

WW1 ANTI-AIRCRAFT GUN SITES
OF THE
WALTHAM ABBEY
ROYAL GUNPOWDER FACTORY

WORLD WAR ONE
ANTI-AIRCRAFT GUN SITES

Of the

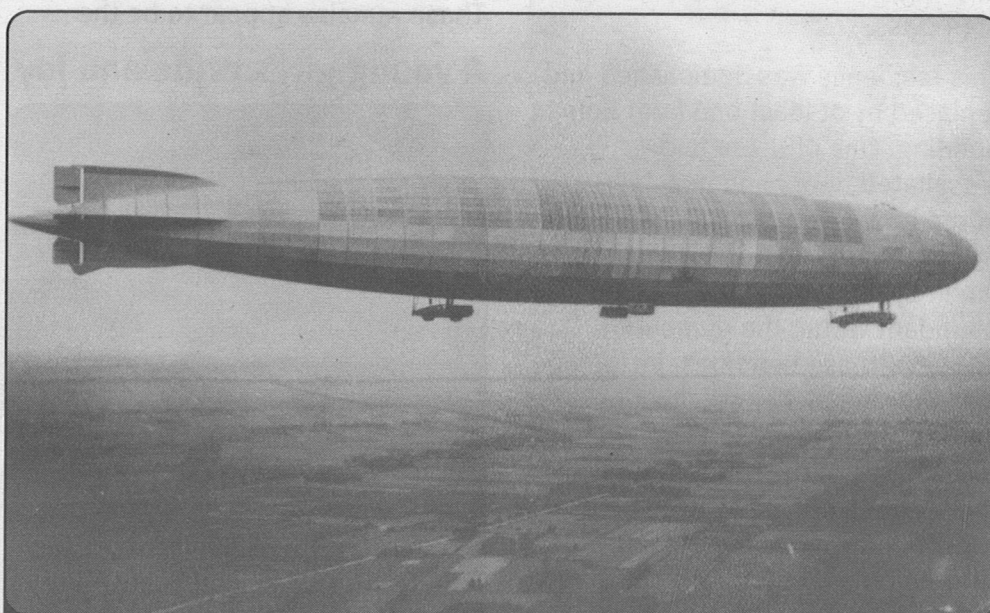
ROYAL
GUNPOWDER
FACTORY
WALTHAM ABBEY.

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WW1 ANTI-AIRCRAFT GUN SITES OF WALTHAM ABBEY'S ROYAL GUNPOWDER FACTORY.

The commander of Zeppelin L10 peered out into the blackness of the night sky. Weeks earlier, on 31 May 1915, Hauptmann Linnarz in Zeppelin LZ38 had been the first commander to bomb London successfully and, leaving 7 killed and 35 injured, he had made his escape with no response from the defences. Now it was L10's turn.

Coming over Essex, the Zeppelin turned towards East London. The huge airship hit Walthamstow with three bombs, Leyton and Leytonstone with 30 and finally Wanstead with its remaining ten, before heading back for the coast and its German base. Throughout its long flight, and despite being hunted by four fighter planes, it was only spotted and fired upon once – by the one pounder pom-pom guns of Waltham Abbey. These few shots into the night sky heralded the anti-aircraft defence of the Royal Gunpowder Factory, a defence which would grow and develop across two World Wars.



German Naval Airship L.32 was brought down at Snails Hall Farm, Great Burstead, south of Billericay, by 2nd Lieutenant F.Sowrey, flying a BE.2c biplane (IWM Q.58460)

AIR DEFENCE OF ROYAL GUNPOWDER FACTORY WALTHAM ABBEY.

It had been recognised for some years before the outbreak of war in 1914 that the aeroplane constituted an entirely new threat, namely, the possibility that aircraft could fly across the Channel from Germany, the likely enemy, and inflict damage and casualties on areas which, until then, had been safe. In addition, although aircraft design was still in its infancy, and bomb loads were small, Zeppelins, of which Germany was known to possess at least ten, could deliver a big punch. Not only were docks, munitions factories and industrial areas at risk, but the effect on civilians and their morale was a factor hitherto untested.

However, attempts to galvanise weapons development and production in the immediate pre-war period met with little success. In April 1914, there were just 26 guns in position to protect the whole of Britain from aerial attack. Most of these were field guns on improvised mountings that enabled them to fire skywards, notably the one-pounder pom-pom, a quick-firing gun which had been designed by Sir Hiram Maxim in the 1880s and offered to the British Government. This offer had been turned down, but after the gun had been used against British troops in the Boer War, minds were changed and the gun was hastily adopted.

When the air offensive came, in 1915, it was indeed the Zeppelin which at first presented the biggest danger. Carrying a five-ton bomb load, it had a range which included not only the whole of the south and east coast from Dorset to Scotland, but also the industrial Midlands. Nor could much be done to stop them. With battles raging across the other side of the Channel, the great majority of the RFC's machines had been sent to France to support the British Expeditionary Force. As a consequence, most of the aircraft left in Britain belonged, not to the RFC, but to the Royal Naval Air Service and it was therefore decided to incorporate the remaining RFC machines into the naval unit. This brought all home air defence, including anti-aircraft guns, under the responsibility of the First Lord of the Admiralty.....Mr Winston Churchill.

AIR DEFENCE OF ROYAL GUNPOWDER FACTORY WALTHAM ABBEY.

Meanwhile, to add heavier firepower to the lightweight one-pounder pom-poms, more field artillery pieces had been adapted for use against aircraft. These included the 18-pounder, the French 75mm and the Royal Horse Artillery 13-pounder. However, it was the development of a purpose-designed AA gun, the 3-inch 20-cwt, which really added impact to the defences and took the principle and reality of ack-ack defence to a new level. In its 1916 form, this gun threw 16-pound shells into the air at a rate of 16-18 rounds per minute, with a 'ceiling' of 22,000 feet. So successful was this weapon that it was retained after the war as the standard AA gun and saw service throughout the early part of WW2 until replaced by the 3.7 inch.

By the end of 1916, there were 367 guns defending London, the Midlands, the East Coast, Dover and Harwich and the combined forces of AA gunnery and fighter interception had effectively overcome the threat of the airship as more and more were either shot down or crashed through mechanical failure.

