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## **NOR**

Reports of Sir Henry Norman to the Ministry of Munitions,  
1915-1919

Compiled by Penny Rawle  
Edited by Robert Sharpe

## NORM

Norman was the liaison officer, based in Paris, between the British Ministry of Munitions and the French Ministry of Inventions. His reports were produced for the British Ministry's Munitions Inventions Department. Collection Comprises c.850 reports, (some of which are duplicates), including a number of special reports and letters.

## BOX 1

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| 1  | 1916 Jan 31   | 1. Notes on the official organisation of military inventions in France, [also containing proposals for British Representatives to be appointed to French inventions office] 4pp |
| 2  | -             | - On a single and cheap 'illuminating arrow'. [Designer] Pierre Bourdiol. 4pp   |
| 3  | -             | - A French pneumatic Trench mortar; [with description of 8 photographs (not included). Manufactured by Boileau-Debadis] 10pp  |
| 4  | [1916] May 27 | - A new type of trench gun to fire 110 lbs of High Explosive. [Designer M. Claude. Ms. diagram attached] 13pp   |
| 4b | -             | [Draft of above] 13pp + 16pp  |
| 5  | -             | - [Re readiness of 'complete set of the "System C.W." for locating guns by sound'. Chief inventor Pierre Weiss. In continuation of report no.7] 3pp                             |
| 6  | 1916 Apr 5    | 12. "C.S. Paper", a new method of testing an atmosphere for the presence of poisonous gas. [Inventors H Cardot & Paul Sacerdote] 6pp  |
| 7  | 1916 Apr 5    | 13. New method of collective protection against asphyxiating gas. [Uses system of dug-out and trench with earth filter. Designer Maj. Louis Lapique] 15pp                       |
| 8  | -             | 14. A French time-fuse for trench mortars. 3pp  |

8a	-	[Draft of above] 11pp
9	[1916]	14a. A variable time fuse for trench mortars. 3pp
10	1916 Apr 25	19a. Details of the "Brillié" range-finder [with electrical automatic transmission based on principle of Wheatstone Bridge] 5pp
11	-	20. An improved method of making incendiary bombs, grenades & shells. [Uses agglutinated iron oxide and aluminium, "Calorite", with similarities to "Thermit". Inventor C. Delechaux] 10pp
12	[1916 Apr]	[Notes on below] 2pp
12a	1916 Apr 21	21. The incendiary bullets used in France against aircraft. 4pp
13	-	22. [Notes on] Capt. Perrin's new submarine ecouteur. 2pp
14	1916 Apr 21	23. A new light machine-gun support. [13 lbs compared w3ith 70 lbs for tripod. Inventor Capt. Merlet] 3pp
15	[1916] Sept 19	23a. [Letter for transmission to Dr Haldane re Cardot & Sacerdote's "C.S." sensitised paper] 1p
16	1915 Oct 1	27. [Rough notes to Trench Warfare Supply Dept. with specifications and costs of some French guns] 7pp
16a	1916 Apr 21	27. On the new trench mortar & Shells adopted for the French army. 9pp
17	1916 Apr 20	29. A proposal for exterminating the enemy by the use of toxic microscopic dust. [Proposed by French engineer Gaudet] 4pp
18	1916 Apr 27	- A French lateral periscope. [Invented by M. Brocq to fit the Lebel rifle] 2pp
19	-	30 & 31. [Notes on] Range-finders, including sketch] 4pp

20	1916 Apr 23	32. A French excavating machine [the Piocheuse Electrique Trouchet, designed by M. Tronchet] 24pp
21	1916 Apr 21	34. An electro-magnetic method of range control of 75mm anti-aircraft gun. [Inventor F Brocq] 4pp
22	1916 Apr 27	37a. [High explosive content of French and English shells; referring to report no.37] 2pp
23	[1916] May 13	41. [Powder employed as propellant in the French mortars of 240mm. ["B. Sp." - nitrocellulose powder made in small spirals; Italian ballistite - 50% nitroglycerine] 7pp
24	-	42. A carburator for Kerosene & heavy oils. [The "Aldo" carburator] 4pp
25	-	43. Results of firing-tests of the Westinghouse trench Mortar (To be attached to Report No.27) 5pp
26	-	44. A rolling shield against machine-gun fire. 3pp
27	-	47. A new method of collective protection against a gas attack. [Devised by Maj. Nicolaidi; consists of combustible 'sausages' being ignited and causing displacement of air along the trench line; also uses black gunpowder and charcoal to produce smoke] 5pp
28	[1916] May 22	48. A folding cleaning-rod [for military rifles. Inventor Arthur Modiano] 2pp
29	[1916] May 22	49. French steel and cast iron shells. 8pp
30	[1916] May 23	50. Subterranean torpedoes [French and Italian] 10pp
31	[1916] Jun 15	50a. [Note to accompany set of drawings re report no.50] 1p
32	[1916] May 23	51. A new trench-gun to fire tailed 75mm

		& larger shells. 7pp
33	[1916] May 23	52. The French percussion fuze IA 24/31 1915. 2pp
34	[1916] May 23	53. Luminous landmarks to facilitate aircraft bombardment by night. [Inventor Fernand La Brie] 3pp
35	[1916] May 23	54. A new portable barbed-wire entanglement. Designer Capt. Planson] 4pp
36	[1916] May 23	55. Imitation gun-fire to mislead the enemy. [Ribbon with small packets of magnesium ignited electrically, by hand or automatically] 2pp
37	1916 May 30	56. A new type of trench gun to fire 110 lbs of High Explosive in a penetrating projectile. [Inventor Georges Claude] 8pp
38	-	56. [Particulars of subterranean torpedoes. 7pp
39	[1916] Jun 2	58. Firing-tests of the Vanduren (Westinghouse) mortar. [Refers to reports 27 & 43, 51 & 56] 16pp
40	[1916] Jun 5	61. A new system of suspension for wheeled gun-carriages. [Designer Lt. Saillard] 5pp
40a	[1916] Jun 5	[Copy of above] 2pp
41	[1916] Jun 14	61a. The Saillard suspension for wheeled gun-carriage. [Note accompanying technical description and drawings of above] 2pp
42	-	63. A new French High Explosive and bomb. ["Anilite" - mixture of peroxide of nitrogen and saturated hydrocarbon. Inventor Ferdinand Gros] 7pp
42a	[1916] Jun 8	[Copy of above] 3pp
43	-	65. Colonel Ferrié's permission to translate his pamphlet upon mine-listeners. 2pp

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50	-	74. A new commercial method of producing sulphur, soda, &c [by M. Hildt] 8pp
51	-	75a. A new acoustic method of signalling from the front, continued. [Further developments to Capt. Prof. Perrin's method put forward in report no.75 of 1916 Jun 25] 3pp
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		& NO2 separately. 2pp
56	-	84. Incendiary anti-aircraft shells. [Designed by Capt. Otto. Further to report no. 21 of 1916 Apr 21] 3pp
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57	-	85. A new Mechanical hand-driven bomb-thrower. [Inventors Borde & Morel] 8pp
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60	-	88. Incendiary shrapnel against aircraft (Otto). [Report to accompany drawings and photographs. Refers to reports nos. 21 [of 1916 Apr 21] and 84] 6pp
60a	1916 Aug 11	[Copy of above] 3pp
61	-	89. A bullet-proof petrol-tank. [Inventor Lanser] 3pp
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66	-	96. A new ballistic method for heavy projectiles. [Inventor Paul Olive] 6pp
67	-	97. A machine for flinging wire to repair

		breaches in wire entanglements. 4pp
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68	[1916 Aug 16]	99. A device for rendering troops & guns invisible. [Consists of cord net covered with artificial waterproof greenery. Inventor Comm. Kopenhagen] 2pp
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69	-	100. A French trench-digging automobile, [The Legrand-Normand-D'Haille] 2pp
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- 92 - 124. A French paste, called "obturalless" for stopping leaks in petrol and oil tanks & pipes. [Inventor Robert Faucou] 9pp
- 93 - 127. The Benazet-Leblanc rolling shield. 6pp
- 94 - 128. The Jouhandeau-Deslandres trench-mortar with interchangeable barrels to fire tailed shells. [A continuation of report no.51 of 1916 Jun 23] 8pp
- 95 - 129. French G.H.Q. Report on electric rifle-barrel & field-glass signalling devices. 3pp
- 96 - 130. The Claude gun with viscous support. [A continuation of report no.56 of 1916 May 31] 7pp
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252	1918 Apr 1	431. A new design of electric steel- furnace (Sarron-Simon). 1p
253	1918 Apr 1	432. The purchase of Claude gun & projectiles. 2pp
254	1918 Apr 1	433. A new material for filling life-belts & rafts (Lanfrey). 2pp
255	-	434. A proposed method of rendering merchant ships torpedo-proof. 2pp
256	1916 Jan 20	[Details of 'Cabinet technique'] 2pp
257	1916 Jul 31	[Copy letter from Joffre to G.H.Q. requesting them to place an order for a further 10 million "V.B." rifle-grenades] 4pp
258	1916 Sept 30	[Copy letter to Command Paymaster, Base, B.E.F., re hospital debits] 3pp
259	1916 Nov 22	[Copy letter to the Minister, being a review of his work as Liaison Officer with the French authorities] 6pp

