

# Militarising academia: arms corporations and UK universities

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<http://www.sgr.org.uk/>

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# Scientists for Global Responsibility research

- 'Soldiers in the Laboratory' (2005)
  - Detailed report on military sci/tech, especially in UK (and links to US), incl. funding, lobbying, ethical & political issues
- 'Scientists or Soldiers?' (2006)
  - Ethical issues and potential for alternative careers
- 'More Soldiers in the Laboratory' (2007)
  - Assessed new UK government/ industry military programmes
- 'Behind Closed Doors' (2008)
  - Examined growing military involvement in UK university sector
- 'Science and the Corporate Agenda' (2009)
  - In-depth report including chapters on military corporate sector and fossil fuel industry
- 'Offensive Insecurity' (2013)
  - Detailed new data on UK R&D military and that tackling the roots of conflict, incl. assessment of shifts in national security policy



Other SGR activities include education work – including presentations to academics, peace campaigners, and students; articles in specialists media etc – and advocacy work with SGR members and other campaign groups on issues related to military involvement in R&D

References: SGR (2005; 2006; 2007; 2008; 2009; 2013)

UK military  
science and technology:  
key factors

# UK military equipment spending

- £178bn over next ten years
  - Additional £12bn in 2015 Defence Review
- Major programmes
  - Submarines & nuclear weapons (1/4 of budget)
  - Warships
  - Combat planes
  - Armoured fighting vehicles
  - Long-range support aircraft
  - Weapons



- Submarines & nuclear weapons - incl. Trident replacement (4 x nuclear-armed subs – total cost risen to £31bn); completion of 7 x Astute Class conventionally-armed subs – approx ¼ of total equipment budget
- Warships – incl. completion of 2 x Queen Elizabeth Class aircraft carriers; Type-26 Global Combat Ship
- Combat planes - incl. F-35 Lightning II fighter-bombers (accelerated introduction); Typhoon fast jets (lifetime extension); more armed drones
- Armoured fighting vehicles - incl. Warrior, Scout
- Long-range support aircraft - incl. Voyager & A400M for heavy lift, air-to-air refuelling; 9 new marine patrol aircraft
- Weapons - incl. missiles, torpedoes and bombs
- Helicopters - incl. Chinook, Apache, Puma and Wildcat
- More details in HM Government (2015)

## Ministry of Defence Research & Development

- Recent R&D spending: £1.7 bn per year
  - Approx 1/6 of UK Gov R&D spending
  - One of the world's largest funders of military R&D
  - Rising after a period of decline
- Main research arm is Defence Science and Technology Laboratory (DSTL)
- Key weapons lab:
  - Atomic Weapons Establishment
    - Both R&D and manufacture of warheads

- Spending figures for 2014 (latest) from: Office of National Statistics (2016) – now rising after many years of decline

- AWE

- Major facility with £1bn/y budget – includes both R&D and manufacture of UK nuclear warheads
- Facilities include super-computers and powerful lasers
- Government-owned, contractor-operated – AWE management consortium (Lockheed Martin, Serco, Jacobs)
- R&D undermines nuclear weapons treaties
- Sources: SGR (2013); AWE annual reports and other related documents.  
<http://www.awe.co.uk/>

## UK Military R&D: Top 4 areas

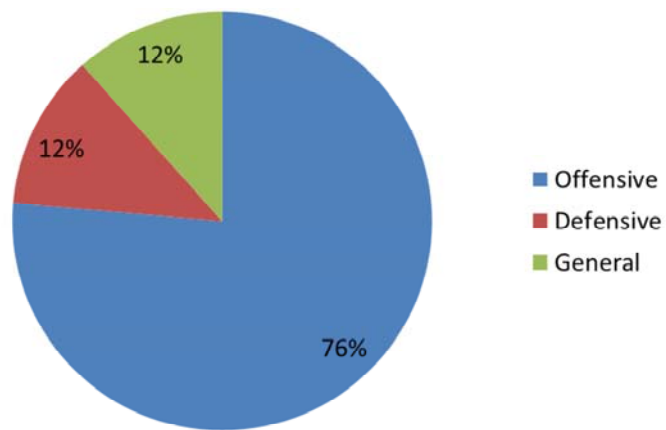
		Public R&D spending 2008-11
1.	Nuclear weapons systems <i>Warheads; 'Successor' submarines; Nuclear propulsion for submarines</i>	£980m
2.	Strike planes <i>Typhoon, F-35 Lightning II, Tornado</i>	£771m
3.	Attack helicopters <i>Mainly Future Lynx/ Wildcat</i>	£599m
4.	Unmanned aerial vehicles <i>'Drones', including Mantis, Taranis</i>	£195m