This respite was, however, short-lived as a new aerial invader now appeared in the sky - the Gotha twin-engined heavy bomber. With the demise of the Zeppelin, the German High Command had turned to aircraft in a dramatic way. On 25 May 1917, sixteen Gothas crossed the Essex coastline in formation. Each had a crew of three and, cruising at 80 miles per hour, could carry a bomb load of 1,000-lbs. While this was a far lighter load than the Zeppelin could carry, the Gotha's small size, compared to the vast bulk of the airship, made it infinitely more difficult to hit by anti-aircraft fire, or for that matter, by attacking British aircraft. The bomb-carrying deficiency could be overcome simply by using more of them.

In the ensuing months, many more Gotha attacks crossed Essex on their way to bomb London. Formations of twenty-plus became commonplace; even forty was not unusual. Casualties far exceeded those that had been suffered from airships. The heaviest of these came on the night of 3 September 1917 when 130 naval ratings died as their barracks at Chatham was hit by two 100-lb bombs.

The final throw of the German air offensive came with the development of the Giant, a multi-engined "flying fortress" bristling with machine-guns. This monster could carry a bomb load of 3,000-lbs, over a ton of high explosives. They first made their appearance in January 1918, their distinctive sound coming from 260HP Mercedes engines which both pushed and pulled the aircraft through the air. There were a number of raids by both Giants and Gothas between January and May 1918 but by this stage of the war both the aerial and ground-based defences had stiffened enormously since their early beginnings and air raids over Britain had become a much more hazardous undertaking. By June 1918 raids had ceased altogether, 469 anti-aircraft guns were in position throughout the country and squadrons of British fighter aircraft now patrolled the skies where Zeppelins once flew.

WW1 ANTI-AIRCRAFT GUN SITES OF
WALTHAM ABBEY'S
ROYAL GUNPOWDER FACTORY.

MEMBERS OF THE RNVR, ANTI-AIRCRAFT CORPS.
MANNING A ONE-POUNDER POM-POM ON A PEDESTAL MOUNTING.



*Members of the Royal Naval Volunteer Reserve, Anti-Aircraft Corps,
manning a one-pounder pom-pom on a pedestal mounting (IWM HU.71778)*

THE ROYAL GUNPOWDER FACTORY.

Long before the outbreak of war, as early as 1910, the likely targets of bombing raids had been considered by the British government. The magazines and cordite factories, mainly grouped within easy flying range around London, were thought to be particularly vulnerable and, as war approached, they were given the highest level of priority, along with dockyards and weapons manufacturing plants, for the few available guns.

The RGPF at Waltham Abbey had been manufacturing explosives since the 17th century and it is known from surviving records at the Public Record Office that three of the original 26 guns deployed in April 1914 were sited there. These "Approved Armaments" records were compiled by the War Office throughout 1914-1918. They show the whereabouts and types of all the guns issued across the country. Unfortunately, no more than a handful of these records survive but those that do provide us with reliable, and immensely valuable, information for specific dates. Thus it is known that four months before war began on 4 August 1914, the factory was defended by two Vickers one-pounder pom-poms, which were later to fire on Zeppelin L 10, and one of the first 3inch 20cwt guns. This is reported as being "not yet mounted". Nine months later, at the beginning of the Zeppelin offensive, two 6pdr Hotchkiss guns had been added. These were essentially the same guns which lined the sides of WW1 cruisers, fired high explosive from the side gun turrets of MK1V "Male" tanks and, stretching their useful life forward to the Second World War, were emplaced in many pillboxes as anti-tank guns!

By February 1916, "Approved Armaments", had grown considerably, and the deployed guns at Waltham Abbey were now listed under six separate locations, none of them identified other than by their names. "Monkhams Hill" and "Cheshunt" are each shown with 6pdr Hotchkiss, clearly those listed the previous year. "Enfield Lock Water Tower" has the 3inch 20cwt gun which had been shown in the earlier listing as being "not yet mounted". "Grange Hill" and "Crooked Mile" each sport one of the original one-pounder pom-poms. "Hill 100" is shown as having a 3inch Q.F. (quick-firing) 5cwt gun. This gun, just produced by the Elswick Ordnance Company, was another attempt to alleviate the shortage problem. However, only fourteen were ever issued as a low muzzle velocity made them too inaccurate for the purpose. Finally, as a travelling back-up, a 13-pounder gun is listed, which, mounted on the back of a lorry, ferried between the sites.

As a measure of how much "Waltham Sub-Command" had grown after two years, an analysis dated November 1916, again unearthed from archives at the Public Record Office, lists 409 personnel manning the anti-aircraft defences. These include 16 Officers, 26 Staff-Sergeants and sergeants, and 150 Gunners, beside supporting Rangetakers, Observers, Telephonists and Cooks.

The Commandant warranted the only motor car while the two Captains had to make do with motor cycles. The 20 bicycles were shared out between the Rangetakers and Observers. Intriguingly, the number of "Gun Stations" is shown as five two-gun and two one-gun, a total of seven sites with twelve guns. The identity of the sites is not shown by, after much head-scratching, it is thought likely that the twin sites were Monkhams Hill, Cheshunt, Enfield Lock Water Tower, Grange Hill and Hayes Hill (of which more later) and the single sites 100 and Crooked Mile, although this is by no means certain.

The final issue of "Approved Armaments" which has been traced comes in July 1917, but this is slightly confusing. Only Cheshunt and Enfield Lock are mentioned, both under Northern Sub-Command. Whether Waltham Sub-Command as a separate unit had ceased to exist by that time is not known, nor whether the other sites under its control had by then been abandoned.

Northern Sub-Command was part of a broad swathe of sites protecting London from an attack from the north and it appears that the two Waltham sites listed the 3inch 20cwt had been widely adopted as the standard weapon of AA defence and all the eighteen sites within Northern Sub-Command were equipped with it.

EMPLACEMENTS AND GUN RINGS.

Any field survey of Waltham Abbey's gun sites could do no better than to start at "Monkhams Hill". This lies immediately to the east of the RGPF North Site which it grandly overlooks. On the top stands what is thought to be the original 6pdr Hotchkiss emplacement, a raised platform of brick and concrete measuring 37 feet by 29 feet. On the west corner, one of the two brick shelters still survives, while in the centre a six-foot diameter steel mounting plate is still embedded in the concrete surface. However, as with much of this subject, there is a question mark. It can be seen from the brickwork that although constructed in the First World War, the emplacement was clearly repaired during the Second. Close by are the remaining bases of WW11 accomodation buildings. Was the emplacement re-used, for another gun, during the Second World War? In which case the mounting plate is not for a Hotchkiss but for another gun entirely.

