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NOTES ON THE HISTORY OF THE ROYAL SMALL ARMS FACTORY, ENFIELD LOCK.

BY COLONEL LORD COTTESLOE, C.B.

INTRODUCTION.

The following account of the Royal Small Arms Factory, Enfield Lock, is compiled from notes written by Mr. G. H. Roberts, C.B.E., M.Inst.C.E., who held the position of Superintendent of the Factory from 1922 to 1931. These notes contain not only the result of researches in the War Office Library, British Museum, Public Record Office, etc., but also information supplied by old employees of the Factory which would soon be lost if not placed on record.

Mr. Roberts has embodied in his notes many details, some of which are accessible elsewhere, while others are too slight to be suitable for the *Journal* with its limited space; but it is thought that the present summarized account should be of value. It is evident that Mr. Roberts has made an important contribution to a little known department of Army History for which all interested in it will be grateful.

COTTESLOE.

HISTORY OF THE ROYAL SMALL ARMS FACTORY.

The Royal Small Arms Factory, officially known as "The R. S. A. F.", and locally and colloquially as "The Lock" (the employees themselves for the same reason being known as "Lockies"), is situated almost due north of London, from which it is distant about 14 miles; it is some 4 miles from Enfield Town. The main entrance gate is in the extreme North-East corner of the County of Middlesex, but the greater portion of the factory is in the County of Essex, whilst its boundary at the Northern end is less than a mile from the Hertfordshire County boundary.

The Factory is about three-quarters of a mile long by a third of a mile wide, and is traversed along its whole length by the River Lea, beloved of Isaak Walton.

The district generally is known as "Enfield Lock," the latter part of the title being, no doubt, derived from the lock of the Lea Navigation a few yards from the main Factory entrance.

Prior to 1804 the Government had depended principally on the private trade for the supply of Small Arms, but when such sources were found to be insufficient it was compelled to go abroad for its requirements. In this connection it is on record that Mr. J. Colgate, an Officer of the

Ordnance Department, was sent to Liège (Belgium) in 1779 to supervise the setting up of 40,000 stands (1) of arms for the British Government, whilst Major-General William Millar, Royal Artillery, was sent to Liège and Hamburg for similar purposes in the years 1794-5 and 1800. A public statement having been made to the effect that the art of making military fire-arms had almost become extinct in England, a Department was formed at the Tower of London in 1802 for manufacturing locks and assembling weapons, but the accommodation proving insufficient, the lock branch was removed to Lewisham in Kent in 1808 and a barrel branch established there also.

The Royal Gunpowder Factory, Waltham Abbey, lies to the North of, and adjoins, the Small Arms Factory at Enfield Lock, and has been established, first as a private factory, and afterwards as a Government factory, for upwards of 200 years, and in 1800 large numbers of walnut trees were planted at Waltham Abbey and Enfield Lock for making gun-stocks. Some of the older men can remember these growing on the site where the stocking shop now stands. This is the earliest reference which the writer has found to Enfield Lock in connection with Government supplies of any kind, although in a lecture, delivered by Mr. Ford in 1880, it was stated that a suggestion to establish the manufacture of gunpowder at Enfield Lock had been put forward in 1653.

The Enfield factory itself appears to have been established about the year 1804, and was built under the supervision of Major John By, Royal Engineers, who afterwards went to Canada to construct the Rideau Canal, and there founded a small village called "Bytown," which has now become Ottawa. [See *Journal*, vol ix. 127 and 173-4.]

When the Factory was first started its principal function was the assembling of 'Brown Bess' muskets, and it appears probable that the existence of the River Lea and the proximity of the Lea Navigation, the latter being partly a natural and partly an artificial waterway designed and constructed by the famous engineer Smeaton in 1767, were the principal reasons for placing the factory on this particular site, as providing water power and transportation respectively.

Unfortunately the information available as to the subsequent history of the Factory for some 50 years is so fragmentary that no connected particulars can be compiled, and it appears best, therefore, to give such information as is forthcoming in chronological order.

1810.

