Scientists for Global Responsibility

SGR
Promoting ethical science and technology

Soldiers in the Laboratory

Military involvement in science and technology –and some alternatives

Executive Summary

Overview

Military technology has contributed centrally to the shaping of the world in which we live. The economic and political dominance of the industrialised countries is in part the legacy of innovations in military technology in Europe and later in the USA. The power and range of military activities is, in a variety of ways, closely linked with the expertise of scientists, engineers and technologists engaged in or funded by the military sector.

The main purpose of this Report is to document the power and influence of the military in the governance and direction of science, engineering and technology in the UK over the past fifteen years. A great deal of the discussion is concerned with the implications for research and development (R&D). We find, however, that teaching, including at the postgraduate level, and public attitudes are also both influenced in various ways by military involvement with, and support of science, engineering and technology (SET).

The report also examines whether some reallocation of the resources that the military currently devotes to weapons-related SET would contribute better to the goals of peace, social justice and environmental sustainability. In exploring this issue, we consider the argument that the concept of security can be more broadly defined, so as to include measures to forestall many of the pressing challenges facing the world today, such as climate change and a range of poverty-related issues.

It should be noted that a lack of openness in this area, often unrelated to national security concerns, has hampered attempts to gather information in some areas.

Background—the science world and the military world

During the last fifteen years, wealth creation has become the major driving force for investment in science, engineering and technology (SET), as exemplified by the UK's ten year science and innovation investment strategy published in 2004. This commercial agenda has led to a plethora of R&D partnerships and funding initiatives, which in turn frame the directions and priorities of the research itself. This agenda also underpins significant involvement from the military sector.

Profound global changes have affected military and security issues over this period. The advent of the 'War on Terror' has reversed the drop in military expenditure that followed the end of the Cold War. Global military expenditure in 2003 stood at a massive US$956 billion, with the USA accounting for over 40 per cent of this. The UK is also a major military power, and is the world's third largest military spender.

An increasing emphasis on high technology weaponry among the wealthier countries is contributing to a narrow approach to dealing with security issues. Currently, the Ministry of Defence (MoD) only spends approximately 6 per cent of its budget on conflict prevention. Meanwhile, there is growing evidence that the international arms trade is contributing to conflict and exacerbating human rights problems and poverty.

Military involvement with science, engineering and technology

Our investigation has uncovered a wide range of information about military involvement with SET. Such involvement is concentrated in a fairly small number of countries, with the USA dominating. For example, in the European Union, the UK, France, Spain and Germany accounted for 97 per cent of the total government military research budget in 2000. The UK itself is the world's second largest funder of military SET. In 2003/04, the military spent approximately £2.7 billion on UK R&D. £2.6 billion of this finance came from the MoD - 30 per cent of the total public R&D budget. Furthermore 40 per cent of government R&D personnel are employed by the MoD. The procurement of advanced weapons technology is also a major component of state expenditure, with the UK Defence Procurement Agency spending approximately £6 billion a year on military equipment.

A small number of military corporations in the UK exert a largely invisible influence on the government. Through a complex array of advisory committees and lobby groups, they have a significant voice in the funding and shaping of the research agenda. Lockheed Martin and BAE Systems - two of the largest military corporations in the world - have a major presence in the weapons laboratories of the UK and USA. They also support work across many disciplines and fields within science, engineering and technology for military objectives.

In addition, the military sector supports emerging technologies such as space technology and the nanotechnologies, enjoying a large-scale effect on the direction of their development.

A number of new multi-million pound collaborations between the military sector and the universities have been created in the UK in the last few years. The three main initiatives are Defence Technology Centres, Towers of Excellence, and Defence and Aerospace Research Partnerships. All reflect a narrow technological approach to security issues.

Science and technology and a broad global security agenda

The world today faces a range of social and environmental problems, many of which have an impact on security. Poverty, lack of access to basic resources such as clean water and sanitation, and global climate change represent urgent problems. Furthermore, unsustainable levels of resource consumption by the industrialised world can contribute to a range of international problems, at times including conflict.

