

Research Material

NATIONAL  
FILLING FACTORY  
NO. 5  
GLOUCESTER

Primary Sources

Part Two

Material in this section was obtained from the Public Record Office, (now the National Archives) Kew.

The index also contains references to schemes not wholly connected to the main subject.

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## DISPOSAL OF AMMUNITION

The quantities of ammunition remaining after peace is declared will, no doubt, be greatly in excess of any reserve that the War Office may desire to maintain, and the quantities of metal, explosives and propellants to be disposed of will therefore be large.

As a basis for this report it is assumed that after the War Office have set aside their requirements, there will be a surplus of eight weeks' stock of ammunition left over at the present rate of output. This is probably a safe minimum for purposes of calculation.

## B.L. AMMUNITION

Shell bodies. As an average figure for all calibres, the weight of shell bodies may be taken as about ten times the weight of the explosive contained therein. On a basis of the surplus assumed above, the explosive content of an eight weeks' stock of shell will be about 24,000 tons, and the weight of the shell bodies about 240,000 tons.

Scrap value of shell bodies including copper driving bands and brass nose bushes is £5 per ton. After cost of transport from ship or store in this country to breaking down stations 20/- per ton. Cost of handling at breaking down station 10/- per ton leaving net value of £3.10.0 per ton to be realized. The sale value will therefore be about £850,000 for the whole eight weeks' stock of B.L. shell.

Recovery of Ammonium Nitrate and TNT from Amatol. It is estimated that Ammonium Nitrate as a fertiliser will sell at £20 per ton. TNT will probably be a drug on the market and is not likely to fetch more than 10% to 20% of its present price, - £20 per ton may perhaps be taken as the probable selling price.

From the experience gained it has been found that the cost for every ton of Amatol passed through the recovery plant, is £6; this figure includes the cost of unloading the shell, boiling out the explosive, recovering the Ammonium Nitrate and TNT and loading the recovered material into trucks.

Taking the quantity of Amatol to be dealt with, as stated above, at 24,000 tons, this amount would have a net sale value of £255,000 after allowing for all costs, this figure being arrived at as follows:-

Gross value of £24,000 tons of Amatol at £20 per ton	£480,000
Deduct loss during recovery estimated at	£80,000
Deduct cost of recovery at £6 per ton	£145,000
	<u>£225,000</u>
NET VALUE	£255,000

## Q.F. AMMUNITION

It is assumed that there will be 10,000,000 18-pdr. rounds to be dealt with, of which 50% will be H.E. and 50% shrapnel. The estimated figures for these are as follows:-

Value of 5,000,000 18-pdr. H.E. bodies	£160,000
Value of 2,000 tons of explosive recovered	<u>£40,000</u>
Gross value of H.E. rounds	£200,000
Value of 5,000,000 shrapnel bodies	£70,000
Value of shrapnel bullets therefrom	<u>£380,000</u>
Gross value of shrapnel rounds	£450,000
Value of 10,000,000 brass cartridge cases	£500,000
Gross value of 10,000,000 complete rounds	<u>£1,150,000</u>
From this sum has to be deducted:-	
Cost of handling and breaking down into components 10,000,000 complete rounds	£550,000
Cost of disassembling shrapnel shell	£30,000
Cost of boiling out and recovering AN & TNT	£12,000
Cost of emptying cartridge cases at £9 per 1,000	£45,000
Cost of transport at 20/- per ton	<u>£80,000</u>
	£724,000

leaving A NET SALE VALUE OF ABOUT £450,000 FOR 10,000,000 18-pdr. ROUNDS.

## DISPOSAL OF AMMUNITION

## BRASS FUZES

On a basis of 10,000,000 the breaking down and cost of handling is £150,000; and the scrap value approximately £350,000, leaving a NET VALUE OF ABOUT £200,000.

## CAST IRON FUZES

The cost of breaking down these fuzes would exceed the scrap value obtainable; consequently these fuzes would not be worth dealing with.

TOTAL NET VALUE £1,755,000

L C P Milman. 1.8.18.

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PRO. MUN4/3523

## DISPOSAL OF PROPELLANTS

D.B.4.C.

The Co-ordinating Committee have now decided that Cordite need no longer be retained for the manufacture of artificial manure, and I shall therefore, be glad if authority can be given for a large portion of the surplus Cordite to be destroyed, and thus reduce the stock at Propellant Magazines to reasonable proportions.

I attach for your information a statement showing that there are some 4,700 tons of Cordite which is either under suspicion chemically, or is useless for cartridge filling, and I shall be glad to get rid of that Cordite, at any rate.

This list does not include new Cordite which was accepted during the War, but which does not chemically or balistically come up to Peace time requirements.

A. Rycroft  
Section Director.

D.G.F.(E.S.S)  
21.8.1919

[Extract]

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Doubtful Cordite on Charge at E.S.S. Magazines.

17th May, 1919.

Q.B. & Q.N. Lots. Size 8. 30 tons at N.F.F. 5.

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## UTILISATION OF FILLING FACTORIES

Letter dated 3.1.19. It is recommended that the site of Gloucester Explosive Magazine be acquired.

11.2.19 Disposal of National Factories. Memorandum from the Minister of Munitions.

Provisional list of National Factories in which it may prove necessary to retain under Government control for a large latent munitions producing capacity in the country which could be raised to full productive activity within a period of 3 - 6 months. To be disposed of by sale or lease to private firms for the re-conversion of the factory to the manufacture of munitions at any time when the Government may require it.

Hereford, Gloucester, Perivale and Banbury Filling Factories.

24.3.19 National Factories to be retained. Memorandum from the Minister of Munitions.

Woolwich Hereford Gloucester\* Banbury

The proved filling capacity of the shell and cartridge filling plants expressed in tons of H.E. or propellants filled weekly was as follows:-

	H.E. (tons)	B.L. Cartridges incl. 4.5" (tons)	Q.F. Assembly (number)
Woolwich	200	350	120,000
Hereford	1,075	---	---
Gloucester	20	550	120,000
Banbury	160	---	---

National Factories handed over to the War Office

Chilwell	1,500	---	---
Georgetown	310	760	170,000
Liverpool (Aintree)	450	590	150,000

Other National Factories

Hayes	175	270	70,000
Leeds	550	1,050	200,000
The Trade	---	---	130,000

Total	4,440	3,570	960,000
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Average actually filled weekly in 3rd quarter of 1918	2,950	2,550	884,000
---	-------	-------	---------

Cartridge filling retained - 900 tons weekly. (25% of the war capacity).

Shell filling retained - 1,455 tons weekly. (32% of the war capacity).

\* Except shell filling. To be retained with plant in situ.

Gloucester is at present being utilised mainly as an explosive store but will probably be required for breaking down ammunition in the near future.

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Letter dated 11.9.19. Gloucester no longer required and may be put up for disposal.

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## CANTEENS AT NATIONAL FILLING FACTORIES

GLOUCESTER

Balance Sheet as at 31st March 1919

<u>LIABILITIES</u>		<u>ASSETS</u>	
<u>SUNDRY CREDITORS</u>		<u>STOCKS OF PROVISIONS</u>	
On open Accounts	£ 71.15.0	etc ON HAND	£73. 7.7
<u>RESERVES FOR MAINTENANCE</u>	112.10.0	<u>DEBTORS</u>	
		Sundry	13.19.7
		Factory Account	1. 4.4
		<u>LOSS</u>	
		Half year ending	
		31st March 1919	95.13.6

Trading Account for half year ended 31st March 1919

<u>SALES</u>		
Canteen Takings		£556.14.7
<u>PROVISIONS</u>		
Amount consumed		352. 4.1
<u>EXPENSES</u>		
Salaries and Wages		176. 3.0
Fuel for Cooking		6.16.0
Repairs and Maintenance		112.10.0
Printing and Stationery		1.18.6
Office Expenses, Postage, Cleaning and Miscellaneous Expenses		2.16.6
	<u>TOTAL EXPENSES</u>	300. 4.0
	<u>TOTAL EXPENDITURE</u>	652. 8.1
<u>GROSS PROFIT</u>		204.10.6
Percentage on Sales		36.62
<u>EXPENSES</u>		300. 4.0
Percentage of Expenses, less Sundry Receipts, on Sales		53.86
<u>NET LOSS</u>		95.13.6
Percentage on Sales		17.24

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SURPLUS GOVERNMENT PROPERTY DISPOSAL BOARD  
 NOTIFICATION OF MATERIAL FOR DISPOSAL

The property is lying at CSD Depot No.251, Quedgeley.  
 13th July, 1920.

4	Suits, Flannel (Women's) Part-worn. Serviceable.	
20	Coats " " " "	
18	Aprons " " " "	
67	Caps " " " "	
6 & 1	part Blankets, Grey	
132	Handkerchiefs, Trotyl 16½"x14½" S/hand. Part Serviceable.	
4	Sheets, Linen 70"x92" " Serviceable.	
1	" Twill 78"x96" " "	
6400	Caps, Flannel " Washed. Part only serviceable for use, remainder suitable rags only.	
1	Overlay, (Bed) 6'x2'2" " Serviceable.	
1	Cover " 6'x2'4" " "	
207	Bags, Kit, Khaki 48"x24" " "	
920	" " Trotyl 16½"x24" " "	
359	" " Blue 48"x24" " "	
487	" " " 24"x24" " "	
3111	Suits, Black, Coat, Cap, Trousers, Women's	} S/hand Women's Magazine Clothing. Washed. Large proportion serviceable, remainder badly worn.
150	" " Coat and Trousers	
30	" " Spare Trousers	
983	Suits, Dark Blue, Coat, Cap, Trousers	
56	" " " Coat and Trousers	
1	" " " Spare Coat	
871	Suits, White, Coat, Cap, Trousers	
325	" " Spare Caps	
4	" " Spare Coats	
2396	Suits, Light Blue, Coat, Cap, Trousers	
300	" " Coats and Trousers	
29	" " Spare Coats	
3078	Suits, Khaki, Coat, Cap, Trousers	
288	" " Coat and Trousers	
4	" " Spare Trousers	
2939	Suits, Brown, Coat, Cap, Trousers	
325	" " Coat and Trousers	
97	" " Spare Trousers	
2398	Gowns, Grey Flannel	
2344	Bags, Flannel	
1115	Gowns, Discoloured Flannel. Discoloured but serviceable.	
190	" Flannel to be repaired. Torn.	
568	pairs Magazine Shoes (Women's) size 3. New.	
1407	" " " " " 4. "	
1519	" " " " " 5. "	
1911	" " " " " 6. "	
609	" " " " " 7. "	
101	" " " " " 8. "	
724	Laces, Boot, Brown, Leather. New stock, not used.	
5000	" Shoe, Blue string. " "	
6	Coats, Crash. S/hand serviceable.	
6	Cloths, Milk. " "	
84	Caps, Trotyl, Women's, White. " "	
1	Coat " " " " " "	
1	Suit " " " " " "	
3	Overalls, Trotyl, Men's, White.. " "	
29	Veils, Trotyl. " "	
17	Ties, Green Poplin, part-worn. " part badly worn.	
6	Pin Cushions. Serviceable.	
6	Bags, Chintz. " "	

Continued/

71	Blue Armbands, plain, (Silk),	New material, not issued.	
22	yards Drill Suiting, speckled grey.	New material, not issued.	
27	" " " Chocolate.	" "	
10 $\frac{3}{4}$	" Khaki, Holland.	" "	
2 $\frac{1}{4}$	" Suiting, Blue.	" "	
24 $\frac{1}{2}$	" " Khaki.	" "	
16	" White Drill.	" "	
29 $\frac{1}{2}$	" Canvas, Striped for Deck Chairs.	" "	
71 $\frac{1}{2}$	" Dark Blue Drill.	Part new, part worn.	
	Italian Cloth, Grey.	New material, not issued.	
	Flannel, Grey.	" "	
	Blankets, Cloth, Grey.	" "	
	Flannel, Red.	" "	
	Crash.	" "	
	Calico, unbleached.	" "	
	American Cloth, (White).	" "	
	American Leather.	" "	
250	yards Oilskin Material.	Bad condition, run together.	
689	pairs Leggings, Oilskin, (Women's).	New.	
240	reels Cardboard.	"	
257	Sun Hats, part-worn.	S/hand serviceable.	
13	Velvet Hats, part-worn.	" "	
27	Hats, Grey Straw, Police Women, part-worn.	S/hand serviceable.	
24	Costumes, Grey, Police Women's.	S/hand serviceable.	
24	Sou'westers, Police Women's.	" "	
	reels Cotton, Black.	New material, not issued.	
	" " White.	" "	
6	pkts Needles, sewing.	" "	
6	" " machine.	" "	
	reels Thread, Black.	" "	
	" " Yellow.	" "	
	" " Tan.	" "	
	" Cotton, Red.	" "	
3	skeins Floss, Thread, Grey.	" "	
5	feet Braid, Gold.	" "	
144	yards " Scarlet.	" "	
1	ball Cotton Cord, White.	" "	
5	dozen Buttons, various.	" "	
24	yards Tape, Black.	" "	
14 $\frac{1}{2}$	" Ribbon, Blue Silk.	" "	
33	Bags, Large, unbleached Calico.	" "	
28	Boots, Men's, Size 7.	" "	
9	" " " 6.	" "	
2	" " " 8.	" "	
2	" " " 11.	" "	
2	" " " 10.	" "	
1 $\frac{1}{2}$	" " " 9.	" "	
5	Goloshes, Men's, size 8.	" "	
4	" " " 14.	" "	
13	" " " 11.	" "	
10	" " " 6.	" "	
1	" " " 7.	" "	
1	" " " 12.	" "	
7	" " " 10.	" "	
1	" Women's, size 9.	" "	
2	" " " 8.	" "	
10	" " " 6.	" "	

1	Clogs, Felt Lined, High Top, size 6.	New material, not issued.
1	" " Ankle, " 6.	" "
3	" " " " 7.	" "
6	" " " " 4.	" "
3	" " " " 3.	" "
1	Overshoes, Leather, size 6.	" "
3	" " " 10.	" "
1	" " " 12.	" "
876	Armllets, various, part-worn.	S/hand.
16	Overalls, Women's various, part-worn.	" Washed serviceable.
6032	Women's Shoes, various sizes, part-worn.	S/hand. Part only serviceable.
91	Powder Cups, Leather.	S/hand.
26	Mackintosh Coats, (Women Police), part-worn but serviceable.	
14	Coats, Cloth, Navy, Women's.	" " "
8	" " " " light.	" " "
1	Coat. Motor, Women's.	" " "
-	Dustpans, wooden.	" " "
88	Women's Magazine Trousers, various.	" " "
1	" Trousers, Corduroy.	" " "
22	" Caps, Grey.	" " "
7	" " Blue.	" " "
3	" " Brown.	" " "
50	" " Khaki.	" " "
50	yards Braid, Black. New.	
1	Leather Cushion 30"x20"x7".	S/hand.
221	lbs. Rags, Old Clothing.	Rags.
356	Aprons, Canvas.	Part-worn.
16	Straps, Stretcher, Canvas.	New stock, not issued.
18	pairs Gloves, Leather.	" "
125	Covers, folding.	" "

[W. Stoye.]

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Note: Much of this material was offered to firms and the remainder auctioned.  
 Some of the smaller quantities not copied out, (p.2).

HIS MAJESTY'S OFFICE OF WORKS MAINTENANCE ACCOUNT  
 NATIONAL FILLING FACTORY, GLOUCESTER.  
 [Notes]

Weekly applications for remittance, from Frank Baines, Principle Architect for the Ministry of Munitions, to the Director General of Munitions Finance, for Mr. W. J. Miller, Clerk of the Works, Gloucester.

1917.

About £600 per week. 10/17 £550 - £525. 12/17 £500. (Balance about £100).  
 5/10/17 Draft for £8,500 to Filling Factory Account, from H.M. Paymaster, MoM.

1918.

1/18 £450 (Bal. £137). 2/18 £1,000 (£84). 3/18 £500 (£122). 3/18 £900 (£77).  
 4/18 £500 (£37). 5/18 £450 (£96). 7/18 £475 (£128). 8/18 £1,050 (£115), then about £500 (£100+) to the end of the year.

1919.

1/19 £75 - £100 (£100). 2/19 £150 (£41). 3/19 £125 (£39). 4/19 £300 (£88).  
 4/19 £150 (£88). 5/5/19 forward nil (£159). 14/5/19 £75 (£76). 6/19 £65 (£66).  
 7/19 £75 (Nil). 8/19 £100 (£74). 9/19 £70 (£76).

1920.

1/20 £70 (£101). 2/20 £20 (£42). 3/20 £35 (£14). 11/3/20 £14 (£14) Final.

Bankers: Lloyds Bank, Eastgate Street, Gloucester.

Accounts held at 10/18.

W & T Avery Ltd., 7 Market Parade, Gloucester. (Weighing machine mfs).  
 Thomas Kiss, Wrottesley Street, Birmingham.  
 Iron and Hardware Co., 75 Westgate Street, Gloucester.  
 Wilson Bros.  
 Estcourt & Sons. 278 Barton Street, Gloucester. (Builders).  
 Bristol Tramway Co.  
 John Jennings. City Works, Brunswick Road, Gloucester. (Printers).  
 Jennings Guilding & Co. 60 Southgate Street, Gloucester. (Ironmongers).  
 Ellis Tracey.  
 Mark Williams & Co., Grange Crescent, Gloucester Road, Cheltenham. (Contractor).  
 Aberthaw and Bristol Channel Portland Cement Co., Merthyr House, Cardiff.  
 Aberthaw and Rhoose Portland Cement and Lime Co. Ltd., 56 St. Mary Street, Cardiff.

1920.

Thomas W. Ward Ltd., Sheffield. (Railway materials).  
 Wm. Butler & Co. Ltd., St. Philips, Bristol. (Tar Distillers).  
 Sessions & Sons Ltd., Southgate Street, Gloucester, & Gloucester Docks.  
 (Builders merchants. Iron tank and cistern mfs).

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MINUTE TO HEADS OF SUPPLY AND STORES DEPARTMENTS.  
PRECAUTIONARY MEASURES IN ANTICIPATION OF THE POSSIBILITY OF CIVIL DISTURBANCE.

SECRET.

THE SECRETARY.

By request of the Commander-in-Chief, I attended yesterday afternoon a Conference at General Headquarters at which the War Office and all General Officers in Command in the United Kingdom were represented to consider precautionary measures in anticipation of the possibility of civil disturbance.

The main objects in view are, firstly to facilitate the Commander-in-Chief in establishing an efficient system of Military Guards or garrisons and of their reinforcement. Secondly, to render as difficult, as to delay as much as possible, the offensive use of any warlike matériel that may fall into the hands of the evil disposed.

I have been able to supply a considerable amount of information to G.O.C's. [of the whereabouts of stores of filled ammunition, explosives, machine guns, light guns, small arms, &c,] but under the changing circumstances of the present time, it would be a great convenience if Heads of Sections might be directed to send me a fortnightly return giving the information required.

It was considered desirable that matériel of a like description should be stored together nature by nature, explosives in bulk or filled in the open country away from inhabited districts, whilst other matériel might be stored in towns and preferably garrison towns.

It was considered that all matériels should be stored as far as possible under such circumstances as would render their immediate effective use impossible: even to such an extent, if feasible, that components should be stored in different localities:- for instance, that the firing gears of rifles and guns should be disassembled, that ammunition should be far away from guns and rifles, that rifles and bayonets should not be stored in proximity, that the means of rendering active ammunition and demolition explosives should be widely separated.

[signed] W. CLARE SAVILE  
Brig.-General.

M.A.\_\_\_\_\_  
29.xi.18.

[Extract]  
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MEMORANDUM ON THE PROTECTION OF EXPLOSIVES AND  
FILLING FACTORIES, STORES AND MAGAZINES  
17th February 1919

Present Position. Owing to the cessation of hostilities the present position of factories and magazines is entirely different [to that during the war]. The production of explosives and the filling of shells, cartridges, etc., is rapidly ceasing and the storage arrangements have undergone and are undergoing considerable modifications.

Manufacture and Filling. The Trade explosive factories are all on the point of closing down and as they and the Government factories finish up, all explosives are cleared from them.

The only Government factories working are the following:-

Propulsive explosives	The Royal Gunpowder Factory and H.M.F. Gretna.
High Explosives	H.M.F. Queensferry.
Small Arms Ammunition	G.C. Factory No.3 near Worcester.
Filling Factories	No.3 Park Royal.
	No.5 Gloucester.
	No.9 Banbury.
	No.13 Morecambe.
	No.14 Hereford.
	No.18 Pembrey.
	No.26 Erith.
Stores	Gamlingay and Hemel Hempstead.
Ammunition Dump	Newhaven.

These seven filling factories, the two stores and the ammunition dump are engaged on emptying shell, breaking down cartridges etc. The quantities of explosives and filled ammunition of all natures in these factories are considerable, but vary day to day according to receipts and outgoings. The other filling factories are being used as stores.

Storage. The greater number of the brickfields magazines are vacated, and explosives in bulk are being stored in magazines and factories. In most cases the maximum quantities are very nearly reached.

(Extract)

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PRO. MUN4/6332

ADOPTION OF MEASURES TO PROTECT ARMS AND AMMUNITION  
IN THE EVENT OF CIVIL DISTURBANCES

[Note]

Protection Committee.

Notes of First Meeting held at the Home Office on Monday 3rd March, 1919.

Terms of Reference. To consider the arrangements for protecting during a strike (1) workmen who do not join the strike; (2) substituted labour employed at essential works or in transport; (3) stores of food and fuel and other vulnerable points; and generally for the maintenance of public order.