An old cash-book gives the wages paid to employees at the "Royal Manufactory" of the Office of Ordnance, Lewisham, from August to

1. A stand, or set, of arms, meant a rifle, or musket, with bayonet complete.

December of that year. Three foremen and viewers (1) were employed and paid 7s. per day; 24 artificers 3s. to 4s. 6d. a day. In addition to the above there were apparently employed at that time 82 lock-filers, 11 barrel-filers, 4 barrel-borers, 7 barrel-grinders, 10 barrel-forgers (who had to pay for their own coal), 13 other workers and 9 labourers, whose wages ranged from 2s. to 2s. 6d. a day. The total weekly wages bill was about £360.

There were 2 foremen's houses and 6 cottages at Lewisham. The Superintendent was Mr. J. Colgate. It is interesting to note that a considerable amount of work was done for India at this time. The Cashier was called "Clerk of the Cheque." Several items of £2 each appear for "Chair (*sic*, but *qy* Chaise) hire" to the Tower of London.

1812.

The Board of Ordnance purchased the ground, about 32 acres in extent, on which the Enfield Factory stood.

1816.

About this year, principally owing to transport difficulties and insufficiency of water power at Lewisham, the barrel branch was transferred from that place to Enfield Lock, and additional buildings erected there. As this date coincided approximately with the close of the Napoleonic Wars, it was determined to retain the nucleus of a Small Arms Factory at Enfield, and the "Lock" and "Finishing" sections were later removed from Lewisham and the whole work concentrated at Enfield.

1819.

According to Debrett, there were then three Arms Departments, viz:—The Tower of London, Lewisham and Enfield.

1823.

There were employed at Enfield 6 foremen, 2 viewers (1), 1 warder, 1 mill-wright, 1 first-class, 7 2nd, 17 3rd, 1 4th, and 2 5th class artificers, 3 labourers, and 1 extra man. The place was called "Royal Armory Mills, Enfield."

1828.

The area of the Factory at this time was 27 acres, and in the immediate vicinity were cottages for 2 foremen and 60 factory employees, let at 2s. a week.

1830.

From a Record of Lands of this time, it appears that the area covered by buildings and enclosures, immediately connected with the Establishment, was about seven acres.

1841.

In this year the Small Arms Department at the Tower of London was completely destroyed by fire, together with the stock of flint-lock arms which it contained.

1. Inspectors or examiners of goods, materials, etc., supplied by contract.

1852.

In his Presidential address to the Institution of Civil Engineers in 1868, Mr. Gregory, speaking of the year 1852, stated that "prior to this time the construction of fire-arms was really carried on by small manufacturers, who each made only one separate part, one for locks, one for barrels, one for bayonets, etc., the gunmaker being, in fact, little more than a setter up; and the Government, after obtaining by contract the separate parts of their muskets, excepting barrels and some small parts, from separate manufacturers, put them together at their own works at Enfield."

In this year a new barrel-rolling plant was installed.

1853.

Between 1816 and 1853 two water-wheels, of 46 horse-power, had been installed for shop-driving purposes. They were 18 feet in diameter, by 14 feet, and 9 feet wide respectively, of the breast-wheel pattern, made of cast-iron. They had no governors, and their output was very irregular. Workshops, offices, and storehouses for gunstocks, had been erected, and houses or cottages for 64 families built. The whole of the property was now valued at £120,000.

The actual production of the factory for some years had been at the rate of 7,000 small arms and 1,500 swords per annum, and the water-power required for this production averaged about 25 horse-power; at this time there was no steam power in the Factory. In the year 1853, however, the actual capacity of the Factory was 50,000 muskets and 3,000 swords per annum. It appears probable that up to this time, or even a little later, many weapons had been made for private firms or for sale abroad.

On 7 October, 1853, Mr. (afterwards Sir) John Anderson, Superintendent of the Ordnance Factories at Woolwich, was sent to Enfield to report on the capabilities of that establishment for the manufacture of bayonets by machinery. Following on Mr. Anderson's report a Committee was appointed to consider the whole question of the provision of Small Arms for H.M. Service, and produced a voluminous report. Under the existing practice, the components of muskets were made up by contractors, and after examination by viewers were "set up" or "assembled" and finished into complete arms, some at Enfield, others by contractors. Bayonets had not hitherto been produced at Enfield. There was no proper system for production.

Lieut.-Colonel Alexander Tulloh, Royal Artillery, Inspector of the Royal Carriage Factory, Woolwich, and Colonel James Archibald Chalmer, R.A., Inspector of Artillery, put in statements to the Committee in which the following passages occur:—

"It appears that the system hitherto adopted to procure small-arms is so heterogenous in its character, that it could not fail to produce considerable difficulties. The Government establishment at Enfield Lock is comparatively small and of a mixed nature, some parts of the work

being performed by the establishment, some by contractors; many of the lathes and other tools are the property of the workmen; others belonging to the establishment. The men possessing lathes hire them out to other men."