Our investigations show that SET programmes in conflict prevention, poverty alleviation, and environmental protection often yield clear benefits for relatively little cost, yet these areas get a fraction of the budget allocated to military technology. Disarmament and peacebuilding initiatives also tend to be smaller scale. Equally, R&D budgets for renewable energy technologies, essential to tackle the threat of climate change, are dwarfed by budgets for the development of weapons technology.

Principal conclusions

There are seven main conclusions which have arisen as a result of the research undertaken for this Report concerning the military influences on SET. These can be summarised as:

1. The military sector, especially in the UK and USA, has a very large and disproportionate effect on science, engineering and technology. The UK-US 'special relationship' (largely based on a 1958 treaty, which was renewed in 2004) further drives military R&D which has profound social and ethical implications.

2. Current military thinking is based predominantly upon the idea of security through the superiority of military force, and marginalises broader concepts of security based on social justice and environmental sustainability. This affects which areas in SET are funded by the military.

3. The UK government policies which have shaped SET over recent decades have moved commercial priorities centre stage, and military corporations have played a large part in this process.

4. Military and commercial pressures compromise openness and accountability in SET, for example, through the use and overuse of commercial confidentially and national security arguments. This can stifle debate and dissent over ethical issues in SET. In general, public scrutiny of SET in the UK, including its funding and direction, is weak.

5. Military support of emerging technologies such as the nanotechnologies is high (especially in the USA). This imposes barriers to full public scrutiny of these technologies and colours the public perception of the potential usefulness of such technologies.

6. Technology transfer from military-supported R&D to civilian use is a complex and expensive route which has, to a large extent, been disappointing in view of the massive investments involved.

7. Areas such as peace-building and sustainable development are currently underfunded, and would benefit substantially from an expansion of SET expertise paid for by a reallocation of proportions of military budgets.

Furthermore, we make eight additional conclusions:

8. Global security today faces more challenges from terrorist groups than from nation states. However, the use of essentially Cold War-type strategies and technologies (and the R&D that supports them) in the industrialised countries does not significantly address these needs.

9. Globally, military spending on equipment procurement and R&D not only can divert resources from, for example, health or poverty alleviation programmes, but can also contribute to arms proliferation and refugee crises globally.

10. A broader interpretation of security is called for which takes account of global issues such as climate change, resource depletion, loss of biodiversity and an array of human health problems. Some redirection of the global 'defence' burden to underfunded areas (many with a SET component) such as renewable energy and climate change mitigation would significantly assist in the development of these areas.

11. The development of a new generation of nuclear weapons, by US and probably UK weapons laboratories, is likely to compromise security through the undermining of the Nuclear Non-Proliferation Treaty. Nuclear weapons create a climate of fear and send a strong message to other countries who do not yet have them that possession of nuclear weapons is a desirable and acceptable security objective. Furthermore, new, so-called 'bunker-buster', low-yield nuclear weapons are likely to blur the distinction between conventional and nuclear war.

12. Areas such as space science and the biosciences have become 'militarised' in the USA. This has influenced, and potentially downgraded, the priority given to other areas such as research to produce low cost therapeutic agents, energy efficiency and strategies for urgent climate change amelioration. These effects originating within the USA ramify across the world essentially because of the country's pivotal role in SET.

13. A number of consortia have been launched over the past three years in the UK which involve the military corporations, government departments and the universities. These forms of collaboration have a largely military agenda for research. Such an agenda has not been sufficiently scrutinised for its social and ethical implications.

14. Intellectual property rights and patents are highly contentious areas within university-industry collaboration, especially given the new consortia involving the military corporations, and clear guidelines need to be implemented to safeguard individual and public utility.

15. There is a pressing need for a much wider public debate over the direction which science, engineering and technology is taking in the UK (as currently laid out in the 2004-2014 investment strategy), taking particular account of the role of the military sector.