In reply to an enquiry as to the possibility of calling upon the Royal Defence Corps [it was] stated that this Corps was still being employed in guarding prisoner of war camps and explosives factories.

Continued/

The Secretary.

WAR OFFICE,

LONDON S.W.

December 10th, 1919.

Sir,

I am commanded by the Army Council to refer to the decision of the War Cabinet given at a Conference held at 10 Downing Street on the 18th November, 1919, relative to the release of the Army from the responsibility of guarding war-like stores and factories, and of protection duties generally, and to say that the Council would be glad if the Minister of Munitions would make arrangements for the relief of the existing military guards, permanently mounted for the protection of establishments under his control, to be completed as early as possible and not later than the 31st December, 1919.

I am also commanded to say that, owing to the great reduction that has been made in the strength of the Army, not only will it be difficult to provide the above mentioned permanent guards after the 31st December next, but that it will also now be impossible for the Army to provide the further military guards which, up to now, would have been required by the Minister of Munitions, in the event of civil disorder, for the protection of the additional stores and vulnerable points also under his control for this reason, therefore, the Army Council propose at once to cancel the instructions under which preparations have been made for the provision of these additional guards if they should have been required.

I am to add that a copy of this letter has been sent to the Field Marshal, Commanding-in-Chief, The Forces in Great Britain, with instructions that the details of the relief of the existing permanent guards should be arranged by him in direct communication with you.

I am,  
Sir,  
Your obedient Servant,

B. B. Cubitt.

THE SECRETARY,  
MINISTRY OF MUNITIONS.

-----  
SAFETY SERVICES COMMITTEE.

Extract from Minutes of fourth Meeting held at Armament Buildings  
on Thursday, December 18th, 1919.

Military Guard. It was reported that the War Office had intimated that all Military Guards will be withdrawn on December 29th, 1919. Such guards are now apparently mounted only at National Filling Factory Hereford, National Filling Factory Morecambe and H. M. Magazine Longtown.

[Extract]  
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Continued/

## MINISTRY OF MUNITIONS

IMMEDIATE

December 30th, 1919.

Sir,

With reference to your letter of the 10th December, concerning the relief of military guards permanently mounted for the protection of establishments under the control of this Department, I am directed by the Minister of Munitions to state, for the information of the Army Council, that he has made arrangements for the relief of these guards to take effect at all the Establishments under his control not later than the 31st December, 1919.

I am, Sir,

Your obedient Servant,

W. H. Salter.

The Secretary,  
WAR OFFICE,  
S.W.1.

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PRO. MUN4/4973

## SPECIAL PRECAUTIONS TAKEN TO SAFEGUARD C.S.D. DEPOTS AND MAGAZINES.

PRECIS OF PROCEEDINGS OF A MEETING HELD AT THE HOME OFFICE,  
TO DISCUSS THE SAFE GUARDING OF C. S. DEPOT AT WHITELUND,  
MORECAMBE, at 3.30. p.m. NOVEMBER 23rd, 1920.

Whitelund. The attitude of the Home Office appeared to be one of considering the possibility of sudden raids, for the purpose of obtaining arms and ammunition, by motors, filled with members of Sinn Fein.

The question of the relations between the Chief Constable of the County and Special Constables in Factories and depots arose.

I [Brig. General Fortescue, representing the Ministry of Munitions] stated that instructions had been given to Managers that they were at liberty, after consultation with the Chief Constables of Counties etc., to engage such additional watchmen in reasonable numbers as might be considered necessary, and to make arrangements for swearing in those men as special constables.

It appears that there still are instances, probably the remains of arrangements made by the Department of D.G.F., in which the Home Office have removed the special constables in factories etc., from under the jurisdiction of the Chief Constables of Counties etc., and placed them under the Managers of the Factories. This may have been a convenient arrangement, while regular Uniformed Police Forces and Military Officers of Experience, as Senior Danger Building Officers, were to be found in factories. It was considered that conditions are now changed, and that the Chief Constable of the County or Borough should be responsible for the Special Constables in the factories and depots: that he was more likely to know the antecedents and habits of the men away from their work, he would satisfy himself as to their fitness for the work, and should it be necessary at any time to arm the Police, he would be in a position to issue the necessary instructions. In fact the Chief Constable would become directly responsible for the Policing of the factory, whilst the men would continue to be paid by the Ministry of Munitions.

Continued/



I recommend that a letter should be addressed to the Home Office asking them to withdraw their permits for the special constables to be under the Managers, thus allowing them, as in the case of all other specials to come directly under the Chief Constables.

As it is possible that this might bring these men within the "Desborough Act" whilst the men should be selected, they should not be sworn in until the necessity arises.

F. A. Fortescue.

Fire and Police Adviser.

24.11.20

[Extract]  
[Also Ellesmere Magazine]  
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MINISTRY OF MUNITIONS

November 29th, 1920.

Sir,

I am directed by the Minister of Munitions to refer to the recent conference held at the Home Office on the 23rd instant, regarding the protection of Depots and Magazines in my charge, and to say that in his opinion the time has now come to terminate the special arrangements whereby the watchmen in certain factories, who were appointed special constables, were placed under the direction and control of the Factory Managers, instead of that of the Chief Constable of the County, for which they were appointed.

As regards the Ministry establishments, the present arrangements consist of a certain number of watchmen - selected by the Manager of the Depot or Magazine - with possible little or no knowledge of antecedents or reliability etc. I am directed to suggest that Chief Constables should consult with Managers, and that if the former are not satisfied with the existing safeguards, that the Chief Constable should arrange for the appointment of additional watchmen, with whom he would be satisfied (at the cost of the Ministry of Munitions - either at the existing rates of pay of that Ministry - or within reasonable limits) and that the Chief Constable should then swear these men in as special constables.

The Chief Constable would then be in a position to ensure more effective control and supervision for the safety of the Depot or Magazine.

The Minister of Munitions will be glad if the Secretary of State will, and if he concurs, cancel the orders referred to above, and communicate the necessary instructions accordingly to all Chief Constables concerned.

I have the honour to be,

Sir,

Your obedient servant,

F. A. Fortescue.

Fire and Police Adviser.

The Secretary,  
Home Office,  
Whitehall,  
S.W.1.

The Secretary,  
Scottish Office,  
Whitehall,  
S.W.1.

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Room No. 43.  
Charing Cross Huts,  
W.C.2.

November 29th, 1920.

Dear Captain Eades,

Without wishing to be an alarmist or prophet of evil, I would advise suggesting to District Superintendents that they should issue instructions that until further orders, fire hoses should be run out, and all possible arrangements made daily to meet a sudden emergency of fire during silent hours.

I gather that the idea is that following on Liverpool attempts will be made to fire factories and stores with the object of creating destruction, un-employment and alarm, but no one can say definitely when and where such may occur. I think therefore for some little time, all reasonable precautions to meet such attempt should be taken. I have telephoned a suggestion in the above sense to the District Superintendents London, North and South, as the next attempt may very possibly be on the Clyde or here.

I enclose a copy of the letter that, after seeing Mr. Carew Robinson of the Home Office, I have written, as Col. Corbett desired, to the Home and Scottish Offices.

As I may not see the Colonel before I leave for Liverpool, will you please let him see the letter; and notify District Superintendents of the propose[d] changes of this [if] necessary.

Mr. Olive, Assistant Commissioner Metropolitan Police has promised to keep me informed, should he receive information effecting us, and I have asked Miss Chatfield to take such letters to you.

I shall stop at the North Western Hotel Liverpool, Tel. No. Royal 2960.

Yours Truly,

[F. A. Fortescue].

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**List of Orders made by Secretary of State under Clause 5  
of Special Constables Order, 1914, and still outstanding.**

<u>Factory</u>	<u>Name of Manager</u>	<u>Date of Order</u>
N.F.F. No 1. Crossgates, Leeds.	Major John Chaplyn Burnett.	23.4.1918
N.F.F. No 7. Hayes, Middlesex.	Major the Marquis de Bucy.	28.6.1918
N.F.F. Hereford.	Capt. Ian George Sinclair.	31.5.1919
N.F.F. No 13. Morecambe.	Major John Chaplyn Burnett.	20.6.1919
N.F.F. No 3. Perivale.	Major Maurice Colton Haines.	27.8.1919
N.F.F. Quedgeley, Gloucester.	Mr. Samuel George Pepler.	28.8.1919
H.M. Factory, Pembrey.	Capt. H. Ralph Hone.	12.3.1920

24.12.20

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Under Secretary of State.

HOME OFFICE.

WHITEHALL.

24th December, 1920.

-----  
 Addressed to the Chief Constable of Gloucestershire,  
 regarding National Filling Factory, Quedgeley.

Sir, I am directed by the Secretary of State to refer to the Order made on the 27th August 1919, under Clause 5 of the Special Constables Order, 1914, directing that the factory police at the National Filling Factory No.5 Quedgeley, Gloucestershire, who were appointed Special Constables, should act under the direction and control of Major Maurice Colton Haines, and to say that he is informed that this officer has now vacated the appointment, and the order has therefore lapsed.

The Secretary of State does not propose to make a fresh order, and if any men engaged at this factory are to retain the status of Special Constables, they must, under Clause 5 of the Special Constables Order, act in the execution of their duty at the factory under your direction and control. I am to request therefore, that you will communicate with the Manager of the factory and consider in consultation with him, the arrangements to be made. If it is decided that the men at the factory are to remain Special Constables, or that any more are to be appointed, it will be understood:-

- (1) that the individuals selected will be subject to your approval after such enquiry as you may consider necessary as to their character and antecedents;
- (2) that you will make such arrangements for their supervision, as you may consider necessary to secure the proper performance of their duties at the factory; and,
- (3) that the Ministry of Munitions will defray the cost of the men so appointed provided the Manager agrees that the numbers and the rates of pay are reasonable; and will accept all responsibility for any claim that may arise owing to their injury or death in the execution of their duty as Special Constables at the factory.

I am, Sir

your obedient servant  
 Edward Troup

-----  
 Protection of Ministry of Munitions Depots.  
 Notes of conference held at the Home Office on 14/1/21.

#### Filling Factories.

During the War the Ministry of Munitions had organised the protection of these factories by means of selected watchmen who were sworn in as Special Constables, but placed under the control of a responsible Safety Service Officer at the Factory.

These Officers and the Watchmen-Specials had disappeared, and their place was taken by a stores manager with a small maintenance staff.

Alongside these Factories were Ordnance Depots, under W.O. charge into which the manufactured ammunition was passed and the Ministry of Munitions had no responsibility for them. But these Depots were now being handed over to the Ministry for disposal, and some of them contained explosives which required protection.

#### Depots Elsewhere.

The managers had to rely on the local Labour Exchange to find men, and generally obtained men of the labouring class.

[Extract for information]

## C.S.D. DEPOTS CONTAINING FILLED AMMUNITION

Postal Address	Stock
C.S.D. 1105 Derwenthaugh, Swalwell, Blaydon.	Filled Ammunition.
C.S.D. 83 Georgetown, Renfrew.	Shells, various.
C.S.D. 402 Crossgates, Leeds.	4,000 tons of shell, various.
C.S.D. 131 Abbey Wood.	Shells various, S.A.A. Loaded fuzes.
C.S.D. 75 Morecambe.	Shells various, Cartridges, Black Powder, Incendiary compo. Filled Fuze, D.M.D.K. Thermite.
Llando Ammunition Dump, Pembrey.	—

Note. The large Depots at Pembrey and at Gainsborough contain a munition of all descriptions, these have been sold to Messrs. Cohen, and the Ministry have no further responsibility for guarding them. Depots containing incendiary material such as wood and wool are not included on this list (as in the previous one which contemplated a General Strike) as it is understood that the Sinn Fein concern themselves only with ammunition and explosives.

31.1.21.

F. A. Fortescue.

## DISPOSALS AND LIQUIDATION COMMISSION

Room No.22,  
Block "A",  
Earl's Court Exhibition,  
S.W.5.

4th April, 1921.

Dear Sir,

It has now been decided to arm with Carbines and Buckshot cartridges, the watchmen at all Depots containing filled ammunition or explosives.

I am directed to inform you that action should at once be taken in accordance with the memorandum on "Principles on which arms will be issued to Watchmen at Magazines and C.S. Depots" from you from this office on March 22nd 1921, a copy of which, was, - to short circuit - sent by the Assistant Controller's instructions direct to certain Depot Managers.

Yours faithfully,

F. A. Fortescue.

District Superintendent.

[Note. The "previous list" referred to above was laid on the table of Maj. M. Browne, (War Office), on 15.9.20 - copy not in file. "A strike for the moment appears doubtful". - F. A. F. to Browne 27.9.20.]

## SECRET

## DISPOSALS &amp; LIQUIDATION COMMISSION

Room No.22,  
Block "A",  
Earls Court Exhibition.

4th April, 1921.

Sir

I am directed to acknowledge the receipt of your "SECRET" letter No. 377,100/266 of the 2nd April 1921, and am further directed to say that the suggestions of the Chief Constables as to increased numbers of watchmen, telephones and means of protection - as far as possible - are being acted on.

In regard to the swearing in of these men as Special Constables, outside the Metropolitan Area, in which, it is understood, there are special reasons why this course should not be adopted, importance is attached to this swearing in, mainly because it instils a sense of discipline in the men. Without being sworn in, the men remain merely labourers, as with a private firm, and if "called out" by their Unions, have no excuse to offer for not obeying; undoubtedly, the men rightly or wrongly, find a morale support in being made "Specials". Undoubtedly it gives to the Chief Constable (who is responsible for public security in his area) direct control over these men in an emergency, a control, which otherwise they might not at first, and without reference be prepared to accept.

The Manager will be none the less responsible for taking all steps for the protection of the Depot or Magazine, because the watchmen are sworn in as Special Constables, whilst without increasing the responsibility of the Chief Constable (which is not desired) it should give him an added sense of security in feeling that he has a right to satisfy himself as to the security of places in his area against the action of seditious persons in whose hands they might become a source of such danger to the public.

It must be remembered also that no guarantee of the political opinions of [any] Manager of Magazines and Depots exists, or of the action they might adopt should turmoils arise.

It is requested therefore that instructions to swear these men in as Special Constables may be issued.

Arms have arrived, or are on their way to all those Depots and Magazines where their issue has been approved by Chief Constables.

I am, Sir, .  
Your obedient servant

[F. A. Fortescue]

The Under Secretary of State,  
Home Office,  
WHITEHALL,  
S.W.1.

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C.S.D. DEPOTS FOR WHICH ARMS ARE REQUIRED

Name of Depot.	No.	Telephone No.	Contents.	Strength of Police.	Remarks.
Georgetown.	83	Georgetown 1274	Shells Various	--	--
Crossgates.	402	Leeds 20901	4,000 tons of shell Various	--	--
Abbey Wood.	131	Erith 125 & Woolwich 783	Shells 60 pdr 18 pdr. fixed Ammunition	--	--
Belvedere.	20	Erith 125	Russian Rifles	--	--
Morecambe.	75	Lancaster 231	Shells, Chemicals, Black Powder, Thermite etc.	--	At present, neither the Chief Constable or the Manager desire arms to be issued.
Gainsborough.	297	Gainsborough 132 & 133	Ammunition Various	29	--
Farlington.	128	--	Filled Ammunition	--	--
Pembrey, Ammunition Dump.	298	Burry Port 43	Ammunition Various	--	--
Perivale N.F.F.3.	-	Willesden 2430	Detonators, Fuzes	--	--
Gatwick.	415	Horley 47	Shells Various	--	--
Oxshot.	132	Oxshot 38	Shells Various	--	--
Banbury N.F.F.	423	Banbury 69	--	45	--
Gloucester N.F.F.	251a	--	Filled Ammunition, Filled Shell, Fuzes	28	--
Avonmouth Gas Factory.	-	--	Poison Gas	10	--

[F. A. Fortescue. 5.4.1921.]

[Note. Georgetown and Belvedere struck out in ink.]

[Extract from "Principles on which arms will be issued...":

Arms to be issued, breech loading carbines, calibre .45" and the cartridges will be those loaded with buckshot. Men armed as watchmen, should be selected from ex-soldiers with active service experience, or from men accustomed in civil life to the use of firearms, and their characters must be closely investigated (with the assistance of the Police) before they are engaged.

21.3.1921.]

FIELD MARSHALL GENERAL SIR. HENRY WILSON, Bart, G.B.C.

As verbally arranged with you this morning, I attach Schedules "A", "B", and "C" setting out —

"A" Factories where we hold stock of Detonators and Grenades.

"B" Factories where we hold stocks of Gas in shells, Cylinders or Drums.

"C" Depots, Magazines or Dumps, where we hold stocks of Propellants, or Explosives in bulk, or Filled Ammunition of an easily transportable nature, or immediately dangerous character.

It is considered that the priority of guarding should be —

1. "A"
2. "B"
3. "C" — (but on account of their situation and special circumstances the places marked \* under "C" should be guarded with the help of Military Forces at the earliest possible moment after "A" and "B" have been dealt with).

9.4.21.

for DISPOSALS AND LIQUIDATION COMMISSION

[F. A. Fortescue]

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SCHEDULE "A"

Factories where Detonators and Grenades are stored.

Name and address.	Stores Held.	Present armed Guard of specially selected civilians.
1 Perivale, C.S.D. Depot, Park Royal, Willesden Lane, N.	Detonators, and Filled Fuzes.	10.
2 Gainsborough C.S.D. Depot No. 297, N.F.F. No. 22, Gainsborough.	Grenades, Detonators, Fuzed Shell and misc. filled ammunition.	12.
3 Farlington C.S.D. Depot No. 128, Farlington Racecourse, Cosham, Hants.	Grenades, Detonators, Fuzed Shell and misc. filled ammunition.	10.
4 Banbury Filling Factory, Oxon.	Grenades, Detonators, Fuzed Shell and misc. filled ammunition.	15.

Continued/

## SCHEDULE "B"

Factories where there is Gas (H.S., P.S., etc.,) in shells, Cylinders and Drums.

Name and address.	Stores Held.	Present armed Guard of specially selected civilians.
1 Morecambe, N.F.F. White Lund, Morecambe, Lancs.	Gas in Shells, Cylinders and Drums.	Nil.
2 Avonmouth, H.M. Factory, Avonmouth, Nr. Bristol.	Gas in Drums and Tanks. 2,000 galls. alcohol.	6.
3 Birkenhead Depot No. 40, East and West Float, Dock Road, Birkenhead.	Russian Gas Shells, (CC).	Nil.
4 Gatwick C.S.D. Depot No. 415, R.A.O.C. Ammunition Depot, Gatwick, Nr. Horley.	Large quantity of Gas Shell, including H.S.	4.
5 Langwith C.S.D. Depot No. 373, H.M. Factory, Langwith, Near Mansfield.	Gas in Cylinders and Drums. (J.L. Liquor and P.S. Gas).	Nil.

## SCHEDULE "C"

Depots, Magazines and Dumps where there are stocks of Propellants or Explosives in bulk. Filled Ammunition of an easily transportable nature of an immediately dangerous character.

Name and address.	Stores Held.	Present armed Guard of specially selected civilians.
*1 Pembrey C.S.D. Depot, Pembrey Burry Port, Carmarthenshire.	<u>Propellants</u> , High Explosives and misc. Filled Ammunition covering large area (Nr. Swansea).	12.
*2 Northolt, H.M. Magazine, Northolt, Nr. Ruislip, Middlesex.	<u>Propellants</u> , High Explosive.	8.
*3 Lanemark, H.M. Magazine, Lanemark, New Cumnock, Ayrshire.	<u>Propellants</u> .	4.
*4 Dalston and Curthwaite, H.M. Magazine, Dalston, Nr. Carlisle.	<u>Propellants</u> .	8.
*5 Earby, H.M. Magazine, Salterforth, Colne, Lancs.	<u>Propellants</u> , and High Explosives.	--
*6 Ellesmere, H.M. Magazine, Ellesmere, Shropshire.	Two Magazines filled with High Explosives (Picric Acid & T.N.T.)	10.
*7 Corsham, H.M. Magazine, Corsham, Wiltshire.	A disused quarry containing <u>High Explosive</u> including 20 tons of <u>Gun Cotton</u> .	3.

Continued/



## SCHEDULE "C"

Depots, Magazines and Dumps where there are stocks of Propellants or Explosives in bulk. Filled Ammunition of an easily transportable nature of an immediately dangerous character.

Name and address.	Stores Held.	Present armed Guard of specially selected civilians.
8 Slimbridge, H.M. Magazine, Slimbridge, Nr. Stonehouse, Gloucester.	<u>Propellants</u> and High Explosive.	11.
9 Normanton Hill, H.M. Magazine, Normanton Hill, Nr. Loughborough, Leicestershire.	<u>High Explosives</u> .	4.
10 Groby and Ratby, H.M. Magazine, Ratby, Nr. Leicester.	Two Magazines about ½ ml. apart, containing <u>Propellants</u> (Cordite & N.C.T.).	9.
11 Ridgmont, H.M. Magazine, Ridgmont, Beds.	A Magazine with about 300 tons of Propellants.	5.
12 Itter, H.M. Magazine, Itter, Steeple Claydon, Bucks.	A Magazine with about 300 tons of Propellants.	5.
13 Crossgates C.S.D. Depot No. 402, R.A.O.C., Ammunition Depot, Crossgates, Nr. Leeds.	Fuzed Shell and Misc. Filled Ammunition.	6.
14 Abbey Wood C.S.D. Depot No. 131, R.A.O.D. Ammunition Depot, Abbey Wood, Nr. Belvedere, Kent.	Filled Fuzes and Fuzed Shells.	4.
15 Farnborough, H.M. Magazine, South Eastern and Chatham Rly, Stn., Farnborough, Nr. Aldershot.	About 800 tons of Solvents (Alcohol, etc.) in drums in the open - very inflammable.	Nil.
16 Oxshot C.S.D. Depot No. 132, Oxshot, Cobham, Surrey.	Plugged shell various natures.	4.
17 Buxton C.S.D. Depot No. 8436, Buxton Frith Range, Harpur Hill, Buxton.	Misc. collection of trench Howitzers, stokes and guns, etc.	Nil.