"The establishment at Enfield Lock being small, and forming part of this heterogeneous system, is unable to hold that salutary check or control over the contractors to prevent exorbitant demands and serious delays."

"The principal part of the gun trade upon which the Government mainly depends for supply in case of emergency, is carried on in Birmingham and London, and by men working by hand in wretched cellars and garrets, and great evil arises from the extreme slowness of manufacture."

It was stated by Mr. J. Gunner, Superintendent of the Royal Manufactory of Small Arms at Enfield, that musket-barrels previously supplied from Birmingham in the rolled state were then being produced at Enfield which had a capacity of producing from 200 to 250 a week. He further stated that Enfield had recently introduced a new method of seasoning timber by means of hot air which enabled them to take almost green timber and use it for producing stocks in a month or so instead of two to three years as previously. He stated also that 100,000 stocks were stored at Weedon for seasoning and also a large quantity at Waltham. All machinery was worked by water-power, about 45 horse-power. Men on piece-work at Enfield worked from 6 in the morning to 8.30 at night.

Evidence was also given that the neighbourhood of Whitechapel was considered to be the "nursery and seat of the military gun trade," but Birmingham contractors seem to have been largely employed, and complaint was made of the inferior workmanship of the parts produced there. It was shown that both in 1803 and in 1840 great difficulties had been experienced following a need for the production of arms in quantity.

The Committee reported in 1854 and recommended that the existing system of manufacture by Contractors should be continued, but that the establishment at Enfield should include a manufactory in which machinery should be more extensively used and which would be a resource in times of emergency; the cost of its products to be carefully checked. The buildings at Enfield at this time occupied less than 2 acres, but there were 6 or 7 acres of spare ground available for the new factory.

In the same year (1854) owing to the delays constantly recurring in the fulfilment of contracts for arms and the high price demanded by the contractors, and also strikes among the London and Birmingham gun-makers during the Crimean War, and the inconvenience occasioned to the service by these causes, the Board of Ordnance considered it advisable to take this branch of manufacture into their own hands. A suitable building was planned and some £150,000 put into the estimates to cover the cost of the necessary machinery. A mission was sent to the United States to investigate the methods of manufacturing small arms; a large number

of milling machines were purchased there for installation in the new factory; and woodworking machines were purchased from the Ames Manufacturing Company, of Chicopee, Massachusetts, some of which were still in use in 1931.

1855-9.

These years saw the completion of the new buildings and the installation and adjustment of the machinery bought in America. The entire sum spent on land, buildings, machinery, gas works, etc., amounted to £315,000, and by 1865 this sum, together with £48,000 for depreciation, had been entirely repaid by the reduced cost of production. The construction of the buildings was apparently carried out by the Royal Engineers under the supervision of Captain Thomas Bernard Collinson, R.E.; they were capable of producing 130,000 muskets, bayonets, etc., per annum. The first Superintendent of the modernised Factory was Colonel W. M. H. Dixon, R.A. The first weapon to be produced in large numbers was the 1853^d pattern Rifle, and it was stated that an "assembler" earned 50s. 0d. a week, the price paid for assembling a rifle being 3·29 pence. This rifle was used by some regiments in the Indian Mutiny—1857-9.

1856-7.