260	1918 Apr 3	[Copy letter to Maj. Clark, with queries] 3pp
261	1918 Apr 9	[Copy letter to Prime Minister from Secretary of State for Air, being a statement of his position and responsibilities] 14pp
262	1916 Sept 16	A Note for Mr. G H Mair upon the wireless transmission of British news to neutral & enemy countries ... 14pp
263	-	[Note on the state of liaison for invention between French and British governments] 5pp
264	1918 Apr 14	[Newspaper photo of Maj. Gen. F. H. Sykes, new chief of the Air Staff]
265	-	[Odd pages from reports and rough index of reports 156 to 163] 5pp
<b>BOX 2</b>		
1	-	1. Notes on the official organisation of military inventions in France. 4pp
2	-	2. Note on a new French device for hearing submarine sounds. 2pp
3	1916 Jan 31	3. Notes upon the method employed by the French Army for locating subterranean sounds. 5pp
4	1916 Mar 21	5. Report on Capt. A. M. Low's aerial torpedo. 11p
4a	1916 Mar 21	[----- as above -----]
4b	1916 Mar 23	[Letter from Dr A. M. Low re above] 1p
5	1916 Apr 2	8. [Analysis of composition of the body of Zeppelin LZ 77] 3pp
6	-	9. A new "Boite Acoustique" or "Listening Box" for Trench Use. 7pp
7	-	10. A new French method of locating submarine sounds. [Capt. Prof. Perrin] 10pp
8	-	11. A French Combustible Paper. 1p

9	1916 Apr 5	12. "C.S. Paper", a new method of testing an atmosphere for the presence of poisonous gas. 3pp
9a	1916 Apr 5	[----- as above -----]
9b	-	[Version of above, in French. Cardot & Sacerdote] 4pp
10	1916 Sept 19	12a. [Note re comments of Cardot & Sacerdote on the R.A.M.C. report on their sensitised paper "C.B."] 1p
11	1916 Apr 5	13. A new method of collective protection against asphyxiating gas. [L Lapique] 3pp + illus.
12	-	14. A French Time-Fuse for Trench Mortars 2pp
12a	-	[----- as above -----]
12b	-	[Notes re above] 2pp
13	1916 Apr 21	14a. A variable time fuze for trench mortars. 1p
14	-	15. A method of distinguishing British from German uniforms at a distance. 1p
14a	1916 Apr 6	15a. [Report in French re above by M. C. de Watteville] 2pp
15	1916 Apr 8	16. Baskets for Pigeons & Bombs [with notes, and letter from Ministry of Munitions requesting the report] 5pp
16	-	19. French anti-aircraft range-finder in operation near the British front. 2pp
16a	-	[Copy of above] 2pp
17	-	20. An improved method of making incendiary bombs, grenades & shells ["Calorite"] 3pp
17a	-	[Copy of above]
17b	1916 Apr 11-12	[Letter re and notes on "Calorite", as above] 4pp

18	1916 Apr 21	21. The incendiary bullets used in France against aircraft. 1p
19	1916 Apr 21	22. A new French instrument for detecting submarine sounds. [Capt. Perrin] 3pp
20	1916 Apr 21	23. A new light machine-gun support. 2pp
21	1916 Apr 20	24. Certain proposals by a Swiss Inventor for improved illuminating Parachute Rocket etc. [Hamberger. With extract from letter of Apr 10] 4pp
21a	1916 Apr 21	[Copy of above report] 2pp
22	1916 Apr 20	25. On a French prismatic sketching apparatus. - 2pp
23	1916 Apr 20	26. On a French proposal to put rifling on the outside trench mortar. 3pp
23a	-	26a. [Drawings of mortar shell] 2pp
24	1916 Apr 21	27. The new trench mortar and shells adopted for the French Army. 3pp
25	1916 Apr 20	28. On the valves in use in France for radiotelegraphy & radiotelephony. 4pp
26	1916 Apr 20	29. A proposal for exterminating the enemy by use of toxic microscopic dust. [Gaudet. With letter of Apr 11 and Gaudet's report] 4pp
27	-	30. The long-base range-finder in use by the French army for fixed anti-aircraft batteries. 10pp
28	-	31. A new French altimeter for fixed anti-aircraft batteries. 7pp
29	1916 Apr 23	32. A French excavating machine by Tronchet. [With notes in French] 10pp
30	1916 Apr 25	33. On signalling from the advanced front by means of Earth-currents. 16pp
31	1916 Apr 26	36. A new French carburetor for aeroplane

		motors. 8pp
32	[1916] Apr 28	37. A proposal to supply more powerful shells for British F.A. 1p
32a	-	[Part copy of above] 1p
33	[1916] Apr 28	37a. [Weight of H.E. shells. With note re safety of French shells] 2pp
34	[1916] Apr 28	38. A French pneumatic Trench mortar. [With Note sur le mortier pneumatique système Boileau-Debladis] 12pp
35	[1916] Apr 28	39. A simple and cheap "illuminating arrow". [Bourdiol. With letter from Bourdiol] 4pp
36	-	40. A simple method of locating enemy guns & machine guns by sound. 4pp
37	[1916] May 13	41. The propellant used in 240mm Mortar. 3pp
38	[1916] May 15	43. Information regarding results of firing-tests of the Westinghouse trench mortar. [See report no.27 of 1916 Apr 21] 2pp
39	[1916] May 16	44. A rolling shield against machine-gun fire. [Benazet-Leblanc] 2pp + drawing
40	[1916] May 18	45. A new French seaplane. [Roulier] 3pp
41	-	46. Signalling with Earth currents. [Continuation of report no.33 of 1916 Apr 25] 5pp
41a	[1916] May 19	[Copy of above] 2pp
42	[1916] May 19	47. A new method of collective protection against a gas attack. [Dr. Nicolaidi] 2pp
43	[1916] May 22	48. A folding cleaning-rod [Modiano. With German advertisement] 3pp
44	[1916] May 22	49. French steel & cast iron shells. 3pp
45	[1916] May 23	50. Subterranean torpedoes. 6pp



46	[1916] Jun 15	50a. The Italian subterranean torpedo [to be attached to Report No.50 of May 23] 1p
47	[1916] May 23	51. A new trench-gun to fire tailed 75mm & larger shells. 3pp
48	[1916] May 23	52. The French percussion fuze IIA 24/31, 1915. 1p
49	[1916] May 23	53. Luminous landmarks to facilitate aircraft bombardment by night. 2pp
50	[1916] May 23	54. A new portable barbed-wire entanglement. [Designer Planson] 2pp
51	[1916] May 23	55. Imitation gun-fire to mislead the enemy. 1p
52	[1916] May 31	56. A new type of trench gun to fire 110lbs of High Explosive in a penetrating projectile. [Claude] 13pp
53	[1916 May 30]	57. A new commercial method of producing hydrogen, soda, sulphur & its derivatives. [Hiltdt] 4pp
54	[1916] Jun 2	58. Firing tests of the Vanduren (Westinghouse) mortar. [Continuation of Reports Nos. 27 of Apr 21 and 43 of May 15] 6pp
55	[1916] Jun 5	59. Stereoscopic views from aircraft. 1p
56	-	60. [Signalling with Earth-currents. '... latest pattern French buzzer is known officially as "Parleur T.M.No.2"] 13pp
56a	-	60. Signalling with Earth-currents. [Continuation of Reports Nos.33 of Apr 25 and 46] 6pp
57	[1916] Jun 14	60a. Earth-current signalling [to be attached to Report No.60] 2pp
57a	[1916] Jun 14	[Copy of above] 1p
58	[1916] Jun 5	A new system of suspension for wheeled gun-carriages. [Saillard] 2pp + sketch

59	[1916] Jun 14	61a. The Saillard suspension for wheeled gun-carriage [to be attached to Report No.61] 1p
60	-	62. The vacuum valves designed & employed by the French Military Telegraphs. 4pp
61	[1916] Jun 8	63. A new French High Explosive, and bomb. [Ferdinand Gros] 3pp
62	-	64. The "Billioque" anti-aircraft range-finder & fire-control. 11p
63	[1916] Jun 8	65. Colonel Ferrié's permission to translate his pamphlet upon mine-listeners. 1p
64	[1916] Jun 24	65a. French T.M. pamphlet on listening methods. 1p
64a	1916 Sept 16	65b. The Pamphlet upon methods of hearing subterranean sounds. 1p
65	[1916] Jun 9	66. The new French "V.B." rifle grenade and discharger. [Viven & Bessière] 3pp + drawing
66	[1916] Jun 15	68. Telescopic masts, "Mors" system. In continuation of Report No.18] 2pp
66a	-	[Draft of above] 4pp
67	[1916] Jun 16	69. The "Daigre" bullet-proof shield. 1p
68	[1916] Jun 15	70. A rifle-rest for trench use. [Lt. Pitet] 5pp
69	-	71. A new method for the commercial recovery of ether. 13pp
69a	[1916] Jun 22	[Copy of above] 5pp
70	[1916] Jun 22	72. The use of Nitroguanidine in the manufacture of explosives. [Lts. Daniel & Bregat. With notes by them] 6pp
71	[1916] Jun 22	73. To destroy enemy crops by fire. [Prof. Giordano] 2pp
72	[1916] Jun 24	74. A new commercial method of producing sulphur, soda &c. [To accompany Report No.57. Hildt] 2pp

