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Ministry
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Historical analysis puts modern command and control in perspective

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Topics

- Project Lions' Leap
- Historical analysis module
 - pre-history of command and control (C2)
 - C2 in written history
 - history of land communications
 - office IT and modern 'ways of working'
- Conclusions
- Questions?

Lions' Leap: future tactical C3

- Part of wider Army Development and Transformation
 - Dstl called to support 'future thinking' project
 - 2030+ timeframe
- Tactical HQ sizes and organizations
- Ways of working ... not radio technology

Dstl modules

- Facilitated a study day with Army HQ
- Essay on current C2 thinking (NEC, etc.)
- Piece on possible 'disruptive technologies'
- Historical review of C3
 - the subject of the rest of this paper

Pre-history of C3

- 64 species exhibit 'war-like' behaviours
 - including meerkats, dolphins and one bird
 - mostly primates, and all great apes except the bonobo
- Most studied in chimps
- It's all in a primate gene:
 - MAOA
 - the 'warrior gene'



What non-human warriors do

- All warrior species are social
 - and all have hierarchies or ‘pecking orders’
- Chimpanzees conduct sustained campaigns
 - ‘total war’, aiming to kill or drive off rival groups
- Apes appear to hold ‘O-groups’ before a raid
- Meerkats move in column, but fight in line ...
 - therefore do they ‘deploy’ for a battle?
- Note: not *all* species exhibit *all* behaviours

What non-human warriors do

- Chimpanzees may use sticks and stones
 - one amassed stones before visitors came to the zoo ...
 - is this the start of logistics as well?
- Conclusion: many basics of warfare are pre-human
 - they evolved that way for a reason ...
 - they work with the brains that we inherit from the apes

Brain size and group size

- Primate group size related to neocortex volume
 - Dunbar (1992): the ‘Dunbar number’
- For humans this is 80–200 ... usually stated as 150
 - the size of a company ...
 - and the mean number of friends on social media sites
- But actually a hierarchy of groups
 - starting with the ‘clique’ of 4 ‘best friends’ ... or a fire-team?
 - some ape societies follow a ‘rule of threes’ (Zhou *et al.*, 2005)

Ancient C2

- Or, what have the Romans done for us?
- Hierarchy of force from contubernium to legion
 - some ‘rule of threes’, some of tens ...
 - but an intermediate command level inserted on campaign
- Century HQ was a small team ...
- Legion HQ was a ‘team of teams’
 - specialist branches for personnel and pay, security, supply ...
 - is anything new?

Ancient communication

- Mesopotamia: as fast as a man could run ...
 - and as much as a man could remember
 - then writing increased bandwidth
- Egypt: as fast as a horse could run
 - and as many papyri as a horse could carry
- Simple messages using smoke and beacons ...
 - speed now limited (theoretically) to the speed of light ...
 - content (bandwidth) highly constrained ...
 - but did the Romans use the optical telegraph?

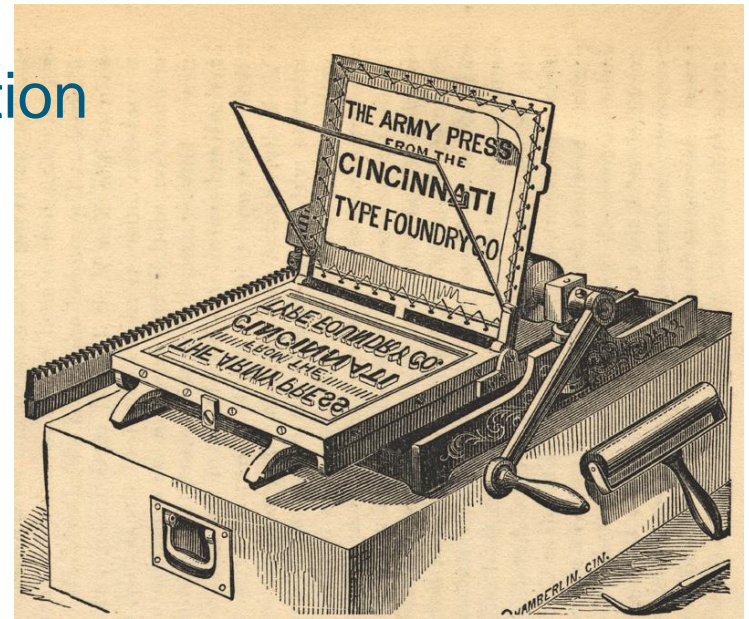
Modern communication

- Telescopes enabled effective optical telegraphy
 - England, France and Sweden, 1790s
- Electric telegraph, 1840s
 - efficient Morse code soon followed
- 1850s, Crimean War ...
 - dawn of the 'long screwdriver'
- 1900s, first WT in the Boer War
 - 1914: one radio per division
 - 2014: one radio per man!



Military office technology

- Wax tablets drove the Roman military bureaucracy
- Paper maps from China
- Renaissance printing revolution
 - standing orders, drill books
- Industrial technology, 1800s
 - but civilians led the field
- Computers from the 1950s
 - now civilian IT in every HQ



But does IT buy efficiency?

- Found little evidence IT wins battles
 - though GPS improved Coalition speed in Gulf War
- Project explored civilian analogies ...
 - *“You can see the computer age everywhere but in the productivity statistics”* – Robert Solow (1987)
- King Canute effect: Army cannot hold back the tide ...
 - needs comms with government, NGOs, CIMIC, ‘Green’

Culture – the forgotten piece

- C2 changes must be culturally acceptable
 - disaster of French combined arms regiments in 1950s
 - and US 'Pentomic divisions' in same period
- History and pride improves fighting effectiveness
- Changes that ignore culture *will* fail

Culture – the forgotten piece



Conclusions

- HA reminds us of the roots of C3
 - not simply a modern thing ...
 - but rooted in our DNA, psychology and culture
- We must use IT intelligently
 - to enable, not to overload
 - requires thoughtful experimentation
- Ignore social and military culture at our peril!

Selected sources

Van CREVELD M.L. (1985) *'Command in War'* Harvard, Cambridge, MA: 339 pp.

DUNBAR R.I.M. (1992) *'Neocortex size as a constraint on group size in primates'* J. Human Evolution **20(5)**: 469–493

DUNBAR R.I.M. (1993) *'Coevolution of neocortical size, group size and language in humans'* Behavioral and Brain Sciences **16(4)**: 681–735

KEEGAN J.D.P. (1987) *'The Mask of Command'* Jonathan Cape Ltd.; Pimlico, London: 366 pp.

KIRKE C.M.StG. (2004) *'Organizational Culture – the Unexpected Force'* J. Battlefield Technology **7(2)**: 11–17

MALLINSON H. (2005) *'Send it by Semaphore: The Old Telegraphs During the Wars with France'* The Crowood Press, Marlborough: 240 pp.

WEBSTER G. (1969) *'The Roman Imperial Army'* A. and C. Black Ltd., London: 330 pp.

ZHOU W.-X., SORNETTE D., HILL R.A. & DUNBAR R.I.M. (2005) *'Discrete hierarchical organization of social group sizes'* Proc. Royal Society B **272(3)**: 435–444

Questions?

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