We know from the records that the other 6-pounder allocated to Waltham Sub-Command was emplaced at "Cheshunt". But, where was this? Although a WW11 heavy anti-aircraft gun site is known west of the A10 Great Cambridge Road, there are no known records showing the location of the earlier site. After exhausting all other lines of enquiry it was finally discovered, like many "lost sites are, by poring inch-by-inch across old aerial photographs with a powerful magnifying glass. The same shape as that at "Monkhams Hill", it lay - because it has now gone to the great fortress in the sky - on the west side of the River Lea, just north of Cadmore Lane. After the Second World War the area was given over to gravel extraction and nothing of the site now remains.



*The 13-pdr 9cwt gun was widely employed in a mobile role.
Here it is seen mounted on Peerless lorries in March 1918 (IWM Q.8559)*

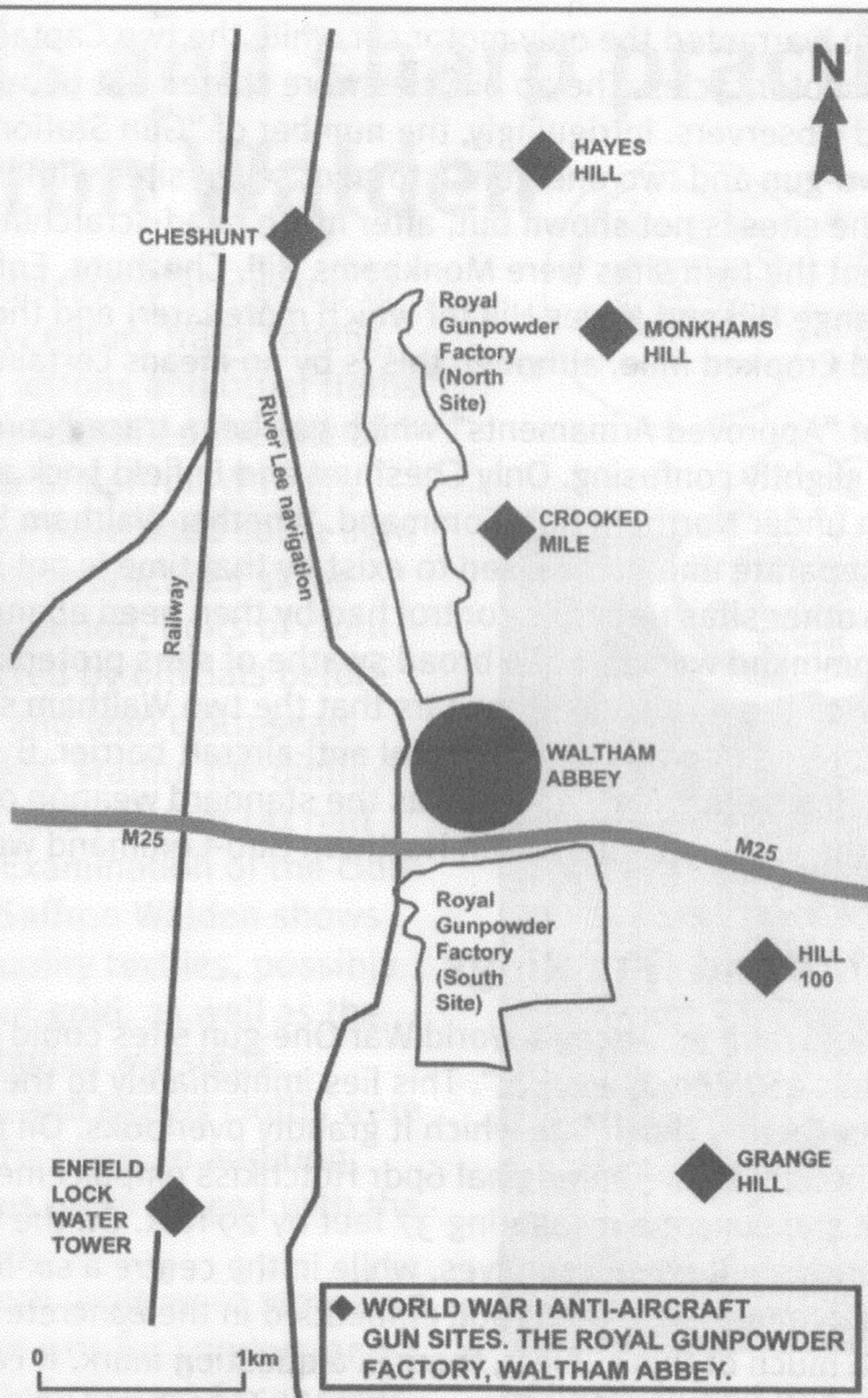
EMPLACEMENTS AND GUN RINGS.

"Enfield Lock Water Tower" was another which at first presented all sorts of problems in its location. It sounded easy, just find a water tower and there it is. But, all attempts to find a wartime water at Enfield Lock drew a blank. Until, with a burst of lateral thinking, it became blindingly obvious. The water cooling towers at Brimsdown Power Station. Aerial photographs from the 1940's- these are the earliest available - confirm it. The familiar shape of a "Monkhams Hill" emplacement could be seen in a field dominated by the Power Station and its cooling towers, but this time there were a number of other enclosures, and at least one overgrown circle, possibly the gun mounting ring for the 3-inch 20 cwt gun referred to in the historical records. By 1947, however, all had gone, to be replaced by the industrial buildings of Bilton Way.

"Grange Hill" on the other hand, is very different. From the summit, virtually all of the South Site is laid out as a panorama, and embedded in the grass are the remains of three AA emplacements, the largest of them 20 feet across.

Although the WW1 records only once identify "Grange Hill" individually, with a one-pounder pom-pom, it is known that most major sites evolved to accommodate 3-inch 20-cwt guns, usually two. From the size of the concrete aprons and their indentations - the steel mounting rings themselves have been removed - it is apparent that two of them did indeed hold these guns. The third comes as a surprise, a physical confirmation of WW1 sites being used again during the Second World War. It is an emplacement for a 40mm Bofors gun, one of the best-known of all WW2 anti-aircraft guns.

