

NEW WAR WEAPONS

By 23/762

THE aeroplane, motor transport, and wireless were regarded as scientific wonders in the first days of the last war. To-day those wonders have become commonplace. Since 1918 the scientists have been busy inventing new weapons, most of which are secret.

There is the "Queen Bee," for instance, an aeroplane which is worked by remote control. Little is known about this machine except that it is directed from the ground by wireless beams or from a mother 'plane which need not come within the direct line of anti-aircraft fire. Such an invention makes it possible to send a pilotless cargo of bombs over enemy territory without losing a man. In addition to directing the "Queen Bee" from a distance, the release of the bombs can also be achieved by remote control.

Electric Eye

Machine guns can also be operated by remote control, which means that a position can be defended by weapons unaccompanied by men. Some distant observer, watching the approach of the enemy through field glasses, will press a button and steel will do the rest. Experiments have also been made with the electric eye (the photo-electric cell) by which the attackers themselves, coming within range of the eye, release the machines of destruction which have been hidden at certain strategical points to bar their progress.

The greatest advances have been made with bombing and fighting 'planes. In the early days of the last war only two men were carried in the fighting 'planes and they dropped their tiny bombs over the side, leaving chance to carry them to their targets. To-day the giant 'planes carry crews of several men and are equipped with range-finders which are marvels of invention. They automatically calculate the speed of the 'plane, the wind force, the height, and several other factors, with the result that a bomber flying at 10,000 feet at a speed of 300 miles an hour can drop 1,000 lbs. of explosive within a few yards of a target.

Science has also achieved wonders in detecting the presence of airplanes and submarines, but the manner in which this is done is a military secret. The principle is that of the supersonic wave—that is, sound waves of a length not audible to the human ear. At sea they are sent out until they strike against a submarine and are reflected back, where they are recorded by a delicate instrument. These waves reveal the position and the distance of the enemy. In the same way the presence of airplanes is detected and recorded long before they are heard by the human ear.

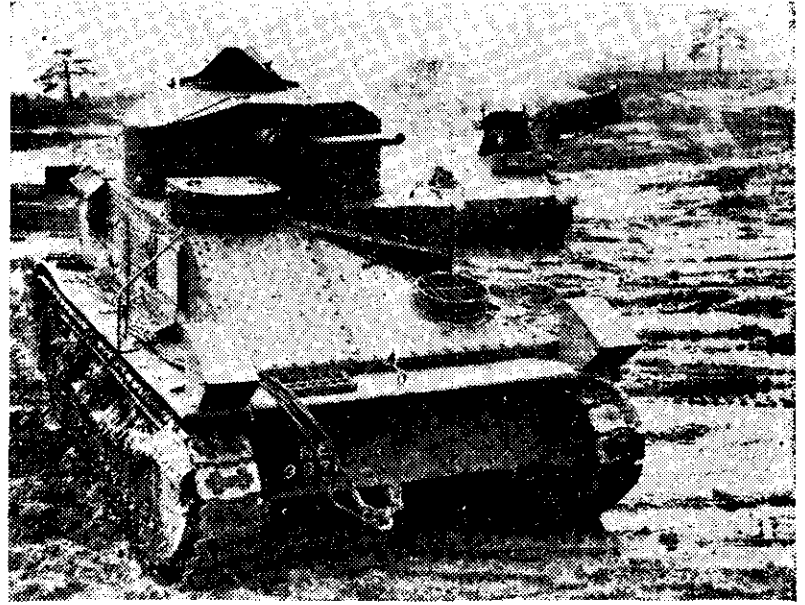
New methods of destroying submarines and airplanes have also been invented. No attempt is made for a direct hit on the under-water craft. The idea is to create such a disturbance around it that the increase in water pressure squeezes the submarine flat and bursts it like a paper bag. The same theory is applied to the destruction of aircraft. Instead of trying for the almost impossible direct

hit the bursting anti-aircraft shell creates such a disturbance round the 'plane that the machine is caught in that disturbance and twisted to scrap.

The Shrieking Bomb

One of Germany's minor inventions, put into operation in Spain, was the shrieking bomb. By turning up the edges of the vanes which keep the bomb steady during its flight, a terrifying scream issued from the bomb as it fell. The effect on non-combatants was unnerving. There is also a new kind of incendiary bomb which breaks into hundreds of parts, each of which is capable of starting a fire up to a distance of 1,000 yards.