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For General FortescueNOTESOn 12.4.21.

1 Officer and 16 O.R. arrived Groby Magazine. Near Leicester.  
 1 Officer and 18 O.R. arrived Ratby Magazine.

Situation at 12 noon 12.4.21. at Gainsborough.

3 Officers and 63 O.R. on the spot.  
 9 Watchmen who have arms.

Corsham Magazine (near Bath).

Military arrived during the night.  
 (numbers not stated).

Skipton Magazine (Yorkshire).

2 Officers and 32 O.R. arrived 2 p.m. 12th.

Farlington.

3 Officers and 31 O.R. arrived 12th.

Ridgmont Magazine (Bedford).

1 Officer and 30 O.R. arrived 12th.

Northolt Magazine.

3 Officers and 46 O.R. arrived 12th.

Normanton Hill Magazine (near Loughborough).

Military arrived 12th.  
 (numbers not stated).

H. Mc.

REPORT FOR 16.4.21.

Alterations only, reported to-day:-

Military Guard at Ellesmere and Hardwick reduced from

4 Officers and 100 O.R.  
 to 2 Officers and 50 O.R.  
 by authority of G.O.C.

Details of military guard at Itter Magazine, the presence of which has been previously reported:-

Strength 1 Officer and 14 O.R.

There is nothing further to report.

[Unsigned]

HOME OFFICE,

WHITEHALL,

S.W.1.

15th April, 1921.

SECRET

Dear General Fortescue,

Thank you for the list of Magazines and Depots enclosed with your letter of the 11th instant which have been notified to the War Office as requiring guarding. I note that it includes several places which were not mentioned in the list which accompanied your letter of the 29th January last.

Is it not rather misleading to put "nil" in the last column in the case of White Lund, Morecambe? It is true that the 21 watchmen employed there are not armed, but the list gives the impression that this place is quite unprotected.

Yours sincerely,

C. D. Carew Robinson.

Brigadier-General F. A. Fortescue,  
C.B.E., M.D.

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## DISPOSALS &amp; LIQUIDATION COMMISSION

CAPT. EADES  
BLOCK "B"  
ROOM No.2.

Have any steps been taken please to provide uniform for the watchmen at those depots and Magazines where the men are armed?

I fear an accident if this is not done, as the men, and indeed the Military Sentries also will be on the look out for armed civilian Sinn Feiners and there is always the liability of a man firing before challenging. Indeed at one time in Mesopotamia an order that this should be done was actually issued.

Room No.22.  
3.5.1921.

F. A. Fortescue.  
Fire and Police Adviser.

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Continued/

## DISPOSALS &amp; LIQUIDATION COMMISSION

MR. ROBERTSON  
ROOM No.2  
BLOCK "B".

With reference to the question of uniforming the watchmen at those Depots and Magazines where these men are armed, the numbers of sets of uniform (approx:) that will be required is 250.

I am unable to say exactly the number because there are I believe certain Depots, for instance Quedgeley, where a proportion of the watchmen are permitted to wear out their old uniforms in their possession.

Room No.22.  
Block "A".  
4.5.21.  
Extn: 52.

F. A. Fortescue.  
Fire and Police Adviser.

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## DISPOSALS &amp; LIQUIDATION COMMISSION

SECRET

To District Superintendent.

Official notification has been received that demobilisation of the Defence Force will probably take place on the termination of the present state of unrest in the Labour World.

On demobilisation taking place, all Military Guards will at once be removed; this is not to be taken as meaning that any precautions can be relaxed in the safe guarding of Magazines, Factories or Depots; on the contrary it will mean the necessity for increased vigilance on our part as the authorities consider the Sinn Fein menace will continue to exist for some time.

Please communicate the above to all Managers under you, at the same time, impressing on them that the communication is a "SECRET" one and for their personal information only.

Until further notice, no reduction of the safety services personnel is to be permitted without sanction in writing being previously obtained from this office.

Managers should be directed to at once apply to this office for any arms, or ammunition, now required to bring the numbers on their charge up to those already sanctioned for each depot, factory or magazine, in which the carrying of arms has been sanctioned.

Room No.2.  
Block "B"  
Earls Court Exhibition  
24.5.21.

G. Eades  
for,  
Director of Stores & Transport.

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Continued/

EXTRACT FROM MINUTES OF THE PROTECTION SUB-COMMITTEE  
HELD AT THE HOME OFFICE ON JUNE 6TH 1921

Protection of Munition Depots.

The question was discussed of the protection to be given after the demobilisation of the Defence Force, to the 33 depots now guarded by Military forces.

General Fortescue said that all the watchmen before the strike, some of whom were armed, were being maintained and would be available.

It was agreed that after the withdrawal of the Military Guards, the Chief Constables concerned should be consulted as to the adequacy of the protection by the watchmen.

It was also agreed that it was a matter of urgency that all munitions, not needed by the War Office, which were unsaleable should be destroyed, and the rest concentrated in a few depots. A strong opinion was expressed that if the stores were valued it would be found in some cases that their protection was costing much more than the stores were worth, and that their destruction would be an economy.

It was agreed that the matter should be strongly pressed on the Disposals Board and the War Office representative undertook that the War Office would facilitate railway movements for the purpose of the destruction or concentration of the stores.

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Under Secretary of State.

HOME OFFICE

WHITEHALL

SECRET

13th June, 1921.

Sir,

I am directed by the Secretary of State to refer to previous correspondence on the subject of the protection of munition depots and to transmit to you to be laid before the Disposals and Liquidation Commission the accompanying copy of an extract from the minutes of a meeting of the Protection Sub-Committee held on the 6th instant at which the question was discussed of the protection to be given, after the disbandment of the Defence Force, to the 33 munitions depots now being guarded by military forces.

The Secretary of State is of opinion that, in view of the recent activities of Sinn Feiners in this country, it is a matter of the greatest importance that all stores of explosives should be adequately guarded and he concurs in the conclusion of the Sub-Committee that all munitions which are of no value to the War Office and are otherwise unsaleable should be destroyed forthwith and that the remainder should be concentrated in the smallest possible number of depots and effectively guarded. It seems probable that the value of the stores is in many cases less than the expense which has hitherto been incurred in guarding them or which will have to be incurred when the withdrawal of the military forces renders it imperative that the civilian guards should be substantially strengthened.

It will be noted that the War Office undertake to facilitate the railway movements of the explosives for the purpose of their destruction or concentration: and I am to say that the Secretary of State desires to urge on the Commission that they will take immediate steps in this matter.

I am,

Sir,

Your obedient Servant,

The Secretary,  
Disposals & Liquidation Commission.

Edward Troup.

## PROTECTION SUB-COMMITTEE.

MINUTES OF MEETING HELD AT NOON ON 27th JUNE, 1921.

Protection of Munition Depots.

The Chairman [Sir Edward Troup - Home Office] inquired whether any progress had been made with the destruction of surplus explosives held by the Disposals Commission and the concentration of the remainder in a few depots, as had been recommended at the meeting on the 6th June.

General Fortescue [Disposals Commission] said that at Perivale the detonators were being destroyed at the rate of 500,000 a month, but the removal of those which could not be destroyed had been held up for about a fortnight as, owing to the discharge of coal at Portland, there was no available labour there for handling and dumping these explosives.

It was intended eventually to concentrate the explosives in 10 depots and the removal was proceeding as transport facilities offered; but none of the 33 depots at present under military guard had yet been cleared.

The Chairman pointed out that if the coal strike came to an end the Defence Force guards would disappear early in July, and it would be necessary again to rely on civilian watchmen. In view of the increase in Sinn Fein activities during the last few months, it could not be assumed that the number of watchmen appointed earlier in the year was now sufficient, and all possible steps should be taken by the Disposals Commission to complete the destruction of surplus explosives and the concentration of the remainder and to strengthen the precautions at depots containing detonators, grenades and small arms ammunition.

[Extract]

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PRO. MUN4/4973

## DISPOSALS AND LIQUIDATION COMMISSION

Tel. Hammersmith 2300.  
Extn: 52.

Room No.22,  
Block "A".  
Earl's Court,  
S.W.5.

June 29th, 1921.

Dear Mr. Robinson,

With reference to the meeting of the Committee at the Home Office on Monday the 27th inst., I am enclosing for Sir Edward Troup's information a copy of a circular minute, that I have sent out, regarding the protection of Magazines and Depots after the withdrawal of Military Guards.

I would wish particularly to emphasise that the first intimation I received that the measures of protection against Sinn Fein that were adopted three months ago - on the advice of the Chief Constables - were now not considered sufficient by the Home Office and Scottish Office - was at the meeting on the 27th.

Unless these offices, or the Constabulary under them are to keep this Department informed, as the necessity for increased protection arises, I cannot see how reasonable security is to be obtained. I may observe that the police carry weapons, I may read the news in the papers, and form my own deductions, but

Continued/

the Finance Department will not accept my personal opinion as sufficient reason for authorising additional expenditure on Police - unless I can support that opinion by something more authoritative than a press cutting.

Sincerely, Yours,

F. A. Fortescue.

Carew Robinson, Esqr.,  
Home Office,  
WHITEHALL,  
S.W.1.

To:-  
Major McKenna,  
District Superintendent, London.  
" " Northern.  
" " Midlands.

Managers C.S. Depots Nos. 439, 297, 423, 75, 361, 40, 415, 402, 85, 20, 132, 8436, 251, 169, 83, 401, 350, 87, 366, 86, 354, 218, 323, 1205, 342, 235, 289, 428, 365, 16.

With reference to the Military Guard now on duty at the Depot (or Magazine) under your charge.

Please at once get into communication with the Chief Constable of the County (or Borough) and ascertain from him whether on the withdrawal of the Military Guard he considers that the then existing means employed for the protection of the Depot (or Magazine) will be then in his opinion sufficient; or if he would recommend any modifications.

In each case please report the reply of the Chief Constable, to me.

F. A. Fortescue.  
DIRECTOR OF STORES AND TRANSPORT.

The Secretary.

WAR OFFICE,  
LONDON, S.W.1.

2nd July, 1921.

SECRET & URGENT

Dear General,

I am directed to inform you that in accordance with the decision of the Cabinet orders were issued at 19.00 hrs on the 1st July for the disbandment of the Defence Force.

As already explained the Military Authorities will be unable to continue military protection to factories and stores of arms and ammunition, and other vulnerable points such as Thames Haven Oil Works, explosive factories at ERITH, pit heads, etc. The Military Authorities have been instructed to inform local police, managers of factories, etc prior to the withdrawal of protective guards.

Yours sincerely,  
M. Browne.

Brig Genl F. A. Fortescue CB., DSO., psc.  
Ministry of Munitions,  
Earls Court Exb Buildings.

Ref. No. 162.

Gloucestershire Constabulary  
Headquarters Office,  
Cheltenham.  
4th July, 1921.

SECRET

Dear Sir,

In reply to your letter of the 30th ult., re the above, I have to inform you that Superintendent Hopkins of Stroud, visited your depot on Saturday last and he reports that the number of watchmen employed by night at present, is not sufficient in view of the possibility of Sinn Fein raids being made.

I suggest that having regard to the area to be covered by the watchmen and the shortest distance required between each to ensure any measure of safety, the number of watchmen employed by night should be increased by 8.

I would suggest also that all the watchmen be armed.

In the daytime, when the watchmen can see each other plainly, I think the number at present engaged is sufficient, but they should be armed.

I have received a letter from the Home Office on this subject and in my reply thereto, I suggested that an additional 8 watchmen should be employed by night.

Yours faithfully,  
F. Stanley Clark, Major.  
Chief Constable of Gloucestershire.

The Depot Manager,  
C.S.D. No. 251,  
Quedgeley,  
GLOUCESTER.

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Midland District Office,  
c/o C.S.D. 1402,  
Common Lane,  
Washwood Heath,  
Birmingham.

11th July, 1921.

Gen. Fortescue,

Depot Protection

Kindly tell me early what action is intended at those Depots where Military Guards were, until recently, posted, as you will have had the Chief Constables' views on this.

For instance, at Quedgeley we were advised to appoint 8 more men on night duty and I, frankly, am opposed to this, and any increase upon pre-strike guarding until conditions warrant this.

C. J. Conacher, Major.  
District Superintendent.

Disposals & Liquidation Commission,  
Director of Stores and Transport,  
C.S.D. 3,  
Room 22, Block A,  
Earls Court Exhibition.

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Minute

Mr. Campbell Robertson,

With reference to Major Conacher's Minute. Will you please see the attached copy of a letter from the Chief Constable of Gloucestershire. It would appear unwise to relieve that officer of his responsibility for life and property in the County.

F. A. Fortescue.

12.7.21.

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[Notes]

Chief Constables' summaries include:

H.M. Factory Avonmouth, containing poison gas.

Magazine at Deep Pit Colliery, St. George, Bristol, owned by East Bristol Colliers Ltd., containing 650 lbs of bellite and 1,000 detonators.

Magazine at Shirehampton owned by Messrs. Curtis and Harvey containing about 10 tons of powder and 1 ton of high explosive.

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PROTECTION OF EXPLOSIVES MAGAZINES AND DEPOTS.  
 EXTRACTS FROM REPORTS OF CHIEF CONSTABLES,  
 JULY 1921.

GLOUCESTERSHIRE.

I have caused the Managers of Slimbridge and Quedgeley to be interviewed on the subject, and I am of the opinion that the number of civilian watchmen appointed at these depots before they were taken over by the Military, is not sufficient for adequate protection now, by night, i.e. 10 p.m. to 6 a.m.

I would suggest, having regard to the area to be covered and the shortest distance required between each watchman to ensure any measure of safety, the number be increased by night as follows:-

SLIMBRIDGE - Increase of 3 men.

QUEDGELEY " 8 "

I would also suggest that all the watchmen be armed.

In the daytime, when the watchmen can see each other plainly, I think the number at present engaged is sufficient, but they should be armed.

The Managers as before mentioned, were interviewed at their respective Depots and are well acquainted with these suggestions.

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[ Reports dated c. 4/21 and 7/21 ]

PRO. MUN4/6267 (Continued)

The Under Secretary of State,  
Home Office,  
London, S.W.1.

HOME OFFICE,  
WHITEHALL.

19th July, 1921.

Sir,

I am directed by the Secretary of State to refer to the Home Office letter of the 30th June regarding the protection of munitions magazines and depots, and to say for the information of the Disposals Commission that in view of the disbanding of the Defence Force, he asked the Chief Constables concerned to consider, in consultation with the Managers, whether any further precautions were desirable to ensure the safety of the explosives in their charge after the withdrawal of the troops which had been protecting them during the recent coal dispute. Extracts from the reports which have been received from Chief Constables up to date are enclosed herewith.

I am, Sir,  
Your obedient Servant,  
Edward Troup.

The Secretary,  
Disposal and Liquidation Commission.

[Extract for information]

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The Under Secretary of State,  
Home Office,  
London, S.W.1.

HOME OFFICE,  
WHITEHALL,

7th April, 1924.

SECRET

Sir,

I am directed by the Secretary of State to refer to the arrangement made in 1921 by which in addition to protecting Army stores of munitions in the event of an emergency arising the Military authorities undertook to parade guards for certain large explosive depots and magazines in charge of the Disposals and Liquidation Commission. War Office have now requested that in view of the changed situation, they may be relieved of their responsibility.

The Secretary of State has agreed to this proposal, and the arrangement will accordingly cease as from the date of this letter.

I am to ask therefore that you will notify the officers in charge of the various Depots now controlled by your Department of the termination of the arrangement in question, and impress upon them the need for providing alternative protection of the Depots, as the circumstances may require, e.g. by means of watchmen, or, in special circumstances, by arrangement with the Chief Constable concerned for the loan of police for the purpose.

I am, Sir,  
Your obedient Servant,  
A. L. Winn.

The Secretary,  
The Treasury,  
Surplus Stores etc., Liquidation Department,  
Caxton House,  
Westminster, S.W.1.

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## LIST OF C.S.D. DEPOTS.

15th June, 1922.

	Reference	Depot No.	
Frampton, Gos.	O.W.	487	Gravel Pit rented. Small government building for sale.
Gloucester, Slimbridge.	M	-	Government buildings - for sale.
Quedgeley, Gos.	F	251	Government buildings - for sale.
Yate, Gos. (Aerodrome and Slab Factory)	R&F	237	Government buildings - for sale.

O.W.- Office of Works. M - Magazine. F - D.G.F. Factory. R - R.A.F. (Air Ministry).

LIST OF DEPOTS WHICH ARE TO BE HANDED BACK TO  
WAR OFFICE OR OTHER GOVERNMENT DEPARTMENTS.

Name	Depot No.
Aldershot Field Stores.	520
Bovington Camp, Dorset.	230
Chilwell, Notts.	354
Harwich, Suffolk.	501
Hereford N.F.F.	86
Lench Street, Birmingham.	94
Southall Electrical Stores.	519

## LIST OF CONCENTRATION DEPOTS.

Name	Depot No.
Aintree, Liverpool.	428
Barnbow, Leeds.	85
Belvedere, Kent.	20
Coventry N.F.F.	87
Gadbrook, Cheshire.	302
Georgetown.	83
Hackney Marshes, London.	311
Hackney Wick, London.	303
Hayes N.F.F. Middlesex.	84
Lemington-on-Tyne.	1101
Morecambe, Lancs.	75
Quedgeley, Gloucester.	251
Rainhill, Lancs.	24
Royds Green, Leeds.	27
Shepherds Bush, London.	5
Swindon.	18
Templeborough, Sheffield.	90
Wandsworth, London.	1701
Watford R.A.C.D.	518
Willesden.	2703
Witton, Birmingham.	1410
Wormwood Scrubs, London.	401
Walton.	1208

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D.G.F. — Director-General of Factories.

PRO. MUN4/6133

## The Disposal &amp; Liquidation Commission

List of properties to be evacuated by 31st August 1923.

Frampton. D.B.2.B. are holding an auction sale here in February and steps should be taken to ensure that the huts, etc., on the site are moved as speedily as possible.

Minutes of Meeting of the Sub-Committee of the Committee  
for the Clearance of Surplus Stores

Frampton. CSD will ascertain the position as regards the Huts, the Railway works have been sold for removal.

Quedgeley. At this Depot there are about 1300 tons of plant and machinery and 1400 tons of metals, plus a large number of huts and railway works. It will be impossible to clear the stocks, remove the buildings and the railway works by the 31st August, and the Depot will have to be retained after that date.

18.1.23.

Minute sheet. To Capt. Pennington, Caxton House, from Earls Court.

The position as regards evacuation of the Depots mentioned by you is as follows:-

Frampton. CSD 487. There remains at this Depot 1 gravelled dredger, 1 loco and 900 yards of laid track which are being put up to public tender by D.B.1.E. There is also 1 loco and 1 crane which have been sold for delivery when other stocks at the Depot have been cleared.

[Signed] Bristow. 26.4.23.

PRO. MUN4/7025

## OPENING &amp; CLOSING DATES OF DISPOSAL BOARD DEPOTS

Gloucester.

Store No.26 Bristol Road. Empty boxes and shooks. Formerly Price, Walker & Co. timber store.

Store No.53 India Road. Empty boxes and shooks. Formerly a skating rink. Closed 31.5.18.

Store No.59 Bristol Road. Formerly Joseph Griggs & Co. timber store.

Store No.169 [unknown location] 22.3.20 - 14.12.21. c/o 1.10.21. (W.O.)

Store No.204 Minchinhampton. 12.4.20 - 15.11.22. c/o 1.2.21. (R.A.F.)

Store No.251 Quedgeley. 26.5.20 - 25.5.26.

Store No.251a Quedgeley. 1.4.21 - 25.5.26. (W.O.)

Store No.487 Frampton. 31.10.21 - 31.12.23. (H.M.O.W.)

Store No.535 Gloucester Docks. 6.7.22 - 5.12.23. (W.O.)

## [Notes]

MUN4/4972 MUN5/226

Store No.26 formerly at Llanthony Dock, 3.1917. Six floors, former flour mill. A portion of the ground floor is still in the occupation of the former owners. Given up on acquisition of Store No.53 by 8.1917. See MUN2/11.

Store No.53 brick with timber and glass roof. About 20 women are employed. 11.1917.

Store No.59 used as an annexe to Depot No.26 is situated on the bank of the Gloucester Canal and used for empty boxes and shooks. 6.1918.

Correspondence regarding complaints of explosions at Quedgeley.

11.3.1922 To Sir Ashton Lister, C.B.E., M.P. The Towers, Dursley, Glos.

From Col. E. S. Sinnott, Tuffley Grange, Gloucester.

Dear Sir Ashton, I am now able to send you the Petition which has been signed by 71 of your Constituents, and we trust that your efforts in bringing about either a cessation, or at least a mitigation, of the present condition of affairs at Quedgeley Filling Factory will be successful.

I can only add that the feeling is very deep seated in the matter, and, if necessary, proof can be obtained on the four heads mentioned in the Petition itself. Yours sincerely, E. S. Sinnott.