72a	[1916] Jun 24	[----- as above -----]
73	[1916] Jun 24	75. A new acoustic method of signalling from the front. [Capt. Prof. Perrin] 8pp
73a	1916 Jun 25	[Copy of above] 5pp
74	-	75b. A new method of acoustic signalling from the front. 2pp
75	-	75b. The Perrin Acoustic Signalling Apparatus. 7pp
76	[1916] Jun 27	76. The urgent delivery of 100 French valves. 3pp
77	[1916] Jul 24	78. Suggested flexible bullet-proof material. [Antonin Parouty] 1p + notes & business card
78	1916 Jul 25	81. The supply of Nitrogen Peroxide. 2pp
79	1916 Jul 25	82. Further particulars regarding the explosive "Anilite". 2pp
80	-	83. A secret proposal for the destruction of long enemy lines by the use of Anilite. 1p
81	[1916] Jul 26	84. Incendiary anti-aircraft shells. 2pp
82	1916 Jul 27	85. A new mechanical hand-driven bomb-thrower. [Borde & Morel. With additional report no. 85a of Oct 24 re same] 6pp
83	1916 Jul 27	86. The Hand or Rifle Grenade "H.B." [With French report re same, and additional note by Norman of Aug 12] 8pp
84	1916 Jul 28	87. A new model French percussion rifle-grenade "D.R." 2pp
85	1916 Aug 11	88. Incendiary shrapnel against aircraft (Otto). 3pp
86	1916 Aug 11	89. A bullet-proof petrol tank. 2pp
87	-	90. A new method of radiogoniometry for peace & war. 15pp
87a	1916 Aug 12	[Copy of above] 6pp

87b	1916 Aug 12	[Copy of above] 6pp
88	1916 Aug 12	91. The Benazet-Leblanc mobile shield and armoured ammunition-cart. [With notes by Leblanc and business card of Benazet] 6pp
89	-	92. A semi-automatic rapid photographic printer. 6pp
90	1916 Aug 14	93. The Production of Nitric Acid in France. [With notes by A. Debieme, and copy letter of 1916 May 19 from William Pearce] 9pp
91	1916 Aug 14	94. The French rifle-grenade with hollow rod. 1p
92	1916 Aug 16	95. A new electrical method of hearing distant aerial sounds. Inventor Prof. Rothé] 3pp
92a	-	[Draft of above] 7pp
93	1916 Aug 16	96. A new ballistic method for heavy projectiles. 3pp
94	1916 Aug 16	97. A machine for flinging wire to repair breaches in wire entanglements. [Torres]. 2pp
95	-	98. An Italian "Datimetre" for land and anti-aircraft fire. [Inventor Capt. Boniti]. 4pp
95a	1916 Aug 16	[Copy of above, with additional report no. 98a re same of Sept 19] 3pp
96	1916 Aug 16	99. A device for rendering troops and guns invisible. [Kopenhagen] 2pp
97	1917 Oct 22	[Cutting from Sunday Times re 'Invisible Warfare]
98	1916 Aug 16	100. A French trench-digging automobile. [With report no.100a of Sept 8] 2pp
99	1916 Aug 16	101. The Delamare-Maze elastic artillery wheels. 2pp
100	1916 Aug 19	102. Concerning the "V.B." rifle-grenade. 2pp
101	1916 Aug 19	103. Day and night signalling by means of rockets. 2pp

102	1916 Aug 19	104. A French hexagonal rolling armoured gun-carrier, [with 5 small photos attached] 2pp
103	1916 Aug 19	105. A resilient platform for heavy trench -mortars. 2pp
104	1916 Aug 19	106. Chemical for protective mask against chloropicrine. 1p
105	1916 Sept 8	107. A new asphyxiating, lachrymatory and smoke-producing gas. [Dr Bertrand] 4pp
106	1916 Sept 8	108. A French automatic fastener. 2pp + advertisement
107	1916 Sept 8	109. An improved form of identity-disc. 2pp
108	1916 Sept 9	110. The asphyxiating gas now used by the Germans. 1p
109	1916 Sept 9	111. A new surgical water-closet fitting. 1p
110	1916 Sept 13	112. A resilient platform for heavy trench mortars. [See report no.105 of 1916 Aug 19] 5pp
111	1916 Sept 13	113. Protection of the eyes against splinters. 2pp
112	-	114. A new method of treating iron & steel turnings. 3pp
112a	1916 Sept 16	[Copy of above] 2pp
113	-	115. A cheap & simple French percussion fuze. 2pp
113a	1916 Sept 16	[Copy of above] 1p
114	1916 Sept 18	116. The Brandt pneumatic trench-mortar and its projectiles. 9pp + 3 photos
115	1916 Sept 19	117. Non-skidding device enabling automobiles to traverse snow and ice. 1p
116	1916 Sept 19	118. French incendiary arrows to set fire to balloons. [With printed, illustrated 'Note sue le Fléchettes Incendiaires "Pacton"'] 4pp

117	1916 Sept 21	119. The synthetic production of Nitric Acid in Italy. 2pp
118	1916 Sept 21	120. French Government plants and processes for the extraction of Bromine from sea-water. 5pp
119	-	121. An Austrian illuminating-star discharger. 2pp
120	1916 Oct 23	122. A French system of "nomograms" to facilitate artillery range-finding. 12pp
121	1916 Sept 29	123. Italian proposals for submarine and aircraft construction. 1p
122	1916 Sept 30	124. A French carrying-girth. 3pp
123	1916 Oct 2	125. A French paste called "Obturaless" for stopping leaks in petrol and oil tanks and pipes. [Robert Faucou] 3pp
124	-	126. A new French aeroplane wireless set (Ronzet system). 9pp
125	1916 Oct 3	127. The Benazet-Le Blanc rolling shield. [In continuation of reports nos.44 of 1916 May 16 and 91 of 1916 Aug 12] 2pp
126	1916 Oct 3	128. The Jouhandeau-Deslandres trench-mortar with interchangeable barrels, to fire tailed-shells. [In continuation of report no.51 of 1916 Jun 23] 3pp
127	1916 Oct 16	129. French G.H.Q. Report on the electric rifle-barrel and field-glass signalling devices. 1p
128	1916 Oct 16	130. The Claude gun with viscous support. [In continuation of report no.56 of 1916 May 31] 3pp
129	1916 Oct 16	131. The Blish Breech Closure. 1p
130	1916 Oct 16	132. Nets for rendering men and guns invisible from aircraft. [In continuation of report no.99 of 1916 Aug 16]
131	1916 Oct 17	134. A stretcher made of metal tubing. 1p

132	1916 Oct 17	135. The "V.B." rifle grenade. [In continuation of reports nos. 66 of 1916 Jun 9 and 102 of 1916 Aug 19] 2pp
132a	1916 Oct 17	[Copy of above] 2pp
133	1916 Jul 31	[Copy letter from Gen. Joffre referred to in report no.135 above] 2pp
134	1916 Oct 17	136. A method of reducing the erosion of guns. [With French note of Sept 29] 6pp
135	1916 Oct 17	137. The Italian centrifugal bomb-thrower. [Gori and Minucciani] 4pp
136	1916 Oct 18	138. Long-range rockets for signalling to aircraft. [With letter in French attached] 3p
137	1916 Oct 18	139. Cases of fibre, to replace leather, for military use. [With letter in French attached] 2pp
138	-	140. Official instructions for the use of the Perrin system of acoustic liaison. [In continuation of reports nos. 75 of Jun 25 and 75a & b] 9pp
138a	1916 Oct 18	[Copy of above, with letter in French from Borel & Perrin attached] 6pp
139	-	142. Professor Perrin's further experiments in the detection of submarine sounds. [In continuation of reports nos.10 & 22] 5pp
140	1916 Oct 21	143. Another French eye-protecting device. 2pp + advertisement
141	1916 Oct 21	144. The Begonin apparatus for mechanotherapy. 1p
142	1916 Oct 24	145. Coloured films for distinguishing friendly and enemy uniforms etc. [De Watteville. With note in French of Oct 22] 5pp
143	1916 Oct 26	146. A new cheap French Shrapnel hand-grenade (Lestorte). 2pp
144	1916 Oct 25	147. The making of clinical thermometers by German prisoners of war in France. The foundation of a new industry. 4pp
145	1916 Oct 26	148. New method of Lubrication of internal

-combustion engines. [Dr Marc Letang] 4pp

146	1916 Oct 27	150. A process of metallising linen or canvas for the manufacture of trench boots, and of waterproofing nets and cables. 2pp
147	1916 Oct 28	151. The Production of powdered silica in France for the manufacture of explosives, firebricks etc. 2pp
148	1916 Oct 30	152. The Perrin acoustic signals for aeroplanes. [In continuation of reports nos. 75 & 140] 5pp
149	1916 Oct 30	153. Portable panels to enable infantry to signal to aircraft. 1p
150	-	154. A small alternator for earth current or W/T signalling. 3pp
151	-	155. Further particulars of the Ferrié radiogoniometry. [In continuation of report no.90 of 1916 Aug 12] 3pp
151a	1916 Nov 16	[Copy of above] 2pp
152	-	156. The microphone & recording arrangements for gun-locating by sound. 1p
153	-	157. Professor Rothe's Electrical method of hearing sounds. [In continuation of report no. 95 of 1916 Aug 16] 2pp
154	1916 Nov 16	158. Construction of the Belgian bullet-proof petrol tank. [In continuation of report no.89] 1p
155	-	159. Instructions for the use of the Sagnac listening apparatus. 1p
156	-	160. Supply of Plug-sockets of French W/T valves. 1p
156a	1916 Nov 18	[Copy of above] 1p
157	[1916] Nov 19	161. Ferrié radiogoniometric W/T apparatus for the Admiralty. 2pp