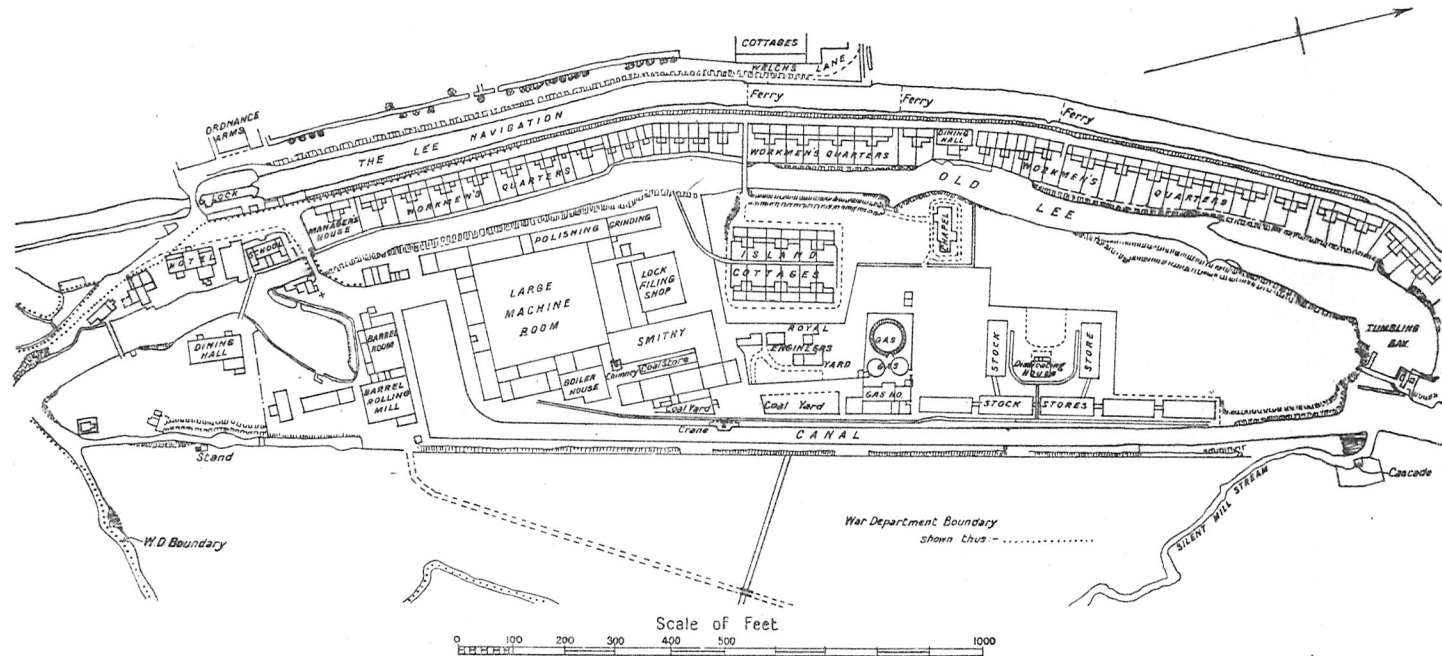
It is evident that the demands created by the Crimean War very soon led to the expansion of the Factory. What is now Machine Shop I was built about this time. By 1859 the portion to the right of the big main doors was fenced off from the rest of the shop and used as a stocking shop. The iron railings used for this fencing are those now used as a fence in front of the Offices. The large room beyond the Clock Tower and stocking section was the Model Shop. Some of the Factory offices were under or near the Clock Tower. In the upstairs places, at present occupied by the Army Inspection Department, the lock-filers for muzzle-loading weapons worked, and the old bayonet shop underneath was then the polishing shop; beyond this to the north was the grinding shop. The smithy was situated at the south end of the present smithy.

The Medical Officer in charge was Dr. Savage, and the dispenser Mr. Steel.

The barrel mill was on the site of the present assembling shop and adjoining it was the rolling mill where barrels were rolled, and where also were two large presses, used to knock up the breech-end of barrels for the powder-pan, or nipple. The plant was driven by water power, and the mill-race emptied itself into a basin on the site of the present polishing shop. A polishing shop, closed a few years ago, was built about this period and the basin in question filled in.

Royal Small Arms Factory ENFIELD LOCK.

(Plan reduced from 1/500 War Office Ordnance Map, dated 1865).



NOTE.—An 1830 plan shows that Island Cottages were then surrounded by water; to the north of them there were no buildings, and no buildings in the dining hall area. The workmen's quarters were much the same.

A boiler-house, presumably the one since called No. 2, was built at the same time as the Large room. It is interesting to note that a grindery was driven by a water wheel until 1887, and that the use of grit grindstones was only finally discontinued about 1926.

The development of the Factory was closely connected with the re-arming of the Forces with the rifled musket of 1851, followed by the Enfield rifle in 1853. The rise of the Volunteer Movement in 1859-60 was marked by the establishment of a Rifle Corps in the Factory, which in 1868 had a strength of 733.

The output of rifles from the Factory for the year ending 30 June, 1860, was 90,707, the average being 1,744 a week; later this figure was increased to 1,900 a week.

