The detrimental effects of corporate influence on science and technology

Dr Stuart Parkinson

Scientists for Global Responsibility
Scientists • Architects • Engineers • Technologists

SGR
Promoting ethical science, design and technology

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

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About Scientists for Global Responsibility

- Independent organisation of about 1000 science, design and technology professionals
- Argues for higher priority for work which contributes to reduction of conflict, environmental protection, social justice
- Research, education and advocacy
- Recent reports on influence of corporate and military influence on science and technology

Unless otherwise stated, the source of material in this talk is:
Langley C and Parkinson S (2009). Science and the corporate agenda: the detrimental effects of commercial influence on science and technology. Scientists for Global Responsibility. http://www.sgr.org.uk/publications/science-and-corporate-agenda

Business and science

- Business influence on science is substantial through:
  - In-house research & development
  - Direct funding of academic research
  - Joint funding of academic research with public bodies
  - Funding of science teaching at universities and schools
  - Input into decisions on public funding of R&D
- UK gov policy over past 20y has been pushing for much closer links

- Business in-house R&D represents more than 2/3 of R&D in UK
- Influence on public decision-making includes appointments on Council for Science and Technology (advisors to PM), Foresight panels, Research Council steering committees, and other advisory committees
- Business funding is growing
- Similar trends in other leading economies

Key policy milestones 1991-2000

1991	Faraday partnerships (industry-academia collaborations)
1993	'Realising our potential' (white paper)
1994	Foresight panels (advisory panels for gov research)
1995	Office of Science and Technology moved from the Cabinet Office to the Dept of Trade and Industry
1997	'Higher education in the learning society' report
1998	'Our competitive future: building the knowledge-based economy' University Challenge Fund (for spin-out companies)
1999	12 Science Enterprise Centres 'Creating knowledge, creating wealth' (Baker report)
2000	'Excellence and opportunity' (white paper) 'Technology matters' (Council for Science and Technology report) HM Treasury's Cross-cutting review of the knowledge economy

• Baker report on commercialisation of research from public sector research establishments

Key policy milestones 2001-2010

2001	Higher Education Innovation Fund 'Opportunity for all in a world of change' (white paper) 'Delivering the commercialisation of public sector science' (NAO report)
2002	Sainsbury's cross-cutting review of science and research
2003	Lambert review of business-university collaboration 'Competing in the global economy' (DTI report)
2004	Science and innovation investment framework 2004 – 2014 Technology Strategy Board; Technology Strategy
2005	Knowledge Transfer Networks
2006	Re-organisation of government depts to create BERR, DIUS and DCSF Warry report; Leitch review; Cooksey report
2007	Sainsbury review of science and innovation
2008	'Innovation nation' (white paper)
2009	Merger of BERR and DIUS into Dept for Business, Innovation and Skills
2010	Spending Review: protection for science budget in return for getting economic contribution

- NAO - National Audit Office
- DTI – Dept for Trade and Industry
- BERR – Dept for Business, Enterprise and Regulatory Reform
- DIUS – Dept for Innovation, Universities and Skills
- DCSF – Dept for Children, Schools and Families
- Warry report – economic impact of Research Councils
- Leitch review – improving skills
- Cooksey report – commercialising health research

Changes in academic ethos

‘Traditional university’	‘Commercialised university’
• Research – Curiosity-driven – Open-ended – Public interest – Open publishing • Education – Knowledge-driven – Critical thinking	• Research – Applied – Industry partnerships – Tech transfer offices & spin-out companies – Patent ownership – Restrictions on publishing • Education – Training for employment, especially business – Vocational

• ‘Traditional university’ is idealised concept – there has always been some ‘dilution’. Likewise the no university is completely ‘commercialised’ according to the definition used here. However, government policies, especially over the past 20y, have led to large-scale shifts towards the commercialised situation.

• Recent and proposed changes lead to researchers having to demonstrate ‘impact’ of their research – impact is defined broadly as covering economic, social, cultural etc effects, but focus is very much on economic factors (McKibbin, 2010).

Reference (e.g.):

McKibbin R (2010). Good for Business. London Review of Books. Vol 32(4), p9-10. http://www.lrb.co.uk/v32/n04/ross-mckibbin/good-for-business

What's the problem with business?

- Business obliged to maximise private (shareholder) profit
  - Social/environmental goals can be marginalised
- Some businesses are very powerful
  - both economically and politically
- Strong international competition leads to government prioritising business interests
- Business needs sci/tech for success, so pushes for large influence

The current economic problems are another reason why government (and professional science institutions) are pushing the economic arguments at the moment.