P.S. We understand that the work of destruction will continue for many months yet! E.S.S.

To SIR R. ASHTON LISTER, C.B.E.

M.P. FOR THE STROUD DIVISION OF GLOUCESTERSHIRE.

PETITION from the Inhabitants of Whaddon, Tuffley, and Lower Tuffley, as to the disturbance, loss and injury caused by the daily explosions at the Quedgeley Munition Works.

Your Petitioners beg to represent that the work of destruction of explosives by Messrs. Cohen, the Government Contractors, is seriously affecting the neighbourhood for the following reasons:-

- (i) Loss of health to aged and infirm persons.
- (ii) Deterioration of buildings due to shaking.
- (iii) Loss of stock, particularly of ewes at this season.
- (iv) Loss of incubator eggs which due to shock are not hatching out.

Your Petitioners, who are your Constituents, ask that you will be so good as to represent the matter to the Government Department concerned.

13.3.1922 To Major T. C. Wells, O.B.E., Caxton House, S.W.1.

From Sir R. Ashton Lister, House of Commons. S.W.1.

Dear Sir, I send you a Petition from my Constituents near the Quedgeley Munition Factory near Gloucester.

Will you kindly see if anything can be done to improve matters.

You will see there is a very strong feeling at the present state of things, and oblige. Yours faithfully, R. A. Lister.

15.3.1922 To Sir Ashton Lister, M.P., House of Commons, S.W.1.

From Major T. C. Wells, The Disposal and Liquidation Commission,  
Room 2, Block "B", Earls Court, S.W.5.

Dear Sir, I beg to acknowledge the receipt of your letter of the 13th instant, enclosing a Petition signed by 71 of your constituents regarding the present condition of affairs at Quedgeley Filling Factory.

This matter is being investigated and I will write you again in the course of a post or two. Yours faithfully, T. C. Wells.

22.3.1922 To Messrs. Geo. Cohen Sons & Co., 95, Wood Lane, Shepherd's Bush,  
W.12. (Iron and Metal Merchants. Administrators of shell contract).

From The Disposal and Liquidation Commission.

Dear Sirs, Confirming my conversation with your Mr. Allcock, a complaint has been received from the inhabitants of Whaddon, Tuffley, and Lower Tuffley, which places are adjacent to Quedgeley. The complaint is signed by a number of people who have brought the matter to the notice of the local member of Parliament, and is to the effect that -

(1) Owing to the constant detonations which are being carried out by Messrs. Cohen the neighbourhood is being seriously affected for the following reasons:-

(a) Loss of health to aged and infirm persons.

(b) Deterioration of buildings due to shaking.

(c) Loss of stock particularly of ewes.

(d) Loss of incubator eggs, which due to shock are not hatching out.

It is evident from the complaints, that the detonations at Quedgeley must be of considerable violence. I am acknowledging the letter from Sir Ashton Lister on the matter, and informing him that steps will be at once taken to minimise the force of the explosions, in the hope that this may satisfy the local inhabitants, but I should be glad if you would immediately go into the whole matter and let me have your views on the subject. Yours faithfully, A.T.B.  
Capt. For Director of Stores and Transport.

24.3.1922 To The Disposal and Liquidation Commission.

From George Cohen Sons & Co.

Dear Sirs, In reply to yours of the 22nd, inst., confirming Captain Eades conversation with the writer, with regard to the complaint from the inhabitants of Whaddon, Tuffley, of the work being carried out at Quedgeley, we beg to inform you that the writer personally investigated this matter on Tuesday of this week, and arrangements were made to considerably reduce the force of the detonation by reducing the number of Detonators being destroyed at one time, and from my personal experience I do not think there will be any

(24.3.1922)

further cause for complaint. If, however, the work is such that it cannot be carried on at Quedgeley the only alternative we can see would be for you to deliver the Detonators in question to our Factory at Credenhill.

We trust, however, that the measures we have taken are such that no further complaints will ensue. Yours faithfully, W. B. Allcock. General Manager.

Minute Sheet

28.3.1922 Col. Corbett. I discussed this with Messrs. Cohen's General Manager and you will see from his letter of 24th inst., enclosed, that the force of the detonations has been considerably reduced.

I think Sir R. Ashton Lister might be informed, and asked if this is not now satisfactory. It should be borne in mind that if we have to move the balance of the detonators it will be at very great expense to the Country, and wherever they go (if destroyed by detonation) the same kind of trouble would probably arise. G. Eades.

30.3.1922 To Sir Ashton Lister.

From Col. Evan B. Jeune, Whaddon Manor, Gloucester.

Dear Sir Ashton, I am sorry to bother you again about the Quedgeley explosions, but the people there refuse to do anything in the way of lessening the nuisance, and Captain Gill tells me that if we stop it by getting an injunction we shall have our windows broken "another way" and that we are not likely to get anything out of Cohen for any damage done. Two of my cottages are being seriously damaged. Could you jog the memory of the department responsible? With kind regards. I am, yours faithfully, Evan B. Jeune.

30.3.1922 To Sir Ashton Lister.

From Col. E. S. Sinnott, Tuffley Grange, near Gloucester.

Dear Sir Ashton, I am sorry to trouble you again about the explosions at the Quedgeley Filling Factory but really they are getting past bearing. Everyone is complaining and I am satisfied that there is a substantial amount of damage to property going on owing to the shocks. I have spoken to the local manager Mr. Gill but he tells me the quantities of explosive fired on each occasion has been laid down by his employers - Messrs. Cohen, and that he is powerless in the matter. We shall be very grateful if you can help us to get a reduction in the quantities fired on each occasion. Yours sincerely, E. S. Sinnott.



30.3.1922 To The Disposal & Liquidation Commission, Caxton House, S.W.1.

From Sir R. Ashton Lister, C.B.E., M.P. The Towers, Dursley.

Dear Sirs, QUEDGELEY - DAMAGE THROUGH EXPLOSIONS.

I beg to acknowledge receipt of yours of the 15th inst.

I am sorry to say I cannot find that you have done any investigating in this matter, or issued instructions that the nuisance shall be abated.

I am aware that these explosions are bound to cause some annoyance, but I think that they might be reduced, so as not to cause actual damage to property, or to life.

I enclose herewith letter received from the County Surveyor of Gloucester, Lt. Col. E. S. Sinnott, and Col. Jeune, of Whaddon Manor, Gloucester.

Will you be good enough to take the matter up with the Contractors, who I understand are Messrs. Cohen, and give instructions that a lesser quantity of explosives should be fired at each time. This can be done, and the nuisance abated. Unless this is done I must bring the matter before the House of Commons, which I am reluctant to do, if it can be avoided. Yours faithfully,  
R. A. Lister.

1.4.1922 To Sir R. Ashton Lister, C.B.E., M.P. House of Commons, S.W.1.

From Major T. C. Wells, Disposal & Liquidation Commission.

Dear Sir, Further to your letter of the 13th March, enclosing a petition from your constituents complaining of the daily explosions at Quedgeley Depot, I am to say that instructions have been given that the force of these detonations must be reduced, and it is confidently anticipated that this will meet the petitioners' objections.

You will appreciate that the explosives in question have to be destroyed, and unless this work can be done on the spot considerable expense will have to be incurred in the removal of the detonators to other parts of England.

We are, of course, most anxious to cause as little as possible inconvenience to members of the public, and I hope that you will find that this has now been effected by the orders that have been issued. In the meantime I am retaining the petition which you sent me. Yours faithfully, T. C. Wells.

P.S. I have just received your letter of the 30th ult., and enclosures, but I expect that by now the explosions will have been sufficiently reduced. I am, however, passing these letters to the officials concerned.

4.4.1922 To The Controller, Disposal & Liquidation Commission.

From Edwd. T. Gardom, Gloucestershire C. C., Shire Hall, Gloucester.

Sir, I beg to enclose copy of a Resolution passed at the Meeting of the Highways Committee of the Gloucestershire County Council on the 1st instant, with reference to the explosions which take place at the Quedgeley Filling Factory.

I may add that since the daily explosions have been taking place, farmers and others have complained of the loss of ewes at lambing season, the depreciation and damage caused to buildings due to shock, and further, the loss in the hatching of eggs in Incubators is very great: In one case there were no less than 58 dead chicks out of 59 eggs.

I am, Sir, Your obedient Servant, E. T. Gardom. Clerk of the Council.

#### GLOUCESTERSHIRE COUNTY COUNCIL

At a Meeting of the Highways, Works and General Purposes Committee held at the SHIRE HALL, GLOUCESTER, on SATURDAY, the 1st day of April, 1922,

present MAJOR F. W. B. CRIPPS, D.S.O. in the Chair.

#### EXPLOSIONS AT THE QUEDGELEY FILLING FACTORY.

RESOLVED that strong representation be made to The Controller of Disposal & Liquidation Commission also to Messrs. Cohen & Co., Contractors, with reference to the loud explosions constantly taking place at the Quedgeley Filling Factory, with a view to the damage done to property and stock, belonging to persons residing in the neighbourhood, being mitigated.

8.4.1922 To The Disposal & Liquidation Commission.

From Sir R. Ashton Lister, C.B.E., M.P.

Dear Sirs, QUEDGELEY FILLING FACTORY. Adverting to your letter of the 1st inst., I am sorry to tell you that the explosions yesterday were as bad as ever, and Col. E. S. Sinnott, County Surveyor of Gloucester, received a telephone message from Mr. Gill, The Manager of Messrs. Cohen, at the Munition Works, saying that he has received no instructions whatever to make a reduction in the charge.

As there is quite a lot of feeling in the neighbourhood on this question, please let me know what you have done, as I had already inserted your letter of the 1st inst. in the local papers in order to allay the anxiety.

Yours truly, R. A. Lister.

11.4.1922 To The Clerk of Gloucestershire County Council.

From The Disposal & Liquidation Commission.

Sir, I have to acknowledge receipt of your letter of the 4th instant to which I have delayed a reply as a similar communication had been received from Sir R. Ashton Lister.

I understand that an official communication has now been addressed to Sir R. Ashton Lister to the effect that the explosions have now been reduced, and it is thought that the action taken would be satisfactory.

I am, Sir, Your obedient Servant, A. H. Hall. Controller - D.B.4.

12.4.1922 To The Controller, Disposal & Liquidation Commission.

From The Clerk of Gloucestershire County Council.

Sir, I am obliged by your letter of the 11th instant, but I am assured by the County Surveyor, who lives within a short distance, that the force of the explosions has not been reduced, and the prejudicial effect is greater than ever.

In any event the damage done is still very great, and it is hoped that the Disposal Board will take action accordingly without delay.

I am, Sir, Your obedient Servant, E. T. Gardom. Clerk of the County Council.

19.4.1922 To The Disposal & Liquidation Commission.

From Geo. Cohen Sons & Co., Shepherd's Bush, London W.12.

Dear Sirs, ATTENTION CAPTAIN EADES. Further to Captain Eades conversation with the writer with regard to a supposed telephone message between Sir R. Lister and our Superintendent at Quedgeley, kindly note we are informed by our Superintendent that he has had no telephone or other conversation with Sir R. Lister.

A local gentleman - Colonel Sinnott - rang him up on or about the 6th April, complaining of the noise and asked if any orders had been given with reference to the reduction of the charges. Our Superintendent informed him that no orders had been received by him to reduce the charge below that fixed by us on the 8th March, namely, 15,000 grains of Fulminate. This is only three quarters of what we are destroying at one time at other Factories and is one quarter of what was originally blown up at Quedgeley.

We have, in accordance with the arrangements made with Captain Eades, still further reduced the quantity, and we do not anticipate any further complaint.

Yours faithfully, MGC.

Minute Sheet

27.4.1922 Col. Corbett. Please see Messrs. Cohen's letter. The detonations are really very light and, in my opinion, can do little or no harm. We should be put to heavy expense in transferring them to another Depôt. The balance will be destroyed in a few weeks. G. Eades.

28.4.1922 To Messrs. Geo Cohen Sons & Co., Shepherd's Bush, London W.12.

From Col. E. S. Sinnott, Tuffley Grange, near Gloucester.

Dear Sirs, I am in receipt of your letter of the 13th inst., for which I am obliged.

I delayed replying as the wind has been very largely in the north since I received your letter, and I was anxious to be quite sure as to the force of the explosions when the wind was in the south before answering definitely.

I am glad to say that the reduction in charge which you have arranged is very material, and personally I am satisfied. Please allow me to thank you for the consideration you have given the matter. Yours truly, E. S. Sinnott.

5.5.1922 To Sir R. Ashton Lister C.B.E., M.P. The Towers, Dursley.

From The Secretary, The Disposal & Liquidation Commission.

Sir, I am directed by the Disposal and Liquidation Commission to refer to your letter of the 8th April, relative to the explosions at Quedgeley Filling Factory. The delay in answering your letter is due to the fact that the matter had to be referred to the depot.

It is understood that on account of the action taken by this Department the explosions in question have now been very considerably reduced and furthermore Colonel Sinnott has expressed himself as being satisfied with the position.

I am, Sir, Your obedient Servant, G. C. N. Sturt.

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COMPLAINTS RE BREAKING DOWN & BURNING AMMUNITION  
(Notes)

Bramley Ordnance Depot.

4.4.23. Complaint forwarded by solicitor acting for Mrs. Cole of Sherfield Hall, Basingstoke. Burning of ammunition had been carried out at the depot since the previous August, and a big explosion occurred on 22.1.23. The work is carried out at the Sherfield end of the camp, 200 yards from the nearest habitation.

Mrs. Cole had 7 windows broken, plaster shaken down and tiles broken. The contractor, Messrs. Cohen, acting as agents for the Government, pour the explosive along the ground, only one field away from the house, and set fire to it, creating a barage of black smoke.

Meeting of Disposal Board at Earl's Court, 4.5.23.

Burning of Lyddite				
Banbury.	25,000	shells remaining	-	2 months' work.
Bramley.	115,000	.. ..		5 months' work.
Credenhill.	70,000	.. ..		9 weeks' work.
Farlington.	160,000	.. ..		3 months' work.

Meeting of Disposal Board, 15.5.23.

Burning of TNT at Bramley should cease, but not cordite. 600 tons of TNT to be removed to Farlington at a cost of £1,200.

Farlington very remote. Burning of TNT and Lyddite carried out at the rate of 12 tons of TNT and 340 6-inch Lyddite shell simultaneously at one burning, resulting in extremely dense clouds of smoke, in which the presence of Picric Acid could be clearly detected, but owing to the position of the Factory, this caused no inconvenience to the neighbourhood.

Other factories where TNT breaking down work is carried out:-

Gainsborough (now completed)  
Farlington  
Credenhill  
Bramley  
Banbury  
Pembrey (now completed)

11.6.23. Recommendation that Lyddite shells be dumped at sea, due to the grave potential danger represented by the burning, the principal component being Picric Acid.

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[Note]

PRO. MUN4/6288

SALE OF FACTORIES REMAINING

Farlington, Hampshire.

186 acres for sale. (Secretary of State for War).

Formerly Portsmouth Park Racecourse.

PRO. MUN4/1602

Sir Eric Geddes DDG(C)  
Armament Buildings.

ARMLETS

Issue to Women engaged on dangerous work

The Minister has had under consideration the case of women employed on munitions work in connection with explosives which involves,

- (1) danger to health
- (2) danger to life and limb, or
- (3) risk of disfigurement.

Typical examples of (1) are exposure to the fumes of nitric acid and the handling of TNT., of (2) the filling of detonators, stabbing fuzes and gages &c., and of (3) the handling of tetryl and picric acid.

The Minister is now prepared to issue to women so employed a special armband as a mark of his appreciation of the spirit in which these women are assuming these dangerous duties, and in the case of disfigurement as an indication that such disfigurement has been incurred in the services of the State. It is not intended that the issue of the armband should affect a woman's right to wear a War Service Badge.

F R Lovett  
13.6.16.

I understand from Mr. Nash verbally that it was agreed to issue badges to women doing dangerous work and that it should be left to the Managements of Factories to decide to whom the badges should be given.

STB ?  
17.6.16.

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Factory Department,  
Home Office,  
London, S.W.

13th July, 1916.

H.M. Chief Inspector.

A conference was held on the 12th instant, Major Cooper Key, C.B., Chief Inspector of Explosives, presiding, to consider what immediate steps were practicable to minimise the risk of illness - notably toxic jaundice - among those coming into contact with T.N.T. in munition factories. The other persons present were Major Sir James Douglas, Bart., R.A., Inspector of Dangerous Buildings and Processes, Ministry of Munitions; Miss R.E. Squire, Deputy Principal Lady Inspector of Factories; Mr. Sydney Smith, Inspector of Dangerous Trades; Dr. Collis, Medical Inspector of Factories; and myself.

The Secretary of State's Order, dated November 27th, 1915, added toxic jaundice to the diseases which, if contracted in a factory, must be notified to the Factory Department. Since January 1st, 1916, 32 cases including 11 deaths have come to my knowledge. Reports of illness from T.N.T. in which jaundice was not specifically mentioned are excluded from these figures. I have no doubt cases have occurred of which we are ignorant.

Periodic medical examination at weekly or fortnightly intervals takes place in practically all the factories and many suspensions have been made of workers showing initial symptoms,\* but the medical man has not many clinical signs to guide him and even early detection of jaundice and immediate suspension has not always prevented a fatal issue.

Of the 11 fatal cases 6 have occurred in the filling of exploder bags with pure T.N.T. in fine powder. The recommendation made below applies especially to this process on account of its unavoidably dusty nature and the impossibility - at any rate for some months to come - of stopping the dust. The wearing of respirators and veils has been tried but found to be an insufficient safeguard; one woman has died who wore constantly both respirator and veil. T.N.T. is an accumulative poison - the average duration of employment before the serious symptom of jaundice shows itself in the person attacked having been usually about 2 months. The recommendation, therefore, was that, pending the time when the process can be carried on in a dust free atmosphere, no person be employed in a bag filling hut for more than a fortnight - or at longest a month - without a corresponding period in work not involving any contact with T.N.T. This might be made to apply to any process where there is constant exposure to fine dust of pure T.N.T.

Adoption of [this recommendation] would, it was believed, go far to minimise serious illness during such time as is required for systematic investigation of mechanical methods for preventing or removing the dust, not only in bag filling, but also in pressing T.N.T. and amatol into blocks and pellets and other processes connected with the filling of bombs and shells.

Emphasis was laid also on the importance of cleanliness both personal and in the process itself. Floors should be swept up after sprinkling with damp sawdust or by some other dustless method.

The wish was expressed that these points might be brought to the notice of the Minister of Munitions as soon as possible.

(Signed) T.M. Legge.  
H.M. Medical Inspector of Factories.

\*Dr. Agnes Learmouth and Dr. Barbara Cunningham, Medical Officers attached to the Women's Hospital, Woolwich Arsenal, group the symptoms noted among 230 women affected by T.N.T. during the past five months thus:-  
Nausea, 140; Pains, 128; Rash, 117; Headache, 104; Vomiting, 78; Constipation, 76; Throat, 76; Sneezing, 63; Eyes, 42; Cough, 40; Giddiness, 40; Faintness, 36; Diarrhoea, 26; Jaundice, 10; Depression, 7; Cyanosis, 4.

## MUNITIONS CANTEENS

[Notes]

The first official body to interest itself in industrial canteens, was the Central Control Board (Liquor Traffic), the prescribed Government authority for the purpose of the Defence of the Realm (Amendment) (No.3) Act of May 19th, 1915. This act enabled the Government to set apart for special treatment in the matter of the liquor trade any areas where, on account of munition manufacture or transport or the training of Military or Naval forces, the continuance of the peace time facilities for the sale of intoxicants would interfere with the successful prosecution of the war.

The Central Control Board appointed a 'Canteens Committee' under the chairmanship of Sir George Newman M.D. (also a member of the Liquor Control Board); its first report of October 12th, 1915, stated 'The Board...attach very considerable importance to the constructive side of their work...and the Board incline to the view that excessive drinking may often be traced to the want of adequate facilities for food, refreshment, and recreation, particularly in conjunction with long hours and overtime. The improvement of public houses and the provision of canteens may therefore do much to render less necessary the imposition of purely restrictive measures'.

In its second report of May 1916, the Central Control Board remarked that 'It devolved upon the Board to secure the supply of proper and sufficient nourishment for the worker, in order to maintain his health, to increase his energy and output, and to diminish or prevent fatigue or exhaustion'...In endeavouring to meet this requirement, the Board have proceeded on two collateral lines of action:-

- (a) The increase of facilities for obtaining suitable meals at public houses
- (b) The establishment wherever necessary of industrial canteens inside or within easy access of the works, supplying both substantial meals and light refreshment at reasonable prices.

In his memorandum of January 24th, 1917, Sir George Newman stated that there were deficits at all but 9 of the National Factory canteens.

The figures give the position for four periods, which are denoted in the tables by letters:

- A. From the beginning to March 31st 1917.
- B. From April 1st 1917 to September 31st 1917.
- C. From October 1st 1917 to March 31st 1918.
- D. From the beginning to March 31st 1918.

## TRADING RESULTS

	<u>No. of Canteens</u>	<u>Profit</u>	<u>Loss</u>	<u>No. of Canteens showing a</u>	
				<u>Profit</u>	<u>Loss</u>
A	60	£59,19.11½	£68,427.8.3	2	58
B	77	£3,365. 8. 2	£49,226.9.4	4	73
C	91	£6,326. 8. 5½	£35,539.7.2	17	74
D	98	£9,749.16. 7	£153,193.4.9	8	90

Of the above profits £6,512.12.2 was set off against losses leaving net profits of £3,231.4.5 to carry forward and net losses of £146,674.12.7 to be written off with Treasury approval.