1861.

1,700 men were employed in the Factory. The Large room was at this time driven by two 40 horse-power steam engines with Fairbairn expansion gear, and the barrel-mill by a 70 horse-power steam engine and water wheels. The tool room was the shop now known as Machine Shop III. Italian walnut was principally used for rifle furniture at this time.

1863.

The "Whitworth" rifle of reduced bore (.45 inch), with hexagonal rifling, was commended but not adopted.

1864.

Trials of breech-loading systems were officially undertaken.

1865.

It was publicly stated that in the seven years (1858 to 1864) during which the Factory had been working it had produced 505,000 hand-guns and pistols.

1866.

A Special Committee was appointed to evolve a satisfactory breech-loading Rifle, which finally (1871) recommended an Enfield modification of the Martini action, with a barrel of .45 calibre, rifled on Henry's system.

1876.

The conversion of Enfield muzzle-loading rifles to the Snider breech-loading system was in active progress, followed by the manufacture of new weapons on the same system. Steel was first adopted for Army rifle barrels in some of these.

1874.

The Martini-Henry rifle was first issued to troops.

1885.

A Committee was appointed to investigate complaints as to the quality of cutlasses, one member of which was Lieutenant J. R. Jellicoe, R.N., now Admiral of the Fleet, Earl Jellicoe. It appeared that in the years 1858-60, sword-bayonets to the number of 94,000 had been made by contract in London, Birmingham, Liège and Solingen. The price of these was fixed by the Inspector of Small Arms from the experience of the Factory, with a margin for profit.

1886.

A Committee recommended an improved Martini pattern rifle of .402 inch bore, but this was never issued, the .303 inch Lee-Metford magazine rifle being adopted for the Service in 1888.

1892.

The Factory was capable of turning out 2,000 rifles a week with bayonets, scabbards and accessories, as well as a considerable number of spare parts for machine-guns, besides doing repair work to these guns. There were 16 steam-engines for driving machinery, and dynamos with a horse-power of 1,050. Twenty-three boilers were used, working at pressures from 30 to 140 lbs. to the square inch.

1894.

The Small Arms Repair Factory, commonly known as the "Royal Small Arms Factory, Bagot Street," which had existed in Birmingham for probably a hundred years, was closed. It was for a long time known as the "Tower," and it is sometimes difficult, in looking up old records, to distinguish between this place and the Tower of London, as similar work was carried on at both places. In closing it down, the work was transferred to the Sparkbrook Factory, which had been bought by the Government some 10 years previously and used for repairing and manufacturing Martini-Henry rifles and components. This Factory was originally owned by the National Arms and Ammunition Company, and had been engaged on a fairly considerable scale in the manufacture of the Mauser Rifle for the German Government.

1900.

Early this year, as a result of the South African War, a Committee was appointed to consider a modified design of the Service Rifle. In 1902 it recommended the adoption of the weapon known as Rifle, Short, Magazine, Lee-Enfield Mark I.

1907.

The manufacture of Mark III S.M.L.E. rifle was commenced. This rifle, with minor modifications, was that used by the British Armies in the Great War, 1914-18.

1914 to 1930.

Considerable extensions to the Factory took place during the Great War, but many of the temporary buildings have since been pulled down as superfluous.

During the Great War the total output from the Factory of new rifles alone was 2,007,119, besides an enormous number of bayonets, scabbards, etc., and a large amount of repair work to all these classes of weapons.

The Factory now has its own power-station and gas-factory. The former contains three 350 k.w. generating sets, giving direct current at 220 volts. There are also installed three 200 k.w. rotary converters taking current at 11,600 volts. All the shops are electrically driven and are lighted with the latest type of gas-filled lamps with special reflectors for general lighting in the main shops. The gas factory has a capacity of some 50 million cubic feet per annum, but the normal production is much less than this. Gas is used for heating furnaces and for the lighting of Factory streets and roads and of Government houses in the immediate vicinity. The carbonizing beds, of which there are 5, are of the regenerative horizontal single-ended type. There is a chemical, metallurgical and mechanical testing laboratory, equipped with the necessary chemical apparatus, mechanical testing machines, machines for impact and hardness testing, etc.

A canal, which is wholly inside the Factory, is largely used for incoming traffic, and to a less extent for outgoing traffic, but transport by canal between Enfield and Weedon has greatly diminished of late years.

