Jr., has written of "the psychotic suspicion that men doubtful of their own virility cling to the gun as a symbolic phallus and unconsciously fear gun control as the equivalent of castration." When queried about the source of this suspicion, he responded that he thought it was a "cliché." Such statements never cite sources because there are no sources. Every mention of the phallic-narcissist theory assumes it is well known, but there is no study or even credible psychoanalytical theory making the point. The germ of the idea derives from the 10th lecture in Sigmund Freud's *General Introduction to Psychoanalysis*, where he maintains that guns can symbolize the penis in dreams—as can sticks, umbrellas, trees, knives, sabers, water faucets, pencils, nail files, hammers, snakes, reptiles, fishes, hats and cloaks, hands, feet, balloons, aeroplanes, and Zeppelins. In other words, any long object can represent a phallus in a dream. Gun owners laugh at the thesis, or are infuriated. One said to me, "Anybody who associates the discharge of a deadly weapon with ejaculation has a *real* sexual problem."

Studies of hunters reveal that they are not much interested in

guns or in killing but in the package of skills and camaraderie involved in the hunt. No one has studied the psychology of gun owners or even hard-core gun nuts, nor are there studies of gun phobia. Fortunately, there is a reasonable amount of sociological data available, in the form of public opinion polls, which are believable because they give support to ordinary observation. Gun ownership is more prevalent among men, rural and small-town residents, Southerners, veterans, and whites. Except for the lowest income groups (who may not be willing to admit ownership), guns are fairly evenly distributed by income. Education, occupation, and politics make little difference. Protestants are more likely to be armed than other religious groups. When asked why they own guns, most people respond that they hunt or target shoot. But most handgun owners have them for self-defense, and long-gun owners admit to defense as a secondary purpose of their firearms.

Two generations of good data show that substantial majorities of the populace support gun registration, and this is cited fervently by individuals who prefer not to cite similar data favoring, e.g., maintaining prohibitions on marijuana, having courts get tougher with criminals, and restoring capital punishment. Of course, questions on "registration" are considerably misleading, because no one is advocating the mere registration of weapons, but rather licensing. Most people live in places where there is no licensing and have no idea of the difficulty and expense this would impose upon public authorities and gun owners if the standards of New York or Connecticut were applied nationwide. Gun owners and people with knowledge of existing gun-control laws are considerably less enthusiastic for registration. Supporters of interdiction are more likely to be young, single, prosperous, well-educated, liberal, New England non-gun owners with little knowledge of existing gun-control laws.

The real issues

The main point that emerges from any serious analysis is that the gun-control issue, under conditions that exist in the United States today, has practically nothing to do with crime control. I think that there are other issues at stake.

In 1967, armed robbers with pistols killed two policemen in London. There was a wide outcry to "bring back the noose." The Labour government, opposed to capital punishment, responded by

extending strict licensing requirements to small-bore shotguns used in rural areas for shooting birds and rodents. In Canada in 1974, there were two incidents of boys running amok with rifles in schools. There was wide agitation to restore capital punishment. The Liberal government, opposed to capital punishment, proposed a far-reaching program to eliminate registered pistols in private ownership and to register all rifles and shotguns. It is possible that gun control is, at least in part, a strategy to divert the mob away from the issue of capital punishment.

Political factors are clearly important. The assassinations of the 1960's and 1970's rather unnerved the politicians. But the wide social unrest of the 1960's probably had more impact. In 1939, George Orwell noted, "When I was a kid you could walk into a bicycle shop or ironmonger's [hardware store] and buy any firearm you pleased, short of a field gun, and it did not occur to most people that the Russian revolution and the Irish civil war would bring this state of affairs to an end." There is a remarkable coincidence between gun control agitation and periods of social upheaval. English and Canadian gun laws date from the "red scare" following the First World War, and the original United States national controls are the product of the violent days of the New Deal.

But underlying the gun control struggle is a fundamental division in our nation. The intensity of passion on this issue suggests to me that we are experiencing a sort of low-grade war going on between two alternative views of what America is and ought to be. On the one side are those who take bourgeois Europe as a model of a civilized society: a society just, equitable, and democratic; but well ordered, with the lines of responsibility and authority clearly drawn, and with decisions made rationally and correctly by intelligent men for the entire nation. To such people, hunting is atavistic, personal violence is shameful, and uncontrolled gun ownership is a blot upon civilization.

On the other side is a group of people who do not tend to be especially articulate or literate, and whose world view is rarely expressed in print. Their model is that of the independent frontiersman who takes care of himself and his family with no interference from the state. They are "conservative" in the sense that they cling to America's unique pre-modern tradition—a non-feudal society with a sort of medieval liberty writ large for everyman. To these people, "sociological" is an epithet. Life is tough and competitive. Manhood means responsibility and caring for your own.

This hard-core group is probably very small, not more than a few

million people, but it is a dangerous group to cross. From the point of view of a right-wing threat to internal security, these are perhaps the people who should be disarmed first, but in practice they will be the last. As they say, to a man, "I'll bury my guns in the wall first." They ask, because they do not understand the other side, "Why do these people want to disarm us?" They consider themselves no threat to anyone; they are not criminals, not revolutionaries. But slowly, as they become politicized, they find an analysis that fits the phenomenon they experience: Someone fears their having guns, someone is afraid of their defending their families, property, and liberty. Nasty things may happen if these people begin to feel that they are cornered.

It would be useful, therefore, if some of the mindless passion, on both sides, could be drained out of the gun-control issue. Gun control is no solution to the crime problem, to the assassination problem, to the terrorist problem. Reasonable licensing laws, reasonably applied, might be marginally useful in preventing some individuals, on some occasions, from doing violent harm to others and to themselves. But so long as the issue is kept at white heat, with everyone having some ground to suspect everyone else's ultimate intentions, the rule of reasonableness has little chance to assert itself.

