

The First Scientific Dispute over  
**EFFECTS**

*Rob Wheeler*



# Weaponneering Principles 1943

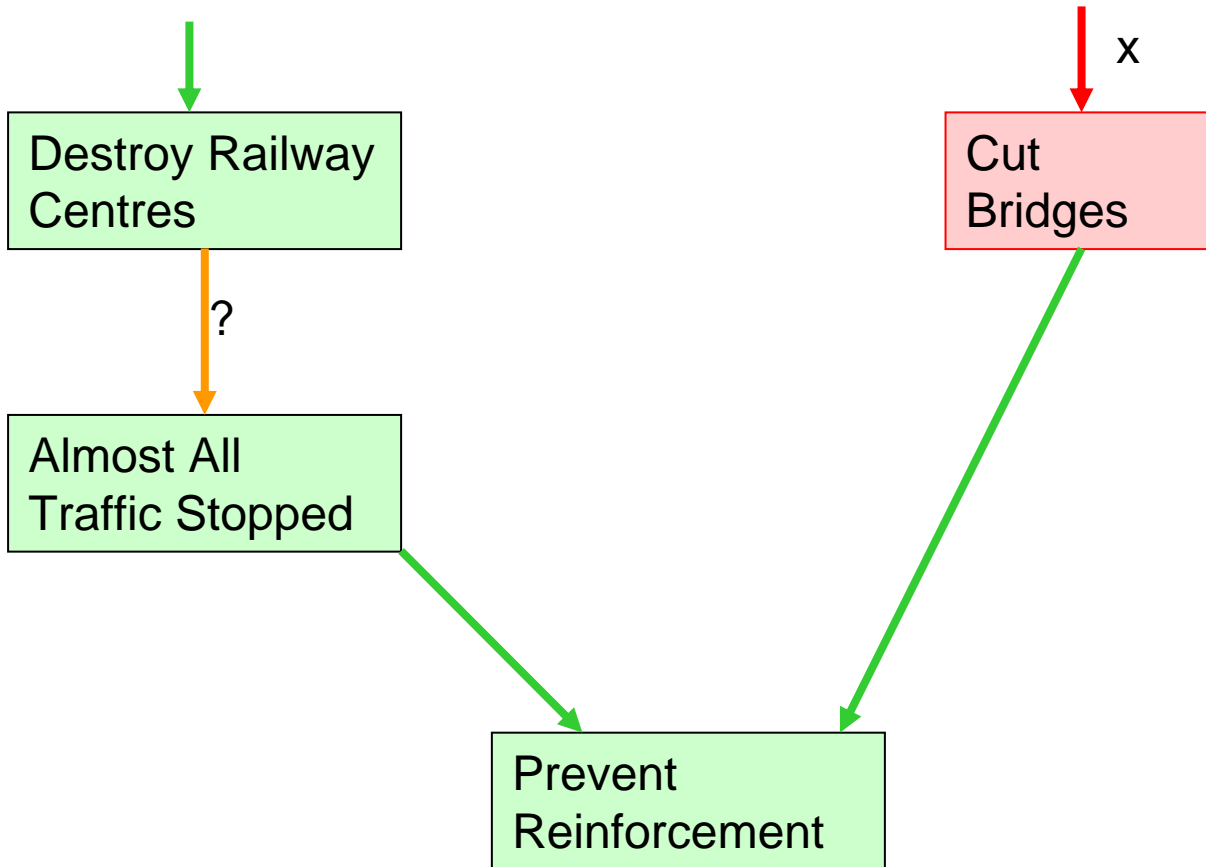
- Distribution of impact points about aim point
- Weapon effects (cookie-cutter)
- Sufficient to kill 1/3 of guns  
(because Alderney guns arranged in batteries of 3  
– but this ratio was then used elsewhere)