The present entrance to the Factory was completed in 1918 after the erection of a new central office.

The Factory had its own schools from 1846 to 1895. A Church was built within the precincts of the Factory in 1857; it was closed in 1921 and demolished in 1928; it had never been consecrated.

Of the dwelling houses within the Factory, a number appear to have been built as long ago as 1813, but many have been altered or rebuilt.

PRODUCTIONS OF THE FACTORY.

Considerable difficulty has been experienced in compiling a reliable and trustworthy list of weapons made at Enfield, but the following is believed to be fairly complete as regards Muskets, Rifles, Carbines, and Pistols.

MUSKETS AND RIFLES.

Year	Name.	Bore	Grooves	Remarks.
1840	Musket, Percussion, smooth-bore.	.753"	Nil.	Experimental.
1842	Musket, Percussion, smooth-bore.	.753"	Nil.	A new model for Infantry except for Rifle Corps.
1843	Rifle, Brunswick, M.L. Percussion.	.704"	2	This rifling was approved for Rifle Corps in 1836.
1850	"Prussian Needle Gun," B.L.	.656"	4	A number made in 1850 for trial.
1850	Rifle, Minié	.702"	4	
1853	Rifle, Enfield (Long), M.L.	.577"	3	Originally designed as a "Rifled Musket."
1854	Rifle, Musket, "Sea Service."	.753"	3	Converted from Musket percussion Patt. 1842.
1856	Rifle, Enfield, Short M.L.	.577"	3	
1858	Rifle, Naval. Short M.L.	.577"	5	
1860	Rifle, Short, M.L.	.577"	5	
1863	Rifle, Whitworth.	.450"	6	Experimental with Hexagon Bore.
1866	Rifle, Snider, B.L. Pattern I.	.577"	3	Converted from the Rifle Enfield, Long Pattern, 1853.
1872	Rifle, Martini-Henry.	.45"	7	Experimental patterns used in trials previous to final approval in 1872.
1874	Rifle, Martini-Henry, Mark I.	.45"	7	
1876	Rifle, Martini-Henry, Mark II.	.45"	7	
1879	Rifle, Martini-Henry, Mark III.	.45"	7	
1886	Rifle, Enfield Martini.	.402"	7	Experimental.
1886	Rifle, Lee Burton, with bolt action.	.402"	7	Experimental.
1887	Rifle, Martini-Henry, Mark IV.	.45"	7	Converted from the 1886 Experimental Enfield-Martini.

Year	Name.	Bore	Grooves	Remarks.
1887	Rifle, Owen Jones.	.402"	7	Experimental.
1888-1891	Rifle, Magazine Lee Metford, Mark I.	.303"	7	Following the introduction of the .303" bore, a number of Martini-Henry rifles and carbines were converted to .303"
1890	Rifle, Martini Metford, Marks I and III.	.303"	7	Converted from Martini-Henry
1892	Rifle, Magazine Lee Metford, Mark I*	.303"	7	
1892	Rifle, Magazine Lee Metford, Mark II.	.303"	7	
1895	Rifle, Magazine Lee Metford, Mark II.*	.303"	7	
1895	Rifle Magazine, Lee Enfield, Mark I.	.303"	5	
1895	Rifle Martini, Enfield, Mark I.	.303"	5	Converted from Martini-Henry
1896	Rifle Martini Enfield Mark II.	.303"	5	Converted from Martini-Henry Mark II.
1899	Rifle Magazine Lee Enfield, Mark I.	.303"	5	
1902-1905	Rifle Short, Magazine, Lee Enfield, Mark I.	.303"	5	
1905	Rifle Short, Magazine, Lee Enfield Converted, Mark II.	.303"	5	Converted from Rifles M.L.E. and M.L.M.
1906	Rifle Short, Magazine, Lee Enfield Converted, Mark II.*	.303"	5	Converted from Rifles M.L.E. and M.L.M.
1907	Rifle Short, Magazine, Lee Enfield Mark III.	.303"	5	In 1926 designated No. I, Mark III.
1907	Rifle Short, Magazine Lee Enfield Converted Mark IV.	.303"	5	Converted from M.L.E. and M.L.M.
1907	Rifle Charger-Loading, M.L.M. (Mark II).	.303"	7	Converted from Rifles M.L.M. Mark II.
1907	Rifle Charger-Loading M.L.E. Mark I.*	.303"	5	Converted from Rifles M.L.E. Mark I.*
1911-1913	Rifle Magazine .276"	.276"	5	Experimental. A number made for trial. Not adopted for the service.
1916	Rifle Short, Magazine, Lee Enfield, Mark III.*	.303"	5	Ordinary Mark III, but without cut-off.
1922	Rifle Short, Magazine, Lee Enfield, Mark V.	.303"	5	A number produced, but not adopted for the Service.
1929	Rifle Short, Magazine, Lee Enfield, Mark VI.	.303"	5	

CARBINES.