EXHIBIT B

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Taylor & Francis Group

Boca Raton London New York

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CRC Press
Taylor & Francis Group
6000 Broken Sound Parkway NW, Suite 300
Boca Raton, FL 33487-2742

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Version Date: 20150611

International Standard Book Number-13: 978-1-4987-2570-5 (eBook - PDF)

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Following its introduction into the United States, the Glock pistol became involved in controversy when members of the media and some politicians contended it was a *plastic gun* that was not detectible by x-ray or metal detectors. This is, of course, nonsense. While the gun does have a polymer frame, the slide, barrel, and internal components are steel. Numerous other pistols with polymer frames are now being manufactured.

Rifles

A rifle is a firearm with a rifled barrel that is designed to be fired from the shoulder. Barrel length is immaterial in classifying a firearm as a rifle. However, the U.S. federal law requires rifles to have a minimum barrel length of 16 in. The types of rifles commonly encountered are single shot, lever action, bolt action, pump action, and autoloading. A single-shot rifle has one firing chamber integral with the barrel that has to be manually loaded each time the weapon is fired. A lever-action rifle has a lever beneath the grip that is used to open the rifle action, extract the cartridge case, and, in closing the action, insert a fresh cartridge in the firing chamber and cock the gun. There may be a boxlike magazine in front of the trigger or a cylindrical magazine under the barrel.

In a bolt-action rifle, a handle projects from a bolt. Pulling back and pushing forward on this projection causes the bolt to extract and eject a cartridge case and then to insert a new cartridge while cocking the gun. The slide-action rifle uses the manual movement of a slide under and parallel to the barrel to open the action, extract and eject a cartridge, load a fresh cartridge, and cock the weapon.

In autoloading or semiautomatic rifles, the weapon fires, extracts, ejects, reloads, and cocks with each pull of the trigger using the force of gas pressure or recoil to operate the action. After each shot, the trigger must be released and then pulled again to repeat the cycle. Autoloading rifles are commonly but incorrectly called “automatic rifles.” An automatic rifle is one that, on pulling the trigger and firing the weapon, utilizes the force of gas pressure or recoil to eject the fired case, load the next round, fire it, and then eject it. This cycle is repeated until all the ammunition is used or the trigger is released. Automatic weapons are generally used only by military and police organizations. While it is possible to alter some semiautomatic rifles to deliver automatic fire, unlike the impression given by the media and some politicians, this is not a simple procedure. In fact, such conversions are uncommon. In the United States, deaths due to full-automatic weapons (rifles and submachine guns) are extremely rare. The author has seen only a handful of such deaths in the past 30 years, all of which involved illegal drug dealings with the shooter from Mexico and the weapon a military AK-47. Weapons fired in the full-automatic mode are very difficult to control. In most instances, while the first shot may be on target, subsequent rounds fly high and to the right.

Assault Rifles

Strictly speaking, the term “assault rifle” refers to a rifle that (1) is autoloading, (2) has a large-capacity (20 rounds or more) detachable magazine, (3) is capable of full-automatic fire, and (4) fires an intermediate rifle cartridge. The best examples are the AK-47 and AK-74 (Figure 1.10). This term has been corrupted by the media and some politicians to include most self-loading weapons. They have also coined the meaningless term “assault pistol” that appears to refer to large, ugly-looking pistols having large-capacity magazines (20–40 rounds) or to semiautomatic versions of submachine guns (Figure 1.11).



Figure 1.10 AK-74. (Retrieved from Wikipedia Commons 10/15/2014. Photo made available and published under the Creative Commons CCo 1.0 Universal Public Domain Dedication by user and author Russian Trooper, original upload date January 29, 2014.)



Figure 1.11 Intratec Tec-9 often referred to as an “assault pistol” is just a cumbersome, ugly-looking, inaccurate pistol with a large magazine capacity.

“Assault pistols” are with rare exception cumbersome, difficult to shoot, inaccurate, and cheaply made. They are usually acquired by individuals with little knowledge of firearms who, like many of the press and politicians, associate the effectiveness of a weapon with *ugliness*.

Weapons that fire pistol ammunition are not by definition assault rifles nor are self-loading rifles with fixed magazines that were never intended for full-automatic fire. The best example of the latter weapon is the SKS-45 (Figure 1.12a). While this weapon is an autoloader and chambered for an intermediate-power cartridge, it has a fixed 10-round magazine and was never intended for full-automatic fire. The weapon may be altered to accept a 30-round magazine, however. Because of wear and breakage of parts, this rifle has on rare occasion *gone fully automatic*. The weapon in this state is uncontrollable and dangerous to the shooter.

There is a group of weapons that might be considered *assault rifles* if one eliminates the criteria of full-automatic capability. These are semiautomatic versions of the AK-47 and M-16 assault rifles. These weapons are usually the *assault rifles* referred to in the press. The M-1 carbine is an unusual weapon in that it has the appearance of a small rifle and fires ammunition more powerful than a pistol but less than a rifle, even an assault rifle (Figure 1.12b).

sucked into the barrel, chamber, and firing mechanism of the gun. A pillow may absorb all the soot coming out the muzzle with none present in the wound. Entrance wounds through pillows may show a wide irregular abrasion around them (Figure 4.12b).

Muzzle Brakes/Compensators

Silencers are rarely encountered. More common are muzzle brakes and compensators. Just as in a silencer, they may be integral with the barrel or attached to the muzzle. A muzzle brake works by redirecting some of the gases so as to generate a forward thrust on the muzzle countering the force of recoil, i.e., reducing recoil. A compensator diverts gas upward to counteract the tendency for the muzzle to rise on firing. The terms muzzle brake and compensator are often used interchangeably, however, with muzzle brakes often functioning as compensators as well. Figure 4.13a shows a contact wound under the jaw from a 7 mm Magnum rifle equipped with a muzzle brake.