The following is a list of the canteens showing profits:-

- A. Coventry Filling Factory. Dagenham Dock Salvage and Box Repair Factory.
- B. Georgetown FF. Glasgow (Mile End) Projectile Factory. Keighley Shell Factory. Horley No.35 Stores Depot.
- C. Litherland Explosives Factory. Watford Ex F. West Gorton Ex F. Georgetown FF. Liverpool (Amatol) FF. Dudley PF. Glasgow (Moss End) PF. Glasgow (Mile End) PF. Keighley SF. Workington SF. Birkenhead Stores Depot. Horley No.35 SD. Leeds (Oulton) No.27 SD. Neasden SD. Swindon No.18a SD. Erith Trench Warfare Factory. Watford No.2 TWF.
- D. Litherland Ex F. Dudley PF. Glasgow (Mile End) PF. Keighley SF. Horley No. 35 SD. Leeds (Oulton) No.27 SD. Neasden SD. Erith TWF.

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MR. DUGGANDEFICITS SHOWN ON TRADING ACCOUNTS OF CANTEENS  
IN NATIONAL FILLING FACTORIES FOR JUNE 1918

	<u>Remarks</u>
1. Leeds. £188 Leeds Amatol. £676	Gross profit good. Extravagant wages bill.
2. Liverpool. £72 Amatol. £92	Had shown small profit consistently until the management was changed.
3. Perivale. £28	New manager installed in August. A profit is now shown.
6. Chilwell. £2,176	I wrote to Chilwell on 9th August asking for an explanation of the unexpected loss of £4,353 in May and June. I have had no reply to date.
9. Banbury. £37	Tariff has been raised - prospects improving.
11. Abbey Wood. £167	Fall in canteen custom owing to many workers having been paid off. Tariff has been raised and the canteen staff reduced - prospects are good.
12. Cardonald. £36	The staff has been reduced. Georgetown buying is effecting economies.
14. Hereford. £291	High cost of fuel and large wages bill. Hereford's deficit has been steadily falling month by month, since the beginning of the year.
18. Pembrey. £80	Large wages bill. The deficit shows a declining tendency.
21. Coventry. £540	This is the first deficit since January. There was a week's strike in June. The actual loss in the month's trading was £128
22. Gainsborough. £80	A new canteen. It is too large for present custom. The situation cannot become normal until there are a large number of workers in the factory.
26. Erith. £9	Tariff has been raised.
27. Fulham. £39	A new manageress has been installed lately.

As a rule trading in the summer months is not so profitable as in winter, for one thing there is a good deal more nose-bagging.

Now that women are receiving an allowance of 5/- per week, presumably to meet the increase cost of food, I think that a proposal should be made to the Food Section to increase the tariff charges in all our canteens, where prices have not been raised since March 1st, 1918.

Foods have gone up in price 9% during the first half of this year and the  $\frac{2}{7}$ ths of the 5/- advance to women workers, which canteen staff will be entitled to, will place a further burden on the canteen wages bill.

[Sgd] J. Smyth Wood

G.A.F.(F)  
18.9.18  
JSW/HEW

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### QUARTERLY REPORT ON HOSTELS FOR MUNITION WORKERS

Hostels before the war fell into four categories:-

1. Boarding houses for educated women.
2. Boarding houses for working men.
3. Hostels managed by firms to house their own workers.
4. Houses of an institutional type.

The first two types were run on a commercial basis with the minimum of rules necessary to communal life. The third class was mainly subsidised by the firms and this system constituted in fact an addition in kind to the wages of the employees. The fourth class catered for girls who were paid low wages. The charges made were not on a commercial basis and the hostels were subsidised by private persons and religious societies. Those in charge of the hostels usually tried to exercise a good moral influence to counteract the temptations to which girls who are underpaid are particularly exposed.

Perhaps the best example of hostels which still exist of this type are the "Shrimpton Homes" in London.

The YWMC Hostels which belong to this category are perhaps the least institutional.

Before the war the YWCA and GFS acted largely as "clearing hostels" in providing lodging for respectable girls arriving in large towns.

8/1917.

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PRO. MUN5/93/346/131

### RELIGIOUS & CHARITABLE SOCIETIES

Church Army.  
 Free Church Council.  
 Salvation Army.  
 Wesleyan Conference.  
 Church of Scotland.  
 Young Women's Christian Association.  
 Young Men's Christian Association.  
 Girls' Friendly Society.  
 Traveller's Aid Society.

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Rationing has not been advocated in munition hostels in view of the fact that the women are engaged on important national service, and that the medical statistical branch of the Welfare and Health Section after careful investigation is of opinion that in no cases are they getting more than is necessary to produce the output required.

Staff in Hostels managed by the Ministry of Munitions.  
 Superintendents £200 - £250 per annum all found.

1917/1918.

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REGULATIONS FOR MAGAZINES AND CARE OF WAR MATÉRIEL.

1913

Table showing Distances from Protected Works for Magazines and other Danger Buildings

AMOUNT OF EXPLOSIVE TO BE ALLOWED IN THE MAGAZINE OR DANGER BUILDING.	pounds	500	1,000	1 "ton" 2,000	3,000	2 "tons" 4,000	5 "tons" 10,000	10 "tons" 20,000	100 "tons" 200,000
Room used in connection with the magazine, in pursuance of Section 46 of the Act.	yds	50	50	50	51	52	55	60	100
Workshop used in connection with the magazine, in pursuance of Section 47 of the Act.	.	.	75	100	101	102	110	120	300
Mineral or private railway, whether worked by steam or otherwise.	.	.	.	.	.	.	.	.	.
Highway or public path. Promenade or open place of resort for the public, or for persons carrying on any trade or business.	.	.	.	.	.	.	.	.	.
Canal or navigable water. Dock. River wall or sea water. Pier or Jetty. Reservoir.	.	.	.	.	.	.	.	.	.
Room or workshop in connection with another magazine, store, or registered premises. Any other room or workshop or any shop.		100	150	200	200	200	200	250	1,600
Magazine for explosive. Store for explosive.	.	.	.	.	.	.	.	.	.
Furnace, kiln, or fire for the use of any boiler, engine, or machine, or for any manufacturing purpose.	.	.	.	.	.	.	.	.	.

Table showing Distances from Protected Works for Magazines and other Danger Buildings

AMOUNT OF EXPLOSIVE TO BE ALLOWED IN THE MAGAZINE OR DANGER BUILDING.	pounds			1	2	5	10	100	
		500	1,000	"ton" 2,000	"tons" 3,000	"tons" 4,000	"tons" 10,000	"tons" 20,000	"tons" 200,000
Public Railway	yds	100	150	200	210	215	265	330	1,600
Dwelling-house, with the consent, in writing of the occupier.		50	75	100	110	120	175	250	1,600
Dwelling-house, without such consent.		100	150	200	240	280	525	850	6,853
Factory not belonging to Government.									
Church or chapel.									
University, college, or school.									
Hospital or public institution.									
Town hall or court of justice.		.	.	.	.	.	.	.	.
Covered market.									
Theatre or building wherein persons are accustomed to assemble.									
Public Building in charge of the Commissioners of His Majesty's Works and Public Buildings.									
Factory or magazine occupied by a Secretary of State, the Commission- ers of the Admiralty, or other Department of the Government, with the consent, in writing, of the Secretary of State, Commissioners, or Department.		.	.	.	.	.	.	.	.
Do. without such consent.		880	1,320	1,760	1,780	1,805	1,930	2,110	6,853
Palace or house of residence of His Majesty, His Heirs and Successors.	miles	2	2	2	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	17 $\frac{1}{3}$

In cases where the Protected Work is effectively screened from the Magazine or Danger Building...the distance from that Protected Work (except for quantities of 1,000 lbs. and under) will be reduced by one-half.

ULTIMATE GUN AMMUNITION PROGRAMME

## Weekly requirements for Completed Ammunition

Figures represent complete rounds delivered to the War Office  
July 1916 - June 1917

	Jly	Aug	Sep	Oct	Nov	Dec
18-pr S	420,000	420,000	420,000	420,000	420,000	420,000
18-pr HE	280,000	280,000	280,000	280,000	280,000	280,000
2.75" S	3,700	5,500	7,400	9,400	10,500	12,000
2.75" HE	3,700	5,500	7,400	9,400	10,500	12,000
4.5" How* HE	236,250	248,500	248,500	248,500	248,500	248,500
60-pr* S	36,000	40,000	40,000	40,000	41,000	42,500
60-pr* HE	36,000	40,000	40,000	40,000	41,000	42,500
4.7"* S	6,440	6,440	6,440§	6,400	6,440	6,440
4.7"* HE	6,440	6,440	6,440§	6,440	6,440	6,440
6" How HE	58,000	74,000	87,000	100,000	112,000	131,000
8" How HE	16,630	20,130	23,630	28,000	33,500	37,000
9.2" How HE	22,750	26,950	30,500	33,600	34,500	37,000

§ Raised to 10,000 rounds per week, 20.9.16.

\* Chemical and incendiary.

[Quedgeley natures only. 18 natures listed]

Continued/

	Jan	Feb	Mar	Apr	May	Jun	Jly
18-pr S	420,000	420,000	420,000	420,000	420,000	420,000	
18-pr HE	280,000	280,000	280,000	280,000	280,000	280,000	
2.75" S	12,000	12,000	12,000	12,000	12,000	12,000	
2.75" HE	12,000	12,000	12,000	12,000	12,000	12,000	
4.5" How* HE	248,500	248,000	248,500	248,500	248,500	248,500	
60-pr* S	45,000	47,500	49,000	49,000	49,000	49,000	
60-pr* HE	45,000	47,500	49,000	49,000	49,000	49,000	
4.7"* S	6,440§	6,440	6,440	6,440	6,440	6,440	
4.7"* HE	6,440§	6,440	6,440	6,440	6,440	6,440	
6" How HE	149,000	167,000	185,000	201,000	204,000	204,000	
8" How HE	46,000	55,500	65,000	72,000	77,000	78,500	80,000
9.2" How HE	42,000	49,000	53,000	60,000	61,000	62,000	63,500

§ Raised to 10,000 rounds per week, 20.9.16.

\* Chemical and incendiary.

D.M.R.S. 25.7.16.

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PROPELLANT FACTORIES AT THE  
COMMENCEMENT OF HOSTILITIES.

R.G.P.F. Waltham Abbey.	Curtis and Harvey.
New Explosive Co. Ltd.	British Explosives Syndicate Ltd.
Nobel's Explosive Co. Ltd.	Chilworth Gunpowder Co.
National Explosives Co. Ltd.	Cotton Powder Co. Ltd.

Kynock Ltd. (Not on War Office list at the outbreak of war).

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PRO. MUN5/191/1500/19

PROPELLANTS

CORDITE M.D.	Nitro Glycerine	30%	Fats,	) Solvent = Acetone = ) Distillation of ) Acetate of Lime = ) Distillation of wood.
	Gun Cotton	65%	Soap Works. Cotton from abroad.	
	Vaseline	5%	Petroleum.	
CORDITE R.D.B.	Nitro Glycerine	42%	Fats,	) Solvent = Ether ) and Alcohol.
	Nitro Cellulose	52%	Soap Works. Cotton from abroad.	
	Vaseline	6%	Petroleum.	
NITROCELLULOSE POWDER	Nitrocellulose		Cotton.	) Solvent = Ether ) and Alcohol.
	Diphenylamine		Coal-Tar product.	

NITRIC ACID = Chili Saltpetre + Sulphuric Acid.  
 SULPHURIC ACID = Sulphur or Pyrites burnt in excess of air.  
 NITRO GLYCERINE = Glycerine + Nitric Acid + Sulphuric Acid.  
 GUN COTTON = Cotton + Nitric Acid + Sulphuric Acid. 13% Nitrogen content.  
 NITRO CELLULOSE = Cotton + Nitric Acid + Sulphuric Acid. 12.2% Nitrogen content.  
 Sulphuric Acid is mixed with Nitric Acid so that the water liberated during the process can be taken up by the Sulphuric Acid, leaving the Nitric Acid more free to do its work.

HIGH EXPLOSIVES

T.N.T. = Toluol + Nitric and Sulphuric Acids.  
 LYDDITE = Phenol + Nitric and Sulphuric Acids.  
 AMATOL = Nitrate of Ammonia + T.N.T.

Toluol - from distillation of Benzol which comes from distillation of Coal Tar from Gas Works.  
 Phenol - from Carboic Acid which comes from Coal Tar from Gas Works.  
 Nitrate of Ammonia - from Ammoniacal Liquor + Nitric Acid.  
 Ammoniacal Liquor comes from distillation of coal in the process of making ordinary gas.

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6th September 1915.

The Minister.

You asked for a short report on the introduction of H.E. into the Army and the history of Gaines, &c. Colonel Minchin has put up the enclosed interesting report on the subject.

On the Outbreak of War,

H.E. was used with 4.5" Howitzers, 60 prs., 5" and 6" Howitzers only.

No H.E. was used with 13 prs. or 18 prs.

Fuze 17, Percussion, and No.44, Percussion.

A Gaine was not used.

Soon after the War commenced,

H.E. was introduced for 13 pr. and 18 pr.

Fuzes - 80, Time, and 44, Percussion. No Gaine was used.

About September 1914, owing to the difficulty of obtaining two fuzes for each shell when a large number had to be manufactured, a Gaine was introduced in place of No.44 Percussion Fuze.

The best results are obtained from H.E. shell when they are burst low down, but not on the ground. It is found that bursts on the ground lose a large part of their effectiveness, unless of course direct hits are obtained, in that the crater formed confines the spread of the fragments of the shell. With this in view, and also owing to difficulty in getting two fuzes for each shell, the No.100 Graze Fuze with Gaine was introduced for all guns from 18 pr. to 12" Howitzer. The No.100 Graze is a simple one to manufacture and has a very sensitive graze action. After the slightest graze the shell rises and bursts low down. Also has .04 second delay to permit penetration before bursting when attacking buildings. The No.100 Fuze was introduced about March 1915 and is now being made in great numbers.

Gen. Philipps.

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PRO. MUN5/180/1300/62

## THE MANUFACTURE OF A COMPLETE ROUND OF 18-PR. H.E. AMMUNITION.

Notes prepared for the Minister's speech, June 1917.

The materials that contribute to a complete round of 18-pr. Gun Ammunition are of great variety and are derived from every quarter of the world, ...a remarkable testimonial to the British Sea-power.

France. Aluminium; Emery stone. Denmark. Cryolite. Norway. Iron ore; Spelter; Ammonium Nitrate; Aluminium; Calcium-Carbide. Sweden. Iron ore. Spain. Iron ore; Pyrites; Lead; Copper. Greece. Magnesite; Lead. Portugal. Wolfram ore. Russia. Platinum. America. Aluminium; Acetone; Copper; Carborundum; Nickel; Petroleum; Spelter; Tin; Ammonium Nitrate; Petroleum Coke; (for electrodes) Lead; Wolfram. Canada. Nickel; Spelter; Acetone; Calcium-Carbide. Greenland. Bauxite. Chile. Nitrates; Saltpetre. Africa. Copper; Nuts; Beans and seeds for oil. Madagascar. Corundum. Egypt. Cotton. India. Manganese; Wolfram; Nuts; Beans and seeds for oil. Ceylon. Plumbago; Nuts; Beans and seeds for oil. Burma. Lead; Wolfram ore; Molybdenite. Australia. Lead; Wolfram ore; Zinc; Zinc concentrates; Spelter; Scheelite; Copper. Japan. Copper; Spelter. China. Antimony; Lead.

Raw materials for TNT include: Nitrate of Soda, Pyrites of Sulphur, and Coal - a source of toluol.

Raw materials for Amatol include: Calcium Nitrate or Sodium Nitrate, Ammonia. For Cordite: Cotton Waste, Glycerine, Nitrate of Soda, Pyrites of Sulphur, Alcohol, Mineral Jelly and Coal are required.

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(Extract)



LIST OF CALIBRES

BL 10pr  
 BL 2.75"  
 BL 13pr  
 BL 15pr  
 BLC 15pr  
 QF 18pr  
 QF 4.5" How  
 QF 4.7"  
 BL 5" How  
 BL 60pr  
 BL 6" 30cwt How  
 BLC 6"  
 BL 6" MkVII Gun  
 BL 8" How  
 BL 9.2" How  
 BL 12" How  
 BL 9.2" Gun MksIII and VI  
 BL 12" Gun MkIX

10/1915

PRO. MUN4/1410

DIAMETER OF GAUGES OVER PAINT  
 Quedgeley natures only

Calibre:	
2.75" and 10 pdr.	2.74"
18 pdr.	3.295"
4.5"	4.49"
4.7"	4.709"
5.0" and 60 pdr.	4.98"
6.0" and 80 pdr.	5.98"
8.0"	7.98"
9.2"	9.18"

PRO. MUN5/181/1300/81

EXPLANATORY LIST OF SERVICE MARKINGS

Projectile Markings - Painting.

H.E. shell; Yellow.

Chemical shell; Light grey.

Incendiary shell (with H.E. burster); Body up to shoulder, red; point to shoulder, yellow. The same shell without H.E. burster is all red.

Smoke shell; Body to shoulder, green; point to shoulder, yellow.

Shrapnel shell made up with reduced charge will be painted white from shoulder to driving band.

All other shell; Black.

Additional Markings on Separate Loading Shell.

Red band with yellow crosses below shoulder denotes shell filled for use in hot climates.

Fixed Ammunition with H.E. Shell.

Red band below shoulder denotes filled shell.

G2 denotes gaine fitted.

Green band on body denotes Amatol filled.

$\frac{80}{20}$  shows the percentage of Ammonium Nitrate and Trotyl respectively.

Other Markings.

⊕ Denotes the centre of gravity of shell 12-in. and upwards.

F1, F2 etc. National Filling Factory monogram.

6/1917

COMPONENTS OF A ROUND OF AMMUNITION

NATURE OF GUN OR HOWITZER	CARTRIDGES					SHELL										
	EMPTY	CORDITE: WEIGHT & SIZE	BALLISTITE: WEIGHT COMPOSITION & THICKNESS	OTHER PROPELLANT: WEIGHT & NATURE	PERCUSSION PRIMER OR CAP	IGNITER	LID	AMOUNT OF CORDITE REQUIRED PER 100 CHARGES LBS	TUBES	NATURE	BURSTING CHARGE: GUNPOWDER OR HE	FUZES	GAINES	ADAPTERS 2-INCH FUZEHOLE	FUZES	BOX FOR COMPLETE ROUNDS
B.L. 2.75"	Shalloon	7ozs 9drs size 7½	--	--	--	3drs SFG2 or RFG2 at each end of charge	-	49 <sup>10</sup> / <sub>16</sub>	Friction 'T'	H.E.	10ozs 7drs	No 80/44	No 1	No 7	No 80	To hold 7 shell 7 cartridges and tubes.
do.	do.	-	7ozs 12drs A100	--	--	-	-	-	do.	S	2ozs 4drs*	No 80	--	--	do.	do.
Q.F. 18-pr	Brass	11b 6ozs 15drs MD size 8	--	--	No 1	-	147 <sup>5</sup> / <sub>16</sub>	--	--	H.E.	13ozs	No 80/44 or No 100	No 1	No 4	No 80F or 100F	To hold 4 rounds.
do.	do.	-	--	11b 8½ozs NCT7 f	do.	¼oz FG	-	-	--	S	12drs powder pellets, 1oz 12drs RFG2 or Blank FG new	No 80 or 85	--	--	No 80F or 85F	do.
Q.F. 4.5" How	Brass	4ozs 13drs MD size 2¼ & 11ozs 1dr MD size 4¼	--	--	No 1	-	MD 4¼ - 69 <sup>3</sup> / <sub>16</sub> 2¼ - 31 <sup>13</sup> / <sub>16</sub>	--	--	H.E.	V-41b 7ozs 12drs VI-41b 8ozs 8drs	No 17 44m or 100	--	No 2 do.	No 13Fp 44Fp or 100Fq	To hold 2 shell & 2 cartridges. y
do.	do.	-	--	11b 2ozs 6drs NCT7	do.	-	-	-	--	-	-	-	No 1	--	-	-
Q.F. 4.7"	do.	51b 7ozs size 20	--	--	--	Metal igniter containing ½oz RFG2	White metal	538	V S Percussion in the adapter (MkVI) screwed into cartridge	-	-	-	-	-	-	-
do.	do.	-	--	61b 15½ozs NCT22 f (51b 12ozs and 11b 3½ozs charges)	--	do.	do.	-	--	-	-	-	-	-	-	-
B.L. 60-pr	Silk cloth	91b 12ozs MD or MC size 16	--	--	--	1oz RFG2 at each end of charge	-	994 <sup>3</sup> / <sub>4</sub>	Friction 'T'	S	4½ozs RFG2	No 83	--	--	No 81Ft	-
B.L. 6" How	Shalloon	21b 9ozs MD size 4¼	--	--	--	½oz RFG2	-	261 <sup>5</sup> / <sub>16</sub>	do.	-	71b 14ozs	No 17 44m or 100	--	No 2 do.	No 13Fp 44Fp or 100Fq No 82F for shrapnel shell. t	* 1oz 12drs compressed burster in cup & 8drs powder pellets in the tube.
do.	do.	-	21b 4ozs 12drs A71	--	--	do.	-	-	-	-	-	-	No 1	--	-	f Charges enclosed in calico bags.
B.L. 8" How	Silk cloth	31b 14ozs 12drs MD size 8 & 51b 7ozs MDT size 20-10 (composite)	--	--	--	1½ozs RFG2	-	MD8 392 <sup>3</sup> / <sub>4</sub> MDT20-10 544 <sup>3</sup> / <sub>4</sub>	do.	-	-	-	-	-	-	m An exploder of 1½ozs trotyl is used with this fuze.
B.L. 9.2" How	do.	101b 4ozs MDT size 20-10	--	--	--	6ozs RFG2	-	1,026	do.	-	-	-	-	-	-	p 50 cylinders in packing case q 20 cylinders in packing case t 25 cylinders in packing case y Each cartridge packed in a tin box contained in a wood box.