158	[1916] Nov 19	161a. Memorandum in reply to further Admiralty letter upon supply of Ferrié radiogoniometric apparatus. 12pp
159	-	162. A proposed machine-gun with multiple projectiles. 2pp
159a	1916 Nov 20	[Copy of above] 2pp
160	1916 Nov 22	163. A simple sighting and ranging device for trench-mortars (Barnier). 2pp
161	-	164. The Frigorific Recuperation of volatile liquids, e.g. ether. [Refers to report no. 71 of 1916 Jun 22] 7pp
161a	1916 Nov 24	[Copy of above] 3pp
162	1916 Nov 25	165. The Percussion Petard "O.P.1." with double safety device. 3pp
163	1916 Dec 6	166. Formulae for manufacture of red and yellow smoke signal grenades. 2pp
164	1917 Jan 16	167. The Claude Gun & Viscous Support. [In continuation of reports nos. 56 pf 1916 May 31 & 130 of 1916 Aug 16] 1p
165	1917 Jan 16	168. The Brandt pneumatic mortar: trials in England. [In continuation of report no. 116 of 1916 Sept 18] 2pp
166	1917 Jan 16	169. Design of Capt.Otto's incendiary shrapnel for British Shells. [In continuation of reports nos. 21 of 1916 Apr 21, 84 of Jul 26 & 88 of Aug 11] 1p
167	1917 Jan 16	170. Portable barbed wire entanglements for the offensive. [Lt. Margot] 2pp
168	1917 Jan 16	172. A Micrometric Correcting Sight for Aircraft machine-guns (Courquin). 1p
169	1917 Jan 22	174. Adaptation of British rifle to "V.B." rifle grenade. [In continuation of reports nos. 66, 102 & 135] 2pp
170	-	175. New type of Perrin acoustic liaison apparatus. [In continuation of reports

nos.75, 140 & 152] 5pp

171	1917 Jan 23	176. New type of bomb-thrower for aeroplanes. 1p
172	1917 Jan 26	177. Making of clinical thermometers by German prisoners. [In continuation of report no.147 of 1916 Oct 25] 2pp
173	1917 Jan 26	178. Confidential information upon the Armament of Italian Aircraft. 1p
174	1917 Jan 26	179. The Chauchat rifle-mitrailleuse. 2pp
175	1917 Mar 20	180. Another rolling shield for machine-gun protection. 1p
176	1917 Mar 23	180a. [In continuation of above] 2pp
177	1917 Mar 21	181. A confidential French pamphlet upon the preparation and regulation of artillery fire. [Emile Borel] 1p
178	1917 Mar 21	182. A movable motor-capstan for use in the field. [Inventor Hochon] 2pp
179	-	183. The new Italian Caproni bombarding triplane. 3pp
179a	1917 Mar 21	[Copy of above, with attached notes and calculations] 4pp
180	1917 Mar 21	184. A new French design of cycle-machine gun. [Blanchard] 2pp
181	1917 Mar 21	185. A new type of artificial arm. [Arnal. With note of 1917 Jan 5] 2pp
182	[1917] Mar 21	186. A new aluminium alloy (Cohen Bacri). 4pp
182a	1917 Mar 21	[Copy of above] 2pp
183	1917 Mar 21	187. A secret French patent method for waterproofing boots (Novel). [With letter, in French from J Novel of 1917 Jan 24] 4pp
184	1917 Mar 21	188. Machines for milling and polishing the insides of shells (Bille). 1p

- 185 1917 Mar 21 189. A direct-reading anti-aircraft chrono-telemetric apparatus (Routin & Le Prieur). [With note in French] 2pp
- 186 1917 Mar 21 190. A patent machine for grinding dies for bullets (Sizaire). [With letter re same of Feb 17] 2pp
- 187 1917 Mar 21 191. An instantaneous or delayed-action fuze to detonate shells on contact with water (Corne). 1p
- 188 1917 Mar 21 193. A new simplified type of service rifle. [Frank Gardner] 2pp
- 189 1917 Mar 21 194. A French official report upon Italian aeroplanes etc. 1p
- 190 1917 Mar 21 195. A releasing apparatus and parachute for use with captive balloons (Robert). 1p
- 191 1917 Mar 21 196. New hand-tools for excavating galleries etc without noise (Tanneveau). 1p
- 192 1917 Mar 21 197. A mechanical delayed-action fuze, giving a delay of from one second to one week (Ditisheim). 2pp
- 193 1917 Mar 22 198. The Italian Minucciani bomb-thrower. [In continuation of report no.137 of 1916 Aug 17]. 2pp
- 194 1917 Mar 23 200. A French projectile for longer ranges. 1p
- 195 1917 Mar 23 201. A percussion hand-grenade to be thrown from aeroplanes. [Boris Serguéeff. With two notes in French re same] 3pp
- 196 1917 Mar 23 202. A cheap message-carrier to be thrown from aircraft. [With note in French re same] 2pp
- 197 1917 Mar 23 203. A simple French patent method of rendering the two parts of a shell-body gas-tight. [Marcel Begaut] 1p
- 198 1917 Mar 23 204. Italian methods proposed for the destruction of wire entanglements at a distance. 1p
- 199 [1917] Mar 23 205. An indicator of sudden rises of temperature

		for fire-alarm (Guasco). 3pp
200	1917 Mar 23	206. A Swiss device for facilitating the handling of heavy cases. [With letter in French of 1917Jan 6 re same] 2pp
201	1917 Mar 23	207. The despatch of a collection of French signal rockets. [With letter in French re same] 4pp
202	1917 Mar 23	208. Man-lifting kites for observation of mines or submarines, or land operations (Panténier). 1p
203	[1917] Mar 23	209. A clinometer to give the range for rifle-grenades. 2pp
203a	1917 Mar 23	[Copy of above] 1p
204	[1917] Mar 24	210. Utilisation of the phenomenon of surfusion for the cooling of internal-combustion engines & machine-guns (Jansen). 4pp
204a	1917 Mar 23	[Copy of above, with report in French by Jansen attached] 5pp
205	1917 Mar 23	211. Italian projectiles for asphyxiating and lacrimogenous gas. 1p
206	1917 Mar 24	212. The Otto incendiary shrapnel shells etc. 3pp
207	1917 Mar 23	213. The situation as regards the explosive "anilite". 2pp
208	1917 May 1	213a. Captain Otto's Anilite (Panclastile) Aeroplane bomb. 1p
209	1917 Mar 24	214. The Delamare-Maze artillery wheels. [In continuation of report no.101] 1p
210	1917 Mar 24	215. The Galanti cuirass. [With letter of Mar 6 in French re same] 3pp
211	1917 Mar 25	219. A machine for cabling telephone-wires at the front. 1p
212	1917 Mar 25	220. A micrometric semi-automatic sight-

		corrector for aeroplane guns. [In continuation of report no.172 of 1917 Jan16] 2pp
213	1917 Apr 18	223. Electrically-warmed aviators' clothing. 2pp
213a	1917 Dec 10	[Postscript to above] 1p
214	1917 Apr 21	224. A rudder-bar clutch for aeroplane. [Inventor Lt. S. J. Prevost de St Cyr] 2pp
215	1917 Apr 21	225. Cheap waterproof rest-boots for soldiers in billets (Lacoste). 1p
216	1917 May 2	226. The supply of Cerium (Vescovacci). 1p
217	1917 May 8	227. Selective relays for Audible Signals, & short-range W/T sets. 3pp
218	1917 May 2	228. Captain Otto's combined tracer and incendiary Shrapnel Shell. [In continuation of reports nos. 21, 84, 88, 169 & 212] 1p
219	1917 May 8	229. The Doyen trench-mortar. 3pp
220	1917 May 8	230. A new high-frequency alternator (Girardeau). 2pp
221	-	- The latest Perrin listening & speaking cones. [Refers to report no.218 of 1917 Mar 25] 6pp
222	1917 May 13	231. A new method of cooling machine-gun barrels and motor-cylinders (Debauge). 3pp
222a	1917 May 13	[Copy of above] 3pp
223	1917 May 14	232. Anti-aircraft gunnery (Dobrski and Bethoux). 1p
224	1917 May 14	233. A delayed-action exploder (Winsback). 2pp
225	1917 May 14	234. New base for 80 and 90mm field-guns. 2pp
226	1917 May 15	236. A French rifle-howitzer (Nivert). 2pp
227	1917 May 16	237. The Szepczynski body shield. 2pp
228	1917 May 25	238. A French device for attaching field-glasses to helmet. [Lesieur] 1p