SGR (2013; 2014)

- All have major role in 'force projection', i.e. offensive
- These are minimum figures due to incomplete Ministry of Defence data

- Other areas of interest include missile systems, communications systems, warships, cyber-security, body armour, chemical/biological/radiological/nuclear defence, emerging technologies etc
- These are minimum figures – 1/4 of MoD R&D spending not clearly documented at programme level
- In public relations, the 'life-saving' contribution of military R&D projects is often emphasised, e.g. soldier armour, although in practice this is a small proportion.
- Indications that, since then, R&D on armed drones, nuclear weapons and cyber-security have all increased

## UK military R&D: main roles



SGR (2013)

Total military R&D spending, 2008-11: £5.4 billion

- Classifications based on military/ academic literature – discussed further in SGR (2013)

## International comparison of military R&D

Country	Proportion of total public R&D spending for military purposes	Public R&D spending for military purposes (\$bn)
USA	52%	75.9
UK	17%	2.5
South Korea	13%	2.7
France	7%	1.2
Japan	4%	1.4
Germany	3%	1.0

OECD (2016)

Public funding of military R&D in 2015: comparison of six major nations in the OECD  
(OECD, 2016)  
2015 prices (purchasing power parity)



## Corporations and military R&D

- Majority of military R&D (including gov-funded R&D) takes place within industry
- UK home to major arms companies
  - UK HQ: BAE Systems, Rolls Royce, Babcock, QinetiQ
  - Subsidiaries of US and other foreign companies
- Ethical issues especially significant
  - Arms exports to oppressive regimes, e.g. Saudi Arabia
  - Nuclear weapons development
  - ‘Revolving door’/ Corruption investigations

- Often, government funds military R&D within industry and then purchases the resulting technology – effectively paying twice
- BAE Systems – Europe’s largest arms company (3<sup>rd</sup> in world) following takeover of several US contractors
- Rolls Royce – specialises in engines for ships, aircraft (2<sup>nd</sup> largest in UK)
- BAE Systems, Rolls-Royce, Babcock all part of the consortium building new nuclear-armed ‘Successor’ submarines
- QinetiQ – privatised government military labs
- Arms industry is a powerful lobby – reps sit on many influential advisory committees
- ‘Revolving door’ between senior figures in government and arms industry
- References: SGR (2005; 2013); CAAT (2016a; 2016b; 2016c; 2016d)

## The nuclear dimension

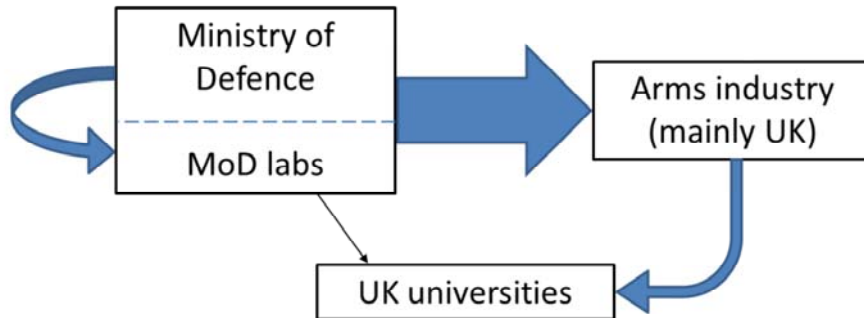
- Significant skills and technology overlap between civilian and military nuclear projects
- New study from Sussex University
  - 46 companies involved in both civilian and military nuclear work in UK
  - Range of other political and industrial connections
- Key area
  - Military: nuclear reactors for submarines (in use)
  - Civilian: small modular reactors (under development)
- How does this affect academic nuclear research?

