

first noted in early 14th century in Europe. The fundamental characteristic of the gun has not changed from that day to this. Even the terminology remains the same:

“A gun consists basically of a tube closed at one end, inside which an explosion takes place in order to eject a missile. The tube is called the *barrel*; the hole down the middle of the barrel is the *bore*, the closed end the *breech* end and the open end the *muzzle*. The missile discharged by the gun is broadly called a *projectile*, though in small arms... is usually called the *bullet*. The bullet is ejected from the gun by the explosion of a *propelling charge*, which may be of *gunpowder* [black powder] or *smokeless powder*, and the complete combination of all the requisites to fire one shot from the gun – bullet, propelling charge and means of ignition – are collectively referred to as a *cartridge* or *round*...”¹⁰

For many centuries the gun changed very little. Except for some experimental pieces, small arms were single shot muzzle loaders using black powder as the propellant, a lead ball as the bullet, and over the centuries a match, flint or percussion cap as the igniter. By the early 19th century, reloading took anywhere from 12 to 30 seconds or longer, depending on the firearm and the skill of the shooter. Over time, qualitative improvements were made with regard to the propellant, igniter mechanisms, gun metallurgy, and accuracy of the weapon itself [primarily through the use of rifling grooves, sights and development of the Minié ball]. Many other minor innovations improved overall reliability and efficiency. However, there were no revolutionary improvements in the effectiveness¹¹ of the firearm from one century to the next. It would be fair to say that, all else being equal, 100 skilled long bowmen from 14th century England could probably defeat 100 skilled British infantrymen using the Brown Bess Musket circa 1815 on open terrain. The longbow men could fire farther, faster and with as much or more accuracy, using an arrow which was every bit as lethal as the musket ball (depending on the range).¹² Why then did the musket prevail over the long bow? It was simply much easier to train soldiers to use muskets effectively and these new weapons could be produced in a reliable quantity more cheaply and more efficiently than the long bow and its ammunition, the arrow.

It was the era from the 1860s to the 1890s that saw a truly revolutionary change in the nature of SALW. (This included the development of the first crew served non-artillery fire arm or light weapon – the machine gun.) Some of these developments could be indirectly attributed

¹⁰ Hogg, *Guns and How They Work*, p .10.

¹¹ The words “effectiveness” and “effective” as opposed to “lethality” and “lethal” are perhaps better descriptive terms. A .753 inch calibre lead ball fired from an 18th century muzzle loader at 100 meters is just as lethal, if not more so than a 5.56 mm round fired from the most modern rifle. The term “Lethality” is a synonym for “deadly” and is not generally suited to comparative analysis. Effectiveness takes in a multitude of considerations, including lethality, accuracy, range, ability to acquire and/or engage multiple targets and different types of targets, ease of use, reliability, ease of maintenance, and combat sustainability [ammunition loads etc].

¹² James F. Dunnigan, *Digital Soldiers* (St Martin’s Press, 1996), pp. 13 and 281.