229	1917 May 26	239. Protective metal leggings for infantry. [Gaston Mondolfo] 1p
230	1917 May 26	240. A method of telephonic communication with a marching soldier. [Bret, Lasserre, Judas] 3pp
230a	1917 May 26	[Copy of above] 3pp
231	1917 May 28	241. A French secret patent for mineral tanning of leather. [Paul Dapsence] 2pp
232	1917 May 28	242. A new French machine-gun ranging-level. [Capt. Saillaut] 1p
233	1917 May 30	243. Supply of raw silica. [Refers to report no. 151 of 1916 Oct 28] 1p
234	1917 May 31	244. French long-range rockets. 2pp
235	1917 Jun 1	245. A new design of cable railway for the front. 1p
236	1917 Jun 2	246. A new patent automativ and indicating safety petrol tank (B.C.R.) [Sgt. Copetta] 5pp
237	1917 Jun 5	251. A French army lantern for bright and dim light (Ariane). 1p
238	1917 Jun 7	252. A new firing-mechanism for guns, trench-mortars etc (Forgeat). 2pp
239	1917 Jun 8	253. Improved equipment for carrying and using Lewis guns in action, [With illustrations] 8pp
240	-	254. A new French material for glazing huts etc (Dryvers). 3pp
240a	1917 Jun 9	[Copy of above] 1p
241	1917 Jun 11	255. The Pupin paralleloscope. [With postscript of 1917 Sept 26] 3pp
242	1917 Jun 11	256. A French lenticular hand-grenade, with Mills fuze-ignition (Chaussat). 1p
243	1917 Jun 11	257. An experimental demonstration of a new electro-magnetic method of detection

		and destruction of enemy submerged and surface craft (N.B.V.) 8pp
244	-	258. Further information upon the Hildt process of producing sulphur. [Refers to reports nos. 57 of 1916 May 30 and 74 of 1916 Jun 24] 12pp
245	1917 Jun 12	259. Italian methods of mine-perforation. 1p
246	1917 Jun 13	260. A new apparatus for revealing dangerous vapours in ships' magazines etc (Nicolardot). 3pp
246a	1917 Jun 13	[Copy of above] 3pp
247	1917 Jun 14	261. A new portable type of flame-projector (Chapal). 4pp + photo
248	1917 Jun 15	262. Tools for filling sandbags and for silent mining (Tanneveau). [Refers to report no.196 of 1917 Mar 21] 4pp
249	1917 Jun 18	263. New information regarding NO2 bombs and explosives. 3pp
250	1917 Jun 18	264. Improved shells for 37mm gun and a new 20mm automatic gun. [Dourlen] 3pp
250a	1917 Jun 18	[Copy of above] 3pp
251	1917 Jun 23	266. A metallic machine-gun belt (Peugeot) 1p
252	1917 Jun 25	267. Official ballistic tests of the Claude gun. [In continuation of reports nos.56, 130 & 167] 2pp
253	1917 Jun 25	268. The Citron-Foug hand-grenade. 2pp
254	1917 Jun 25	269. The new P.B. nitro-hydrocarbon explosive. 3pp
255	1917 Jun 25	270. A suggestion by Prof. Amar for protection against torpedoes. 2pp
256	-	271. Further simplification of Perrin acoustic liaison. [Further to reports nos.75, 140, 152 & 217] 2pp
256a	1917 Jun 25	[Copy of above] 1p

257	1917 Jun 25	272. A new machine-gun support, for field or position firing (Goumarre). 7pp + photo
257a	1917 Jun 25	[Copy of above] 7pp
258	1917 Jun 26	273. The explosives used in French aircraft bombs. 1p
259	1917 Jun 26	274. A new automobile trench-digger (Gautier). 2pp
260	-	275. Special W/T valves, T.M. Conditions of acceptance. 16pp
260a	1917 Jun 28	[Copy of above] 4pp
260b	[1917] Jun 28	[Copy of above] 4pp
261	-	277. A constant-speed propeller for dynamos etc on aeroplanes. 4pp
261a	1917 Jul 2	[Copy of above] 2pp + photo
262	1917 Jun 29	278. The use of Courquin's predicting sight in France. 1p
263	1917 Jun 30	279. The Guilmoto cable-transporter. 2pp
264	1917 Jun 30	280. The improved Borde-Morel centrifugal bomb-thrower. 2pp
265	1917 Jun 30	281. An automatic telescope-sight for fire from aircraft to the earth or sea. 3pp
265a	1917 Nov 23	[Postscript to above] 1p
266	-	282. Electrical method of learning velocity of wind at a height. 5pp
267	1917 Jul 3	283. A French patent post-extractor. 1p + photo
268	-	284. The portable water-filter of "L'Epu-ration des Eaux". 8pp
268a	1917 Jul 4	[Copy of above] 2pp
269	1917 Jul 6	285. The French acoustic goniometer, T.M.



2pp

270	1917 Jul 6	286. The Frangar military rifle. 2pp
271	1917 Jul 7	287. The Collaye-Geordano body-shield. 1p
272	1917 Jul 7	288. A rolling armoured shield for machine-guns (Lebey). 2pp
272a	1917 Jul 7	[Copy of above] 2pp
273	1917 Jul 7	289. A French abdominal body-shield. 1p
274	-	290. Further information upon the electro-magnetic method of submarine detection. 5pp
275	1917 Jul 10	291. The Baron process of waterproofing uniform cloth. 1p
276	1917 Jul 10	292. Lieut.Goybet's system of fire control. 2pp
277	[1917] Jul 10	293. Supply of amplifiers, model 3ter, T. M., to the Admiralty. 2pp
277a	1917 Jul 10	[Copy of above] 1p
278	1917 Jul 10	294. New French eye-protecting device (Polack). 2pp
279	1917 Jul 12	296. Spring link, buckle, small shock-absorber etc (Lacambra). 1p
280	-	297. A new type of two-stroke motor (Tournayre). 3pp
281	-	298. A sighting-rest (J.M.T.) and a clinometer (Traffey) for use with rifle-grenades. 2pp
281a	1917 Jul 13	[Copy of above] 1p
282	1917 Jul 13	299. A new French patent process of cold tinning (Francois). 3pp
283	-	300. A French design of "caterpillar" driving-band (Delamare-Maze). 1p
283a	1917 Jul 16	[Copy of above] 1p
284	1917 Jul 13	300. A personal communication for the Air Board [re Frank Gardner and the Spad

		aeroplane] 2pp
284a	1917 Jul 13	[Copy of above] 2pp
284b	1917 Jul 13	[Copy of above] 2pp
285	-	301. An internal-combustion turbine (Teyssédou). 1p

### **BOX 3**

1	1917 Jul 22	302. French long-range rockets (Robert). 3pp
2	1917 Jul 23	303. French explosive machine-gun bullets. 2pp
3	1917 Jul 23	304. Trials for the automatic gun-sight from aeroplanes (Faure). [Further to report no. 281 of Jun 30] 2pp
4	1917 Aug 29	305. The Nivert rifle-howitzer. 1p
5	1917 Aug 29	306. A new French trench-mortar of 150mm (Fabry). 3pp
5a	1917 Nov 27	[Postscript to above] 1p
6	1917 Aug 30	307. Practical tests of the French anti- submarine magnetic net. 2pp
6a	1917 Aug 30	[Copy of above] 2pp
7	1917 Sept 12	308. The Goybet fire-control as adapted for destroyers. [In continuation of report no.292] 2pp
8	1917 Sept 12	309. French official method of making war- bread. 2pp
9	1917 Sept 13	311. French method of drying potatoes (Foucrière). 2pp
10	1917 Sept 20	312. Experience of the French abdominal body-shield (Adrian). 1p
11	1917 Sept 20	313. The details required for variable speed propeller (Sautter-arle). 2pp

12	1917 Sept 22	314. French smoke-producing bombs (Muzelier). 1p
13	1917 Sept 22	315. French & German anti-flash powders. 2pp
14	1917 Sept 23	317. The R.F.C. and Admiralty orders for French long-range rockets (Robert). 3pp
14a	1917 Sept 26	[Postscript to above] 2pp
15	1917 Sept 24	318. A lever for moving heavy wheeled vehicles (Faye). 2pp
16	1917 Sept 23	319. A technical examination of German steel cartridge-cases. 1p
16a	1917 Dec 17	[Postscript to above] 1p
17	1917 Sept 26	320. The Frangar rifle. [In continuation of report no.286] 1p
18	1917 Sept 26	321. A new Steering Gear for large vessels. 1p
19	1917 Oct 9	322. Improved safety-pin for the Mills or other grenades. [Prost] 1p
20	1917 Oct 9	323. The Robert parachute, and "speed accelerator". 2pp
21	1917 Oct 9	324. The new asphyxiating liquid "S.O." 2pp
22	-	325. The production of picric acid from aniline. 2pp
23	-	326. The Tresse parachute. 4pp
24	1917 Oct 12	327. A cheap form of camouflage (Bougier). 1p
25	1917 Oct 12	328. A very portable grenade-thrower. [Brandt] 1p
26	-	329. An application of the principle of Lissajous' figures to the location of aircraft (Bougier). 16pp
26a	1917 Oct 13	[Copy of above] 3pp
27	1917 Oct 13	330. The acoustic location of aircraft by a binaural parabolic mirror (Baillaud).