Recommendations

Based on the extensive evidence which we have assembled in this Report, we make a series of recommendations which address the concerns we have identified. They are divided into three groups according to the audience to which they are addressed: the UK government; professional scientific and engineering institutions and publishers; and individual scientists and engineers.

Recommendations to the UK government

1. Divert a large fraction of current UK military R&D funds to addressing wider issues. To redress the disproportionate involvement of the military in publicly-funded

SET, the government should begin a rapid and significant shift of funding from military R&D to civil R&D which contributes to peacebuilding, addressing environmental problems and alleviating poverty at a national and international level. A public review should be conducted to decide on exact levels and timescales but, as a first estimate, we recommend a shift in funds of the order of one-third to one-half of the current military R&D budget in the near term. Such a review should be part of a re-examination of current priorities in UK SET - with widespread public involvement - which was broadly lacking in the drawing up of the recent ten year science and innovation investment strategy.

2. Restrict military involvement with R&D of emerging technologies. Ministry of Defence funding for emerging technologies such as nanotechnology should be less than ten per cent of that from civil public funds. Military involvement should not restrict full public scrutiny of such areas. The UK government should call on the USA and others to follow suit.

3. Enact procedures to make Ministry of Defence funding of R&D far more transparent and open to public scrutiny. Organisations receiving MoD funding whether directly or indirectly (eg through the Defence Science and Technology Laboratory or QinetiQ) should be required to publicly acknowledge the source, its extent and purpose.

4. Devote more resources to implementing a far more inclusive concept of security within policy. Such a broadened concept would place social justice, peace and environmental sustainability at the centre of considerations of security. Such an approach would lead to the Ministry of Defence relying to a much lesser extent on the development and implementation of military technology and the use of force, and a much greater support where SET and other activities can contribute to peacebuilding and non-violent conflict resolution.

5. Conduct a full and transparent review of the 1958 Agreement for Co-operation on the Uses of Atomic Energy for Mutual Defence Purposes (renewed in 2004) and all other military agreements between the USA and the UK. Such agreements are a powerful driver of new nuclear and other military technologies and have not received full Parliamentary scrutiny or public discussion.

6. Cease all scientific and technical work related to the design and development of new nuclear weapons. Call on the USA and other nuclear powers to do the same. As a signatory to the Nuclear Non-Proliferation Treaty, the UK has agreed to pursue global nuclear disarmament, yet it is making little effort to do so. The UK government should be leading international efforts to make rapid progress in this area.

Recommendations to professional bodies, scientific and engineering institutions and publishers

7. Require all academic papers and reports based on work funded by the military (whether government or corporate) to publicly acknowledge this funding and its scale.

8. Strengthen or initiate professional ethical codes to encompass the problems of professional involvement with the military and its current narrow interpretation of the concept of security.

9. Reduce or eliminate financial ties with the military at least until the adoption of the policies recommended above (1 to 6).

10. Lobby for the above changes in government policy.

Recommendations to individual scientists and engineers

11. Educate yourself about any military interest in your field of work and in your institution. Examine whether it is more likely to encourage security policies focused on the use of military force, or security policies based on, for example, the tackling of the root causes of conflict.

Either

12. Engage with military interests to try to encourage a shift in the way they use the work to a more holistic security perspective.

Or

13. Avoid working with the military altogether and choose a scientific/ engineering post which provides civil benefits to society, for example, by helping to address social and/ or environmental problems.

14. Support lobbying for the above changes in government policy.

15. Encourage discussion of these issues in your institution and within the appropriate committees or boards of your professional associations.

This executive summary and the main report were published by Scientists for Global Responsibility (SGR) in Jan 2005.
The main report can be ordered from SGR using this form or downloaded from the SGR web-site, http://www.sgr.org.uk/.
Full references are given in the main report.

SGR is an independent UK-based organisation which promotes ethical science and technology.
The report was written by Chris Langley, and edited by Stuart Parkinson and Philip Webber.

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