Directions for Overlookers  
**FIXED AMMUNITION**  
 Cartridge Q.F.: High Explosive Shell  
 18 pdr, Mark II, having 2" Gauge for Fuze.

Filling Shell and assembling complete cartridge.

1. Filled with block Amatol. Fuze No.100 with Adapter and Gaine.  
 Blocks of Amatol received, { 80 parts Ammonium Nitrate.  
                                   { 20 parts Trotol = T.N.T.
  1. Lower block solid.
  2. Upper blocks with hole to receive the Gaine.  
 All coated with paraffin wax.
2. Wipe round socket.
3. Insert the charge; first the solid block, then the others. Weight of charge about 12 oz.  $\pm$   $\frac{1}{2}$  oz.
4. Insert felt wad at bottom of hole for Gaine.
5. Gauge for depth of Gaine.
6. Insert washer, and gauge 2.2" to top of fuze hole, and other washers if necessary (felt or millboard).
7. Screw in adapter with Gaine down to .45" to .5" below rim of shell, if for 83 or 85 Fuze. See para. 30.
8. Gauge.
9. 3 stabs in screw thread of Adapter.
10. Screw in temporary plug, to go to Assembling Room.
11. Paint with green ring to denote Trotol or Amatol.
12. Stencil (on base), Station and date.

ASSEMBLING ROOM

13. Receive cordite M.D. size 8.
14. A certain proportion is cut to length 9.6" for core in the case of the 18pr. Not more than 500 lbs. allowed in the building at one time.  
 Remnants of cordite may be remade up once.
15. Weigh out core 5  $\frac{10}{16}$  oz. and tie in two places with silk twist treated with vaseline (to preserve it from acid action due to the cordite).
16. Weigh out, with core, a total of 1 lb. 12 oz. 9 drs. (or more or less according to quality). $\ddagger$
17. Tie round core, upper end flush; lower end to fit over the primer, the tying being temporary.
18. Tie ditto, in 3 places with silk braid.
19. Receive cartridge case of solid drawn brass.
20. Fit the charge in the case, allowing for the cavity to fit over the primer.
21. Coat round base of shell with P.G.S. $\dagger$  cement.
22. Insert and press the shell base into the mouth of the case, by means of a vertical press.
23. Place the whole in a horizontal machine for pressing the rim of the case into the lowest cannellure of the driving band of the shell.
24. Receive Primer No.1 Mark II.
25. Screw in Primer, with P.G.S. cement in the threads.
26. Examine carefully by eye and feel to see that the primer is not above the flat surface of the case.
27. Fit the clip on the base.
28. Take out the screw plug and clear out luting from set screw hole.
29. Insert felt wad and one or more felt or cardboard washers, to gauge if not done previously. See paras. 4, 5 & 6.
30. Screw in the Fuze, etc., either Gaine, Adapter and 100 Fuze; or 83 or 85 Fuze. (Gaine and Adapter No.4 being already in Shell).  
 N.B. - Special Adapter and no Gaine if for No.44 Fuze, which takes a 5 drams Exploder in place of a Gaine.

$\ddagger$  Accurate information must be obtained as to the amount of "Adjustment" necessary for each "Lot" of cordite.

$\dagger$  Pettman General Service.

31. Indent fuze through set screw hole; avoiding limits marked red on fuze, to denote dangerous neighbourhood of detonator.
32. Screw in set screw with P.G.S. cement.
33. More P.G.S. cement over set screw.
34. Stencil on base - W. "Fuzed" Date.
35. Packed 4 in a box; marked at each end { T&P or nature of fuze.  
High Explosive.

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13-pdr., Mark I

- Practically the same as the 18-pdr. except
13. Weight of Amatol blocks, or else a single block of TrotoI, having the central hole for the Gaine.
  14. Cordite length only 10.4", so the core projects upwards in the centre.
  15. Weight of core 5 11/16 ozs.
  16. Total weight of cordite, 1 lb. 4 ozs. 11 drs. A.C. (i.e. Adjusted Charge, according to quality).
  17. Top not flush.

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18-pdr., Shrapnel

1. Filling.
  - (a). Remove plug, wipe fuze socket and pour in the measured charge of R.F.G2 black powder, shaking and working it down with a copper wire.
  - (b). No powder pellets are now used. ††
  - (c). Place over powder tube a red shalloon disc, 1.5" diameter, secured by shellac.
  - (d). Screw in plug.
- 13 to 28. Fixed Ammunition; the same process as for High Explosive Shell.
30. Screw in No. 80 T. & P. Fuze or, it might be, No. 83 or 85.
- 31 to end. The same as for High Explosive.

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13-pdr., Shrapnel

1. Differs from above only as to
  - (a). Weight of charge.
  - (b). The tube is filled with hollow powder pellets.§ The two lower pellets have a paper disc over the lower end, attached with shellac, to prevent powder from the charge choking the hole in the pellet.

†† "Without pellets" stencilled on shell.

§ To increase visibility of burst.

MINISTRY OF MUNITIONS,  
WHITEHALL, S.W.  
8th November, 1915.

By Order,  
H. B. STRANGE,  
Lieut. Colonel,  
Director A.M.4.

## REPORT ON EXPLOSION AT ROUEN, 10.3.16.

Destruction of one large shed, 400ft x 70ft,  
and some 480 tons of ammunition.

The Court are of opinion that the accident was caused by the explosion of a 4.5" Amatol filled shell, fuzeed with No.100 fuze and No.2 gaine, while the box containing it was being placed in position on the stack.

There is no evidence to show that the box received unduly rough usage.

The evidence is perfectly clear that there was no fire previous to the first explosion.

That the accident was due either to an incorrectly assembled No.100 fuze; to some previous rough usage which armed the fuze; or to some defect in the fuze or gaine.

That the explosion of the first shell started a fire which burnt fiercely owing to the presence in the boxes of the propellant - each box containing 2 complete rounds.

That the fire soon assumed such proportions that it could not be subdued by the appliances available.

[Extract]

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PRO. MUN4/556

Explosion at Explosives Loading Company works, Faversham, 2.4.1916, connected by water. Caused by a spark from a chimney. 143 men killed, 60 injured. Five tons of TNT exploded.

Explosion at Barnbow, Leeds, 10.30 pm, 5.12.1916. Shell had burst in a shop in which 190\* girls were working when screwing a fuse into a shell.  
\*160 in official report.

PRO. MUN4/1731

Report of an accident caused by explosion on 25.10.1916 in a pellet pressing house at the factory of Messrs. Curtis's and Harvey Ltd., at the Marsh, Faversham. Marsh Works built c.1780 - 1790. Fire and explosion caused by a slipping belt on a cam press on a heavy charge of TNT [overweight] igniting explosive dust. Two women died at the time of the accident:

Ethel Alberta Broadhurst, married, 31.

Ethel May Shrubshall, single, 24.

Two women died of injuries later:

Edith Gardner, single, 22.

Norah Jemmett.

Eight injured, some with burns.

The factory normally pressed gunpowder for blasting purposes, an overweight charge of which will 'give.'

PRO. MUN4/5177

Report of an explosion at Chilwell, 1.7.1918. 109 men and 25 women killed.

Explosion at NFF No. 18 Pembrey, 12.58 pm 8.1.1919.

1419 Gwen Williams killed drilling the set screw out of shells in order to enable the fuse to be removed. A shell exploded in the cubicle.

848 Sarah Jane Thomas removing shells from a trolley, keeping cubicles supplied, struck by fragments and died later.

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PRO. MUN4/1407

C.M.4.Z/455/a/114

Major Geo. Yewdall.

Sec: No. 1 National Filling Factory,  
Crossgates,  
NR. LEEDS.

3rd March 1916.

Sir,

ASSEMBLING FILLED FUZE NO. 100 AND GAINE NO. 2.

With reference to the decision that the Factory are to assemble filled Fuze No. 100 and Gaine No. 2, it is to be understood that the safeguards prescribed are to be made use of as may be now available, or as soon as ever they can be made available. These safeguards are indicated in the Sketches...which have been separately sent you.

Meanwhile, the work is to be performed in accordance with the attached memorandum, which describes the means whereby accidents can be avoided. It must be recollected that the punctilious conduct of work by all concerned is indispensable. Written instructions must be drawn up at the Factory according to the appliances in use, before work is put in hand.

I am, Sir,

Your obedient Servant,

J. C. Angus,

For D.D.G.M.S. (C)

[Extract]

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To Leeds.

10th March 1916.

I am instructed to inform you confidentially that a fatal accident occurred at Hayes to-day while assembling Fuze No. 100 with Gaine No. 2, during the final operation of stabbing the Adapter to the Fuse. The accident was apparently caused by the punch slipping from the Adapter and being carried down over the screwed portion of the Fuse on to the Detonator Plug.

Will you please observe in your written instructions to Overlookers that the stab must not be delivered to the Adapter immediately over the Detonator Plug, indicated by the red patch on the Fuze, but should be spaced equidistant on either side.

[Hayes to determine whether the Fuse was assembled at Southwark, or by C.I.W.]

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To Leeds.

17th March 1916.

With reference to previous communication of 10th inst. in regard to an accident which occurred at Hayes while stabbing Adapter to Fuze No. 100. A careful enquiry has been made as to the cause of the accident, and an examination of the Fuze has disclosed that the detent had been inserted wrong end up, so that the centrifugal pellet was free to move. The Fuze had apparently passed the test imposed at the Factory, viz, striking on the side and afterwards on the nose, but this test had failed to dislodge the pellet, or left it in such a position that the operation of stabbing liberated the pellet, causing the Fuze to detonate.

The enquiry held brings out the following points, which should be given immediate and careful attention by the Factories engaged on assembling.

(a) The test of dropping the Fuze twice, using the dropping box, should be most strictly and carefully carried out, as being the only means of detecting an imperfect Fuze. It has occasionally occurred, however, that fuzes have been

Continued/

17th March 1916.

made with the keyhole on the same side as the detent channel and the centrifugal bolt, and it must, therefore, be realised that the position of the detent channel itself must be taken as the guide for correctly placing the Fuze in the block of the dropping box.

(b) The use of a brass protection ring around the screwed portion of the Fuze, when stabbing the Adapter to the Fuze.

(c) The screening off, as far as possible, of the operator, so as to protect other workers from flying fragments, should an accident occur.

(d) When stabbing the Fuze to Adapter, it is advisable that a heavy block to set the Fuze be used, and also that a not over-light hammer be employed, so that the necessary force may be got by a steady short blow.

(e) In addition to the precautions already made known, it is necessary to see that the stab is not placed immediately over the detent, but equidistant on either side.

(f) Apart from a misplaced stab or a defect in the Fuze, there exists some danger in the presence of the 10-grain Detonator in Gaine No. 2, and if for no other reason than this latter, it would be wise to advance the provision of safeguards as much as possible.

It is desired that you will acquaint the D. B. Officer with the above information by showing him this letter.

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To Leeds.

28th March 1916.

I am directed to ask you to report immediately and fully what steps you have taken to provide the safeguards prescribed in my letter to you dated March 3rd, for assembling Fuze 100 and Gaine. You are also asked to detail how you are at the moment performing the operation of stabbing.

Owing to a further accident that has occurred during the assembling operation, it is considered imperative that a shield be provided over the Gaine when assembling the Adapter to Fuze, and the enclosed rough sketch is sent for your guidance in rigging up this shield. So that as little delay as possible may take place in providing this additional safeguard, instructions have been given to Woolwich to forward to-day to your Factory, shell bodies suitable for the purpose, and it is asked that you will immediately have these put into position, so that the operation referred to may be carried out under the safest conditions.

The shell body is provided with a side slot, so that the Fuze may be adjusted to the block with the Gaine uppermost. After the Fuze and Gaine are placed in position, the shell body is to be rotated, so that the slot is away from the operator. The stabs are then to be delivered by hand in the prescribed manner.

I am again to remind you that your report as to the present position should be submitted without delay, and so soon as the further safety arrangement, above described, is installed, you are requested to at once communicate this fact.

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To Leeds.

29th March 1916.

I wired you to-day as follows:-

"With reference to letter of 28th assembling Fuzes and Gaine. It is found that Woolwich have supplied Shells suitable for shields without side slot. Amended sketch will be sent by to-night's post." Angus Munexplo London.

In confirmation of this I now send you a further Sketch showing the shield, which is formed from an 18-pdr Shell cut down, suspended over and surrounding the Gaine. It was ascertained that the Shell had been sent from Woolwich without the slot cut in the side, and with the base removed, but the arrangement by suspension will prove quite as efficacious a safeguard as that described in my letter of yesterday.

## ACCIDENTS

I regret to report that at 2.45 on the morning of the 7th inst. an accident occurred in the Fuze Branch of the Royal Laboratory. During the operation of stabbing the adapter to a No. 100 Fuze, the gaine exploded. The operator sustained the loss of three fingers and received in addition a slight wound in the chest, and another man standing by was slightly injured. There was no damage to the building.

Examination showed that the fuze had been correctly assembled and that the needle had not touched the detonator. The cause of the explosion therefore lies between the fuze detonator and the gaine detonator, either or both of which might have been fired by the shock of stabbing.

It does not appear probable that the fuze detonator was at fault, as the detonator had burnt and not detonated.

The gaine detonator was of the Nobel pattern, and as already pointed out verbally (to the Ordnance Committee) this detonator contains certain elements of danger i.e.:-

- (1) The pressure on the fulminate is on the low side.
- (2) The contact of metal with metal is objectionable.

The adapter was only stabbed in one place, and the mark of the punch was well clear of the fuze detonator. Although of course it is impossible to say definitely which detonator was at fault, I am inclined to think that the gaine detonator is the more sensitive of the two and the more likely to be responsible.

The stabbing was being carried out in accordance with the decision on O.F. No. 252/215 i.e. by hand and without complete guards. All the protected machines at present available are being used for what is considered to be the more dangerous operation of stabbing the gaine in the adapter.

The work of provision of extra shields is being urged.

Major Sir J. Douglas should be informed of this accident as early as possible, as he recently visited R.L. to discuss and inspect the methods and safety precautions employed in R.L.

(Signed) V. L. Raven.  
ACTG. C.S.O.F.

9.3.16.

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Messrs. Kent's factory, Luton, 22.3.16.

Fuzes, Percussion. No. 2 Gaine. Accident in assembling Gaine.

A Gaine exploded while a 10-grain detonator was being put into it. The accident was due to the needle, which makes the hollow in the powder pellet of the gaine, having been accidentally left in the gaine, and the detonator, as it was being placed into position, coming into contact with this needle.

They mention that in the filling of the No. 2 gaine, the Company had arranged with the C.I.W. to be allowed to press the powder pellet in the gaine itself, i.e. using the gaine as the mould. In doing this the needle which is used to make the hollow in the pellet occasionally gets detached and left in the gaine. In such cases, the gaine is put aside and the needle separately extracted from it before any further operation is done. In this particular case, by some carelessness, the gaine appears to have been passed on to the next room, where the 10-grain detonator is put into position. The needle was not noticed, and as a girl was gently pressing the detonator down into position it exploded. She received a nasty wound in the hand, and some slight wounds on the face from the fragments of a wooden plunger with which she was inserting the detonator.

Continued/



Steps have been taken to prevent a recurrence of an accident of this nature by not only inspecting the gain between the pressing of the pellet and the insertion of the detonator, but also by the operator who inserts the detonator feeling with a metal plunger to make quite certain that this source of danger is not present.

5.4.16.

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[Circulated to Leeds, Liverpool, Georgetown, Hayes, and Messrs. Vickers, Ltd., Naval Construction Works, Barrow-in-Furness]

10th April, 1916.

C.M.4.Z./455/a/37

Sir,

ACCIDENT AT EXPLOSIVES LOADING CO.'S WORKS, FAVERSHAM.

On April 2nd an accident took place at the above Works resulting in considerable loss of life. The facts of the case are simple, and are as follows:-

A fire broke out in the Boiler House in the immediate neighbourhood of a large Store in which was stored at the time both T.N.T. and Ammonium Nitrate. This Store, or Magazine, was approximately 60 feet long by 40 feet wide, and being of light construction, and not surrounded by a mound, caught fire from the Boiler House. Workers to the number of possibly 200 turned out, and endeavoured to get the fire under. While they were thus surrounding the burning buildings, directing water on to them by means of hand appliances, the Store exploded, resulting in great loss of life. The burning debris from the building set fire to two Fuzing Houses, and several other buildings.

The T.N.T. and Ammonium Nitrate were stored separately, although within the same building. Apparently, however, conditions were favourable to the formation of Amatol, possibly by fusion brought about by the heat of combustion, thus giving rise to the very destructive explosion that occurred.

I am directed to communicate the above facts to you as indicating that T.N.T. and Ammonium Nitrate should not be stored in bulk in the same building, and it is requested that you will issue instructions that this must on no account be done.

I am, Sir,  
Your obedient Servant,  
(Signed) P. A. M. Nash.  
DIRECTOR C.M.4.Z.

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[Notes]

Memorandum of meeting in regard to circulation  
of reports of accidents at Filling Factories.

It was agreed that it was desirable to let all Factories have the benefit of the experience in dangerous operations of all other Factories; that it was not desirable to circulate the details of what happened, or of injury to persons or buildings as the result of an accident. Accidents should not be reported to the Home Office District Inspector, but to Director C.M.4.Z., Administration Section.

(Signed) E. C. Geddes.  
23.3.16.

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Continued/

PRO.MUN4/1540 (Continued)

[Notes]

The jury returned a verdict of "Accidental Death" on the death of Mrs. Atherley. Proceedings were similar to those of the Inquest held on Irene Brady at Hayes.

[Accidents not identified]

15.3.16

Accidents. It is noted that you are paying the injured employees 50% of their wages, and this is in order in accordance with the terms of the Workmen's Compensation Act, 1906.

Ref. Abbey Wood. 3.5.16.

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NOTES OF CONFERENCE BETWEEN THE MINISTER OF MUNITIONS AND BOARDS OF MANAGEMENTBristol and West of England.  
(From Sir Percy Girouard's papers).

A meeting was held at the Council House, Bristol, on Saturday June 12th, 1915, at 4.15 p.m. The Chair was occupied by Mr. Stothert. Sir Percy Girouard was accompanied by Mr. West and Mr. Middleton, to consider a National Factory for shell manufacture. The filling could also be included in the National Scheme. Sir Percy said he wanted them to quickly form their Committee. Then there was the Executive Committee and Board of Management. The latter reports direct to Mr. West's department but the Board must be approved by the Minister. The members of the Board of Management were usually voluntary workers. It was for themselves to decide whether they had a labour member on the Board of Management. Sir Percy Girouard said the Board of Management must consist of the best business men.

[Extract]

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PRO. MUN5/141/1121/12

## DIRECTORY OF MUNITIONS COMMITTEES AND BOARDS OF MANAGEMENT

31st July, 1915.

## WEST OF ENGLAND

## MUNITIONS COMMITTEE.

## Members.

## Employers—

Mr. J. P. Brazil, Messrs. Brazil, Straker & Co.  
 Mr. W. Trimmer, Uskside Engineering Co., Ltd.  
 Mr. C. Lister, Messrs. R. A. Lister & Co., Ltd.  
 Mr. H. G. Hill, Messrs. John Lysaght & Co., Ltd.  
 Mr. R. F. Hodgson, Messrs. Saxby & Farmer, Ltd., Chippenham.  
 Mr. J. E. Thornycroft, Messrs. J. I. Thornycroft & Co., Ltd.  
 Mr. J. J. Steinitz, Gloucester Wagon & Carriage Co.  
 Mr. J. P. Rogers, Messrs. Brecknell, Munro & Rogers, Ltd., Bristol.  
 Mr. W. L. Philip, Messrs. Spencer & Co., Ltd., Melksham.  
 Mr. C. P. Newman, The United Brassfounders, Ltd., Woodchester, near Stroud.  
 Mr. A. Strong, Messrs. H. O. Strong & Co., Ltd., Bristol.  
 Mr. C. E. Hodgkin, Pulsometer Engineering Co., Reading.  
 Mr. H. N. Hickley, Messrs. Newtons Ltd., Taunton.  
 Mr. F. D. Depree, Messrs. Willey & Co., Ltd., Exeter.  
 Mr. W. R. Blakiston, Board of Trade L. Es.

## Employees—

Mr. C. A. James, A.S.E.  
 Mr. W. H. Miller, A.S.E.  
 Mr. A. Wakeham, A.S.E.  
 Mr. J. Flower, A.S.E.  
 Mr. J. Firth, National Union of Gas Workers.  
 Mr. W. C. McStocker, Brassworkers' Union.

Chairman: Mr. P. K. Stothert.

Private address: Wooley Grange, Bradford-on-Avon.  
 Telegrams: "Stothert, Grange, Bradford-on-Avon."  
 Telephone: 4 Bradford-on-Avon.

Secretary: Mr. P. F. C. Williams.