Year	Name.	Bore	Grooves	Remarks.
1836 1837	Carbine, Percussion, rifled, with back action lock.	—	2	Probably experimental.
1840	Carbine Victoria, M.L. Percussion, smooth-bore.	.656"	Nil	A flintlock arm converted to percussion.
1841	Carbine, Percussion for sappers	.656"	—	With sword bayonet.
1844	Carbine, M.L. Percussion, smooth-bore.	.656"	Nil	
1844	Carbine, M.L. Percussion, smooth-bore, "Cadets."	.656"	Nil	
1853	Carbine, M.L. Artillery.	.577"	3	
1858	Carbine, M.L. Irish Constabulary, smooth-bore.	.656"	Nil	
1859- 1861	Carbine, M.L. Artillery.	.577"	5	
1861	Carbine M.L. Cavalry, E.I. Govt.	.577"	5	
1866	Carbine, B.L. Westley Richards.	.450"	8	A considerable number made at Enfield.
1867	Carbine Artillery, Snider, Pattern I.	.577"	5	Converted from Carbine Artillery Pattern '61.
1867	Carbine Cavalry, Snider Pattern I.	.577"	5	Converted from Carbine Cavalry Pattern '61.
1867	Carbine Snider, Irish Constabulary.	.577"	5	Converted from Rifle M.L. Pattern 1856.
1877	Carbine Cavalry, Martini Henry, Mark I.	.45"	7	
1878	Carbine, Artillery, Martini Henry, Mark I.	.45"	7	
1891	Carbine Artillery, Martini Henry, Mark II.	.45"	7	
1891	Carbine Artillery, Martini Henry, Mark III.	.45"	7	
1892	Carbine Artillery, Martini Metford, Mark I.	.303"	7	Converted from Martini Henry.
1892	Carbine Cavalry, Martini Metford, Mark I.	.303"	7	" " " "
1892	Carbine Cavalry, Martini Metford, Mark II.	.303"	7	" " " "
1892	Carbine Cavalry, Martini Metford, Mark III.	.303"	7	" " " "

Year	Name.	Bore	Grooves	Remarks.
1892	Carbine Artillery, Martini Metford, Mark II.	.303"	7	" " " "
1893	Carbine Cavalry, Martini Metford, Mark I.*	.303"	7	" " " "
1893	Carbine Cavalry, Martini Metford, Mark II.*	.303"	7	" " " "
1894	Carbine Artillery, Martini Metford, Mark III.	.303"	7	" " " "
1894	Carbine Cavalry, Magazine Lee Metford, Mark I.	.303"	7	
1895	Carbine Artillery, Martini Enfield, Mark I.	.303"	5	Converted from Martini Henry.
1896	Carbine Cavalry, Martini Enfield, Mark I.	.303"	5	" " " "
1896	Carbine Cavalry, Magazine, Lee Enfield, Mark I.*	.303"	5	
1897	Carbine Artillery, Martini Enfield, Mark II.	.303"	5	Converted from Martini Henry.
1899	Carbine Artillery, Martini Enfield, Mark I.*	.303"	5	" " " "
1899	Carbine Cavalry, Martini Enfield, Mark I.*	.303"	5	" " " "
1899	Carbine Artillery, Martini Enfield, Mark II.*	.303"	5	" " " "
1899	Carbine Artillery, Martini Enfield, Mark III.	.303"	5	" " " "
1899	Carbine Cavalry, Magazine Lee Enfield, Mark I.*	.303"	5	" " " "
1900	Carbine Magazine Lee Enfield, with fittings to take the Patt. '88 sword bayonet.	.303"	5	A number made for the Govt. of New South Wales.

PISTOLS.

