WW1: AMMUNITION PRODUCTION & DEVELOPMENT

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Outline

- Factors – August 1914
  - Lessons & Legacy
  - Industrial Base
- Nature of Targets
- Ammunition Improvement
  - Metallurgy
  - Exterior Ballistics
  - Wire Cutting
  - Fuzes
  - Propellant
  - Explosive Fill
- Australian Manufacturing
- Epilogue
- Conclusions
The Basics

- The Weapon of Artillery is the Projectile
- Effect at Target depends on
  - Rate of fire
  - Total number of rounds
  - Type of round
  - Timing of detonation
As of August 1914

- Field Artillery lessons not embraced:
  - Boer War
  - Russo-Japanese War
  - Franco-Prussian War
  - American Civil War

- Reasons
  - Policeman
  - Envisaged enemies – e.g. tribesman
Industrial Base

- Good research capability – Royal Arsenal Woolwich
- Limited ammunition manufacturing base
  - Not prepared for expansion
- Ammunition Holdings
  - 13-pr & 18-pr – 1000rpg
  - 4.5-in How – 800rpg
  - 60-pr – 500rpg
- Shell Scandal
Industrial Base

- By War’s end there were 12 National Filling Factories, 4 Projectile Factories, and 2 Explosives Factories.
- A huge increase considering there were only three Royal Ordnance Factories in 1914.
The Nature of Targets & Lessons

- Insufficient ammunition
- Shrapnel – limitations
- Shortage of HE
Ammunition Improvements

- Range Tables
- Carrier Shells
- Projectile Metallurgy
- Projectile Shape & Exterior Ballistics
- Wire Cutting
- Fuzes
- Propellant
- Explosives
Australian Manufacturing

- Only 15,000 Shrapnel Shell bodies produced
Epilogue – Rounds Fired

- 18-pr gun – 99,397,670 – 70%
- 4.5-in how – 25,326,276 – 18%
- 60-pr gun – 10,125,32 – 7%
- 8-in how – 4,189,165 – 3%
- 9.2-in how – 3,119,158 – 2%
- Total – 142,157,590
Conclusion – Ammunition Production

- Production capacity was a major limitation
- Fundamental ammunition design improvements did not generally occur
- Main effort in meeting artillery ammunition requirements was in quantity over quality