Office: West India House, Bristol.  
 Telegrams: "Munitions, Bristol."  
 Telephone: 5010 Bristol.

PRO. MUN5/150/1121.26/2

DEPARTMENT OF MUNITIONS SUPPLY

To The Chairman,  
West of England Munitions Committee,  
Bristol.

Sir,

I am commanded by the Army Council to authorise the establishment in the West of England of a National Shell Factory on the lines of the scheme which has been drawn up in consultation between representatives of your Committee and of the War Office; and also to proceed with production by co-operative methods in accordance with the provisions of the scheme.

The Council hereby appoint the following gentlemen, who have offered their services to His Majesty's Government for the purpose, to form the Board of Management of the West of England Munitions Committee:-

BOARD OF MANAGEMENT

Mr. P. K. Stothert of Stothert & Pitt, Bath.  
Mr. H. G. Hill of Messrs. John Lysaght Ltd., Bristol.  
Mr. J. D. Brazil of Messrs. Brazil, Straker & Co. Ltd., Bristol.  
Mr. C. A. Lister of Messrs. R. A. Lister & Co. Ltd., Dursley.  
Mr. W. Trimmer of the Uskside Engineering Co. Ltd., Newport.

Authority to proceed has already been conveyed to you, and an advance of £5,000 has been placed to the credit of the Board of Management with Messrs. Parr's Bank Ltd., Corn Street, Bristol, whom the Board have appointed to be their Bankers.

Mr. Stothert to take charge of materials, Mr. Hill of finance, Mr. Brazil of drawings and gauges, Mr. Lister of inspection, and Mr. Trimmer of manufacture. Mr. P. F. C. Williams, West India House, Bristol, appointed Honorary Secretary.

R. H. Brade.  
23.6.1915.

[Extract]

Note. The factory to be suitable for the completion of at least 6,000 18-pdr. H.E. shells per week.

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John Lysaght & Co., St. Vincent's Iron Works, Silverthorne Lane,  
St. Philip's.

Brazil, Straker & Co., Vulcan Iron Works, Chapel Street, Bristol.

## HISTORY OF BRISTOL NATIONAL FACTORY

Prepared in Historical Records Branch  
14.9.20

BRISTOL NATIONAL FACTORY. (1)

On 12th June 1915, Mr. Lloyd George visited Bristol. He then strongly advocated the establishment of a National Shell Factory in addition to a co-operative scheme. The suggestion was acted on and on 23rd June, the West of England Board of Management was authorised by the Army Council to establish a factory. (2)

Premises which would be central for the large and scattered area administered by the Committee had to be found. Works at Bristol, Swindon and Gloucester were examined and Iron Works belonging to J. Priest & Son, St. Philip's Marsh, Bristol were eventually rented for £360 per annum.

Conditions in the area were more favourable to co-operative work, and it was decided to use the factory at first as an assembling place for co-operative shell and develop the manufacturing side later. Tools were collected for the latter purpose, but by the beginning of 1916, it became clear that there was little prospect of turning out shell and the factory has concentrated wholly on the completion of co-operative shell. The total output of finished, inspected and accepted shell has been 3,044,337 18 pounders while 169,673 18 pounders shrapnel have been rectified.

(1) Based on Hist/Rec/H/1121.26  
Hist/Rec/H/1121.5  
A.O. Misc/1394

(2) Through an oversight ministerial approval was not received till 9th August.

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MISCELLANEOUS NOTES**Ammunition.**

MUN4/1656 Total War Office requirements for 4.5" H.E. are 250,000 a week [which includes] 50,000 a week from Woolwich, 20,000 from the trade and three other factories with orders for filling and assembling. Acting DDGC, 5.8.1916.

MUN4/1513 150,000 rounds loaded with H.E. bursting charge to be shipped from Bethlehem Steel Co. and the American Locomotive Co. Contract for complete rounds. No accommodation to receive loaded shell, special arrangements for storage will have to be made with one or two of the National Filling Factories to utilize their magazines. 1.1916.

MUN4/1656 The present flood of incomplete ammunition is understood to be the result of allowing American factories to send in their contracts for completed ammunition piecemeal. 4.1.1916.

MUN4/2528 Q.F. 13pdr. cartridges. Cordite size 8 as supplied (nominally 10.4 inches long).  $5\frac{10}{16}$  oz. cordite bundled together to form the core of the charge 1.1 inches in diameter sewed in two places with silk sewing No.1. Round this core sufficient cordite to bring the total weight of cordite to 1 lb  $4\frac{11}{16}$  ozs. bundled leaving the core projecting 0.75 of an inch at one end. 7.1915.

MUN4/3265 Programme of requirements: 800,000 H.E. and 700,000 Shrapnel 18-pdr. shells per week. Of the shrapnel, 300,000 are to come from Canada. 2.1917.

There is a relative difference of range of 50 yards to the mean point of impact when using cordite and NCT charges in the 18-pr. gun. NCT invariably shooting further. These variables naturally increase the difficulties of Battery Commanders in their efforts to obtain accurate fire. [W.O. to M. of Munitions]. 9.1. & 31.1.1917.

MUN5/180/1300/62 Filling the Shell. ...by pressing in a weighed charge of 80/20 by hydraulic pressure (Leeds, Georgetown and to a small extent Woolwich) or by inserting two compressed blocks of Amatol with a third block of compressed Trotyl between them. Below the gaine, in a small cavity...is a small bag of Trotyl, known as an exploder. This bag, which is about  $2\frac{1}{2}$ " long, is filled with pure Trotyl powder by special machines which have done away with the very dusty and noxious process of hand filling which used to give great annoyance to the workers.

The Assembling. The Inspection Department sees that each component has passed all necessary proofs and tests, and bears the necessary marks. Each round is chamber gauged to ensure its being concentric, and that it will load in the gun.

H.E. shell manufacture goes through 29 machining operations, and Shrapnel, 40. The number of components of an 18-pr. H.E. round is 71, and Shrapnel, 66. The fuze is made from a brass rod or stamping from a billet and goes through 30 machining operations. 6.1917.

MUN5/187/1340/49 Lecture Papers. One advantage of NCT is that it is possible to control the rate of burning to give more even pressures. In the 4.5" Howrs. for instance, a charge of NCT is used which gives the same muzzle velocity as a charge of cordite but with the reduction of 10% to 14% in the maximum chamber pressure. Our latest propellant is Flake Cordite. It is of the same composition as R.D.B. but is produced in square flakes, somewhat similar to ballistite. Its greatest advantage is that it can be poured into a cartridge, and so the tying and forming of cores etc., is avoided.

Propellants are not easy to ignite. At an explosion of a propellant magazine... about 10 tons of cordite and a similar quantity of ballistite and two or three barrels of powder blew up. Where the magazine had been was only a depression in the ground. If the fingers were passed through the loose soil anywhere in this depression it was found to be full of un-burnt cordite, evenly distributed in the soil, and un-burnt ballistite was distributed in such quantities over the surfaces of the neighbourhood that it seemed impossible that more than a very small quantity had exploded. Yet all these propellants had been in one room 50' square, no trace of which remained. This will emphasize that ignition does not take place with great facility.

[MUN5/187/1340/49] Fixed Ammunition. When the cases arrive at the Filling Factory they have to be carefully washed, as if there is any trace of acid or alkaline substance inside this is liable to affect the propellant, and if chemical action once starts in a propellant it is liable to spread readily, and the propellant may then explode spontaneously.

Delay mechanism...as the fuze acts on impact, some means has to be employed by which the flash from the fuze is delayed from reaching the detonator of the gaine until the projectile has passed through the wall [of a building]. This is done by means of the copper delay cup containing a quantity of mealed powder and on top is placed a gunpowder pellet. The flash from the fuze detonator through the shutter meets the mealed powder in the delay cup and as this powder burns more slowly than gunpowder, the flash is delayed for a small fraction of a second.

TNT is manufactured by the action of nitric acid upon toluol. This, however, can give rise to a very large number of products of which the ordinary TNT we wish to use is only one. 1918.

MUN4/6332 Ammunition at RAOD Newhaven to be railed to Richborough, from whence it will be dumped from Cross Channel Barges. 27.1.1920.

#### Factories and Depots.

MUN4/1656 Leeds, Liverpool, Glasgow and Gloucester were all laid down to complete the same capacity of goods and that they must consider themselves in competition with one another...this will result in a healthy competition. Maurice Graham, 29.1.1916. [Director, CM4(P).]

Attempted Zeppelin raid on Chilwell factory on night of 31.1 - 1.2.1916.

MUN5/186/1340/24 Hereford. Decided upon in the spring of 1916 as an insurance against disaster at Chilwell. Labour has always been difficult to obtain at Hereford. Factory built by Messrs. Mowlem & Co. Ltd., London. [MUN2].

Processes at Hereford: A considerable amount of pure TNT is required for the finishing of shells 4.5" and upwards. This "finish" consists of an annular lining of TNT which is either pressed or poured into the cavity between the amatol and the exploder container, into which the gaine and the exploder are inserted. Pure TNT contains no oily matter. Steel and glued card containers used.

Hot mixed 80/20 process: Hot dry ammonium nitrate is mixed with melted TNT, the result of the mixture being much in the nature of a bran mash. When filled by screw filling, no subsequent mechanical pressing is required. Filled by hand, the mixture is introduced into the shell by ramming with a wooden rammer.

Banbury. Factory designed for Lyddite, a much more sensitive explosive than amatol. The buildings are all designed so as to be entirely free from any metal which could possibly form dangerous combinations with picric acid. The buildings are separated by very heavy traverses. 9.1917.

MUN4/4587 Bramley AOD Stores. Built with some PoW labour/H.M.O.W. In view of this Depot no longer being required in connection with the storage of output from the National Filling Factories which have now practically ceased, to complete the scheme as decided upon by the War Office it is considered that the further sanction required should be given by the War Office. GAF 11.1.1919

Quedgeley AOD Stores. Balances: £16,136 8. 1. 30.4.1920.

AOD stores were built by the Ministry of Munitions for the War Office and were utilised as the places for reception of the output of the various filling factories.

MUN4/6294 HM Magazine, Ellesmere. Standard magazine: 319 ft. x 108 ft. with two loading platforms, 27 ft. x 11 ft. 6 ins., connected by corridors 46 ft. 6 in. x 8 ft. 6 in. and a sampling room 20 ft. x 14 ft., magazine change room with barrier. Walls, breeze blocks, cement coated on the outside, total thickness 5 in. approximately. Corrugated asbestos roof.

[File contains reports on Pembrey, Ellesmere, RAF Northolt, Morecambe, Hardwick, Farlington, Credenhill and others.]

MUN4/6199 List of CSD Depots. Credenhill, Herefordshire. War Office Depot. Depot No. 474. Government buildings for sale. 15.6.1922.

MUN2/8 28.4.1917. New Central Stores Branch started work on Monday 23.4.1917. [Combining a number of storage departments. MUN5/393/2000/1]

MUN5/393/2000/1 Explosive magazines. Disused tunnels were adapted and hulks on the Thames and the Sloyne (Liverpool) were also used.

MUN2/14 Proposed National Magazine near Normanton Hill: Messrs. Pauling & Co., construction managers for ESS are engaged on the construction of a new magazine at Barnstone Sidings between Loughborough and East Leke. Due to labour supply to inaccessible site, the GCR are to construct a platform adjacent. 2.3.1918.

MUN2/16 New works: Oxshott Ammunition Dump in lieu of Newbury. 13.7.1918. Oxshott: Brent Brick & Lime Co's brickworks for ammunition dump taken this week under DORA. 20.7.1918.

MUN4/4973 Northolt Magazine No. 97: guarding. Maj. M Browne (War Office) to Brig. Gen. Fortescue, Disposal & Liquidation Commission, Earls Court, re letter from magazine superintendent: In regard to frequent change of guards, I fear this is inevitable, and I do not think 4 changes in over 6 weeks is bad. You cannot keep Defence Force personnel, whose discipline is only skin deep tied up for long periods of guard duty. Even allowing 50% out on pass does not eradicate the sense of imprisonment to the improvised soldier. 11.5.1920.

MUN4/1411 & MUN4/1716 The Metropolitan Munitions Committee (appointed by the Ministry of Munitions), Perivale Factory, Coronation Lane, Willesden, London NW.

Transfer of Perivale factory from the board of management to the Ministry on 10.7.1916: As the factory expanded, it was found that direct communication with Mr. Allcock was essential on all working details, and as this was rather resented by the board, Sir Eric Geddes decided that the factory must be transferred to the Ministry for productive purposes, and after necessary negotiations with the Perivale board, this was duly effected.

MUN4/1397 Banbury factory replaced projected amatol factory at Bushey Lodge, Watford, abandoned as unnecessary and difficulties of site for sidings.

MUN4/1576 Horley fuse filling sheds and stores, not danger buildings, 1.1916. Built by Read & McDonald, 16 Cork Street, Bond Street, London, W.

MUN2/16 Surplus Stores Department. The preliminary steps in the organisation of the department are now practically completed. 21.9.1918.

MUN5/353/360/4 Controlled factories. The original purpose of control was to obtain the removal of all Trades Union restrictions and practices calculated to reduce output.

MUN2/17 Acetone factory, Speech House Rd. New sidings sanctioned w/e 5.10.1918.

MUN5/381/1540/1 Functions of Explosives Storage Section.

14. Supply filling factories.

15. Keep filling factories fully supplied.

#### Hostels.

MUN5/346/118 The object of a clearing hostel is to house and look after the girls imported into munition areas by the Employment Exchange, until they can find suitable permanent lodgings.

MUN2/15 Hereford. New hostel required. 25.5.1918. Sanctioned w/e 29.6.1918.

MUN2/16 Hereford. Rotherwas House (150 persons) to be vacated by the military for use as hostel accommodation. [Also listed, premises used as hostels].

#### Holidays.

MUN4/3879 To Mr. S Dannreuther, D G of Munitions Finance.

I beg to inform you that the Department's proposal for the cancellation of holidays in 1917 has been considered by the War Cabinet, who have decided that



[MUN4/3879] the Easter holidays in England and the Spring holidays in Scotland shall not be interfered with. An announcement to this effect will appear in the Press immediately. [Sgd] P G Hurst. [undated].

#### Labour.

MUN7/462 Women examiners. Managements of National Filling Factories will supply Danger Building outfits as worn by the factory employees to women examiners. It is probable the Inspection Department will issue a special badge or armband, but in other respects, their costumes will be identical with that of the Danger Building workers. M of M 29.6.1916.

[The inspection department supervised the operations and checked assembled and empty components].

MUN4/1520 [To Leeds] The filling factories engage their own overlookers and send them to Woolwich to undergo a course of training organised by Department C.M.4. (late A.M.4.). While these ladies are at Woolwich, each factory makes them such allowance for expenses as is deemed suitable and in addition, pays them 30/- a week - which is the rate they subsequently receive in the factory, when their period of training is over. Major Yewdall was, therefore, quite in order in engaging overlookers at 30/- per week, and allowing them a subsistence allowance of 15/- a day while at Woolwich. Women who have trained under the auspices of the C.I.W. as inspectors of the completed manufactures sent out from the factory are not appointed by the factory, neither are they in any way subject to the factory authorities. They are under the control of an outside authority, - the C.I.W. - who, of course, fixes their rate of pay, which in the case of workers destined to be subsequently stationed at Leeds, seems to have worked out at £1 per week, plus subsistence allowance, running down from 4/- per week. 25.1.1916.

MUN2/12 Strike ended, NFF Hereford. About 1,000 women struck on 9th October and returned the following day. Women are in a very "jumpy" state. A slight explosion and air-raid tension have unnerved the girls. W/e 27.10.1917.

MUN2/15 Bricklayers engaged by a contractor building an aerodrome were dismissed on two hours' notice under local conditions prevailing. Tribunal awarded a week's wages at Gloucester, 27.3.1918.

MUN2/9 Henbury factory. Restrict the erection to one half the size originally contemplated. Two units instead of four. W/e 21.4.1917.

MUN5/92/346/38 Toxic jaundice. Between 1st January and 14th August 1916, 20 males and 6 deaths, and 42 females and 12 deaths had been notified to the Chief Inspector of Factories by the attending surgeons of all trade and national factories.

MUN5/94/346/35 Three factories not alternating from TNT handling in 1916: Chilwell, Leeds and Morecambe. Of 7,500 workers there have been 85 cases of toxic jaundice, out of which 25 have died. Hayes, Georgetown and Aintree, which are alternating, had only 9 cases, out of which 2 have died.

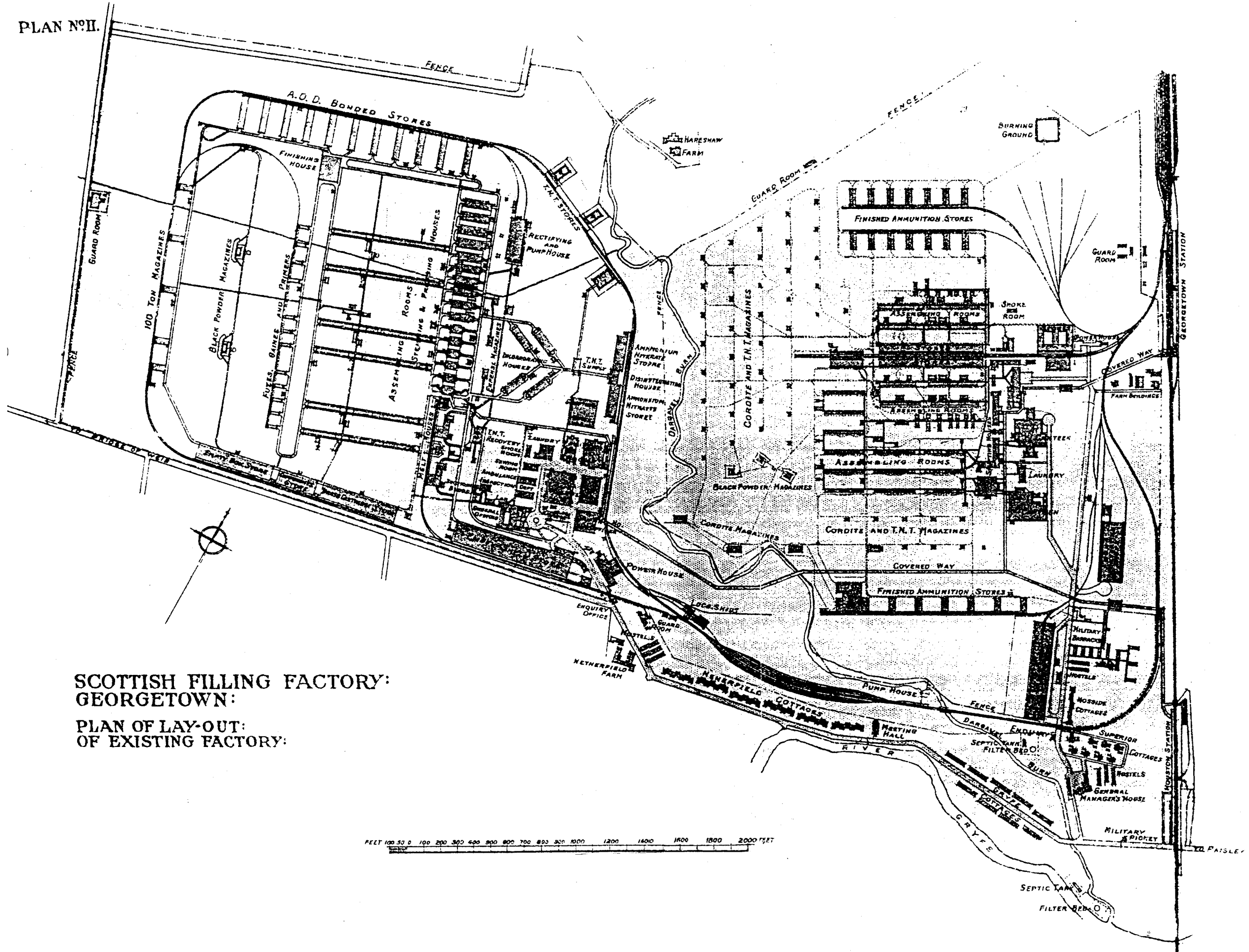
#### Materials and Handling.

MUN7/360 The output of TNT per week is now about 3,000,000 lbs i.e. 60,000 boxes each containing 50 lbs. Woolwich 19.6.1918.

TNT is packed in bags for transport and packed in wooden cases and these are often very roughly handled in process of opening. The bags are pulled out, emptied straight on to an endless band or other type of conveyor and the TNT goes straight into process. 26.10.1918. [Live match heads and pieces of wood found in TNT ex Queensferry works].

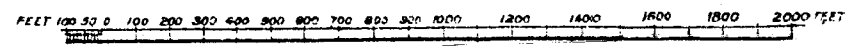
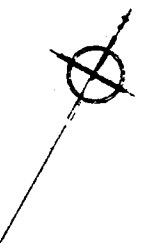
MUN5/393/2000/1 [History] Cut in raw materials caused by submarine menace and entry of USA into the war - shipping used to transport troops and stores. On 1st February 1918, the reduced filling programme was approved.

MUN5/155/1122.3/54 [Publication] Leeds: Every article of production had to be examined and passed by the Inspection Department. This inspection was under the control of the War Office [representatives] and the examiners were specially trained on the premises.