Companies include major engineering corporations, e.g. Alstom, Atkins, Costain, Carillion, Mott MacDonald, as well as key arms companies, e.g. Babcock, Rolls Royce, Thales

Reference: Cox et al (2016)

## Military involvement at UK universities

## UK military R&D funding relationships



- Figures for 2014 from Office of National Statistics (2016)
  - MoD funding of arms industry: approx. £1.6bn (£0.1bn overseas)
  - MoD funding (net) of its own labs: approx. £0.1bn
  - MoD funding of universities: few million – but also Research Council co-funding
  - Arms industry funding of universities: approx. £0.2bn (no official figures: estimate from SGR, 2005; 2007; 2008)

## Military & UK universities

- Numerous paths for military funding of R&D in universities
  - About £200 million a year, but figures very uncertain
- Corporate schemes
  - Large programmes run by Rolls Royce, QinetiQ
- Joint government-industry schemes in recent years
  - e.g. Defence Technology Centres (DTC)
- Government schemes
  - Through military labs, civilian Research Councils etc

- Government schemes run in conjunction with: Defence Science and Technology Labs (DSTL); Engineering and Physical Sciences Research Council (EPSRC)
- References: SGR (2005; 2007; 2008); Parkinson (2015)

## Which universities?

- Main studies
  - 29 universities, 4 national programmes (2005)
  - 26 universities, mainly Russell Group (2007)
  - 16 universities, random sample (2008)
  - 53 universities with AWE funding (2014)
  - Work mainly carried out by SGR, Campaign Against Arms Trade, Nuclear Information Service
- Universities receiving most military funding
  - Cambridge, Cranfield, Imperial College London, Oxford, Sheffield
- Are there any without military funding?

- A few other smaller studies have been carried out as well.
- A list of studies, with references, is provided in: Parkinson (2015).

## Some recent examples

- Military funded projects focused on science and engineering depts
- Atomic Weapons Establishment
  - William Penney Fellowships
  - Institute of Shock Physics, Imperial College
- UAV research
  - Example: Centre for Autonomous Systems Tech, Liverpool University
  - BAE Systems is key funder project
- Research is not 'security classified'

- AWE William Penney Fellowships, named after leader of team that designed Britain's first atomic bomb, are "professorships and funding awarded by AWE to leading academics at UK universities who specialise in academic disciplines of interest to AWE."
- Institute of Shock Physics - £10m research centre investigating "the fundamental science behind shock waves, high velocity collisions, heat and pressure extremes."
- CAST is "concerned with programmable robots acting autonomously without human intervention".

Sources: Nuclear Information Service (2014); Liverpool Friends of Palestine (2015)