In its simplest form, a compensator consists of gas ports (openings) cut in the top of the muzzle of the barrel. These direct gas upward to counter upward muzzle travel. In contact wounds, the jets of gas escaping out the ports may produce characteristic patterns on the skin or clothing. Figure 4.13b shows a *rabbit-ear* pattern produced by a .22-caliber target pistol with a compensator having two slits. Figure 4.13c and d shows a similar pattern from a large-caliber weapon. Because the ports were much larger, there was searing of the skin and powder tattooing. Figure 4.13e shows a pistol with ports.

Flash Suppressors

Modern military rifles and some civilian rifles have flash suppressors attached to the muzzle. These devices are intended to reduce muzzle flash, i.e., an incandescent cloud of gas that emerges from the muzzle of the rifle when fired at night. Such a device is useful in combat to decrease the possibility of counter fire.

Muzzle flash is determined by the nature of “the propellant (type, chemistry, burning rate, flame temperature, gas volume at the muzzle), barrel length, muzzle pressure, nature of the gas products, projectile type and primer composition.”⁷ The longer the barrel, the less the muzzle flash. Gases from combustion of the propellant (carbon monoxide and hydrogen) and carbonaceous particles from the powder are expelled from the muzzle under high pressure and temperature where on mixing with oxygen they ignite, producing the muzzle flash. Some propellants, including that used in U.S. military ammunition, contain flash retardants.

The duration of a muzzle flash is 0.01–0.03 s.⁷ In comparison, the average duration of an involuntary blink of the eye is approximately 0.1–0.4 s. Because of this, two individuals could be looking at a gun at the time of discharge with only one seeing the muzzle flash as the second individual just happened to blink at the time of discharge.

Flash suppressors generally consist of a cylinder, having a number of longitudinal slits along its length that is attached to the muzzle of the weapon (Figure 4.14a). On firing, the gas emerging from the muzzle is bled out the slits rather than emerging as one large cloud. Soot is present in this cloud of gas. If the muzzle of such a weapon is held in contact with the body, the flash suppressor will produce a distinctive pattern of seared, blackened zones around the entrance due to the emerging jets of hot gas. If fully formed, this results in



Figure 4.13 (a) Contact wound under jaw with muzzle imprint; seared zone of skin below entrance from muzzle break. (b) “Rabbit-ear” pattern of soot on T-shirt produced by .22-caliber target pistol with muzzle break at end. Two slits on top of the muzzle break directed gas upward and forward, producing the soot pattern (c). (d) Searing of skin with powder tattooing from two ports at the end of the barrel of large-caliber weapon. (e) Ported pistol. (Retrieved from Wikipedia Commons October 15, 2014. Photo released into the public domain by user and author XDanthony, original upload date 9 March, 2008.)

an unusual flower-like pattern of soot and seared skin (Figure 4.14b). The number of slits will determine the number of *petals* to the *flower* and may give one an idea of the type of weapon used. Thus, for the M-14 with five slits in the flash suppressor, there are five *petals* to the *flower* pattern. The flash suppressor on the M-16A1 and AR-15 rifles initially had three slits, which was changed to six slits. The M-16A2, AR-15A2, and M-4 have a suppressor with five slits with the absence of the slit at the 6 o'clock position.

This picture is seen neither with handgun bullets nor with rare exception, with FMJ rifle bullets. Virtually, the sole exceptions with military bullets are the M-193 and M-885 5.56 × 45 mm cartridges with their 55 and 62 gr. bullets, with propensity to fragment that has been previously discussed. Although the snowstorm appearance of an x-ray almost always indicates that the individual was shot with centerfire hunting ammunition, absence of such a picture does not absolutely rule out the possibility. The lead snowstorm from hunting ammunition is dependent on the velocity of the bullet. If a rifle bullet is traveling at a low velocity, either because of extreme range or having been slowed by passing through various other targets before striking an individual, x-rays will not show a lead snowstorm. It must be stressed that a rifle bullet does not have to hit bone for a lead snowstorm to occur.

The radiological appearance from the new forms of ammunition with lead-free cores and the new marine and army ammunition is unknown at this time to the author.

A gunshot wound of the head from a high-velocity handgun bullet—typically the .357 Magnum—can produce an x-ray picture superficially resembling the lead snowstorm of hunting bullets. Breakup of the handgun bullet, however, requires perforation of bone that is not necessary with a rifle bullet. In addition, the fragments produced by the handgun bullet are fewer in number and larger. Lead dust is also not present (see Figure 11.5).

An x-ray of an individual shot with an FMJ rifle bullet, with the exception of the M-16 cartridge, usually fails to reveal any bullet fragments at all even if the bullet has perforated bone such as the skull or spine. If any fragments are seen, they are very sparse in number, very fine, and located at the point the bullet perforated bone. If, however, an FMJ bullet is destabilized immediately prior to or at the time of entrance into the body, it may break up creating a lead snowstorm. The bullet that struck the back of the head of President J. F. Kennedy was a 6.5 mm, 162 gr., round-nose, FMJ bullet. The bullet struck the skull at a shallow angle in the occipital region, destabilizing and breaking up at the cannellure like the M16 bullet. This resulted in a wound path through the brain that demonstrated a lead snowstorm radiologically.

Perforating Tendency of Centerfire Rifle Bullets

FMJ rifle bullets almost always exit if the deceased is the primary target and is within a few hundred yards of the muzzle of the weapon. The 5.56 × 45 mm round is the only FMJ round that has a tendency to stay in the body. Most hunting bullets of medium and large calibers also exit the body. Varmint cartridges such as the .22-250 tend to stay in the body. With a cartridge such as the .243, it depends on bullet weight, the area of the body struck, and the length of the wound path.