WW1 ANTI-AIRCRAFT GUN SITES OF
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THE WW1 GUN SITES OF WALTHAM SUB COMMAND.



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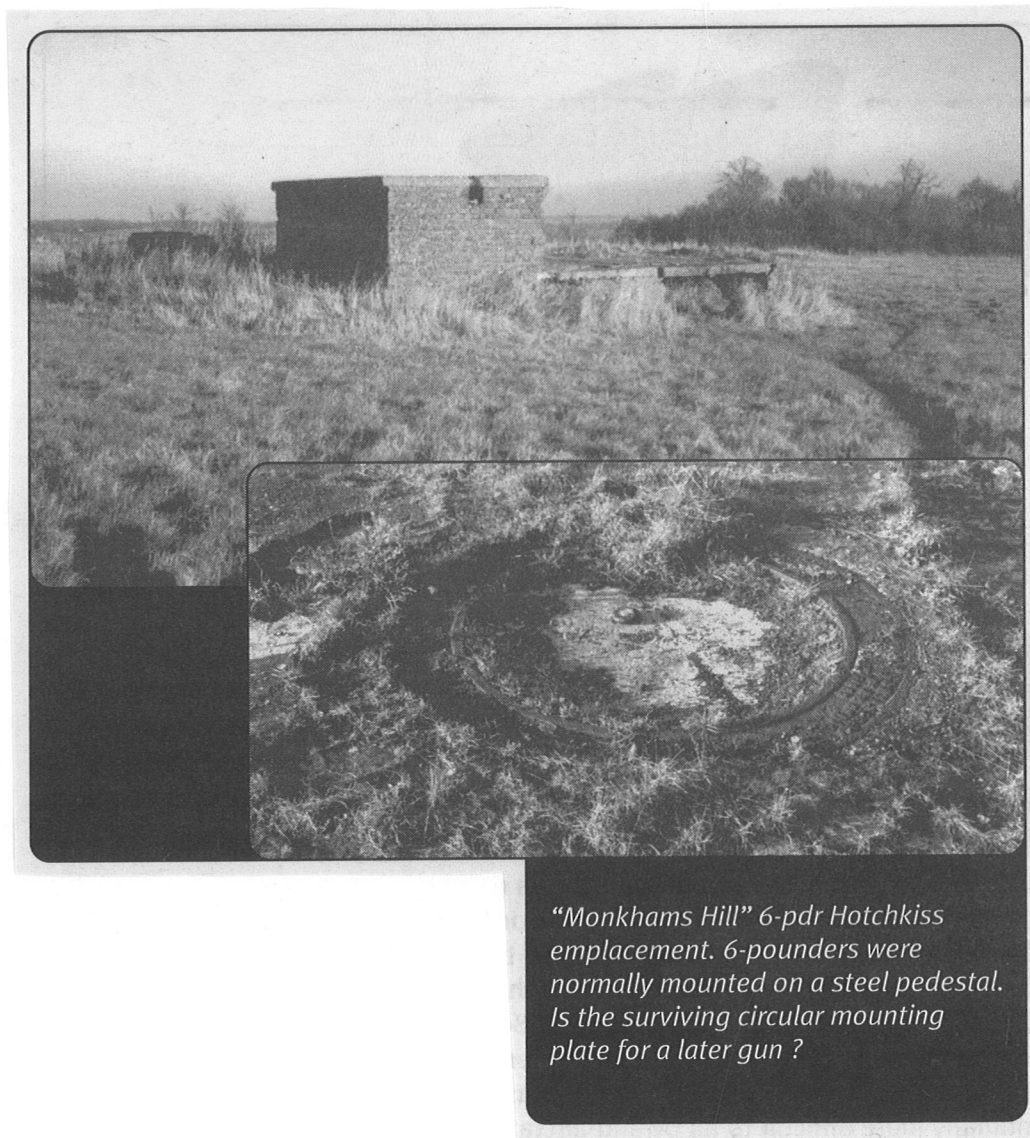
"HAYES HILL" poses its share of questions.

"Hayes Hill" poses its share of questions.



WW1 ANTI-AIRCRAFT GUN SITES OF WALTHAM ABBEY'S ROYAL GUNPOWDER FACTORY.

"Monkhams Hill" 6-pdr Hotchkiss emplacement. 6-pounders were normally mounted on a steel pedestal. Is the surviving circular mounting plate for a later gun?



*"Monkhams Hill" 6-pdr Hotchkiss
emplacement. 6-pounders were
normally mounted on a steel pedestal.
Is the surviving circular mounting
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EMPLACEMENTS AND GUN RINGS.

"Hayes Hill" is something of an enigma. Two anti-aircraft gun "holdfasts" - the steel mounting plates - are embedded in an ovoid concrete base on the summit of this low hill. One is clearly that for a WW11 40mm Bofors, just like that at "Grange Hill". The other is a mystery. It is much larger than the Bofors, approximately 5 feet square, and has a number of locating studs upstanding. Both holdfasts may, of course, have been emplaced during WW11 - there is no mention of the site in the WW1 records - but equally, and again like "Grange Hill", the site may have been established during WW1 for one gun and re-activated with the Bofors 25 years later.

In locating and identifying these sites, "Hill 100" is an interesting example of how cartography can provide a vital clue. Immediately to the east of Waltham Abbey South Site there is a low hill, shown by Ordnance Survey maps to be exactly ...100 feet high. Initially the site of one of the few 3inch 5cwt guns in the First World War, a local resident remembers the hilltop as an active anti-aircraft gun site in WW11. In 1945, however, the site was cleared and the field returned to agriculture.

And, finally, "Crooked Mile". Just like the others, there was no guide other than the name. The Crooked Mile is a road leading north from the centre of Waltham Abbey. It had to be somewhere along there. But where? Aerial photographs from the 1940's, not for the first time, came to the rescue. In a meadow between the road and the North Site stood the now familiar shape of the platform. with its shelters. By 1950, however, it had been demolished and the area is now light woodland.

1 POUNDER POM-POM ANTI-AIRCRAFT GUN.

Originally designed in the 1880s by Sir Hiram Maxim with the intention of producing what was virtually a machine gun but one having a longer range and a larger projectile.