		6pp
28	1917 Oct 15	331. The testing of shells and cables by their magnetic permeability (Pozzo & Colonnetti). 4pp
29	1917 Oct 15	332. A new method of attacking submarines. 4pp
29a	1917 Oct 15	[Copy of above] 4pp
30	1917 Oct 15	333. A new ballistic method for trench-mortars and guns (Delamare-Maze). 4pp
30a	1917 Oct 15	[Copy of above] 4pp
31	1917 Oct 16	334. A device for conversation between a pilot and passenger (Le Vaillant). 2pp
32	1917 Dec 10	[Postscript to above] 1p
33	1917 Oct 16	335. A device for quickly and economically filling petrol tanks (Treillet). 2pp
34	-	336. The Delamare-Maze wheel, caterpillar band etc. 4pp
34a	1917 Oct 16	[Copy of above] 3pp
35	1917 Oct 17	337. Method of using the French signalling rockets. 2pp
36	1917 Oct 18	338. Supply of luminous radium compound. 1p
37	1917 Oct 18	339. A proposal of a K-Na alloy for incendiary purposes (Jouve). 2pp
37a	1917 Oct 18	[Copy of above] 2pp
38	1917 Oct 18	340. The new French 150mm trench-mortar. 1p
39	1917 Oct 23	341. The employment of Robert long-range rockets. [Further to report no.317] 5pp
40	1917 Oct 23	342. Captain Goumarre's machine-gun mounting. [Further to report no.272] 2pp
41	1917 Oct 23	343. French carriage for hand-transport of wounded (Baudry). 1p

42	1917 Oct 23	344. Anti-aircraft m.g. sight (Fleuriau). 1p
43	1917 Oct 23	345. French machine-gun mountings for anti-aircraft fire. 1p
44	1917 Nov 7	346. A.A. m.g. sighting corrector (Fleuriau). 1p
45	1917 Nov 7	347. A "Cyclorail", enabling bicycles to run on railway tracks (Martin). 2pp
46	1917 Nov 8	348. The Lebe rolling shield. [Further to report no.288] 1p
47	1917 Nov 23	351 & 405. Novel experiments in the stabilisation of shells (Duchêne). 6pp
48	1917 Nov 23	352. An improved type of artificial leg (Amar). 2pp
49	1917 Nov 24	353. New method of stabilising unrifled projectiles (Naud). 2pp
50	1917 Nov 24	354. A new French armour-piercing bullet (Naud). 1p
51	1917 Nov 25	355. Improvements in the manufacture of Chlorated Explosives (Hildt). [See reports nos.57 & 258] 2pp
52	1917 Nov 26	356. New Belgian bomb and bomb-dropper for aeroplanes (Wegimont). 1p
53	1917 Nov 26	357. A new automatic sight for fire against moving objects (Chevalier). 1p
54	1917 Nov 26	358. French smoke-producing compounds for land use. [Further to report no. 314] 3pp
55	1917 Nov 26	359. French Government orders for Robert rockets. 1p
56	1917 Nov 27	360. A new French process for automatically removing copper deposit from the rifling of guns (Dagory). 4pp
57	-	360a. [Postscript to above] 1p
58	1917 Nov 27	361. The Jouhandeau-Dourlen portable automatic

20mm gun. [Further to report no. 264] 2pp

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|----|-------------|--|
| 59 | 1917 Nov 27 | 362. A bomb-dropping device for aircraft (Mogue). 1p                                   |
| 60 | 1917 Nov 27 | 363. A predicting sight for submarine-chasers (Courquin-Serre). [See report no.281] 1p |
| 61 | 1917 Nov 27 | 364. A detachable trailer for motor-lorries (Foucher). 1p                              |
| 62 | 1917 Nov 27 | 365. An important new method of filling large shells (Palyitch). 2pp                   |
| 63 | 1917 Nov 27 | 366. A direction-sight for air-pilots (Chretien). 1p                                   |
| 64 | 1917 Nov 26 | 368. The Dourlen explosive bullets for machine guns. [See report no.303] 2pp           |
| 65 | 1917 Nov 29 | 371. Trials of the French Robert parachute. [Further to report no.323] 2pp             |
| 66 | 1917 Nov 29 | 370. The new explosive Hellite. 1p   |
| 67 | 1917 Nov 29 | 372. Details of the Delamare-Maze trench-mortar. [See report no.333] 1p                |
| 68 | 1917 Dec 1  | 373. The "Correcteur mécanique d'Arnouville, 1917". 1p                                 |
| 69 | 1917 Dec 3  | 374. Italian methods for the underwater protection of merchant ships. 1p               |
| 70 | 1917 Dec 3  | 375. A French laterally exploding bomb (Aulanier-Jacob). 2pp                           |
| 71 | 1917 Dec 10 | 376. Supply of French 3-valve amplifiers &c to Admiralty. 3pp                          |
| 72 | 1917 Dec 14 | 377. An American "Liquid fire". 1p   |
| 73 | 1917 Dec 16 | 378. The nitration of wood cellulose. 2pp  |
| 74 | 1917 Dec 17 | 380. Further notes upon the Robert long-range rockets. 3pp                             |

75	1917 Dec 17	384. The Winsback delayed-action exploder. 1p
76	1917 Dec 20	385. A writing appliance for artificial right hand (Pernelle). 2pp
77	-	387. Italian extraction of ethyl alcohol from Chyme and chestnuts (Balsano). 2pp
78	1917 Dec 20	388. An improved Italian illuminating bomb for aircraft. 2pp
79	1917 Dec 20	389. A new Italian spherical anti- submarine bomb for aircraft. 1p
80	1917 Dec 20	390. A Belgian invention for automatic sweeping-fire by machine guns (Bekaert-Binard). 1p
81	1918 Jan 17	391. Captain Goumarre's Machine-gun Mounting. [Further to report no.342] 2pp
82	1918 Jan 18	393. The Nivert rifle-howitzer. [See report no.236] 2pp
83	1918 Jan 21	394. A new French sparking-plug (Eole). 2pp
84	1918 Jan 18	395. Bougier's application of Lissajous's figures to sound-location. [Further to report no.329] 1p
85	1918 Jan 18	396. A simple French portable delayed- action detonator (Artaud). 2pp
86	1918 Jan 18	397. A French site-telemeter for anti- aircraft fire (Parent). 1p
87	1918 Jan 18	398. Trench-roofs in reinforced concrete. 1p
88	1918 Jan 18	399. Captain Andreau's calculations regarding tailed projectiles. 1p
89	1918 Jan 18	400. The Mors auto-observatory. [See report no. 18 of 1916 Apr 11] 2pp
90	1918 Jan 18	401. The explosive "Anilite". 2pp
91	1918 Jan 18	402. Supply of French amplifiers and transformers to the Admiralty. 1p

92	1918 Feb 4	403. The French system of range-finding by observation of air-bursts. 3pp
93	1918 Feb 6	404. Supply of cerium or ferro-cerium. 2pp
94	1918 Mar 30	405. The Duchesne shell and the long-range bombardment of Paris. 2pp
95	1918 Mar 30	406. Italian methods of camouflage. 1p
96	1918 Mar 30	407. The latest French acoustic "Télésitemètre" (Perrin). 2pp
97	1918 Mar 30	408. Italian method of anti-aircraft defence of a town. 1p
98	1918 Mar 30	409. French artificial leg & knee (Boulanger). 1p
99	1918 Mar 31	410. French artificial hand (Valler) and fork-holder (Juster). 1p
100	1918 Apr 1	413. An Italian system of acoustic submarine -detection (Buffa). 4pp
100a	1918 Apr 1	[Copy of above] 2pp
101	-	413a. [Further to above] 1p
102	1918 Apr 1	414. A French percussion-fuze without mechanism (Dourlen). 1p
103	1918 Apr 1	415. A new French message-carrying projectile (B. L. M.). 2pp
104	1918 Apr 1	416. An Italian wire-carrying anti-aircraft shell (Samaia). 1p
105	1918 May 21	416a. [Postscript to above] 1p
106	1918 Apr 1	417. A new Belgian percussion-fuze (Algrain). 1p
107	1918 Apr 1	418. The Brandt portable bomb-thrower and grenade. 1p
108	1918 Apr 1	419. A message-carrying projectile for the Nivert rifle-howitzer. 1p
109	1918 Apr 1	420. A shot-counting mechanism for artillery



		(Cousin). 1p
110	-	421. An improved French device for sketching panoramas (Pavy). 2pp
110a	1918 Apr 1	[Copy of above] 1p
111	1918 Apr 1	422. Insulated electrical resistances for high temperature (George). 3pp
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113	1918 Apr 2	424. An improved method of filling H. E. shells (Landrin). 1p
114	1918 Apr 1	425. The Gautier automobile trench-digger. [See report no.274] 1p
115	1918 Apr 1	426. The Foucriere method of drying potatoes. [In continuation of report no. 311] 1p
116	1918 Apr 1	427. The Duchene method of stabilising shells. [See reports nos. 351 of 1917 Sept 23 and 405 of 1918 Mar 30] 2pp
117	1918 Apr 1	428. Conversion of aniline into picric acid (Sernagiotto). [Further to report no.382] 2pp
118	1918 Apr 1	429. Proposal to use shells of French 150mm trench-mortar with Stokes gun. [Further to reports nos. 306 & 340] 1p
119	1918 Apr 1	430. Swiss automatic cooling mechanism for machine-guns. 1p
120	1918 Apr 1	431. A new design of electrical steel-furnace (Sarron-Simon). 1p
121	1918 Apr 1	432. The purchase of Claude gun and projectiles. 1p
122	1918 Apr 1	433. A new material for filling life-belts and rafts (Lanfrey). 1p
123	1918 Apr 3	434. Drawings of the Robert long-range rocket. 2pp
124	1918 Apr 3	435. French official secret reports upon