Intermediary Targets

If a centerfire rifle bullet passes through an intermediary target, such as a wall or door, before striking an individual, the severity of the wound produced may be much greater than if the same bullet had not perforated the target. If the intermediary target is of sufficient thickness and resistance, the bullet will destabilize, be deformed, or even break up. Such a bullet—when it strikes the victim—will more readily lose kinetic energy, increasing the severity of the wound. This is true even though the bullet has lost kinetic energy in piercing the intermediary target. This phenomenon is most pronounced in hunting bullets that because of their design and construction more readily deform and break up. If multiple

intermediary targets are perforated or if the intermediary target is very resistant, e.g., steel plates, the bullet may lose so much kinetic energy in passing through these targets that the wound has the characteristics of a handgun wound.

The entrance produced by a bullet that has perforated an intermediary target is usually atypical in appearance with a large, irregular entrance hole surrounded by an irregular, nonsymmetrical, often wide, abrasion ring. In passing through the intermediary target, the bullet, whether it be FMJ or hunting, may shed fragments of metal or even break up. If the individual is close to the intermediary target, they may be struck by fragments of the bullet and/or intermediary target. If the main mass of the bullet is intact and produces a single entrance, the skin around the entrance site may be *peppered* with small fragments of metal broken off the bullet and/or fragments of the intermediary target (Figure 7.21).

In some cases, in passing through the intermediary target, the bullet breaks up. In the simplest scenario, the core and jacket separate producing two entrances. More commonly, both the jacket and core are torn apart and multiple, sometimes scores, of fragments impact the skin. Figure 7.22 shows multiple entrance wounds, on the top of the left shoulder, from a single .270 soft-point hunting bullet that passed through two layers of wallboard. The deceased was bending over at the time he was shot facing the wall perforated by the bullet. In passing through the wall, the core and jacket separated producing the two large entrances. Fragments of jacket and core produced the rest of the wounds. In Figure 7.23, the deceased was struck by two 7.62 × 39 mm FMJ bullets having steel jackets and lead cores. The bullets perforated the wall of a frame house and a sofa before striking the deceased. Both the jacket and core had fragmented prior to striking the deceased.



Figure 7.21 Large irregular entrance wound of the face from a centerfire rifle bullet that passed through intermediate target. Stipple marks around the entrance caused by fragments of a bullet and an intermediate target.



Figure 7.22 Multiple entrance wounds at the top of the left shoulder from a .270 soft-point bullet that broke up after perforating wall boards. The two largest defects are the entrance sites of the core and jacket.



Figure 7.23 Two entrance wound complexes from two 7.62 × 39 bullets that broke up after perforating the wall of the house and the sofa. Each entrance consists of a cluster of wounds from a fragmented bullet.

A bullet may carry large fragments of an intermediate target into the body. Figure 7.24 illustrates the case of an individual shot through an automobile car door with a .30-30 hunting rifle. The main mass of the bullet remained intact, penetrating into the chest and causing death. A small fragment of lead core also penetrated, with another fragment producing a superficial wound of the skin. In exiting the door, the bullet carried with it a large piece of steel, which in turn inflicted a fourth, penetrating wound. This piece of steel was recovered from the muscle of the side, not having penetrated into the chest cavity.

Soot-Like Residues: Pseudo-Soot

If a bullet perforates an intermediary target of suitable resistance, the impact may be sufficient to vaporize lead from the core that then travels forward with the bullet. This lead can be deposited on a surface behind the intermediary target if the surface is in close enough proximity to

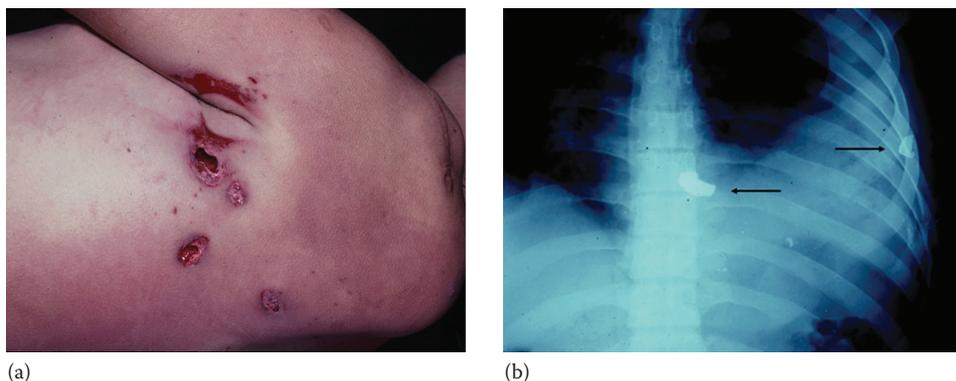


Figure 7.24 (a) Bullet and shrapnel wounds of the left side of the chest from a .30-30 rifle bullet that passed through the car door. (b) X-ray of the chest showing the bullet in the midline with a steel fragment in the left side of the chest.

the intermediary target. The lead deposit around the second entrance can simulate soot such that the wound is mistakenly interpreted as a contact or close range. This phenomena was described by Shem.⁹ In his case, a .270 soft-point bullet perforated the sheet metal wall of the cab of a pickup truck before striking the driver. The bullet hole in the deceased's jacket was surrounded by vaporized lead simulating soot. Shem reproduced the same effect with a soft-point .308 bullet. If the bullet had an FMJ, however, no deposit occurred.

Dodson and Stengel reported a case of an FMJ 7.62×39 bullet, which, after perforating a window pane and a curtain behind the glass, deposited vaporized lead on the surface of the curtain facing the glass, i.e., the entrance side of the curtain.¹⁰ They were able to reproduce the phenomena experimentally. The lead vapor around the entrance in the curtain apparently came from the exposed lead core at the base of the bullet.

