Who's looking after British science?

No-one, says Prospect, the union which represents 122,000 scientific, technical, managerial and specialist staff in the civil service, related bodies and major companies.

PROSPECT HAS serious concerns about the likely impact of decisions about science funding for UK capability, economic competitiveness and the public good.

While Prospect accepts that priorities can and do change, we object to the fact that major decisions about public sector science are being taken without central knowledge by government of the range and value of work undertaken by its own scientists.

The reality is that government could not function effectively without this experience and expertise, but much of this essential work is low profile and – except in times of crisis – largely hidden from public view.

The Government's 2009 Science, Engineering and Technology statistics show that while science budget expenditure has grown significantly over the last 10 years, SET expenditure by civil departments has fared much worse, with the exception of the Scottish government.

The table on p8 shows that, overall:

- civil departments' SET expenditure fell by 18.2% in real terms over a ten-year period from 1997-98, and 28.1% between 2006-07 and 2007-08
- expenditure on SET by the Department of the Environment, Food and Rural Affairs fell by 17.5% over the same ten years and very sharply – by 51.2% – between 2006-07 and 2007-08
- the Department for Transport suffered a 53.6% cut in SET expenditure between 1997-98 and 2001-02, which has not been restored
- growth of 20.2% in NHS SET expenditure in the ten-year period from 1997-98 masks a 33.8% cut elsewhere in the Department of Health over the same period
- a 28% overall cut in the Ministry of Defence's SET expenditure over the ten years from 1997-98 includes a cut of 12.4% in research expenditure and a cut of 33.1% in development activities.

For further information about Prospect's work on science, go to: www.prospect.org.uk/news/publicscience/index or www.prospect.org.uk/groups/G02/public/p4 or contact Sue Ferns (E: sue.ferns@prospect.org.uk)

"The Government faces clear choices in the comprehensive spending review. Support for science is a necessary investment in our fragile economy and cutting it makes no sense at all. The £7 billion paid in bankers' bonuses this year would keep 200,000 scientists in employment for a year."
Paul Noon, Prospect general secretary

prospect
union for professionals
WWW.PROSPECT.ORG.UK

Don't give science the cold shoulder

REBALANCING OUR economy away from over-reliance on financial services and fuelling economic growth by investing in science. Isn't that what everyone agrees the UK economy needs?

So why have just four of our MPs signed an early day motion to that effect?

Julian Huppert, Liberal Democrat MP for Cambridge, put down early day motion 767 on September 16, 2010. It says that this House:

- notes the UK's proud history of excellence in science and engineering, whereby it produces over 10 per cent of global scientific output with just one per cent of global population
- believes that continued investment in research is vital in order to meet the technological and social challenges of the 21st century, and to continue to attract high-tech industries to invest here
- further believes that large cuts to science funding are a false economy, due to evidence that research investment fuels economic growth;
- further notes the increased investment in science by the UK's international competitors, such as the USA, France and Germany; further believes that investment in research and development is vital to help rebalance our economy towards hi-tech manufacturing and away from over-reliance on financial services
- recognises the work of the Science is Vital coalition and the Campaign for Science and Engineering in arguing that the UK should seek to retain its role as a world leader in these fields; and calls on the government to safeguard the UK's scientific excellence by providing a research investment strategy which builds on the success of UK science and engineering.

Latest revision of this document: https://library.prospect.org.uk/id/2010/01566
This revision: https://library.prospect.org.uk/id/2010/01566/2010-11-05

Government axe over Big Society scientists

SCIENCE ADVISORY bodies which cost the taxpayer peanuts are on the leaked list of arms-length bodies that the government wants to abolish.

These bodies account for nearly half of all arms-length bodies. But most do not have their own budgets – they simply offer a way of bringing expert advice to policy makers at a lower cost than through consultancy contracts.

Many of them raise, or save, far more money than they cost. The Sustainable Development Commission says "moves towards greater sustainability made to date are saving government £60-70 million every year, and further progress has the potential to save hundreds of millions more."

The government intends to introduce a Public Bodies Reform Bill which will give ministers the power to abolish, merge or transfer functions without the inconvenience of full parliamentary scrutiny.