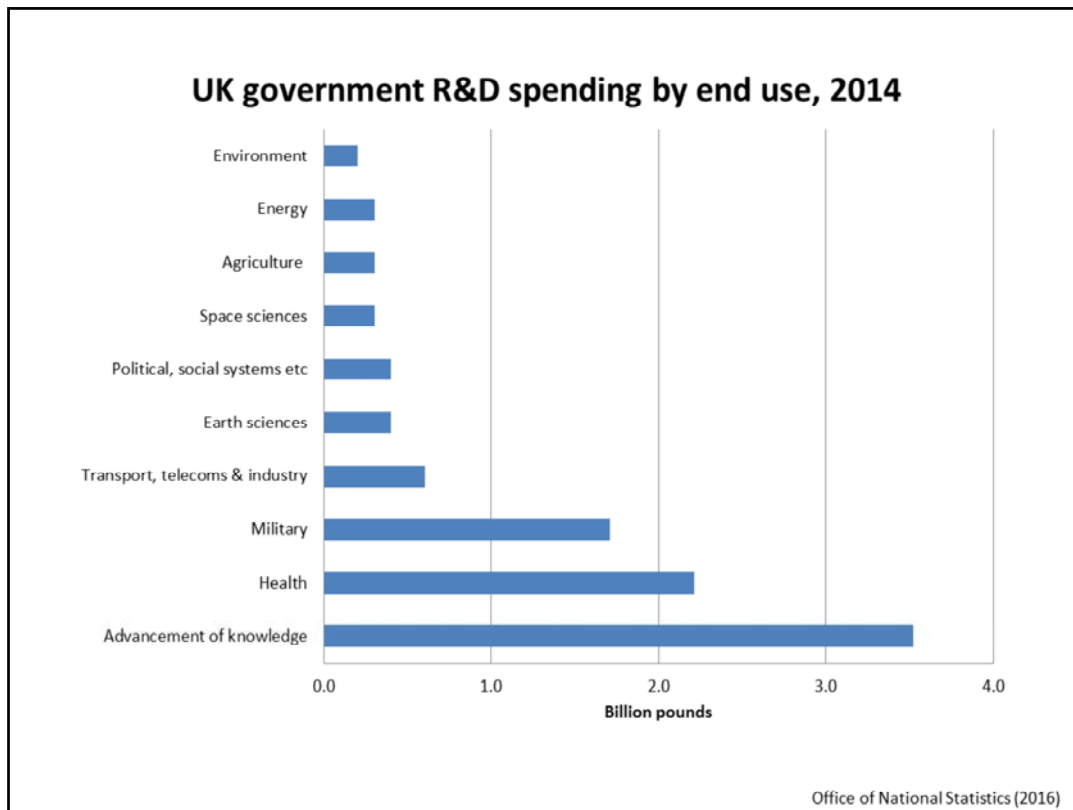
## Key concerns

- Arms industry funding is small percentage of university income but:
  - Focused on key disciplines
    - engineering, computing, physics
  - Provides reliable supply of qualified scientists/engineers
  - Creates sympathetic, long-term professional relationships

SGR (2005, 2008); Parkinson (2015)