A report by Messler and Armstrong described lead residue sprayed backward, rather than forward, when a bullet perforated a firm intermediary target.¹¹ The circumstance described was the reverse of that encountered by Dodson and Stengel.¹⁰ A rifle bullet perforated a window shade and then a pane of glass. A deposit of melted lead particles simulating soot was observed around the hole in the shade, but on its exit side, i.e., the side facing the glass. Thus, the bullet perforated the shade and then the glass, at which time melted lead particles were sprayed backward from the bullet onto the shade. This phenomenon was reproduced experimentally for lead bullets and bullets with an exposed lead tip but not for Silvertip or copper-jacketed bullets.

Assault Rifles

The term "assault rifle" refers to an autoloading rifle having a large-capacity (20 rounds or more) detachable magazine, capable of full-automatic fire and firing an intermediate rifle cartridge. This term has been corrupted by the media, politicians, and the bureaucracy to include virtually all self-loading weapons that look "ugly" and/or "mean." Weapons that fire pistol ammunition, e.g., Intratec Tec-9's and Cobray M-11's, are not assault rifles by virtue of their firing pistol ammunition, and they were not designed for full-automatic fire. Nor are weapons that while firing an intermediate rifle cartridge have fixed magazines and were never intended for full-automatic fire, e.g., the SKS-45.

In the United States, civilian versions of true assault weapons, e.g., AR-15 and M-4, which can only deliver semiautomatic fire, are widely available. Strictly speaking, these are also not assault rifles as they are designed for semiautomatic fire only. Conversion of these weapons to full-automatic fire capability is difficult and rarely encountered in spite of stories appearing in the press. Use of assault rifles in crimes is uncommon as they are not concealable.

The first true assault (*Storm*) rifle was the Sturmgewehr 44 (StG 44).^{12,13} This rifle was developed as a result of the experience of the German Army in World War I. They wanted a short rifle chambered for a midrange (intermediate) cartridge, capable of controllable full-automatic fire and with a large magazine. In 1938, the firm of Polte was given a contract to develop this cartridge, while the firm of C. G. Haenel was awarded a contract for development of a weapon to fire it. The cartridge, the 7.9 mm Kurz Patrone (7.92 × 33 mm), completed development by late 1940 to early 1941. The weapon, called a Maschinenkarabiner (machine carbine), completed initial development by 1940. The first prototype apparently appeared in late 1941. By July 1942, the first 50 test weapons were produced. In January 1941, Walther was also commissioned to develop a weapon. By July 1942, only two prototypes were developed. Mass production was to begin by Haenel in November 1942 and Walther in October. The Haenel weapon was designated the Maschinenkarabiner 42(H) and the Walther the Maschinenkarabiner 42(W). By February 1943, less than 2000 weapons of both types had been delivered. Also by this time, the Haenel design was selected over the Walther. Full-scale production of the Haenel weapon, now the MP 43, has begun in July 1943. The MP 43 was a simplified version of the MKb 42(H) with a modified gas system and the internal hammer firing system used on the Walther design. These weapons were first used by German troops on the Russian front in the winter of 1943. By January 1944, the Army had received more than 19,000 MP 43's. The name MP 43 was changed to StG 44 in late 1944. Total production of all weapons is estimated at approximately 425,000.¹³

As can best be determined, in 1939 Russia began the development of an intermediate-power rifle cartridge, probably independent of the work in Germany. The new cartridge the 7.62 × 39 mm was developed by 1943. The first weapon to utilize this cartridge was the SKS-45, a traditional semiautomatic rifle and not an assault rifle. The rifle using this cartridge that was to symbolize assault rifles throughout the last half of the twentieth century and the beginning of the twenty-first century, the AK-47, was adopted in 1949. The most pithy description of this weapon appears in the motion picture *Lord of War* (2005): "It's the world's most popular assault rifle. A weapon all fighters love. An elegantly simple 9 pound amalgamation of forged steel and plywood. It doesn't break, jam, or overheat. It'll shoot whether it's covered in mud or filled with sand. It's so easy, even a child can use it; and they do."¹⁴

The U.S. military did not appreciate the significance of the development of the assault rifle and continued to be wedded to weapons chambered for traditional rifle cartridges until the early 1960s. It was not until 1957 that the first AR-15 chambered for the 5.56 × 45 mm cartridge was to appear, and it was not until 1963 that the first *one-time* order was placed for this weapon, the M-16A1, by the U.S. Army. In the early 1970s, the AK-47 was replaced in the Russian Army with the AK-74 chambered for the 5.45 × 39 mm cartridge and the M-16 evolved into the M-4. The M-4 is a short barreled version of the M-16 with a collapsible stock. Table 7.2 compares the assault rifle cartridges.

One of the common fallacies about assault rifles is that the wounds produced by them are more severe than those due to regular military rifles and hunting rifles. In fact,

wounds from assault rifles are less severe, even when compared to such venerable hunting rifles as the Winchester M-94 (introduced in 1894) and its cartridge the .30-30 (introduced in 1895).

In dealing with rifles, the severity of the wound is determined to a great degree by the amount of kinetic energy lost by a bullet in the body. The intermediate cartridges used in assault rifles possess significantly less kinetic energy than traditional military cartridges as well as rifle cartridges designed for hunting. Therefore, it is impossible for an intermediate-power rifle cartridge to produce severer injuries than a full-power rifle cartridge, all other factors being equal.