		H.A. ballistics in A.A. fire (Lancret). 1p
125	1918 May 18	436. The Nivert rifle-howitzer. [Further to report no.393] 1p
126	1918 Apr 3	436. A proposed method of rendering merchant ships torpedo-proof. 1p
127	1918 May 20	437. The Brandt portable bomb-thrower. [Further to report no.418] 1p
128	1918 May 20	438. The Dourlen portable automatic 20mm gun. [See report no.361] 1p
129	1918 May 21	439. A new method of preparing cellulose for the manufacture of nitro-cellulose or paper-pulp (Dumoulin). 4pp
130	1918 May 21	440. Secret signalling by infra-red rays. [Charbonneau] 2pp
131	1918 May 21	441. The latest Perrin listening apparatus - the "Télésitemètre". [In continuation of report no.407] 2pp
132	1918 May 21	442. An armed searchlight (Chatel). 1p
133	1918 May 21	443. The Winsback Exploder. [Further to report no.384] 1p
134	1918 May 21	444. Reports of the French Commission of Orthopaedic Studies. 1p
135	1918 May 21	445. The Thomas machine-gun mounting. 1p
136	1918 May 22	446. French official report upon the shells fired upon Paris. [Further to report no.405] 2pp
137	1918 May 22	447. Improvement in propellers for aircraft and ships (Cesario). 1p
138	1918 May 22	448. The George electrical tungsten-quartz resistances. [See report no.442] 1p
139	-	449. French official report upon Mechanical Culture. 1p
140	1918 May 23	450. A stream-lined projectile with

		detachable base. 1p
141	1918 May 23	451. New method of making boats (Carentan). 1p
142	1918 May 23	452. Metric System Instruction for American and British soldiers in France. 2pp
143	1918 May 23	453. An Italian delayed-action fuze (Cerletti). 2pp
144	1918 May 23	456. The "Piloteur", a new departure in the training of pilots (Lender). 3pp+ photo
145	1918 May 23	457. The Delamare-Maze portable field-mortar. 2pp
146	1918 Jun 9	458. Comparative tests of French & German photographic plates (Buisson). 2pp
147	1918 Jun 10	459. A new cheaper process of producing phosgene (Helbig). 3pp
148	1918 Jun 10	460. Aerological data at extreme altitudes (Gamba). 2pp
149	1919 Mar 6	460a. [Further to above] 1p
150	1918 Jun 10	461. "Eterol", a new Italian petrol-substitute (Purgotti). 2pp
151	1918 Jun 10	462. A new French anti-aircraft "Intensive Projector" (Gerville-Réache). 3pp
152	1918 Jun 11	463. French experiments in the ignition of flame-projectors. 1p
153	1918 Jun 24	464. The Robert long-range rockets. 2pp
154	1918 Jun 28	465. Sterilisation of water by liquid chlorine. 1p
155	1918 Jun 28	466. An automatic camera-control for aeroplanes (Chretien). 3pp
156	1918 Oct 18	466a. [Further to above] 1p
157	1918 Jun 28	467. An improved Italian body-shield (Fariselli & Frati). 2pp

158	1918 Jun 28	468. A new Italian observation-balloon. 1p
159	1918 Jun 28	469. French methods of camouflage. 1p
160	1918 Jun 28	470. A new French type of automatic rifle (Faucon). 2pp
161	-	471. A method of producing artificial fog (Trillat). 2pp
162	-	472. A support and unroller for Hotchkiss m.g. belt (Pieton). 1p
163	1918 Jun 28	473. A Belgian study of aircraft bombs (Algrain). 1p
164	1918 Jun 28	474. New protective covering for driving- bands of large shells (Bellan). 1p
165	-	475. A bicycle-carrier for machine-gun (Blanchard). 1p
166	1918 Jun 28	476. Articulated artificial leg by Prof. Amar. 1p
167	1918 Jun 28	477. The Pavy device for field-sketching. 1p
168	1918 Jun 28	478. The Brandt rapid-fire infantry gun of 60mm. [See report no.437] 3pp
169	1918 Jun 28	479. An insubmersible seaplane or "aerial tank" (Grau). 1p
170	1918 Jun 29	480. The trench message-carrying projectile. 2pp
171	1918 Jun 29	481. A new method of producing commercially absolute alcohol for use in a petrol-substitute (Solari). 5pp
172	-	483. New type of headlight, "Eiffelty", for motor cars (Heidelberg). 2pp
173	-	484. A new method of radiosopic localisation of foreign bodies (Nemirovsky). 1p
174	1918 Jul 9	485. The Delamare-Maze portable field-gun. 2pp
175	1918 Jul 9	486. New French method of range-finding

		for plunging percussion fire (Vizern). 1p
176	1918 Aug 10	487. Slow-burning powder for fuzes. 2pp
177	-	488. Col. Duchêne's method of stabilising shells. 2pp
178	1918 Aug 10	489. Further reports of the French Orthopaedic Commission. 1p
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184	1918 Aug 10	495. A confidential French official work upon 3-electrode W/T valves and their applications. 2pp
185	1918 Aug 10	496. A new method of greatly increasing muzzle-velocity (Hallam). 2pp
186	1918 Aug 10	497. A petard to imitate the discharge and flash of the 75mm gun. 2pp
187	1918 Aug 10	498. Method of working a Vickers m.g. from the driving-shaft of an aeroplane motor (Paumier). 2pp
188	1918 Sept 4	499. The Bloch wire-carrying A.A. shell. 1p
189	-	500. An Italian bomb-thrower for assaulting infantry (Piersantelli). 3pp
190	1918 Sept 10	501. Perrin Télésitemètre. 1p
191	1918 Sept 10	502. The Nivert rifle-howitzer. 1p
192	-	503. Inaccurate analysis of shell-

		fragments of long-range gun. 2pp
193	1918 Sept 10	504. The Pineau tinder-fuze. [See report no.491] 1p
194	1918 Sept 10	505. The Snelling rifle-sling. 1p
195	1918 Sept 19	506. The Pineau pamphlet-dropping device. [In continuation of reports nos.491 & 504] 1p
196	1918 Sept 19	507. The Robert long-range rockets. 2pp
197	1918 Sept 19	508. A non-explodable reservoir for volatile liquids (Gille). 1p
198	1918 Sept 19	509. Devices to enable a submarine to enter a defended port (Boussac). 1p
199	1918 Sept 19	510. The new form of French identity disc. 1p
200	1918 Sept 19	511. French report upon Paget and Ilford photographic plates. 1p
201	1918 Oct 5	512. A new method of treating peat (Liais). 2pp
202	1918 Oct 5	513. French W/T from tanks. 2pp
203	1918 Oct 5	514. The Faucon automatic rifle. [See report no. 470] 2pp
204	1918 Oct 5	515. The Waligorski process of brick-making. 1p
205	1918 Oct 5	516. The Perrin télésitemètre. 2pp
206	1918 Oct 5	517. Suppressing gun-flash by use of CO2 (Durien). 1p
207	1918 Oct 5	519. Col.Duchêne's further experiments with stabilised shells. [In continuation of reports nos. 351, 405 & 427] 2pp
208	1918 Oct 5	520. French field artillery on caterpillar tractors. 1p
209	1918 Oct 5	521. Complete list of F. M. T.apparatus. 1p

210	1918 Oct 7	522. The Dourlen 20mm & 80mm guns. 1p
211	1918 Oct 7	523. The B.L.M. message-carrying projectile. 2pp
212	1918 Oct 17	524. Translation of the French military telegraphs booklet upon W/T valves. 2pp
213	1918 Oct 17	525. Theory and practice of the Perrin "Télésitemètre". 1p
214	1918 Oct 17	526. Prof.Portevin's notes on the wear of gun tubes. 1p
215	-	527. The camouflage of enemy shell-bursts. 2pp
216	1918 Oct 18	528. A new type of delayed-action fuze (Menager). 1p
217	1918 Oct 18	529. A new type of French "Gas-brake" or "Muzzle-brake" (Galliot-Bory). 1p
218	1918 Oct 18	530. Improvements to the Robert parachute. 1p
219	1918 Oct 26	531. The Kerr adjustable rifle-sling and stirrup-leather. 2pp
220	1918 Nov 1	532. The Darmezin C.W. generator and wireless telephony microphone. [See report no. 454] 2pp
221	1918 Nov 4	533. Italian instructions for the use of optical filters. 1p
222	1918 Nov 1	534. New patented method of treating cellulose for nitration (Bourbon). 1p
223	1918 Nov 1	535. French report upon thermit incendiary bombs. 1p
224	1918 Nov 1	536. New Belgian method of treating wounds. 1p
225	1918 Nov 1	537. The Landrin method of shell-filling. 1p
226	1918 Nov 1	539. The German "Canon Mitrailleur" of 2cm "F. L. Z. Becker". 1p
227	-	540. Secret signalling by infra-red rays (Charbonneau). [See report no.440] 1p

228	-	541. The Naud message-carrying projectiles for 75mm gun and for service rifle. 1p
229	1918 Nov 4	542. Material of Boulanger artificial legs. [See report no.409] 1p
230	-	543. A proposal to convert soldiers' rubber sheets into garments (Brun). 1p
231	1918 Dec 2	544. The Liais method of treating peat. [Further to report no.512] 2pp
232	1918 Nov 30	545. Special iron from the S.F.R. 1p
233	1918 Nov 30	546. The Frati bullet-resisting plates. [Further to report no.467] 1p
234	1918 Nov 30	547. The Robert long-range rockets. 1p
235	1918 Dec 2	548. The Waligorski process of brick-making. [Further to report no.515] 1p
236	1919 Jan 18	549. Details of the Cerletti delayed-action fuze. 1p
237	1919 Jan 18	550. A new Italian magneto. 1p
238	1919 Jan 18	551. An Italian intermittent lamp for aerial navigation (Luria). 1p
239	1919 Jan 18	552. The utilisation of anti-aircraft balloons for meteorological purposes (Rothé). 1p
240	1919 Jan 18	553. The Delamare-Maze gun. 1p
241	1919 Mar 6	554. French body-shields of manganese steel and silk. 1p
242	1919 Mar 6	555. Autogenous welding under water (Corne). 1p
243	1919 Mar 6	556. A new French incendiary material and bomb (Bernard). 1p
244	1919 Mar 6	557. Barbier, Bénard and Turenne's Electrical Control System. 3pp

