

Here a few very brief things that may be of use or interest regarding big guns.

There basically two kinds of shells - armor piercing and high explosive.

**Armor Piercing** are solid and depend on speed (kinetic energy) to do any damage - they do not 'explode' and are all but useless against infantry but the best solution against tanks. AP shells can't be too small or they aren't heavy enough to do damage but it is difficult to get them both large and fast.

**High Explosive** are hollow shells filled with explosives - the force of the explosion does all the damage and they can damage a wide area. They are best against infantry but all but the largest can be stopped by relatively thin armor. Obviously, bigger is better in this case because more size means more explosive charge and more bang.

Guns are measured by two numbers such as a 20/65, 75/18 or 88/56, which is also written as 20/L65 or 20L65. These numbers tell you most of what you need to know about a gun.

The first number is the diameter of the shell or bullet in millimeters. So the bigger the number the bigger the bullet or shell.

The second number is the length of the barrel in units of the diameter of the bullet or "calibers" - basically how many bullet sizes the barrel is long. So a 20/65 gun would have a barrel  $20\text{mm} \times 65 = 1300\text{mm}$ , which is about 52". They use a proportional measurement because if they just used inches there are times where a large gun has a relatively short barrel compared to its shell but it is physically longer than a smaller gun with a relatively longer barrel. Empirical length just doesn't give very much information.

The longer the barrel is relative to the bullet size the more the propellant gas acts on the bullet and thus the faster the bullet travels. Higher speed means the bullet is more accurate and has more energy when it hits the target. More energy means more armor penetration and more damage, this is essential for AP shells. Of course, physics being what it is, the faster and larger the bullet the more the recoil and thus the heavier the overall gun.

Going fast is very important for anti-tank guns that depend on the speed of the bullet for all their impact. However, if a gun is primarily used to hurl explosive shells a slower speed is fine. Explosive shells don't need to go fast they just need to explode. In this case a shorter barrel is good enough so the gun can be shorter, lighter, and easier to move around.

So understanding the two types of shells and the gun designation it is possible to look at the gun's sizes and know where it excels. A gun of around 75/15 is a very common size for a medium field gun that infantry can use to drop smoke or engage enemy bunkers with high explosive shells but almost useless against tanks. In fact the British Empire is pretty much the only force without such a gun. A gun of say 40/52 is a good anti-tank gun but not so good at HE.

Knowing all this - imagine, then, what a German 88/56 can do. Or, maybe, what, if anything, it *can't* do.

Reference: *Tank Killing* by Ian Hogg