In the past few years, the author has had extensive experience with deaths due to the 7.62×39 mm cartridge loaded with FMJ bullets having either a mild steel core (standard Russian and Chinese military designs) or a lead core. In a review of 50 cases involving this cartridge, the following observations were made:

1. All primary head wounds were perforating.
2. While entrance wounds of the head, and usually their exits, can be mistaken for wounds inflicted by handguns, internally, there are very severe internal injuries with multiple fractures of the skull and extensive lacerations of the brain. The severe nature of the internal injuries clearly indicates that one is dealing with a centerfire rifle and not a handgun.
3. Tangential and shallow (superficial) perforating wounds of the head are extremely mutilating. Evisceration of part or all of the brain is common. These wounds cannot be mistaken for handgun wounds.
4. In distant wounds of the trunk, the entrance wounds appear similar to small-caliber handgun wounds. Exit wounds are variable in size, sometimes indistinguishable from those from handgun bullets, though at other times too large. The wounds to the internal organs (chest and abdomen) are often no more severe in appearance than those from 9 mm or .357 Magnum handgun bullets. In many cases, especially involving bullets with a mild steel core, after examining the wounds internally and externally, one cannot say whether the individual was shot with a centerfire rifle or a handgun. The wounds are not anywhere as severe as those from hunting ammunition.
5. Most tangential wounds of the trunk, and some shallow (superficial) perforating wounds, are obviously too severe to be from handguns and thus have to be of rifle origin.
6. If the bullet has perforated an intermediary target, it may be retained in the body even if it does not appear deformed.
7. Wounds of the extremities are perforating. They usually cannot be differentiated from handgun wounds unless they are tangential.

That entry wounds of the skin from the 7.62×39 mm bullet are not different from wounds due to handgun bullets is not surprising. What is surprising is the relative innocuous appearance of the internal injuries to the trunk and extremities. The explanation for this has to do with the stability of the 7.62×39 bullet in the body. Most of the shootings seen by the author involved Chinese ammunition loaded with bullets having an FMJ and a mild steel core. This construction is typical of military ammunition of this caliber. In ballistic gelatin testing, these bullets do not undergo significant yawing until 25–27 cm of penetration.⁶ Thus, a 7.62×39 mm bullet

with a mild steel core may pass through 25–27 cm of tissue, perforating vital organs, without production of a significant temporary cavity, with resultant injury no greater than that from a handgun bullet. With 7.62×39 rounds loaded with bullets having a lead core, the severity of the injuries increased and there was often breakup of the bullet.

AK-47 Round: 7.62×39 mm

The Soviet/Warsaw Pact version of the AK-47 round, the M 43, was loaded with a 122 gr. (8 g) FMJ, boat-tail bullet, 7.87–7.9 mm in diameter, which had a copper-plated steel jacket, and a mild steel core 5.74 mm in diameter with a tapered end at the front, which was sheathed in lead approximately 0.5 mm thick and had a cone-shaped piece of lead in front of the steel core (Figure 7.25a and b). In tissue, this bullet typically travels for about 26 cm point forward before beginning to yaw significantly.

This version of the 7.62×39 round was banned for importation into the United States by the Clinton administration as it was said to be armor piercing. Overseas manufacturers then altered the cartridge by loading a hollow-point bullet with a lead core so that they could once again be imported.¹⁵ The replacement bullet, weighted 122 gr., had a mild steel jacket with the jacket cut off at the tip and an open base and a 88 gr. (5.7 g) lead core and a circular plug of translucent polyethylene plastic disk, weighting 1.5 gr. (0.1 g), at the base of the bullet (Figure 7.26). This was succeeded by an FMJ 122 gr. (7.9 g) bullet with a lead core weighing 89 gr. (5.8 g). The mild steel jacket had an open base and weighted 33–34 gr. (2.1 g). There was no plastic plug but rather an internal shelf or ledge inside the jacket with the lead core inserted from the base and resting on the ledge. An airspace is present at the nose. Also manufactured were 125 gr. semijacketed bullets with an exposed lead tip and closed flat base. Newer cartridges may have a polyethylene coating, zinc plating, brass



Figure 7.25 A 7.62×39 cartridge: (a) cross section of a steel-cored bullet with a lead tip and (b) tip of a bullet sheared off exposing steel core and lead sheath.

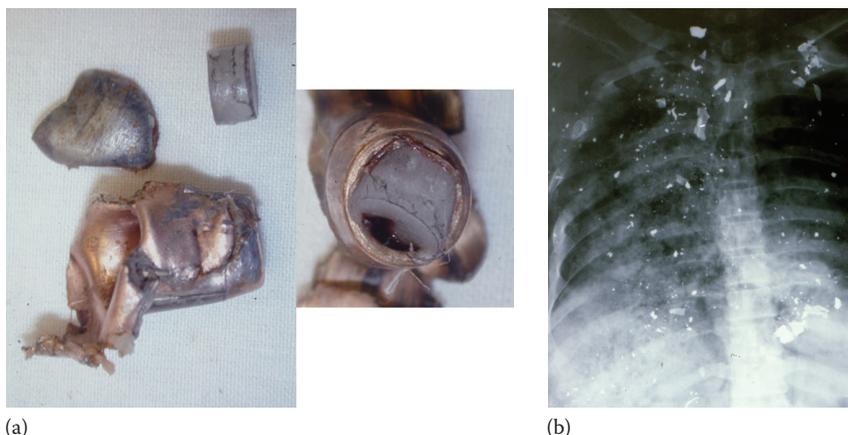


Figure 7.26 (a) Fired Russian 7.62 × 39 soft-point bullet with a plastic wad extruding from the base. (b) Chest x-ray of an individual shot six times in the chest with this ammunition and showing massive lead snowstorm.

plating, or a lacquered cartridge case. Some may have a copper-jacketed bullet. 7.62 × 39 ammunition is now being manufactured in the United States with a copper jacket and a lead core.

The SKS-45, a 10-shot semiautomatic rifle, is also chambered for the AK-47 cartridge.

In the 1960s, the former Yugoslav developed the M67 cartridge. In this cartridge, the bullet had a copper jacket and a lead core. Fackler determined that when this cartridge was fired from the AK 47, it typically travels point forward for only about 9 cm prior to yawing.⁶ Yawing caused some flattening of the bullet resulting in a few small lead fragments being squeezed out the open base. The wounds produced were more severe than those from steel core bullets.