### Unnumbered reports



245	-	The use of geophones for the detection of submarines. [See report no.3 of 1916 Jan 31] 14pp
246	-	W/T to & from submerged submarines. 8pp
247	-	An application of Huyghen's construction to the detection of submarines (Walzer). 11pp
248	? Mar 21	A releasing apparatus & parachute for use with captive balloons (Robert). 2pp
249	? Mar 25	Final remarks (for the present) on the Perrin acoustic liaison. 7pp
250	? Mar 25	New French listening apparatus for the detection & location of aircraft. 6pp
251	? Mar 25	Progress in the detection of submarine sounds. 6pp
252	-	Postscript to report no.? [re paraboloid to observe and determine the site-angle of the line of flight of an aeroplane] 2pp
253	-	[Odd page (5) to report]
254	-	Reports by Capt. Sir Henry Norman [from no. 1 of 1916 Jan 31 to no.145 of 1916 Oct 24] 7pp

### **Letters and Special Reports**

255	? Mar 25	H Norman, re the Perrin acoustic liaison apparatus and the use of 'sparklets'/ H Norman. 6pp (draft)
256	1916 Mar 2	To H Norman/H W Dickinson, Secretary, Munitions Inventions Panel, re request for listening instruments for anti-aircraft observation post. 1p
257	1916 Aug 14	To Col Goold-Adams/H Norman, re many inventions and reports nos. 88, 90, 91, 71, 93, 75b. 11pp (draft)
258	1916 Sept 15	To G H Mair/H Norman, re wireless transmission

		of British news to neutral and enemy countries. 6pp (copy)
258b	1916 Sept 15	[Copy of above, with letter of Sept 4 to Norman from Mair] 7pp
259	1916 Oct 5	To Sir Charles E Ellis/H Norman, re recommendations for British honours. 2pp (copy)
260	1917 Jan 17	To Controller of Munitions Inventions/H Norman, re long range signal rockets. 1p (copy)
261	1917 Jul 16	Note re 'Wetcarbonising, Limited', with letter to Norman from J D Wales(?), seeking meeting with M. Loucheur. 5pp
262	1917 Sept 27	Special report for Sir Arthur Lee, Director -General of Food Production, re Purchases of motor tractors by the French Government. 4pp
263	1917 Sept	Special report for Maj.Gen. Sir G M W Macdonogh, re French investigations into methods of secret correspondence. 2pp
264	1917 Oct 13	Special report for Maj.Gen. Sir G M W Macdonogh, re a method of secret W/T communication with distant cities, without receiving aerials or earth connections. 3pp
265	1917 Oct 13	To Maj. Gen. Sir G M W Macdonogh/H Norman, being covering letter re above. 1p (copy)
266	1917 Oct 19	To Maj. Gen. Sir G M W Macdonogh/H Norman, re W/T apparatus, with copy letter of Oct 15 to Norman from Macdonogh. 6pp (copy)
267	1917 Dec 1	To The Comptroller, M I D/H Norman, re order for amplifiers. 1p (copy)
268	1917 Dec 9	To Maj. Clark/H Norman, re Prof. Rothé's wind-registering apparatus (see report no.282 of 1917 Jul 3). 1p (copy)
269	1917 Dec 10	To Churchill/H Norman, re organisation of the 'inventions of war'. 4pp (copy)
270	1917 Dec 11	Notes upon the Air Service. 26pp
271	1918 May 15	To H Norman/Maj. W H D Clark, Assistant Controller, Munitions Invention Dept,

- re 'Green Sensitive' photographic plates. 1p
- 272 1918 May 29 To H Norman/Maj. W H D Clark, re Trench Mortar of 150mm (Fabry), reports 386 & 428. 1p (copy)
- 273 1918 Jun 1 To H Norman/Maj. W H D Clark, re above. 1p
- 274 1917 Jul 11 Summary of questions, replies and comments on various subjects covered by Norman's reports. One page has attached photo. 7pp (draft)
- 275 - Series of letters and reports from Lt. Col. Baudrand (one dated 1917 Jun 20). In French. 9pp (copies, in envelope)
- 276 1918 Jun 12 Ministère de l'Armement et des Fabrication de Guerre. Direction des Invention des Etudes et des Expériences Techniques - Section Aéronautique. Résumé des Expériences relatives à l'effet des fils ou de cables sur les hélices. Report 6pp; tables 5pp; 9 photos (on) 4pp; blueprints 4pp. With letter of 1919 Mar 12 to Commandant/C de Watteville. 4pp
- 277 - Blueprint: Exploseur pour Mines à explosion retardée. 1p
- 278 1916 Sept 25 121. Notice sur les Lance-Etoiles Eclairantes employées par l'Armée Autrichienne. 3pp
- 279 - Patents (3) and blueprints (7) re "V.B." shells. 21pp
- 280 1916 May Note comme suite à la visite du Lieut. Ph. Robert en date du 16 mai. [Includes additional ms. notes] 4pp
- 281 - Instruction provisoire et notice sur les appareils [i.e. sur la manoeuvre de matériel de transport et des appareils de pointage, constituant une unité de Velos-Mitrailleurs "Blanchard"] 10pp
- 282 1917 Jun 6 Section technique de l'Artillerie. Laboratoire

- de Chimie. No.507. Note sur les douilles en acier allemandes de 77, 105 et 150. 9pp (including blueprints & photos)
- 283a 1917 Jan 27 Letter to Director of the British Ministry of Munitions, Paris/William Youlten, re hyoscopes. 2pp
- 283b - Catalogue of Periscopes and Hyoscopes Limited, Westminster for Youlten's inventions.
- 283c - Catalogue of Youlten's patent Prismatic Hyoscope applied to the Lewis Gun/ Periscopes and Hyoscopes Limited [2 copies]
- 283d 1916 Oct Youlten's patent prismatic hyoscope applied to the Colt gun. Correspondence and reports thereon as a result of Tests at Hythe under the supervision of the Commandant, Canadian Machine Gun Depot/Periscopes & Hyoscopes Ltd. 11pp
- 284 1916 Sept 22 Note sur le remplacement des tables de tir par des nomogrammes. 6pp
- 285 1916 Sept 9 Section technique de l'artillerie. Laboratoire de chimie. No.324. Note sur les balles perforantes (anglaises) traçuses (anglaises et françaises) et explosibles fusantes (allemandes). 20pp (including blueprints & photos)
- 286 1915 Oct 20 Etude des gaz asphyxiants et délétères (interdits par la Convention de La Haye) et des matières puantes, corrosives et incendiaires, exécutée à la Section Technique de l'Artillerie avant la guerre. 22pp
- 287 1916 Jul 29 Ministère de la Guerre. Aéronautique Militaire, Section Technique. Note sur les obus du Capitaine d'Artillerie M.P. Otto pour tir contre les aéronefs. 5pp[With letter to H Norman/Capt.Otto (2pp)]
- 288 1916 Jun 15 Comité Interallié des Inventions pour la Guerre. La déléguée de l'Italie. Appareil de pointage pour fusil et pour

		mitrailleuse par l'ing. Dal Verme. 3pp (including photos)
289	-	----- as above ----- Système Boniti de pointage contre avions. 12pp (including photos & diagrams)
290	1916 May 2	----- as above ----- Torpille électrique souterraine. 6pp (including photo)
291	1916 Apr 18	----- as above ----- Télémetre à indication continue pour le tir contre avions. 3pp (including photos)
292	-	Subterranean Torpedo (of) Georges Rupalley. 1p
293	-	Torpille Souterraine "Rupalley"/G Rupalley. 3pp
294	1917 Apr 9	Section technique de l'artillerie. Laboratoire de chimie. No. 453. Note sur les procédés d'écriture et de correspondance secrètes. 27pp (including insertions)
294a	1917 Apr 9	[Copy of above]
295	1914	French patent of Alexandre Douaud re Appareil d'alimentation, avec gazéificateur, pour moteurs à combustion interne utilisant les combustibles liquides lourds. 3pp (including drawing)
296	1917 Sept 26	Compagnie pr. la Fabrication des Compteurs & Matériel d'Usines à Gaz. Appareils Électromagnétiques Colonnetti & Pozzo pour la détermination de la dureté des aciers. 10pp (including blueprints and photos)
297	1917 Sept 21	Letter from above company to H Norman re demonstration of named apparatus. 1p
298	1916 May 23	Rough notes re trench mortars. 3pp
299	-	Rough notes on trench bombs and shells. 1p
300	1917 Mar 6	House of Commons. (Extract from "Official Report"). Civil Services Supplementary

Estimates. Speech by Sir Henry Norman.  
7pp

300a 1917 Mar 6

[As above]

301 -

Brochures (3) re "Abacot" medico-mechanical  
apparatus for practising the "Zander"  
system of medical gymnastics

302 1916

Report for D. Lloyd George, Secretary of  
State for War by Capt. Sir Henry Norman:  
The Treatment and Training of Disabled  
and Discharged Soldiers in France. 48pp

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