Year	Name.	Bore	Grooves	Remarks.
1856	Pistol, 10 inch, Pattern No. 1 (Muzzle-loading).	.577"	5	Believed to be the first "rifled pistol muzzle-loader" adopted for the Service.
1857	Pistol, 10 inch, Pattern No. 1 (Muzzle-loading).	.577"	5	Identical with above except for the butt-stock which was made to detach easily, permitting the pistol to be used with or without butt-stock. A few made to meet special requirements.
1858	Pistol, 8 inch, rifled, Pattern No. 1 (Muzzle-loading).	.577"	5	Similar to the 1856 10 inch, except that the barrel was 2 inches shorter and the leaf backsight left off.
1860	Pistol, 10 inch, Pattern No. 2 (Muzzle-loading).	.577"	5	Similar to Pattern No. 1 of 1856, but the "tige" was removed.
1860	Alteration to the 1856 and similar pistols—"à tige."			Instructions given to remove the "tige" from all pistols manufactured with same, objections being made that the method of cleaning was defective.
1880	Pistol, Revolver Enfield, Mark I.	.455"	7	Breech-loading; self-extracting
1882	Pistol, Revolver, Enfield, Mark II.	.455"	7	" " "
1887	Pistol, Revolver, Enfield, Mark II, with safety catch, Mark I.	.455"	7	" " "
1889	Pistol, Revolver, Enfield, Mark II, with safety catch, Mark II.	.455"	7	" " "
1921	Pistol, Revolver, Webley, Mark VI.	.455"	7	Since 1926 designated, Pistol Revolver No. 1, Mark VI.

OFFICERS OF THE FACTORY.

Date Appointed	SUPERINTENDENTS.	Date Retired	Date Appointed	ASSISTANT SUPERINTENDENTS.	Date Retired	MANAGERS.
1818	Mr. John Colgate.		1861	Maj. J. F. L. Baddeley, R.A.	1862	Mr. Perkins (?).
1823	Mr. W. Noble.			Maj. Arbuthnot, R.A.	1866	Mr. Burton (1859).
1838	Mr. R. W. Gunner.					
1854	Mr. J. Gunner.					
1855	Col. W. H. M. Dixon, R.A.	1871	1866	Capt. M. P. Eden, R.A.	1871	
1872	Col. G. H. J. A. Fraser, R.A.	1875	1871	Col. Dyer.	1875	Mr. Barnes (was acting in 1864).
1875	Col. F. Close, R.A.	1880				
1880	Col. Arbuthnot, R.A.	1887	1875	Maj. King-Harman.	1880	Mr. Perry (1876).
1887	Col. King-Harman.	1887				
1887	Mr. J. Rigby, M.A.	1895	1880	Capt. McClintock.	1886	
1895	Mr. S. Clarke (Staff Officer in charge).	1896				
1897	Mr. G. N. Tapp (Acting).	1898				
1898	Mr. (later Sir) F. Donaldson, M.Inst. C.E. (Officer in charge).	1899		No Assistant Superintendents.		Mr. McGee (1880-1897).
20/7/99	Col. D. O'Callaghan (did not take up the appointment).					Mr. J. Speed (1898-1909).
1899	Col. H. S. S. Watkin, C.B.	1905				
1905	Dr. H. T. Ashton, D.Sc., M.Inst.C.E.	1909	1901	Capt. J. B. Pym, R.M.	1906	
1909	Col. Sir F. Nathan, K.C.B.	1909				
1909	Col. F. T. Fisher.		1906	Col. A. L. Tisdall, R.A.	1909	
1917	Lt. Col. C. J. Newton,	1921			1909	
1921	Mr. F. Carnegie, C.B.E., M.Inst.C.E.		1910	Capt. C. J. D. Freeth.	1912	
	M.I.Mech.E.	1922	1912	Maj. F. J. Byrne.	1914	Mr. F. Carnegie (1909-1916).
1922	Mr. G. H. Roberts, C.B.E., M.Inst.C.E.	1931	1914	Maj. S. C. Halse, R.A.	1916	
			1915	Capt. Leadley-Brown (2nd Asst.)	1916	
1931	Mr. F. E. Robinson, A.R.T.C., M.Inst. C.E., M.I.Mech.E.		1916	Capt. O. F. G. Hogg, R.A. (2nd Asst.)	1919	
			1916	Mr. F. Carnegie	1921	Mr. F. E. Robinson (1921-1931).
				Post abolished.		