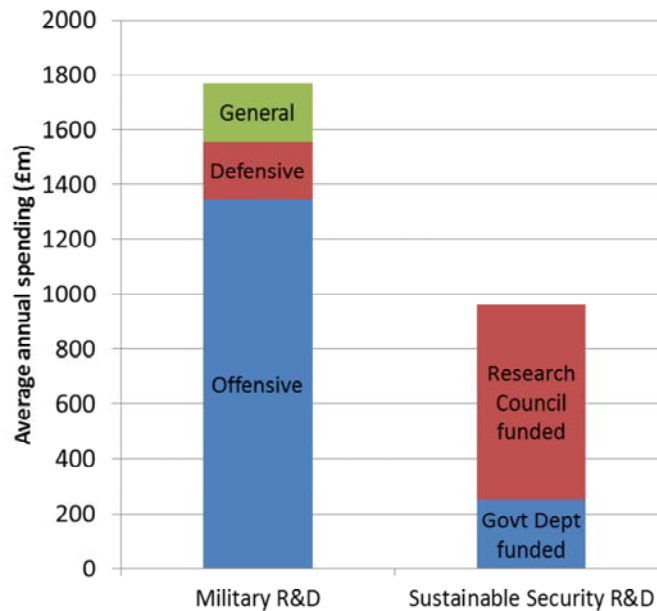


## Comparing military and civilian R&D



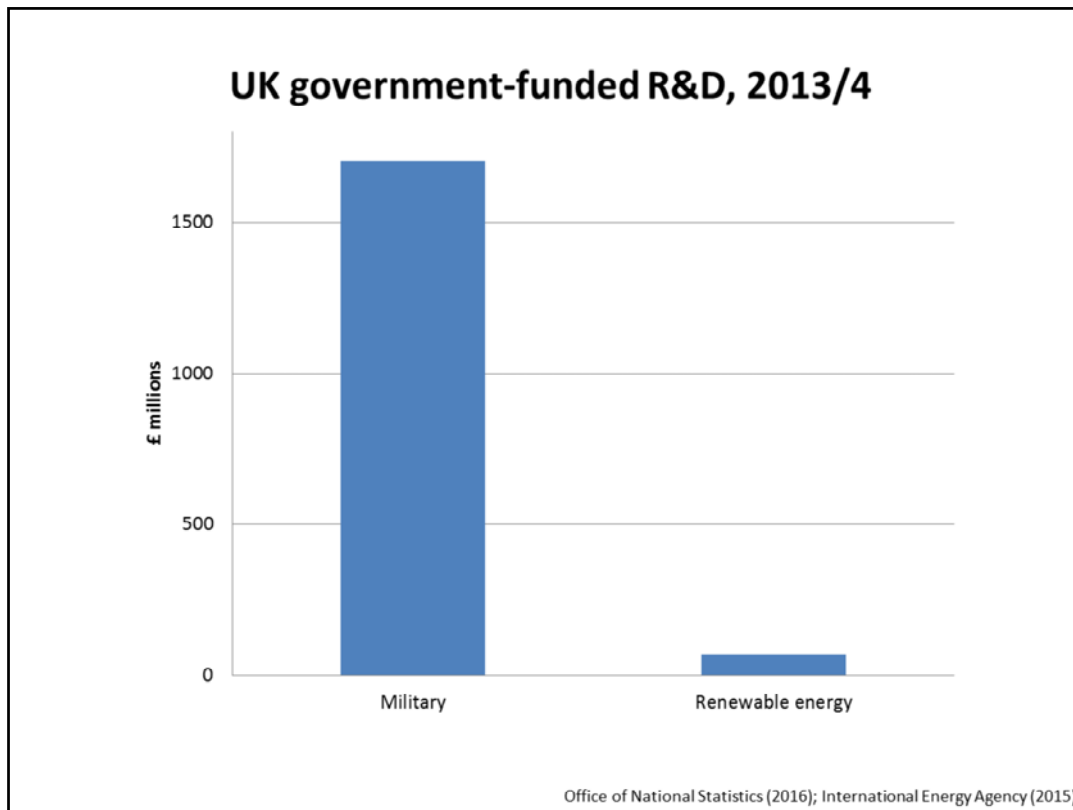
- Latest analysis by Office of National Statistics – Office of National Statistics (2016). Table 8.
- Military R&D is spending by Ministry of Defence.
- Earth sciences includes mining.
- Private R&D spending (by arms companies) is smaller and less certain – around a few hundred million pounds (SGR, 2005)
- Government military R&D spending increased in 2014, while civilian R&D spending fell.

## Comparing UK security R&D (2008-11)



SGR (2013)

- Sustainable security R&D spending includes: international development and poverty alleviation, climate change impacts, sustainable energy technologies, food security, international relations, natural resource management, biodiversity, environmental risks and hazards, sustainable consumption and other measures to mitigate and adapt to climate change
- The concept of sustainable security was defined in Oxford Research Group (2006)



Military spending: 2014 figures (as in slide 17) – Office of National Statistics (2016)

Renewable energy spending: 2013 figures – International Energy Agency (2015)

Campaigning/ Education:  
Making the case for a shift in  
science and technology  
resources

## Commit universities to peace

- Campaign run by INES
  - International Network for Engineers and Scientists for Global Responsibility
- ‘Civil clause’ campaigns in Germany and Japan
  - Ethical clause within university governing charter
  - Commitment to civilian work only
  - 21 universities in Germany
  - 5 universities/ 19 research institutes in Japan
  - Some success, but mixed interpretations



- Civil clause provides basis on which to challenge any military funding, but may be interpreted in narrow ways (eg military funding/ projects allowed if not directly for weapons) or ignored
- Further details in INES (2015)

## SGR programmes

- Military Influence on Science and Technology
  - Research: including new ‘peaceworker’ project
  - Advocacy: scientists/ campaigners/ policy-makers
  - Related work on arms conversion
- Science4Society Week
  - Activities for school children
- Ethical Careers in Science, Design and Technology
  - Info for university students



- Recent campaigning against planned new EU military R&D budget – approx. 25m euros/y for next 4y (Science Business, 2016)
- More details on SGR project work:  
<http://www.sgr.org.uk/projects/military-influence-scitech>  
<http://www.sgr.org.uk/projects/science4society-week>  
<http://www.sgr.org.uk/projects/ethical-careers>

## Other UK organisations

- Campaign Against Arms Trade
  - Universities campaigning
  - Arms to renewables
- General
  - Forces Watch, Peace Education Network, Oxford Research Group, Article 36, QPSW etc
- Technology specific
  - CND, ICAN-UK, Drones Campaign Network etc

List of UK peace groups at:

<http://www.networkforpeace.org.uk/members>



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