Prospect believes the government should answer five key questions before it abolishes a public body (see p8).

Opposition to these plans is mounting. Six of the UK's biggest food and farming organisations have urged the government not to knock consumer confidence in pesticides by scrapping or weakening the role of two key pesticide committees.

Dominic Dyer, chief executive of the Crop Protection Association, said on behalf of the campaigners. "We recognise that ministers face tough spending decisions, but it would be a false economy to do away with the bodies that have helped make such significant progress in improving the level of public confidence in pesticide controls."

The Environmental Protection UK Air Quality Committee wrote to the environment secretary in September. It said: "AQEG members are paid a nominal fee to attend meetings – far below their usual consultancy rates – and undertake considerable amounts of work for the group between meetings at no cost to the government.

"Despite the lack of financial reward AQEG is supported by many of the most experienced air quality specialists in the UK, as they can see the value of the work the group undertakes. If AQEG is abolished this support will be lost, and the costs of obtaining expert scientific advice on air quality matters will rise significantly."

Key info, broken down by department, is at: www.civilservice.gov.uk/about/resources/ndpbs.aspx

£107m
City advisers' fees on banks bailout 2009-10

Government funding for Department of the Environment, Food and Rural Affairs advisory bodies in 2008-09

Advisory committee on hazardous substances	£21,500
Advisory committee on pesticides	£55,000
Advisory committee on releases to the environment	£75,000
Air quality expert group	£88,986
Pesticides residue committee	£11,193
Total	**£251,700**

Source: www.defra.gov.uk/corporate/about/with/delivery/landscape/documents/public-bodies-sumary-table.pdf

British botanists an endangered species

SCIENTISTS IN Wales have ambitious plans to generate one kilowatt in every eight of Britain's electricity from Elephant Grass.

Prospect represents 141 scientists and specialists at a world centre for new plant science in Wales.

The University of Aberystwyth's Institute of Biological Environmental and Rural Sciences was formed by transferring the former Institute of Grassland and Environmental Research from the Biotechnology and Biological Sciences Research Council in 2008.

One of its areas of work is biofuels. In a recent article in the *Daily Telegraph*, Steve Jones, professor of genetics at University College London, warned that new crops, new drugs and new sources of energy are needed – but the annual crop of British botany graduates is now so reduced as to make them an endangered species.

Jones said: "Much of the biofuel market is driven by the economics of the madhouse, for subsidies make it profitable to burn crops that could be eaten."

Elephant grass is a 15ft Asian giant that can grow on barren land and is four times better than maize at producing fuel. It is already being burned in British power stations, but almost everywhere just one strain is used. Expeditions to Japan and China have found wild varieties that might do the job even better.

"The plan is to double the plant's yield and to have one kilowatt in every eight of Britain's electricity generated from the crop in two decades," said Jones.

www.telegraph.co.uk/science/steve-jones/8001565/Where-have-all-the-British-botanists-gone-just-when-we-need-them.html

Exploring new frontiers on £29k

CHARGED PARTICLE accelerators are at the heart of numerous frontier projects in science and technology, says scientist Peter Williams.

These include large-scale international research facilities for particle and nuclear physics, and major UK centres such as synchrotron sources for neutrons and photons.

Alternative but much smaller solutions apply to medical and industrial applications.

Peter is employed as an accelerator physicist at the Science and Technology Facilities Council's site in Daresbury, Cheshire. His day job is mainly computational, specialising in optics design and particle tracking for electron machines.

He is currently involved in commissioning the UK's only test accelerator suite – comprising demonstrator-scale machines ALICE (Accelerators and Lasers In Combined Experiments) and EMMA (the Electron Model with Many Applications). The team has achieved some major breakthroughs, he says.

EMMA is an entirely new class of particle accelerator and a world first, right here in the UK.

It promises an affordable route to charged particle therapy for cancer patients – more effective and with fewer side effects than standard radiotherapy.

Another application is as a driver for an entirely new form of nuclear power, based on thorium not uranium. It would be cleaner and safer and even 'burn' waste from conventional reactors, says Peter.

He joined the Accelerator Science and Technology Centre at STFC's Daresbury laboratory in June 2006. He earns £29,566.