Soviet 5.45 × 39 mm: This round is fired from the AK-74. The military bullet has a copper-plated steel jacket and a steel core with a lead plug in front of the steel core. There is an airspace (about 5 mm long) inside the jacket at the bullet's tip. This appears to shift the bullet's center of mass toward the rear, contributing to early yaw.⁶ On bullet impact, the lead behind the airspace shifts forward into this space. As this shift of lead occurs asymmetrically, this may be a reason for the peculiar curvature of this bullet's path in the last half of its path through tissue. The bullet yaws after approximately 7 cm of tissue penetration, resulting in increased temporary cavity stretch.⁶ Only in a shot with a long tissue path, however, would this curved path be evident. Ammunition manufactured for the American market has a 60 gr. bullet with a steel jacket and lead core. Some cartridges are loaded with 50 or 70 gr. bullets. 5.45 × 39 ammunition is now being produced in the United States. A semiautomatic version of the AK-74 is being manufactured in the United States as well as a semiautomatic version of the M-4 chambered for this round.

Miscellaneous Military Ammunition

7.92 × 33 mm

The first assault rifle was the StG 44. It was chambered for the 7.92 × 33 cartridge. Most texts say that no other rifles have been chambered for this round. This is not accurate. Large numbers of AK 47 rifles chambered for this cartridge are being manufactured

in Pakistan.¹⁶ Local gunsmiths are converting AK rifles chambered for the 7.62×39 cartridge to fire the 7.92×33 cartridge by slightly increasing the chamber diameter and inserting a new headspace option in the chamber. Such a rifle can fire both cartridges. New AK rifles are also being manufactured with chambers having dual head space options to fire both cartridges. Cartridges are being locally manufactured from 7.62×51 and 7.92×51 cartridge cases.

7.62 × 51 mm FMJ

The wound produced by the American military version of this cartridge is typical of all nondeforming Spitzer (pointed) bullets. The 7.62×51 cartridge (.308 Winchester), with an FMJ bullet, begins to yaw after 15 cm of penetration with maximum yaw at 28 cm. The yaw progresses until the bullet ends up traveling base forward whereupon it continues the rest of its path with little or no yaw.

A thigh wound will show minimal tissue disruption since the bullet is not yawing until 15 cm. A trunk wound, with a sufficiently long path such that the bullet will yaw, would be expected to be very disruptive, especially if the temporary cavity occurs in a solid organ such as the liver.

Design specifications for NATO small arms ammunition do not specify the bullet jacket material or its thickness. The German 7.62 mm NATO bullet differs from the United States in that the jacket is copper-plated steel rather than copper. The steel jacket is thinner at the cannelure compared to the U.S. copper jacket. This German bullet begins to yaw at about 8 cm and breaks at the cannelure.⁶ The flattened point section retains approximately 66% of the bullet's weight. The remaining mass of the bullet fragments.

7.62 × 54 mm R (Rimmed Case)

The 7.62×54 mm R (rimmed case) bullet is used in the bolt-action Mosin–Nagant. These rifles have become popular in the United States because of their low cost. The bullet has a copper-plated steel jacket. Wounding resembles that of the U.S. version of the 7.62 mm NATO round.

Military Ammunition Converted to Sporting Ammunition

Ammunition loaded with FMJ bullets cannot be used for hunting in the United States. Some individuals have attempted to “sporterize” such ammunition by cutting or grinding off the tip of an FMJ bullet, exposing the core, in an attempt to facilitate expansion. This is potentially dangerous in that the base of such bullets is open. On firing, pressure of the gases of combustion on the exposed core may cause it to be propelled out the tip of the bullet with deposition of the jacket in the barrel. On firing the rifle a second time, the deposited jacket may cause the barrel to explode.

Addendum: Common American Rifle Calibers

At present, at least 50 different caliber rifle cartridges are being manufactured in the United States. Some of these cartridges have been introduced recently, whereas others are almost obsolete with no weapons currently manufactured for them. Obsolete cartridges

no longer manufactured are sometimes available from overseas sources as well as being manufactured by home reloaders or small specialized companies. Rifle cartridges that are not popular in the United States but are popular in other countries can be obtained from the overseas sources. A few of the more common centerfire rifle calibers will be described.

5.56 × 45 mm (.223)

The .556 × 45 cartridge for the M-16 rifle is essentially identical to the 223 Remington hunting cartridge. There are some minor differences such that while .223 ammunition can be safely fired in a rifle chambered for the 5.56 cartridge, firing 5.56 mm ammunition in a .223 Remington chamber may produce excessively high pressures.

5.45 × 39

This cartridge and the AK-74 replaced the 7.62 × 39 cartridge and the AK-47 in the former Soviet Union. While initially uncommon, rifles chambered for this cartridge are becoming more available in the United States. Semiautomatic versions of the AK-74 are being manufactured in the United States and an M-4-type rifle chambered for this round is manufactured by Smith & Wesson (S&W). This ammunition is being manufactured in the United States to a limited degree.

243 Winchester (6.16 × 51 mm)

The .243 Winchester round was introduced in 1955. It is the .308 Winchester cartridge case, necked down to 6 mm. The round is intended for both varmints and deer hunting. It is loaded commercially with either an 85 gr. or a 100 gr. soft-point or hollow-point bullet. Muzzle velocity is 3320 and 2960 ft/s; muzzle energy 2080 and 1945 ft lb, respectively.

.270 Winchester

Introduced in 1925, this is the .30-06 cartridge necked down to 0.270 in. It is a hunting caliber. It is generally loaded with 100, 130, or 150 gr. bullets with muzzle velocities from 3490 to 2850 ft/s and muzzle energies from 2612 to 2705 ft lb.