Some idea of the increase in mechanical transport in the army of to-day can be gauged from the fact that when the British Expeditionary Force landed in France in 1914 it had 800 motor vehicles. The present Force took with it 25,000 mechanical vehicles of every sort. Machine guns were little thought of when the last war broke out, but to-day they are one of the most important units



CLOSE-UP photograph of a British tank manoeuvring in muddy country.

of an army. In addition to them there is also the Bren gun, a formidable weapon which has increased the firing power of a battalion to such an extent that it is

as much greater now than in 1918 as a broadside of a modern battleship is greater than that of one of Nelson's ships of war.

BALLISTICS AND STATISTICS

EVERY time a 15in. gun fires a full charge, £1,000 disappears in flame and smoke.

For every inch of bore in a modern gun the cost is approximately £1,500.

These two items indicate the cost of guns in modern warfare and also the cost of bombardment during action in the field. Hundreds of thousands of pounds can disappear in a few hours, as they did on the Western Front during the last war.

Since the last war great advances in the power and accuracy of modern artillery have been made, but the capacity of the big guns is kept as secret as possible. The following figures are taken from official sources of six years ago, since when no others have been issued:—

Guns		
Calibre	Shell	Range
6 in.	- 100 lbs.	10 miles
9.2 in.	- 380 lbs.	14 miles
12 in.	- 1,000 lbs.	19 miles
14 ins.	- 1,560 lbs.	22 miles
Howitzers		
8 in.	- 200 lbs.	7 miles
9.2 in.	- 290 lbs.	8 miles
12 in.	- 300 lbs.	10 miles
12.45 in.	- 350 lbs.	14 miles

Howitzers, those huge, squat guns which fire high into the air so that their shells will fall as straight as possible on their objectives, were advanced greatly by the Germans during the last war. It will be remembered that they used howitzers of 15.5in. calibre against the Belgian fortress of Antwerp and completely destroyed it because the forts were not designed to stand up to such a battering. These German howitzers threw their 2,000 lb. shells a distance of six miles. Each of those guns weighed 29

tons and required the strength of 13 traction engines to haul it into position. To-day the French have a howitzer which is drawn along double girder tracks by petrol engines and throws a 1,000 lb. shell a distance of seven miles.

Modern guns are most expensive to build. The 18-pounder, one of the smallest and most efficient of the British field guns, costs over £4,000. Some of the new 4in. American howitzers cost £5,000 each, complete with mounting. Ammunition is also a costly business, some of the shells costing over £1,000 each.

The accuracy of the modern big gun is amazing. In ideal conditions a 9.2in. gun, firing at a target ten miles away, should put a series of shells fired with the same sighting into a circle 12 yards in diameter.

Modern gunnery has become an expert business, requiring great skill on the part of the artillery-men and the officers in command. Modern guns have been found to be temperamental, and they must be understood in all their moods before the best can be made of them. The men usually give each gun a special name, indicating pride and affection and obtaining from an ancient privilege called "chalking the guns." To-day even the small anti-aircraft guns are named by their crews.

Nearly 200 miles of steel ribbon, six-one-hundredths of an inch thick and a quarter of an inch wide, are required to wire a 15in. gun. The wire weighs over 20 tons and the work is done by experts. Field and medium guns are usually built by shrinking tubes of steel,

white hot, one over the other, and big guns by wiring the steel ribbon mentioned above over an inner tube. In wiring, the number of turns wound during the operation varies from 20 at the muzzle to 80 at the breech.

How to increase the range of a shell is one of the problems of modern gunnery. This is done by "stream-lining" the rear end, thus reducing the air resistance, but as far as is known it has been done only to field and medium type guns.

"Big Bertha," the gun with which the Germans shelled Paris during the last war, was the longest ranging gun yet built, but it was not a success, and did comparatively little damage. It was, however, a remarkable achievement in gunnery, for it threw a shell weighing 265 lbs. a distance of 76 miles, but because of the distance this shell had only a small bursting charge.

"Big Bertha's" shell was given an initial velocity of 5,000ft. a second and rose 24 miles in the air, but the gun wore out after firing about 30 rounds of ammunition. At its best this gun was not very accurate and required a target two miles long and a mile wide.

Since 1918 armament makers have experimented with many new types of gun, and their achievements have been kept more or less secret. Neither side knows the full details of the ability of the field guns and howitzers which will be used in this war.

Note: By way of comparison we quote the following sentence from the recently published Centennial history of Wellington (The City of the Strait: A. E. Mulgan): "There were eight guns, six 12-pounders and two 9-pounders [in the Tory] . . . There can be no more striking proof of the enormous increase in the cost of armaments in the last century than the fact that these light guns cost the Company only £79/9/0."