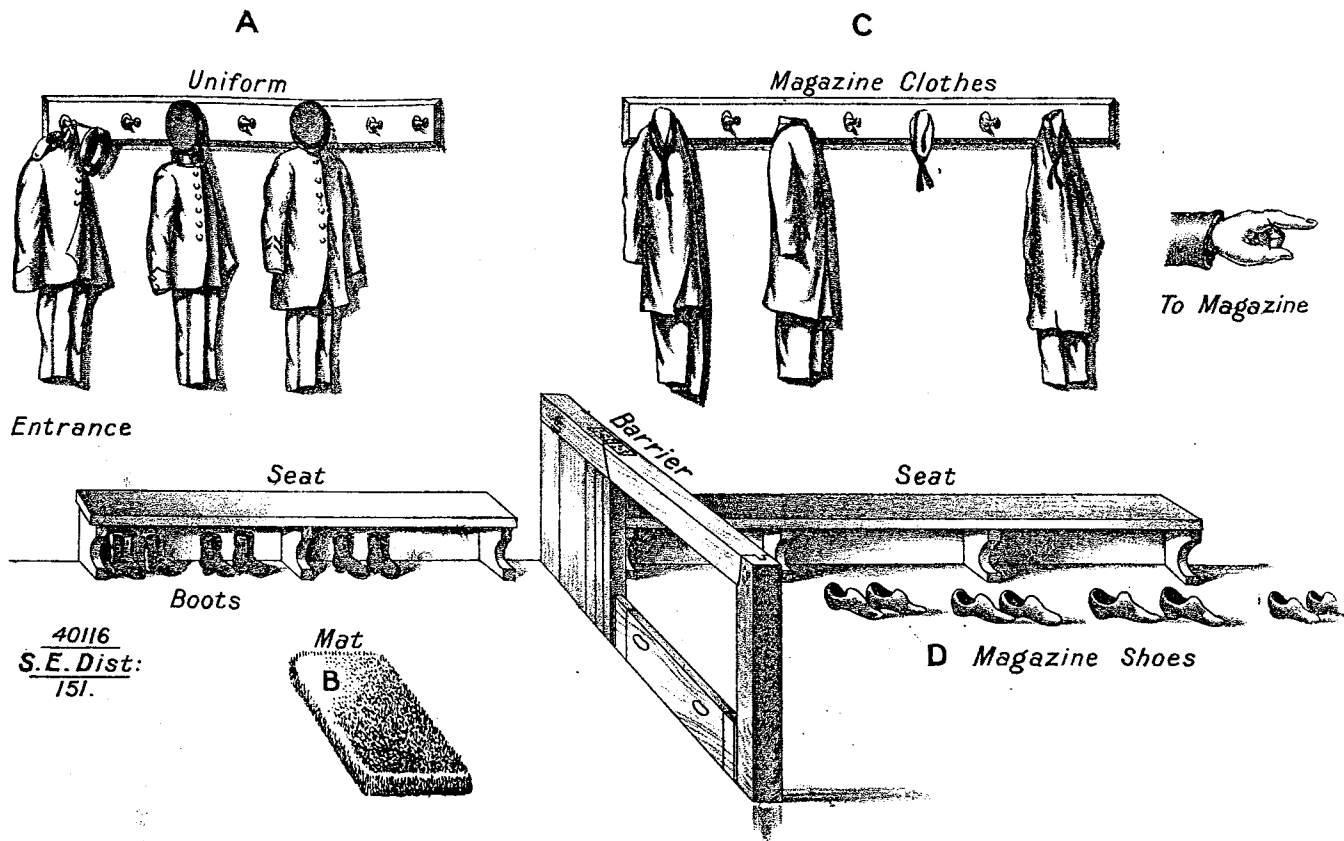
SCOTTISH FILLING FACTORY:  
GEORGETOWN:

PLAN OF LAY-OUT:  
OF EXISTING FACTORY:



(Referred to in paragraphs 47, 60 and 61)

**TO BE READ AND EXPLAINED TO THE MEN.**



40116  
S.E. Dist:  
151.

1. Wipe your boots on mat B and take them off.
2. Take off your uniform and hang it on the pegs A.
3. Pass over the barrier in your socks; then put on the magazine clothes C. and shoes D and go to your work.
4. Inspecting officers should put each foot in succession past the barrier and draw the magazine goloshes over their boots.
5. On leaving the Magazine the order of the above directions will be reversed.

**NOTE** Neither Magazine Clothes nor Shoes must ever be taken outside the barrier nor must uniform or boots be ever brought inside it. If the magazine shoes are allowed to collect grit, they are just as dangerous and as likely to make sparks as boots.

**SECTION II.**

**Magazine Conditions.**

44. The following precautions are to be observed in magazines and laboratories when containing explosives.

45. Lighting fires or smoking is strictly prohibited in or near any of these buildings; any soldier or sailor employed on the premises infringing this rule, or attempting to enter with tobacco pipes, tobacco in any form, matches, or with any combustible, or exposed iron or steel articles, in his possession, or having the least appearance of intoxication will be placed in custody.

46. In the case of Ordnance Depôts care is to be taken that men from other departments are duly warned as to these regulations on each occasion of their entering the premises.

47. No one, except on duty, will be permitted to pass the entrance barriers.

Before entering, all persons will :-

- (a) Search all their pockets for prohibited articles, and deposit them outside the magazine entrance.
- (b) Turn down the ends of their trousers or overalls, and brush off any mud or grit which may be upon them.
- (c) Rub their boots on the mat, and take them off.
- (d) Step over the barrier into the special magazine shoes provided. But Officers will retain their boots, and will step over the barrier into special overboots.

The diagram (Plate I) and instructions (A.F. G. 949) show the place where the change of boots should be effected. Copies of this form will be attached to boards and hung up in convenient positions for the information of those concerned. The instructions on the form regarding magazine clothing apply to magazines and laboratories in A.O.D. and N.O.D. charge and R.A. laboratories when laboratory operations are being carried out, *vide* para. 60.

48. No person whatever is to be permitted to walk upon any clean floors or platforms (that is, such as are within the barrier and under magazine conditions), unless wearing the special shoes above referred to; nor, while wearing these shoes, is he to walk anywhere except upon the clean floors and platforms.

49. The floors and platforms will be kept scrupulously clean, and the latter frequently watered in dry weather. The interior,

[MUN5/155/1122.3/54] In 1916. 150 railway trucks were handled a day. By autumn 1918, the figure had grown to 600 - 700 trucks. Textiles: Barnbow's supply was obtained from Textile Stores in Leeds - controlled by the same directing board but constituted a separate department - which formed the main distributing centre for all the filling factories in the UK.

MUN5/154/1122.3/35 Georgetown Official History: The shifting house was equally divided into a "dirty side" and a "clean side" by a barrier painted red. The was a numbered peg for clothing on the "dirty side" and a corresponding numbered peg on the "clean side." Barrier attendants were responsible for seeing that each person passing into the "clean side" was clear of prohibited articles. QF finishing house: All the filled 6" shells were passed through for stencilling and weighing. Shells were run over the stencilling table which was fitted with rubber type and banding strip blocks with springs to keep them in contact with the shells. They were then reloaded onto trolleys and passed to the finished ammunition stores. Ponies were used for animal traction.

Workers' train fares of 2/6 were paid by the factory which officially closed on 30.11.1918. 1,500 workers were retained for clearing up, handling stores, stocktaking and ancillary services.

The factory was built by Messrs. Robert McAlpine & Sons. The district was named Georgetown on the visit by the Minister of Munitions, David Lloyd George, on 24.12.1915.

MUN5/186/1340/28 [Publication] After assembling the 18-pdr round was gauged in the chamber gauge and afterwards fitted with a primer No.1. [Georgetown].

#### Transport.

MUN4/4209 Quotation for providing and laying plain line materials for siding: £2 2s per lineal yard, i.e. rail, sleepers, bed plates or chairs, trenails, etc. Set of switches and crossing, £24 laid. Not including one foot depth of ashes. 9.2" Projectile Factory No.1., Newlay.

MUN5/393/2020/2 [History] Questions relating to siding accommodation for national factories were submitted for confirmation and the work ordered through the War Office and Railway Executive Committee.

MUN2/8 Sidings and New Works. Orders for the following works have been passed during the week: HMF Henbury - Extensions to platforms at Montpellier, Clifton Down, Shirehampton and Avonmouth Dock stations. A siding made into a loop at Clifton Bridge. Additional platforms and sidings at Avonmouth and St. Andrews Road. New platform and sidings on Sneyd Park Junction Loop for workmen's trains at Hotwells. W/e 28.4.1917.

RAIL491/1133 Credenhill: Additional sidings for AOD 15.2.1917 - 22.11.1917. Completed 17.12.1917. Yate: Extension of siding for WO 10.5.1917 - 27.9.1917. Reported complete 18.10.1917. Cost £551 18. 2.

MUN2/11 W/e 25.8.1917 Employees at GAC Cheltenham, living at Gloucester, have been arriving about 10 minutes late. There is only one train available and the station at which they alight is 20 minutes walk from the factory. Arrangements have been made for the train to be stopped at Malvern Road station which was closed in January last, allowing workers to reach the factory in 6 minutes.

MUN2/12 W/e 6.10.1917. Hereford. In connection with the fire at Morecambe, a large number of workers have transferred to NFF Hereford. Special trains to run from Leominster and Ross to Hereford, morning and night.

W/e 13.10.1917 With a view to improving transport facilities, it has been decided to erect a station inside NFF Hereford, built by the GWR.

MUN2/13 W/e 10.11.1917. Blackpole GCF: New halt. Railway Co. asked to proceed immediately.

MUN2/16 W/e 28.9.1917. Hereford. Railway strike, Bristol. NFF Hereford feared work would be retarded, but special trains ran from Swindon with material. The factory experienced a shortage of TNT from Queen's Ferry.

MUN4/1716 Messrs. Curtis and Harvey: Production of 18-pdr. H.E. pressed charges - January and February 1916, 100,000 per week.

MUN4/1438 Bonding of ammunition arriving from the US and Canada at Plymouth and Liverpool involves cartage from the docks to the store and subsequent re-issue on to rails. 12.11.1915.

#### Post War Disposals.

Cohen and Armstrong contracts, 1923. The Commission has entered into a contract under which it is employing Messrs. Geo. Cohen and Messrs. Armstrong Whitworth to sell certain effects which we still have for disposal. MUN4/6228

MUN4/6188 Tipton explosion, 3.1922. Brass and metal foundry, Groveland Road, Dudley Port, Tipton. Breaking down .22 ammunition. Cartridge inserted in a bar in which there was a hole and wrenching bullet away. Explosion caused roof of building to be blown away killing 19 girls.

MUN5/141/1020/5 Publication "Surplus" 16.6.1919.

National Concrete Slab Factory, Yate, Gloucestershire.

For sale by private treaty. The following is a brief description:-

SITUATION: About one mile from Chipping Sodbury, on the main road to Bristol. Adjoining Yate (M.R.) Goods and Passenger station. AREA: 18a. 1r. 9p. (about) including Quarry. BUILDINGS: Mostly constructed of concrete posts and slab panels, with slate roofs on timber principals and reinforced concrete floors. The principle buildings comprise: Crusher Building (3 floors), total area 10,920 ft. sup.; Casting Sheds, total area 43,200 ft. sup.; Joiners' Shops, total area 7,300 ft. sup. Other buildings consist of Offices, Store and Smithy, Garage, Reinforcing Shop, Heavy Stores, Power House, and Lavatories. Total ground area of buildings, 61,000 ft. sup. (about). POWER AND LIGHTING: Electric, generated on the premises. HEATING: Steam and Stoves. WATER: Part from Well on property and part from Public Main. OFFICE ACCOMMODATION for 20 clerks.

"Surplus" 1.9.1919.

H.M. Wood Distillation and Acetone Factory, Coleford.

SITUATION: About two miles from the town of Coleford on the main road to Monmouth, and adjoining Speech House Road station (Severn and Wye Joint Rly.)

[Extract]

#### Selected Biography.

Sir Eric Geddes, 1875 - 1937: Chmn Dunlop Rubber Co., Imperial Airways Ltd. Took over from Sir Frederick Black as DDG of Munitions Supply 1915 - 1916; DG of Transportation on staff of C-in-C British Army in France, 1916 - 1917. First Lord of the Admiralty 1917 - 1918...

Col. Sir Percy Girouard, 26.1.1867 - 26.9.1932: DG of Munitions Supply, 1915.\*

Hurd, J.E.A. Army List, 1916 - The King's Royal Rifle Corps. (Rifle Depot), 17th (Service) Battalion (B.E.L.) Temp. Lieutenant 9.8.1915; 19th (Reserve) Battalion 16.2.1916.

Lowry, Thomas Martin, 26.10.1874 - 2.11.1936: Assoc. Member of the Ordnance Cttee from 1916; Advisory Member of the T.W. Cttee 1917 - 1919; Director of Shell Filling 10.1917 - 6.1919; Lecturer on Chemistry 1904 - 1913, Council of Chemical Soc., 1912 - 1916, Vice President of same, 1922 - 1924, Vice President Faraday Soc., 1913 - 1919 and 1927 - 1928, President of same, 1928 - 1930.

Brig.- Gen. Lionel Charles Patrick Milman, 1877 - 1962: Entered RA 1900; Instructor in artillery, R.M.A., Woolwich 1910 - 1914. Joined Ministry of Munitions January 1916; CGAF from July 1916, retired 1919. Captain 1912, Major 1915. Gen. Mgr. ICI Ltd., South Africa and, later, Birmingham 1919 - 1923. Director S.A.A. Dept., Ministry of Supply 1940 - 1946.

\* Sir Glynn West, like Sir Percy Girouard, was on loan to the Government from Armstrong, Whitworth. Early in June 1915 West became technical assistant to Sir Percy at the W.O. and under the M of M he was made DDG under Girouard and later under Sir Frederick Black of the department of shell manufacture.

(From The Great Munition Feat 1914-1918 by Geo. A. B. Dewar. Constable & Co.)

Moir, Sir Ernest William, 9.6.1862 - 14.6.1933: Engineer and designer, home and abroad. Latterly a director of S. Pearson & Son Ltd. of London, contractors for public works. Member of the Admiralty Engineering and Civil Engineering Cttee and reviewed before and after the First World War proposed modifications and improvements in the Government schemes for naval bases; was one of the Council of the Ministry of Munitions; founded the Inventions Branch of the Ministry and acted under four Ministers between 1915 and 1919; was on Mr. Churchill's Munitions Council during his term of office.

Army List:-

January 1915 & 1916. Gradation List of Officers of the British Army.

Quarter-Masters.

Stoyle, William. (Hon. Lt. 24.10.1906) d.o.b. 3.5.1862. In Ranks 15yrs.362dys. Wt. Off. 10yrs.117dys. R. Eng. 24.10.1906.

January & July 1917: M.C. (Hon. Capt. 24.10.1916)

April 1918: M.C. (Hon. Maj. 1.1.1918)

Warrant Officers in receipt of pensions:

Stoyle, Serjt-Maj. William, R. Art., 20.12.1911.

Army List, June 1918:

Royal Regiment of Artillery. Temporary Lieutenants.

o.d. Serving with  
the A.O. Dept.

Stoyle, W. (Temp. Capt. 10.10.1916) o.d. 12.12.1914.

Retired Officers &c., Temporarily Employed.

Stoyle, Temp. Capt. W., R.F.A. 10.11.1915.

M.C. Recipient of  
Military Cross.

Royal Engineers. Quarter-Masters.

Stoyle, W. M.C. 24.10.1906. Hon. Maj. 1.1.1918.

Army List, December 1918:

Royal Regiment of Artillery. Temporary Lieutenants.

Stoyle, W. (Acting Maj. 17.10.1918) o.d. 12.12.1914.

Royal Army Ordnance Corps.

Stoyle, W. Temp. Capt. (Acting Maj.) R.F.A. 10.11.1915.

Royal Engineers. Quarter-Masters.

Stoyle, W. M.C. (Temp. Maj. 1.1.1918) 24.10.1906. Maj. 1.1.1918.

Army List, January 1919:

War Services of Officers of the Army.

Stoyle, W. (Temp. Lt. R. Art.)-

South African War, 1899 - 1901:- Advance on Kimberley, including actions at Belmont and Modder River. Operations in the Orange Free State, including operations at Paardeberg. Operations in the Transvaal, including action near Johannesburg. Despatches, London Gazette 10.9.1901 and 29.7.1902. Queen's medal with 5 clasps.

Stoyle, W. (Maj. Qr.-Mr. R. Eng.)-

The War of 1914 - 1918. Despatches, London Gazette 1.1.1916 and 23.12.1918.

Granted hon. rank of Maj. M.C.

Army List, January 1922:

Stoyle, William, M.C. Date of first commission 24.10.1906. Regiment from which retired and date of retirement, R. Eng., 1.9.1919. Date of Rank 1.1.1918.

Army List, 1913:

Strange, Harry Bland. d.o.b. 16.9.1864. Ret'd R.A. 6.2.1907.

Sources of English Explosives, 3.2.1917.

TNT: HMF Oldbury; Queensferry; West Gorton; Litherland.

Cordite: RGPF Waltham Abbey; HMF Gretna; Pembrey.

Note- Triton is TNT from USA. Azurite is TNT from Canada.

From: Britain's Railways in Wartime by Anthony Lambert.  
Historic England / Railway Heritage Trust, 2018

The labour-intensiveness of munitions production required special trains for workers. To deliver the workforce to the largest wartime factories, the GWR ran 360 extra trains a day to factories such as those in Hayes, Avonmouth and Henbury near Bristol, Pembrey in South Wales and Queensferry near Chester. The Midland Railway served 258 munitions factories, the GWR served 47 ammunition works and storage depots.

The carriage of munitions was naturally fraught with danger and governed by elaborate precautions. An incident which nearly became a precursor of the 1944 Soham catastrophe occurred in 1917, when the 1.45 pm Gloucester to Salisbury goods train was nearing Charfield in Gloucestershire. GWR goods guard Kilminster saw that one of the wagons was on fire and succeeded in attracting the attention of the driver, who stopped the train. It was discovered that the wagon contained explosives, so Kilminster uncoupled the wagon and the crew drew it beside a water column and extinguished the fire. There is no record of any recognition of their bravery. [GWR Magazine, December 1917].

**NATIONAL FILLING FACTORY  
GLOUCESTER**

**Transcript of interview with  
Mrs. Lucy Ellen Reeder (b. 9.1.1900)  
27 Cotswold Road  
Cashes Green  
Stroud  
Gloucestershire**

**17 June 1995**



I worked at Hill Paul's and we did look out the window and see the soldiers coming onto the station and going off. We heard that they wanted some people to go to Quedgeley and my sister went and her said "you come, you'll be getting more money than you'll be getting there." I said "I'm not old enough" and she said "we'll work that" so I went along to Lansdown, the Stroud Mutual, and they was taking on these people.

You had to buy a ticket to go on the railway and you would go from Stroud to Gloucester and then get off onto a railway line that was made up for that purpose. Then at night we would come back to Gloucester and go back that way and I went down there to work. In the summer we did walk from Randwick through the park and then down by the Holy Well down into Brookthorpe and then over to Quedgeley. That was where the filling station was. There was tons of powder there and that's why we had to have shoes on, what we called clean shoes and dirty shoes and if you did step off the clean side you had to take your shoes off and clean them - you didn't have to have a spot of dirt or anything.

We had to be very, very careful what we did put in. We worked on all the powder - gunpowder. I wasn't thinking about what sort of shell it was, I was thinking about earning the money. Everybody had to be searched as we did go in. Our menfolk - my young man and Win's young man - they was both in the army look, and they did send us a letter every day and because we didn't go that way we didn't meet the postman. But the friends that did go and catch the train would have our letters and bring them and we did put them down our back. They searched my sister once and her had one down her back. That didn't make no difference but you had to be so careful look. A man got searched and found some matches and he was sent to prison. Well it could have blowed us all up and he didn't do it purposely, it was a mistake, but mistake or not it was dangerous.

I got down by Holy Well and I forgot me pass. I didn't go back and when we get to the gates there's a policeman on the gates look and the policeman had to take I in to see if I was... but they got so used to I and they did say I did only forget me pass 'cos the policeman should take I in.

I was always up for devilment. When the overseer did come in I was always stood on me head! There was some that did take the shells and pack 'em and one day - you could tell what devilment I was up to - I'd say, "I keep putting my name and address on these boxes and I don't get ne'rn letter from ne'rn soldiers." We used to have some fun.

We had to change all our top clothes and then we had to put trousers on and coats. We only had to have a handkerchief, we couldn't take anything else across. When my sister had that letter there was a notice on her peg, 'you're expelled for two days'. Miss Cann was the one over we. There's only so many in one room look. The shells were ever so big and we had to fill them. We had to push it down in like that with a rod 'till just level. It didn't have to be a bit over ne'rn a bit under, then we screwed the top on.

We did get into trouble once we were having some fun. They did bring the trollies to take the things what we... we did fill 'em and the next put 'em in the cases look to send them away. We had two or three girls, they were some bright little sparks and so we pushed 'em on this thing and the trolley went and took 'em all the way down and they had to walk back. They got the sack 'cos they had their magazine shoes on. Course they daren't get on the platform when they got back. It was very strict there.

It was all delivered by trolley and that man that brought the trolley didn't dare get on... and we didn't dare get on... he had to put it off there. I don't know where they take 'em to. We didn't get out of our huts, we were doing the work and we didn't get out to do nothing, only to put the things off, that's the only time we did get out. We was inside all the time while we was at work. It all had to be done by hand look, and the next shop to we, when we filled 'em they'd go in there and pack 'em look, in the next shop. They wasn't packed in the same room as we was, we did fill 'em and put 'em out for the next shop to be packed. We knowd it was vital look, that's the thing, we couldn't slack. There was more overseers than workers.