Due to the long range, it was necessary to provide an explosive projectile which would give the gunners an indication of the strike of shot; since a one-pound shell was the smallest permitted under the Hague Convention, this automatically gave the calibre of the gun.

The original weapons were on fairly standard field carriages, but these were followed by naval versions with pedestal deck mounts, and after WW1 had begun, many modifications were made to convert for high angle shootings, designs of which begun appearing in early 1914.

This weapon on the high-angle mounting field carriage was used by the Belgian Army, and a similar weapon was produced in Germany for use by both the German Navy and Army.

DATA.

Calibre: 1.457-in.

Date of intro: Feb 10th, 1914.

Wt inc breech assembly: 410 lb.

Length total: 73.5-in. with shoulder-piece.

Breech mechanism: Maxim lock.

Firing mechanism: Percussion.

Ammunition Data.

Type: Fixed QF.

Standard projectile and wt: High explosive 1-lb.

Charge wt: 10z 90gr Cordite Mk 1.

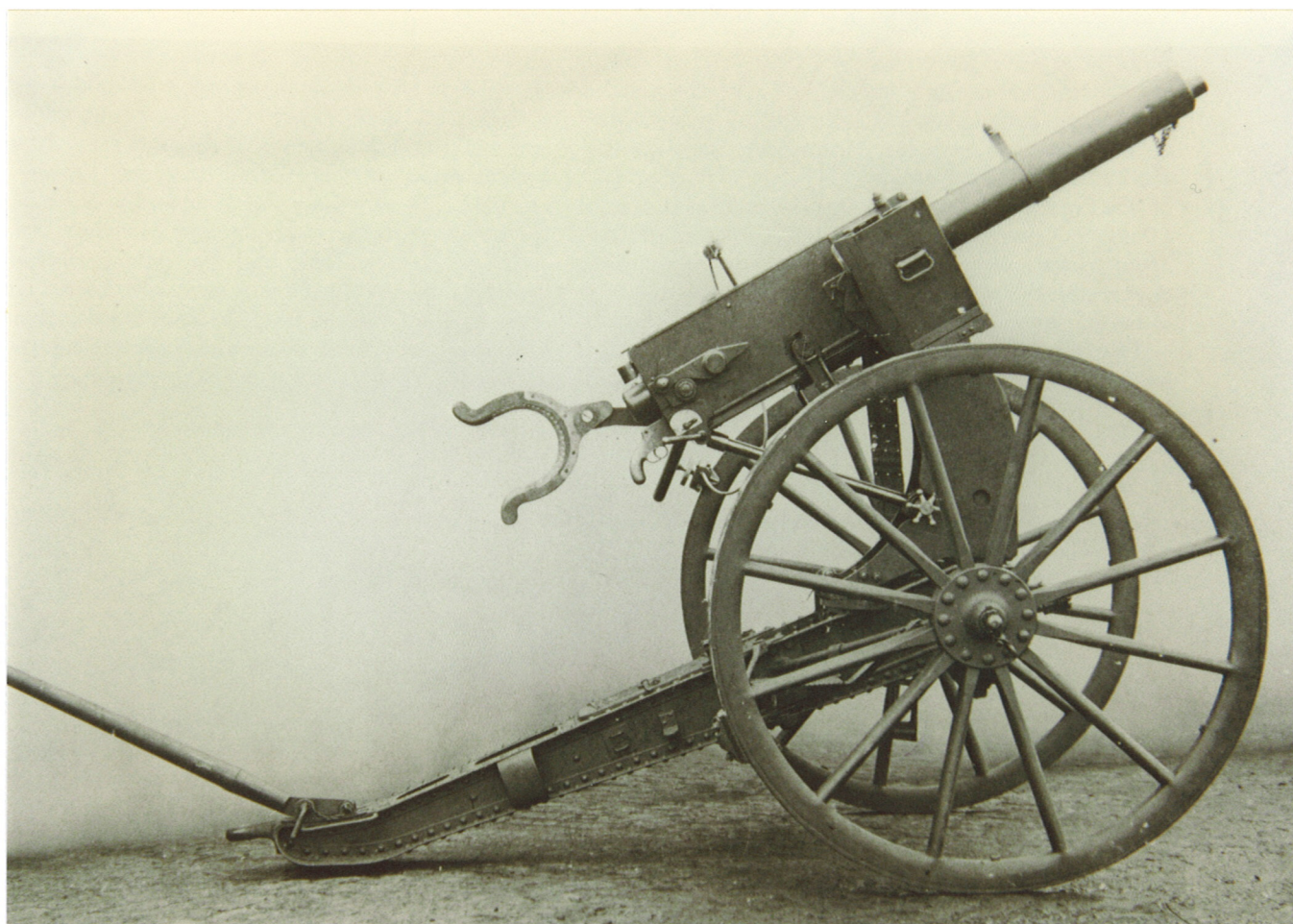
Case length: 3.7-inch.

There wer 5 Marks of the gun.

The Mk 1* was slightly modified to enable higher elevations to be reached on the field carriage to give a range of 4500 yards.

A 1pdr Pom Pom on pedestal mount was the first weapon to fire a shot in defence of London during WW1.

1 POUNDER POM-POM ANTI-AIRCRAFT GUN.



3-inch 20-cwt QF ANTI-AIRCRAFT GUN.

This was the first 'purpose-built' British anti-aircraft gun, having being developed in pre-war years and introduced early in 1914.

It was probably the best gun of its class used by any nation during the war, and was still serving in field army formations in the early part of WW2.

The standard platform was the cruciform travelling platform Mk 1, but these weapons were also statically mounted on pedestals and placed on Peerless Lorries to form mobile mountings.

DATA.

Calibre: 3-inches.

Breech mechanism: early marks vertical sliding block.
Mk 3 interrupted screw.