- *Short-term economic goals now given special priority within science*

Caveats

- Business can and does bring important benefits to society
- Commercialisation of new technologies can and does bring important social/ environmental benefits

➢ But reform is needed

Specific problems

1. Undue influence on individual research studies
   - Sponsorship bias
   - Commercial confidentiality restrictions
   - Undeclared conflicts of interest
2. Misleading the public
   - Marketing bias
   - Unbalanced public relations campaigns
3. Prioritisation of research with narrow economic benefits

Sponsorship bias

- *Problem: Source of funding for a research project influences the results/outcome*
- Numerous academic studies have documented this problem
- Evidence of problems is strongest in clinical trials funded by pharmaceutical or tobacco industries
- Often unintentional
- Sponsorship of teaching is also problematic

Sponsorship bias

- Major studies

Study	Sector	Industry favourable result
Als-Nielson et al (2003)	Pharmaceuticals	3 times more likely
Lesser et al (2007)	Food	4 to 8 times more likely
Bero et al (2007)	Pharmaceuticals	20 times more likely

- Distorted results can compromise patient safety and/ or increase health care costs
- Limited investigation of this problem in other sectors

• Als Nielson et al (2003) – analysis of 370 clinical trials of range of pharmaceuticals

• Lesser et al (2007) – analysis of 206 studies of milk, fruit juice and soft drinks

• Bero et al (2007) – analysis of 192 trials of statins

• Distorted results can lead to drugs being considered safer or more effective than they actually are. New drugs can be more expensive, eg because they are still under patent.

Full references and further discussion in:

Langley and Parkinson (2009). Chapter 4.

Mejia (2008). Taking the industry road. Nature, vol 453, p1138-9.

Commercial confidentiality restrictions

- *Problem: Industry-funded researchers often sign contracts which restrict publication of results*
- Can lead to inconclusive or unfavourable results being delayed or not being published
- Most often found in trials funded by pharmaceutical, chemical or tobacco industries

• At least half of industry-sponsored researchers sign contracts which allow restrictions in publication

• Clinical trials (on pharmaceuticals) which produce industry-favourable results take about 5y to publish whereas unfavourable results take about 7y to publish

• Numerous cases of concern, eg GSK's antidepressant drug, Paxil, where evidence of potential suicidal behaviour had not been published.

References:

Giles J (2006). Stacking the deck. Nature, vol 440, p270-2.

Mejia R (2008). Taking the industry road. Nature, vol 453, p1138-9.

Langley and Parkinson (2009). Chapter 4.

Undeclared conflicts of interest

- *Problem: researchers often don't declare financial interests related to their work*
- Numerous cases have been found
- Few academic journals have rigorous procedures to police conflicts of interest
- Full extent of problem is unknown but has been found across science

• Financial interests include industry research grants, consultancy fees, patents etc that are related to the research being published

• A study of papers submitted to Nature in 2005 found that, of papers with authors with financial conflicts of interest, 2/3 did not declare them.

• Because of the extent of this problem in medical science, the most prestigious journals (e.g. BMJ, Lancet) have become much stricter about policing this problem – but elsewhere, it is not the case.

• Effectively universities now have conflicts of interest through having a financial interest in research outputs through patents, consultancies etc

Reference:

Langley and Parkinson (2009). Chapters 4 and 8.

Marketing bias

- *Problem: information on the benefits and costs of a new product does not accurately reflect the research*
- Marketing campaigns of new products often over-emphasises benefits
- Pharmaceutical & food industries frequently criticised
  - Pfizer fined a record $2.3 bn for mis-selling drugs

• World's biggest drug company, Pfizer agreed to pay $2.3bn (£1.4bn) in the largest healthcare fraud settlement in the history of the US Department of Justice.

• Company was found to have illegally promoted four drugs for uses which had not been approved by medical regulators. A subsidiary of the firm pleaded guilty to misbranding drugs "with the intent to defraud or mislead".

Reference:

BBC News online (2009). Pfizer agrees record fraud fine. 2 September. http://news.bbc.co.uk/1/hi/business/8234533.stm

Misleading public relations campaigns

- *Problem: industry-funded groups run campaigns which distort public view of scientific evidence*
- Most prominent examples
  - Tobacco industry campaigns on smoking & health
  - Fossil fuel industry campaigns on climate change
- Often involve indirect funding of public relations companies, free-market think-tanks
- Internet increasingly used as less restrictions

• Campaigns funded by business which (sometimes covertly) aim to change opinions on a science and technology issue in ways that do not reflect the evidence

Tobacco industry campaigns

- Creation/ funding of lobby groups & think-tanks
  - Tobacco Industry Research Committee; International Committee on Smoking Issues; INFOTAB; Center for Indoor Air Research; Council for Tobacco Research; Tobacco Institute; 'Get Government Off Our Back'
- Funding of sympathetic scientists to speak out
- Campaigns run over many decades
  - Full details only revealed following US legal action in 1990s

• Tobacco industry was aware of health problems associated with smoking as far back as 1950s

Reference:

Langley and Parkinson (2009). Chapter 5.

