The M-16 rifle

Sophisticated Congkiller

G.H. Tichenor

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A minor illustration of the contemporary disappearance of chivalry is the extensive use of a new rifle by United States forces in Vietnam: the M-16. It shoots a tiny, .223 calibre, 55 grain bullet at the very high muzzle velocity of 3,185 feet per second. Its power to inflict wounds is of the magnitude usually associated with the soft-nose and exploding bullets outlawed by the Hague Conventions.

The effect of what may have been an M-16 round was described by Nicholas Tomalin of the Sunday Times (June 5) who accompanied General J.F.L. Hollingsworth on a tour of inspection and witnessed the bagging of a guerrilla, either by the General himself, or by the gunner in his helicopter:

"Obviously a burst of fire had shattered his right arm up at the shoulder. The cut shirt now allows a large bulge of tissue to fall forwards, its surface streaked with nerve fibers and bits of bone."

On the subject of wounds, Dr Norman Rich, a surgeon on leave from the war, addressed the American Medical Association meeting on June 27 and reported that an unusually high proportion Of the casualties in Vietnam are caused by small-arms fire. The effects, he noted, were devastating, particularly those of the M-16. The high speed of the bullet causes tissue to be torn apart, bone and blood vessels to be smashed. On exit, it leaves an open mangled area several inches across.

The excessive wounding capacity of high-velocity projectiles is well known. but the M-16 is a major departure in infantry weapons because it represents an attempt to capitalize on precisely this fact. To a nation of television watchers, all bullet wounds are only different degrees of method acting; but since the war is a prime television attraction, there should be some attempt to provide clinical details.

The path of any penetrating projectile is marked by a core of shredded flesh and blood which is surrounded by a varying volume of damaged tissue that may eventually recover. At high bullet velocities, from, say 2,000 feet per second and above, energy is released at such a rapid rate that an expanding cavity is formed momentarily behind the projectile, increasing the tearing of tissue and causing nerves, bones, and blood vessels remote from the path of the bullet to be damaged or destroyed. These effects can be studied in quickly taken X-ray photographs in the laboratory. When a test animal is struck by a 1/8th inch diameter pellet (approximately 1/10th the weight of the M-16 bullet), travelling at 3,200 feet per second, an ellipsoidal cavity is suddenly formed in the wound which is roughly the Volume of a golf ball. The phenomenon resembles, in miniature, an underwater explosion.

The military advantages of the M-16 can be seen by comparing it with the M-1 carbine, a small weapon developed in the last war as a substitute for the .45 pistol. The M-1 fires a stable, .30 calibre, 110 grain bullet at a muzzle velocity of 1,970 feet per second. The carbine has greater recoil, but its muzzle energy is only 77% of that of the M-16 round.

The wound caused by the carbine bullet is a deep and relatively clean puncture, which has been compared to the type caused by a powerful side-arm. By contrast, the wound of the less stable M-16 bullet is likely to be a volumetric hashing of tissue which forms an excellent medium for bacterial growth. The full effect of high velocity is realized by the tendency of the bullet to tumble or disintegrate. A narrow projectile tends to travel sideways in penetrating, and in this mode, the initial energy release of the M-16 bullet is 2-1/2 times that of the carbine slug. The rate of

energy release, or explosive effect, is 4-1/4 times greater. In all, gross mutilation or death from shock or infection is a more likely result.

The wounding capacity in depth of the M-16 is probably inferior to that of the standard .30 calibre M-14 rifle, which fires a 150 grain bullet at a muzzle velocity of 2,750 feet per second, and is a very deadly weapon in its own right. The M-16 is also inferior to the .50 calibre machine-gun and many other weapons.

But what counts is the ability of the weapon system to inflict damage. Because the M-16 is capable of a greater volume of accurate fire at close range, and because the difference in weight is equivalent to 100 rounds of the smaller ammunition, troops armed with the M-16 can score more hits in battle conditions than can those armed with the standard weapon.

These same advantages, however, also hold for the carbine. It is lighter and capable of fully automatic fire. It would appear, then, that in designing the M-16 and its cartridge, there was an intention to produce a type of wound that would be more severe than the carbine's, should the bullet strike an arm, a leg, or the abdomen. Given the utterly inadequate hospital facilities available to the enemy, there is a strong temptation to disregard the intent of the Hague Conventions by inflicting maiming, rather than merely immobilizing, wounds.

In shooting game, the M-16 ballistics are similar to those of a large family of small, high speed, "varmint " cartridges used on such small pests as prairie dogs and woodchucks. An animal hit by one is literally disintegrated. Hunting larger animals with these cartridges is regarded as very unsporting. The small bullet makes a large wound under the skin, and the animal escapes to a lingering death. Many states in America have regulations against deer hunting with cartridges of inadequate penetration. But then, people do not go after deer with flame throwers. We are told that humanitarian considerations must yield to grim military necessity.

The necessity was partly that of Colt, who promoted the rifle as a private venture and manufactures it under license from the Armalite corporation. According to Business Week, the company was in a stagnant condition before it introduced the weapon on its own initiative to the Vietnamese militia who, along with their Special Forces " advisors," were understandably impressed. The US Air Force had purchased, at one time, a number of Armalite rifles, but the Army had turned the weapon down. In 1963, reports of its effectiveness in combat were so favorable that the Army reversed itself, and Colt was given an initial order for 104,000, at a contract price of \$13.3 million.

The Hague Conventions of 1899 and 1907 are explicit in prohibiting the use of small arms bullets containing chemical explosives and bullets having defective jackets which might allow the nose to expand. Warfare at the time was carried out in such a manner that any wounding in excess of that required to put a soldier out of battle was rightly laid to viciousness, as distinguished from purely military need.

The United States and Britain did not sign the bullet agreements. While the United States maintained that it was content to observe the regulations voluntarily, the British delegate defended the use of "Dum-Dums" in colonial warfare; something drastic was required to stop an "uncivilized" opponent. In the Second World War, the Japanese made use of explosive bullets, bullets with defective jackets, and bullets designed to "keyhole," or tumble in a wound as does the M-16.

The US "hunt-and-destroy" strategy has its own needs and logic, often incompatible with the Hague Conventions, which were intended to govern wars of armies, not of peoples. But guerrilla wars of attrition prove to be especially bitter, leading to atrocities and reprisals in the Algerian pattern. While it would have been inconceivable in 1907 to involve non-combatants by permitting blanket shellings of areas of suspected guerrilla occupation, this has become routine in Vietnam. But then, whatever the US war objectives are, they are obviously deemed more important than any principles embodied in the Hague Conventions.

G.H. Tichenor is a mechanical engineer and an economist. This article first appeared in the November issue of *The Minority of One*, obtainable from 155 Pennington Avenue, PO Box 544, Passaic, New Jersey 07055, USA. It has been slightly shortened.

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