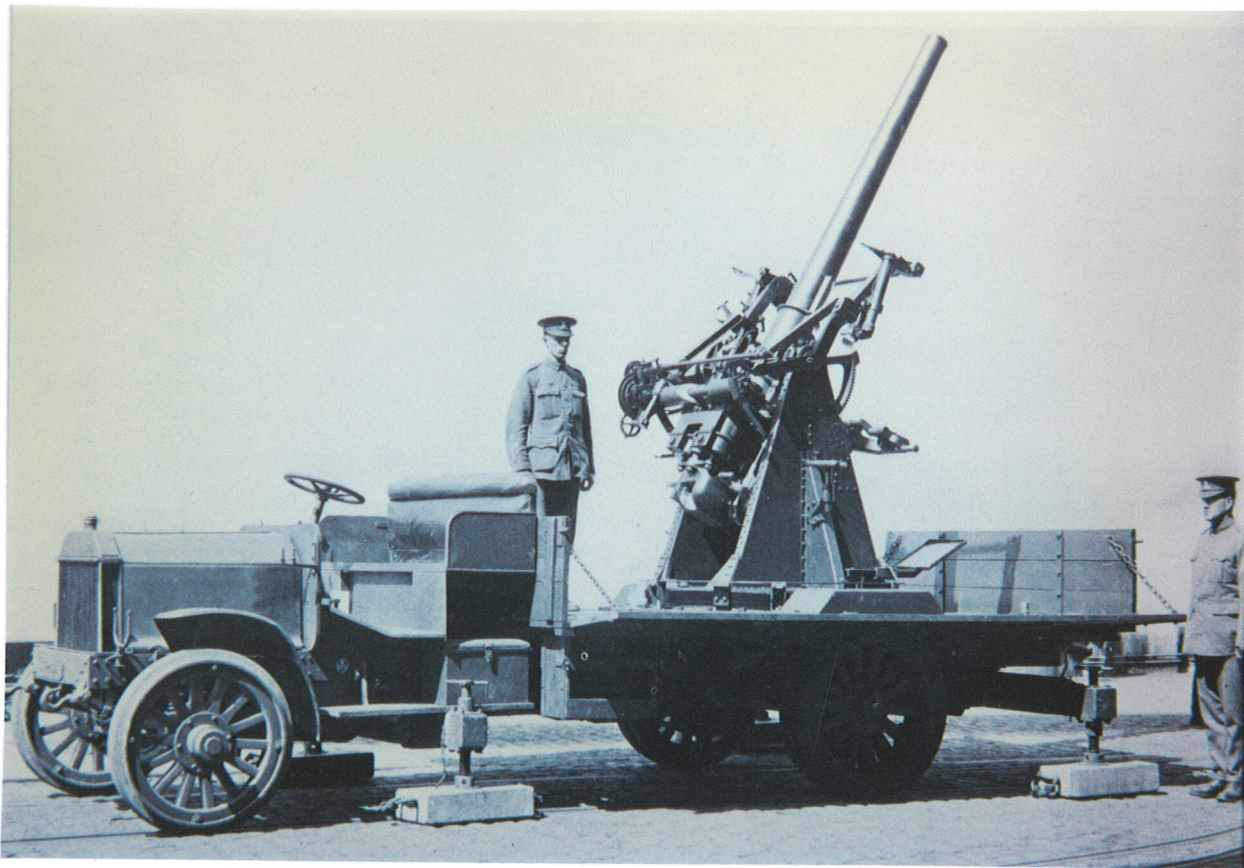
Firing mechanism: Percussion.

Standard projectile: Shrapnel.

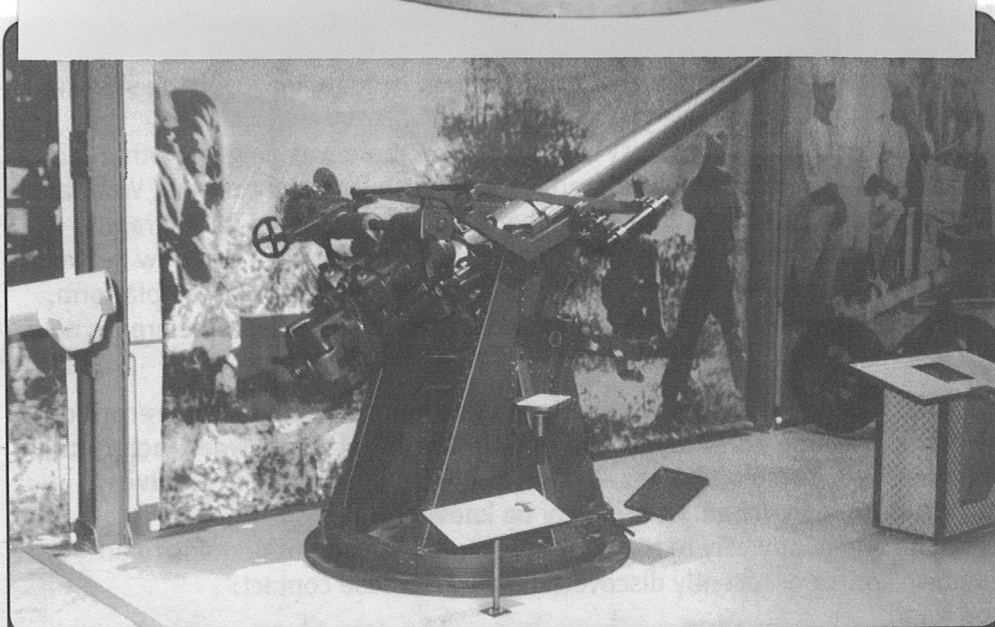
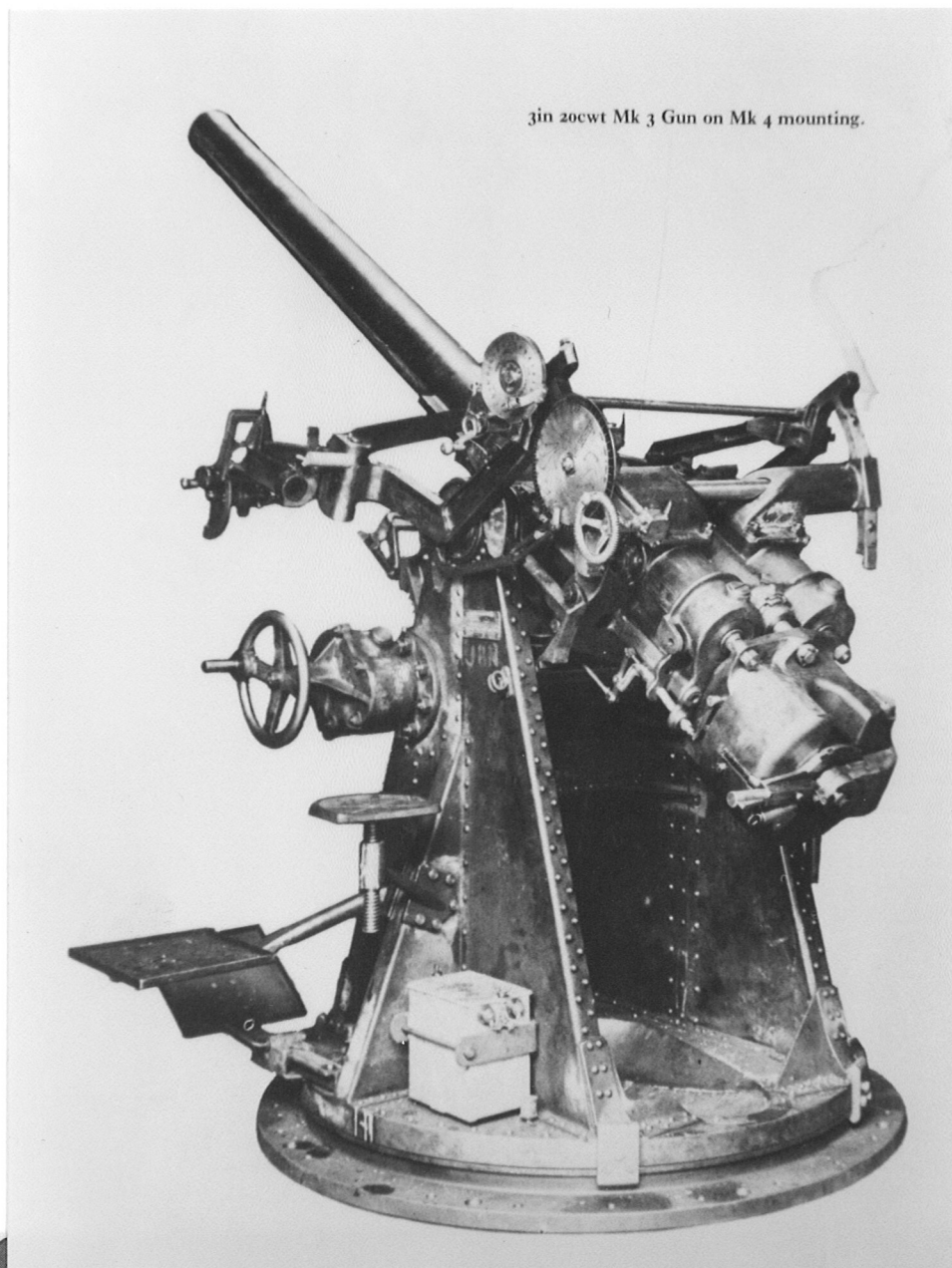
Shell weight: 16-lb.