Fossil fuel industry campaigns

- Creation/ funding of lobby groups & think-tanks
  - Global Climate Coalition; Competitive Enterprise Institute; Heartland Institute; International Policy Network; Institute of Economic Affairs; American Enterprise Institute; Cato Institute
- Campaigns run since late 1980s
- Tobacco industry tactics being used
- Most large oil companies withdrew from supporting climate sceptic arguments in late 1990s, but ExxonMobil continued

• 2007 report by Union of Concerned Scientists (USA) documents the links between tobacco industry campaigners and ExxonMobil

• Royal Society publicly criticised ExxonMobil activities in 2006

• ExxonMobil claim to have changed their views, but some dispute this

Main reference: Langley and Parkinson (2009). Chapter 7.

See also: Union of Concerned Scientists (2007). Smoke, Mirrors and Hot Air: How ExxonMobil Uses Big Tobacco's Tactics to Manufacture Uncertainty on Climate Science. http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf

Prioritisation of sci/tech with narrow economic benefits

- *Problem: research and technological development driven more by business priorities than health/ env etc goals*
- Criticisms across science and technology
- R&D funding decisions involve political and ethical issues, and are complex

Examples of problems across science:

1. Economic criteria increasingly being used by government to decide overarching research priorities – even more so since 2010 Spending Review
2. Universities being internally reorganised to behave like businesses
3. University-business collaborations are being encouraged and expanded
4. More patenting as part of academic research
5. High degree of business involvement in emerging technologies leads to faster and less accountable technological development
6. Sector-specific problems in slides to follow...

Security

- Very strong focus within security R&D on military tech-based approaches to dealing with conflict rather than alternatives
- Military/defence industry receives large grants from government for R&D
  - especially in US, UK
- Network of influential lobby groups and advisory committees pushes industry interests

• Alternatives approaches include: diplomacy, mediation, understanding and addressing root causes of conflict, post-conflict reconciliation

Reference:

Langley and Parkinson (2009). Chapter 6.

Agriculture

- Industry R&D on seeds dominated by small group of companies which prioritise genetic modification and pesticide use
- Public R&D on agriculture also prioritises work on GM crops, monoculture farming
- Agro-ecological farming methods offer cheap, effective methods but receive few R&D funds

Reference:

Langley and Parkinson (2009). Chapter 8.

Health

- '10/90 gap' major problem in health R&D
  - Only 10% of R&D focussed on problems which cause 90% of ill-health
- Commercial pressures in health/ pharmaceutical industries make it difficult to redress balance
- R&D on lifestyle change – eg for tackling obesity – is small proportion of health R&D

• GSK recently announced it will allow open access to its data on potential anti-malaria compounds, so others can pursue drug development.

Reference:

Langley and Parkinson (2009). Chapter 4.

BBC News online (2010). Drug firm boost to malaria fight. 20 January. http://news.bbc.co.uk/1/hi/health/8470087.stm

Climate change & peak oil

- World's biggest companies are oil companies
- Even the 'greenest' only devote small fraction of their income to developing alternatives to fossil fuels
- Action to tackle climate change and peak oil requires much greater effort on reducing energy demand
- R&D in this area is very small proportion of energy R&D

Reference:

Langley and Parkinson (2009). Chapter 7.

Potential solutions – part 1

- Much greater openness about business links with academic researchers and universities
  - Journals with strong conflicts of interest procedures
  - Registers of interests
  - Consistent record keeping
- Ethical standards for university-business links
  - Including social/ env criteria

Reference:

Langley and Parkinson (2009). Chapter 10.

Potential solutions – part 2

- More ‘research on research’
  - Many research areas have not been investigated
- Less ‘business-only’ grants for universities
  - Use of joint funders with competing interests
- More public scrutiny of R&D policies
  - eg House of Commons Committees, NGOs
- Greater fraction of public R&D that is not driven by economic priorities and/or investigates alternatives, side effects etc

Reference:

Langley and Parkinson (2009). Chapter 10.

Broader issues

- Economic and political power of large corporations
- ‘Limited liability’ prevents share-holders being held accountable for misdeeds
- Global economic system
  - Gross inequality
  - Environmentally unsustainable

Key conclusions

- That business has too much influence within science, and can reduce its quality
- That short-term economic goals are now give high priority in science
- That more action is urgently needed to deal with the detrimental effects
- That wider economic reforms are needed for the good of society and environment