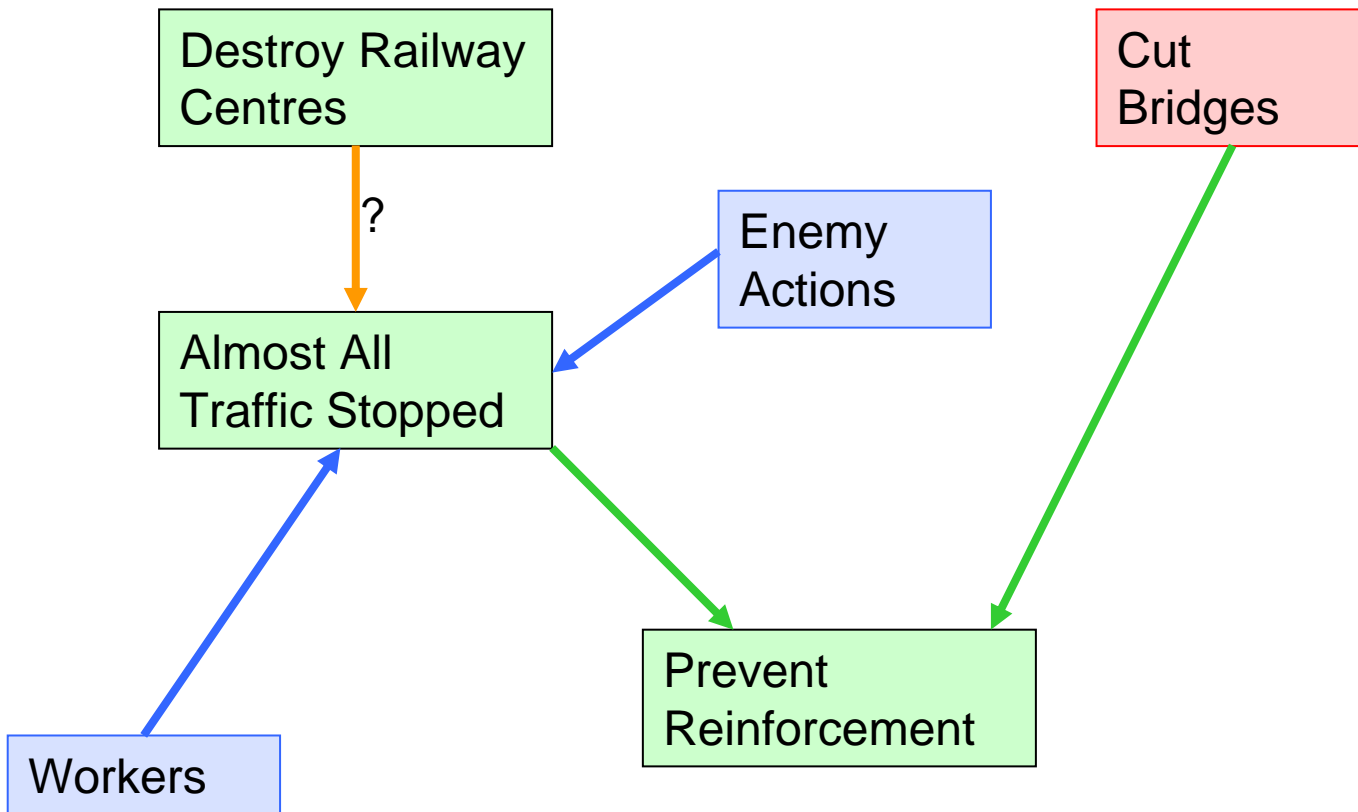
# Attacking Railways

- Strategic / Systemic approach
  - Attack key nodes
    - junctions, marshalling yards, repair & maintenance
    - definition varied with time
- Tactical approach
  - Cut lines

# The Opposition

- Oliver Lawrence
  - UK Ministry of Economic Warfare
- C P Kindleberger
  - Hd / Enemy Objectives Unit  
Economic Warfare Division  
US Embassy, London