Maximum range: 23,500-feet ceiling with 12.5-lb shell.

MV: 2,500-fps.

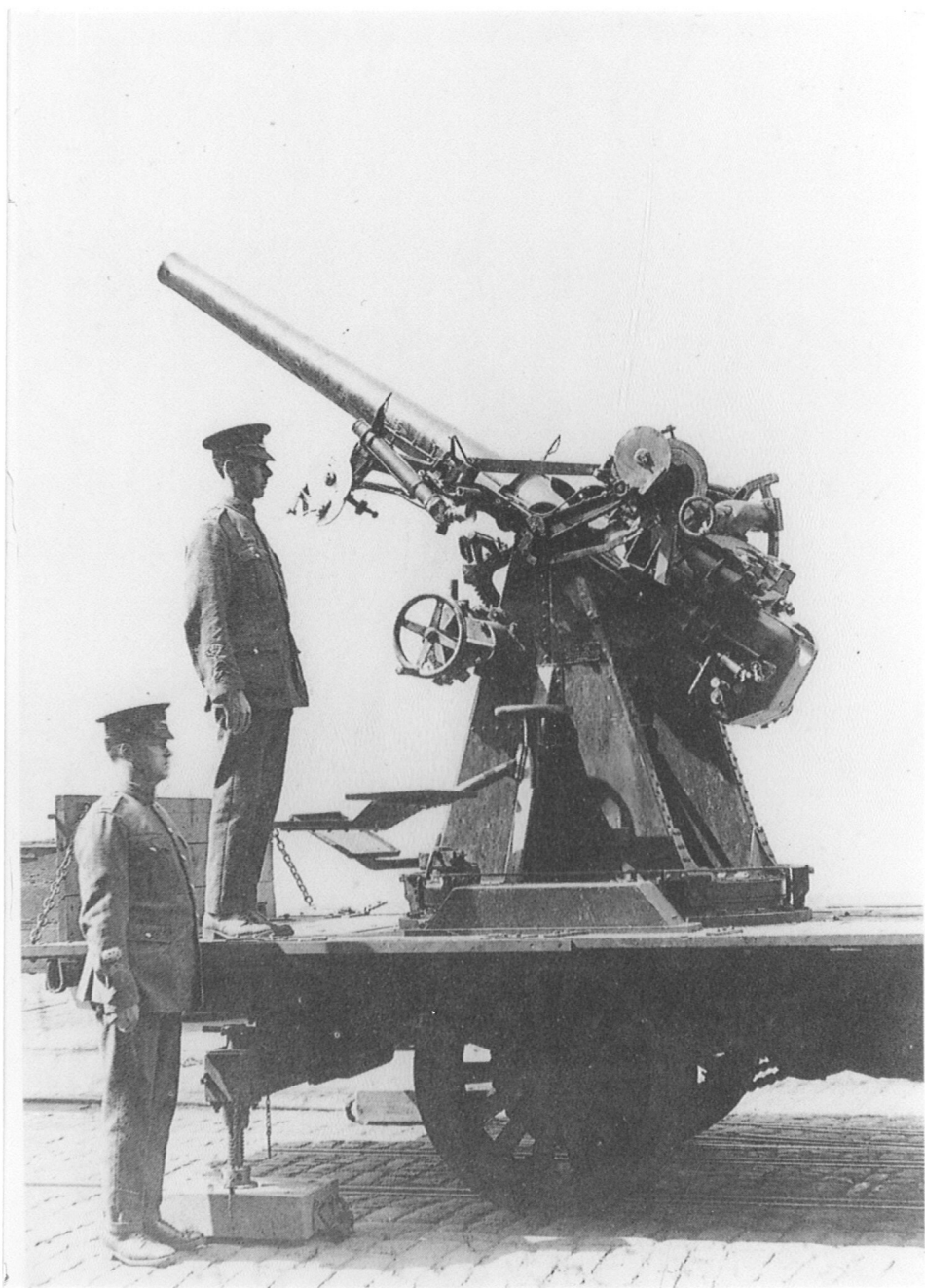


3-inch 20-cwt QF ANTI-AIRCRAFT GUN.



