



Science & Technology

The contribution to Defence

Major General Alan Macklin



Topics

- A changing world
- Changing character of conflict
- Changing S&T challenges
- Afghanistan - The 'Main Effort'
- Operational Context



A changing world....

- The Old World Order
- Globalisation
- Climate Change
- Population growth
- Global Inequality
- Technological Innovation



Changing Character of conflict

Future conflicts likely to be:

- Contested
- Congested
- Cluttered
- Connected
- Constrained

Impact on Technology?



Changing Technological Challenges

External influences result in:

- A closing technological gap
- Widely available technology
- Breakthroughs in commercial sector
- Rapid adaptation for defence



Technological advances in:

- Carbon capture technology
- Renewable energy solutions
- Physical, social and virtual networks



Changing Defence S&T – Trends

- Rapid innovation
- Substantial technological developments in:
 - ICT
 - sensor/network technology
 - behavioural and cognitive science; biotechnology
 - materials
 - production, storage and distribution of energy
 - underpinned by advances in nanotechnologies
- R&D outside established centres

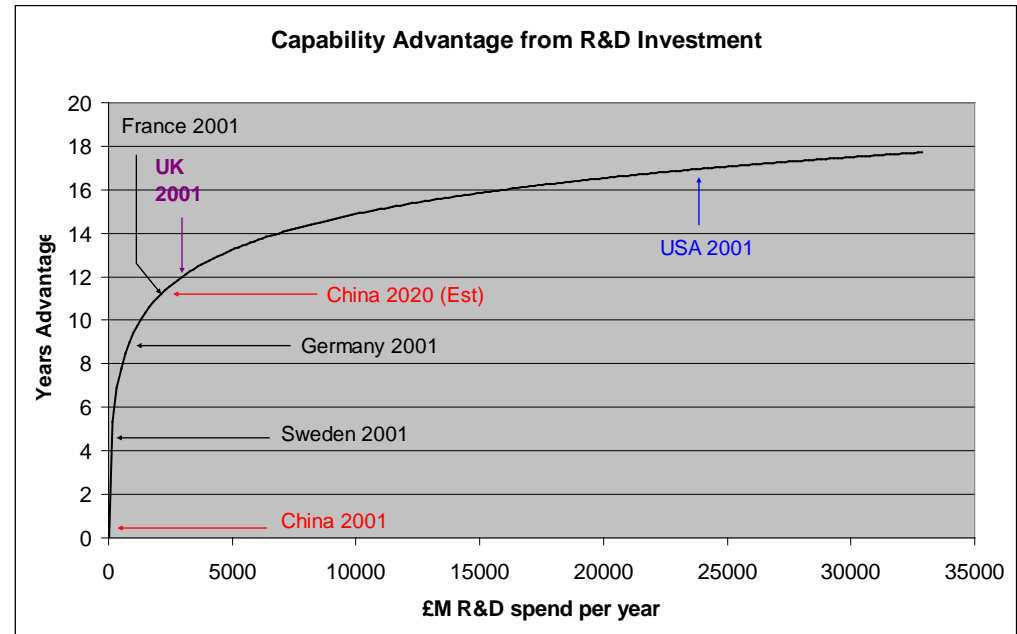
Changing R&D Funding

R&D drives quality

BUT.....

Shrinking budget

NEED TO FOCUS ON.....



Transforming non defence technologies into military advantage

Changing Solutions

- Adaptation
- Open Systems
- Open Architectures
- Open Innovation
- Accelerated incremental upgrades
- Supply chain networks



Afghanistan - The Main Effort

- Supporting Operations
- Resources & priorities
- Sustainable campaign footing
- Pace and urgency

Afghanistan is the main effort!



AFGHANISTAN



Operational Context



Colonel James Daniel MBE late RIFLES



Contents

- Context
 - Environment
 - Enemy Forces
 - Friendly Forces
 - Soldier Burden
- Op MOSHTARAK
- Current R&D



Environment



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Environment

- Complex Terrain - are those areas that severely restrict the Army's ability to engage adversaries at a time and place of its choosing due to natural or man-made topography, dense vegetation or civil populations, including urban, mountainous, jungle, subterranean, littoral and swamps
- Temperature Range -8 to 50 C
- Altitude – 258-7,492 m



Enemy Forces

- British Defence Policy Designed around CRISAT Man
- Enemy has evolved
 - Armed with Eastern Block Weapons largely funded by the West during the Cold War
 - Increased use of IEDs
- Asymmetric Threat
 - 360
 - Use of Ground
 - Compounds
 - Irrigation ditches
 - Tunnels
 - Identification of Enemy



Friendly Forces

- Infantry Soldier
 - Aged 16-43
 - Entry Qualifications – Nil
 - Basic Training – 26 Weeks
- Cold War vs 'The' War



Example - Section Commander

Cpl X

- 25 years old.
- Completed JNCO Cadre at year 3.
- Completed SCBC at year 5.
- Commands 7 men, 2-3 vehicles
- **75kg** carried on all patrols



Example - Company Commander

Major X

- Served 13 years
- RMAS & PCBC
- JCSC, ISCS, CATAC
- 35 years old
- Commands 100+ soldiers of all ranks

Currently on body 45 kg

Rifle 4½ kg

Equipment in daysack 25 kg



Soldier Burden



Soldier Burden

- Burden – Weight, Bulk, Heat, Noise
- Op HERRICK 8
 - Section Load 528kg
 - Soldier Load 66kg
- Key loads figures
 - Body Armour 13kg
 - Helmet 1.45kg
 - Wpn >5kg



Afghanistan – Strategic and Operational Direction

- Strategic - London Conference
- McChrystal operational principles
 - Step away from Kinetic
 - Courageous Restraint
 - Protect the Population
 - Embedded Partnering
- Helmand plan – joint approach
- Op Moshtarak
- **Requires significant changes in thinking, training and technology**
- **Challenges – and your potential contribution – covered this afternoon**



Op MOSTARAK – (Op TOGETHER)

ISAF directed Operational design for the next 12-18 months



RC(S) Op MOSTARAK

Msn – Combined Force conduct population centric ops in key terrain to defeat INS within the next 12-18 months and sp governance and development in order to protect the Afghan people and provide secure environment for sustainable peace

Intent – Time is short, influence must be core activity, restraint and respect are to be the watchwords. Combined force is to maximise the effect of what is available.

Three phase operation to

- 1. Secure principal population centres**
- 2. Ensure freedom of mov and control for the pop on key rte**
- 3. Disrupt, interdict and deny INS activity outside of prot areas**

RC(S) Op MOSTARAK Phases

- Ph 1 - Alignment Complete
- Ph 2 - Ops to Secure CHMD through partnered SCHB
 - Shaping Ops prior to CHB
 - Consolidation (hot stabilisation)
 - Rapid and demonstrable progress on gov and dev
- Ph 3- Expansion of effect

Partnering

- ANSF capability must grow where they can operate independently to protect population
- All ops to be partnered (where possible), at every level
- RC(S) and ANSF partners will train, plan, brief, rehearse, exercise C2, fight and recover together

Questions