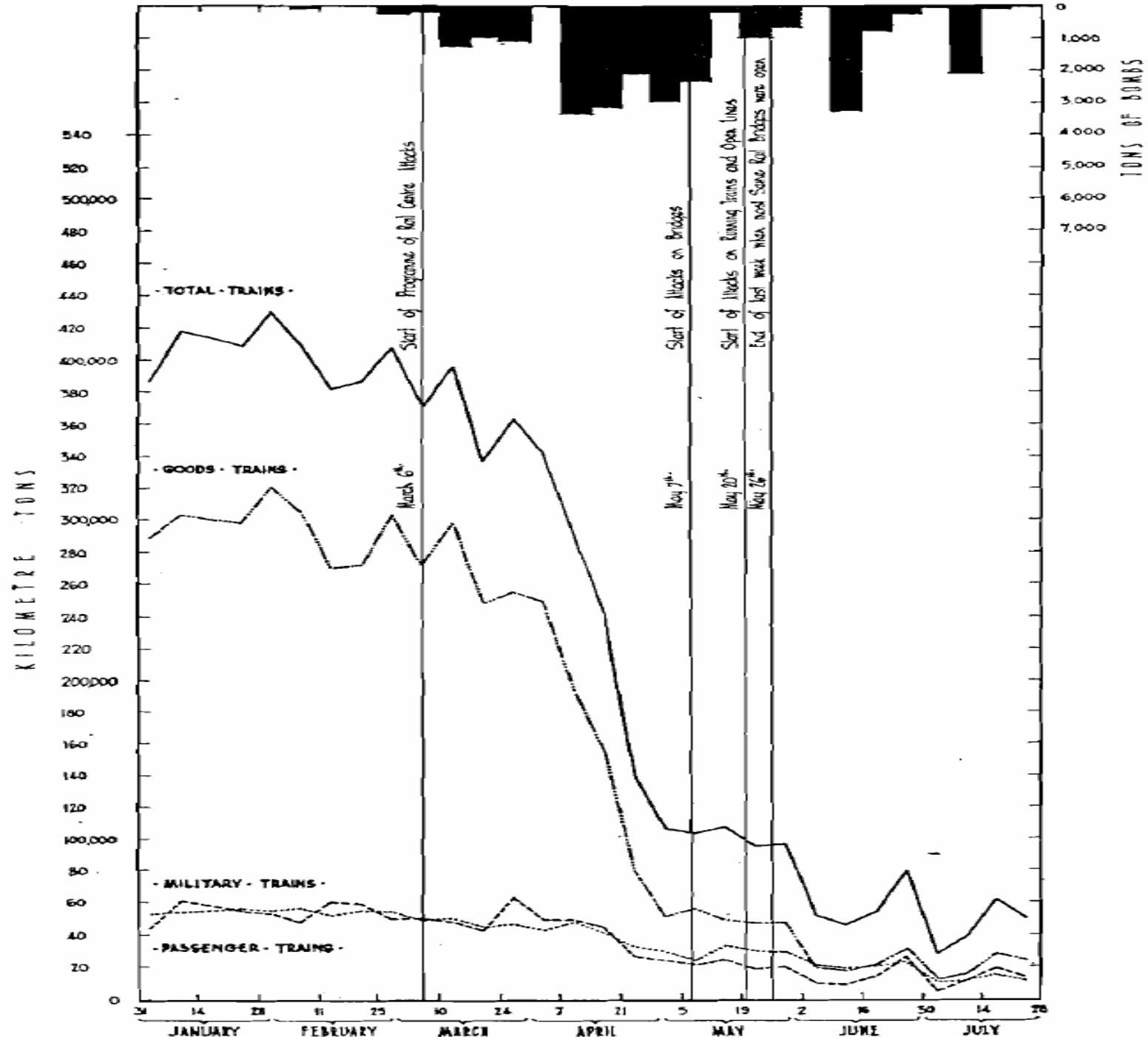


# Timetable of Events (France etc)

<b>1944</b>	<b>Systemic</b>	<b>Tactical</b>
March	START	
end April		Experiments
7 May		Coordinated plan
20 May		+ strafing trains
26 May		X Seine bridges
6 June	D-Day	D-Day



- TONNAGE OF BOMBS DROPPED ON RAIL-CENTRES IN REGION NORD -



# Italy Railway attacks

Tonnage	M/Yds	Bridges	Other
Jan 44	1189	584	0
Feb	509	151	8
Mar	1238	673	53
Apr	123	3052	537
May	351	2418	312

# Conclusions

- Clarity of argument
- Need to persuade all stakeholders
- Commander's intent