A World War One 3inch 20cwt gun, pictured at Firepower, the former Woolwich Arsenal.

3-inch 20-cwt QF ANTI-AIRCRAFT GUN.



13 POUNDER QF Mk 4 ANTI-AIRCRAFT GUN.

This 13pdr owes no allegiance to any of the other weapons of the same name. it was originally a 3-inch gun developed for commercial sale by the Wlswick Ordance Company, and differed from the service 13pdr marks by being one calibre shorter in the bore, having 24 rifling grooves, and having a lower muzzle velocity. It was also different in being fitted with a Nordenfelt breech screw mechanism, as used on the French 75mm but otherwise unknown in British service.

In early 1915 when the search for AA weapons was at its height, six of these weapons were offered by the Elswick company and were promptly bought by the Army and mounted on motor trucks. One is recorded as having been stationed at Enfield Lock in May 1915 to protect the Royal Small Arms Factory, but eventually all six of them were sent to France.

Equipped with an over-powered cartridge to give the muzzle velocity a boost, these six guns performed satisfactory and appear to have seen the war out.

DATA.

Cal: 3-inch.

Date of intro: 1915.

Breech mech: Nordenfelt screw.

Firing mech: percussion.

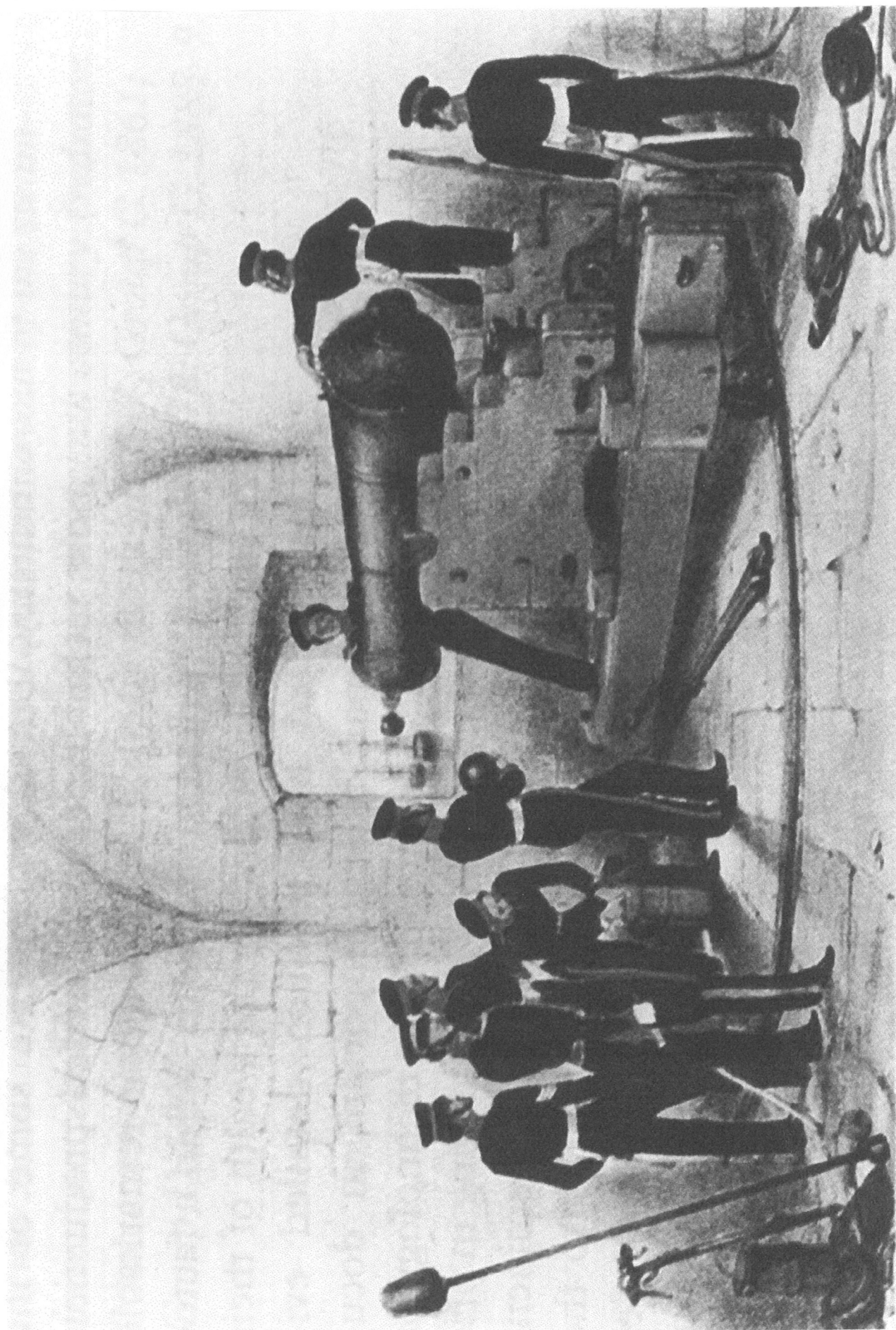
Standard projectile: Shrapnel.

Shell weight: 12.5-lb.

MV: about 1,600-fps.

68 POUNDER CANNON.

Smooth-bore muzzle-loaded, the weapon fired an 18-lb. black powder charge with a projectile weighing some 66-lb.; it represented the largest gun in British service during the Crimean War.



110-TON 16.25-inch BREECH LOADING GUN.

Seen here being charged with 800-lb. of black powder at Shoeburghness proof butts in the 1880s. Note the small wagon to the right which has been used to move the powder charges up to the gun, and the gunners manhandling the assembled charges of prismatic powder into the breech.