The centre was created in 2001 as a centre of excellence for study of the production, acceleration and delivery of charged particle beams.

Peter has a wealth of expertise in this field. He:

- constructed the start to end simulations for the Daresbury 4GLS project
- is the lead designer for the recirculating option of the UK New Light Source project
- contributes to the ALICE prototype through beam dynamics modelling and optics development and commissions and conducts experiments on the machine itself.

He recently completed a full simulation of the New Light Source accelerator, which was stopped due to lack of funding (see page below).

Daresbury has won a contract to do design work for the new Swedish light source, which Peter says should tide him over until other projects in the UK are hopefully forthcoming.

On ALICE and light sources, he explains that machines such as Diamond are great as they let us 'see' the structure of the microworld – molecules and crystal structure.

ALICE augers the next stage – the capability to make 'real time' movies of atomic and molecular processes.

This 'time-resolved' structure has massive implications for pharmaceuticals, materials science, etc, and would revolutionise chemistry and biology, he adds.

Peter is still paying back his student loans, currently £121.40 per month from his undergraduate degree in mathematical physics. His PhD in theoretical particle physics was funded by PPARC (STFC's predecessor).

Peter then went to the US for a postdoctoral position in particle physics, returning to the UK to start work at Daresbury in 2006.

Peter has three children, the youngest aged five months. Despite his performance being rated as exceptional, this will not be reflected in his pay packet because of the pay freeze for public servants announced by the Chancellor earlier this year.

Peter believes there should be an independent investigation, with binding recommendations, into the real-terms erosion of scientists' pay over the last two decades, also taking into account the larger salaries on offer in the university sector.

- **http://alice.stfc.ac.uk/**
- **www.astec.ac.uk/staff/williams.html**

Darkness hits New Light Source project

THE UK risks losing its place at the top table of light source enabled science and technology.

The New Light Source project was intended to be the next generation of machine, going beyond the capability of the Diamond Light Source, which has been an immensely successful scientific investment for the UK.

But the New Light Source project was "parked" in December 2009 because of lack of funds.

One frontier for many areas of science is to measure structural dynamics in real time, i.e. to make movies of the motions of atoms and molecules as they undertake the fundamental changes that underpin physical, chemical and biological processes.

Free electron lasers are set to revolutionise many areas of science and our ability to probe matter on atomic length and timescales simultaneously.

Scientists based in the UK have produced an outline design report and made the science case for a free electron lasers facility in the UK – the New Light Source project.

It was jointly supported by Science and Technology Facilities Council and Diamond Light Source Ltd, with strong involvement from higher education institutes.

One of the project's leaders, Professor Jon Marangos, from Imperial College London said: "There can be little question that sooner or later the UK will need to build a Free Electron Laser or will be frozen out from future developments over a vast landscape of light source enabled science and technology."

- **ww.newlightsource.org/documents/NLS_debrief.pdf**

Public scientists are key protectors of public from chemical hazards

LEGISLATION on the registration, evaluation, authorisation and restriction of chemicals is due to be implemented in 2010.

The legislation will require all chemicals to be registered, involving rigorous testing procedures to ensure their safety for release into the environment and the human food chain.

In the UK, the competent authority is hosted by the Health and Safety Executive, working with the Environment Agency and other government departments.

Here we provide a brief outline of some of the public bodies involved in reviewing and assessing chemicals.

The primary aim of the **Health and Safety Executive's Chemicals Regulation Directorate** is to ensure the safe use of biocides, industrial chemicals, pesticides and detergents to protect the health of people and the environment.

The **Health Protection Agency's Chemical Hazards and Poisons Division**, in conjunction with other agencies, carries out or reviews environmental health risk assessments including: potential public health implications from industrial processes, drinking water contamination and chemical incidents.

The **Centre for Environment, Fisheries and Aquaculture Science** is responsible for the Offshore Chemical Notification Scheme. This scheme manages chemical use and discharge by the UK and Netherlands offshore petroleum industries using scientific and environmental advice from Cefas and Marine Scotland.