7 mm Magnum

Introduced in 1962, this cartridge has a belted case. It is a popular hunting round in the United States. Typical bullet weights are 139, 150, 165, and 175 gr. Corresponding velocities are 3150, 3110, 2950, and 2860 ft/s. Muzzle energies range from 3063 to 3180 ft lb.

7.62 × 39

Introduced in 1943 by the then Soviet Union, it is the most widely used military cartridge in the world. It is used in the SKS-45 and the AK-47. Semiautomatic versions of

the AK-47 are manufactured in the United States. This cartridge is now being manufactured by American ammunition companies. The SKS-45 is being used for deer hunting.

.30 M-1 Carbine (7.62 × 33 mm)

The .30 M-1 Carbine cartridge is neither a rifle cartridge nor a pistol cartridge. The round was originally developed for the U.S. military M-1 Carbine. Commercially, this round is loaded with a 110 gr. soft- or hollow-point bullet. The military round is loaded with a 110 gr. (7 g) FMJ bullet. Muzzle velocity is around 1975 ft/s (579 m/s); muzzle energy 955 ft lb (1173 J). The M-1 Carbine should not be confused with the M-1 Rifle (the Garand), which was chambered for the .30-06 cartridge.

.30-30 Winchester

The .30-30 Winchester was the first small-bore smokeless powder sporting cartridge in the United States. It was introduced in 1895 for the Winchester Model 94. This round is a deer cartridge. It is loaded with either 150 or 170 gr. hunting bullets. Muzzle velocity is 2390 and 2200 ft/s, respectively, and muzzle kinetic energy 1902 and 1827 ft lb, respectively. This is one of the most popular deer rounds in the United States.

.30-06 Springfield (7.62 × 63 mm)

The .30-06 Springfield cartridge was adopted in 1906 as the official military cartridge of the U.S. Armed Forces. It was replaced by the .308 Winchester (7.62 × 51 mm) in the early 1950s. Hunting bullets loaded in it weigh 110, 125, 150, 180, and 220 gr. FMJ military cartridges are available. Muzzle velocities range from 3370 to 2400 ft/s, depending on the weight of the bullet. The M2 military ball round weighed 150 gr. (9.72 g). Muzzle velocity was 2740 ft/s; muzzle energy 2500 ft lb.

.308 Winchester (7.62 × 51 mm)

The .308 Winchester round was introduced in 1952. Military bullets are FMJ and usually weigh 150 gr. Civilian rounds are loaded with 110, 125, 150, 180, and 200 gr. hunting bullets. In ballistic performance it is approximately equal to the .30-06 cartridge. Muzzle velocities range from 3180 to 2450 ft/s. The standard military round is the M-80. It has a 150 gr. (9.72 g) bullet with a muzzle velocity of 2750 ft/s (838 m/s) and muzzle energy of 2520 ft lb (3276 J). Strictly speaking, the .308 Winchester and 7.62 × 51 mm are slightly different dimensionally but this is of no consequence.

7.62 × 54R (7.62 mm Mosin–Nagant)

This rimmed cartridge was introduced in the Russian M1891 Mosin–Nagant rifle. Rifles chambered for this cartridge are almost all of Russian or former Soviet Bloc manufacture. This cartridge is comparable in performance to the .30-06. A typical loading would be a 150 gr. bullet with a muzzle velocity of 2850 ft/s. Large numbers of Mosin–Nagant rifle have been imported into the United States and are being used for hunting.

References

1. Butler, D. F. *United States Firearms: The First Century 1776–1875*. New York: Winchester Press, 1971.
2. La Garde, L. A. *Gunshot Injuries*. New York: William Wood & Co., 1916.
3. Longmore, T. *Gunshot Injuries*. London, U.K.: Longmans Green and Co., 1895.
4. Scott, R. *Projectile Trauma. An Inquiry into Bullet Wounds*. New York: Crown.
5. Edwards, W. B. *Civil War Guns*. Harrisburg, PA: The Stackpole Co., 1962.
6. Fackler, M. L. Wounding patterns of military rifle bullets. *Int. Defense Rev.* 5: 59–64, January 1989.
7. Fackler, M. L. Wound ballistics: A review of common misconceptions. *JAMA* 259(18): 2730–2736, 1988.
8. Personal communication with R. J. Shem.
9. Shem, R. J. The vaporization of bullet lead by impact. *AFTE J.* 25(2): 75–78, 1993.
10. Dodson, R. V. and Stengel, R. F. Recognizing vaporized lead from gunshot residue. *AFTE J.* 27(1): 43, 1995.
11. Messler, H. R. and Armstrong, W. R. Bullet residue as distinguished from powder pattern. *J. Forensic Sci.* 23(4): 687–692, 1978.
12. Senich, P. R. *The German Assault Rifle 1935–1945*. Boulder, CO: Paladin Press, 1987.
13. Handrich, H. D. *Sturmgewehr: From Firepower to Striking Power*. Cobourg, Ontario, Canada: Collector Grade Publications, 2004.
14. Quote from Lord of War. Lionsgate Films, 2005.
15. Haag, L. C. Contemporary Russian 7.62 × 39 ammunition. *AFTE J.* 33(2): 152–160, 2001.
16. Yasin, M. I. Obsolete caliber 7.92 × 33 mm AK type rifles which are also capable of firing 7.62 × 39 mm cartridges. *AFTE J.* 45(3): 277–280, 2013.
17. DiMaio, V. J. M. Wounds caused by centerfire rifles. *Clin. Lab. Med.* 3:257–271, 1983.

General Reference

- Dougherty, P. J. and Eidt, H. C. Wound Ballistics: Minie ball vs full metal jacketed bullets—A comparison of Civil War and Spanish American War firearms. *Military Med.* 174(4): 403–407, 2009.

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