The **Centre for Ecology and Hydrology** hosts the UK Pollutant Deposition website which provides UK information on atmospheric deposition. The emission, transport, chemical conversion and deposition of pollutants in the UK emerged as an important environmental problem in the 1970s following the discovery by Scandinavian scientists in the 1960s of widespread acidification of freshwaters.

The **Food Standards Agency** aims to ensure that the chemicals present in food do not compromise food safety.

The **Food and Environment Research Agency** carries out research in several areas including: chemical residues; contaminants and authenticity and environment risk.

Environment Agency

Prospect represents 569 specialists in the Environment Agency. One area of their work, chemical assessment, shows why scientific expertise within government is vital. EA's Chemical Assessment Unit assesses environmental hazards and risks from the manufacture, use and disposal of industrial and consumer chemicals. It works in partnership with HSE.

Risk assessment

Risk assessment often relies on complex scientific arguments. The consequence of a poor decision can either be to remove important chemicals from the market unnecessarily, which can be bad for British business, or conversely, to fail to take action on chemicals that continue to cause long-term harm, which would be bad for health and environmental sustainability.

Chemical safety assessment is underpinned by standardised guidelines, which ensure safety tests are performed in a reliable way, and can be accepted by governments around the world.

But there has been a significant reduction in scientists working in key areas of environmental aspects of chemical regulation, where it is known other countries like Germany devote higher resources to similar work areas. Reducing the number of such scientists reduces the capability to advise on these and other issues.

Nanomaterials

These are a new and increasingly important technology, which are set to bring many benefits to society.

However, very little is understood about their behaviour and effects in people and the environment

Scientists are needed to ensure:

- fundamental academic research is guided and interpreted correctly in the appropriate policy context
- government decision-makers can make scientifically robust judgments about the quality and adequacy of data submitted to them under various legislative frameworks.

Perfluorochemicals

Perfluorochemicals are a family of chemicals used in products designed to repel dirt, grease and water. They pose a threat to the environment because of their toxicity, persistence and tendency to bio-accumulate, ie once they are in the environment, or in animals or humans, they are very difficult to get rid of.

The Environment Agency has worked with the US Environmental Protection Agency on the hazard evaluation of perfluorooctanyl sulfonate. Based on this hazard profile, the UK was able to develop a risk management strategy to remove it from all but the most essential uses, and this approach was adopted throughout Europe.

Charter for public science

Prospect believes that public science in Britain needs:

- ✔ recognition of the crucial role played by science for the public good
- ✔ a clear strategic vision for UK science
- ✔ a Cabinet minister with authority and accountability for public sector science and a similar ministerial role in the devolved administrations
- ✔ a halt to 'cost-driven' lab closures and privatisation
- ✔ adequate funds to invest in long-term research and infrastructure
- ✔ a stable work environment, ending the culture of continuous review and reorganisation
- ✔ decent pay and careers for staff
- ✔ action by scientists and government to promote better
- ✔ public understanding of scientific issues
- ✔ open decision making.

Why grassland management is vital for food and fuel security

FOOD SECURITY, fuel security and the need to meet our climate change targets means that pastoral farming is as important to the UK in 2010 as it was in the Second World War.

"It's vital that government adequately funds the research needed to underpin the industry," says Nigel Titchen, a research scientist at North Wyke Research in Devon. This institute of the Biotechnology and Biological Sciences Research Council institute was created in April 2008 after the Institute of Grassland and Environmental Research was broken up.

IGER's Welsh sites were transferred to Aberystwyth University. North Wyke was retained by the BBSRC and merged with Rothamsted Research in 2009. North Wyke Research is now the only public sector research facility in England and Wales dedicated to research into pastoral systems.

Grassland is the backbone of the UK agricultural industry and a vital component in rebalancing our food security needs, says Nigel.

"It accounts for over 60 per cent of agricultural land in the UK and supports dairy, beef and sheep enterprises in both the lowland and uplands. It also has an immense landscape scenic value that is vital to tourism and leisure industries," he added.

Grassland management is also important for the environment – providing pasture on flood plains reduces damage to property and infrastructure and locks up nutrients that would otherwise be released by cultivation which can pollute water supply etc.

Nigel adds: "My work has included developing fertiliser strategies to maintain productivity in nitrate vulnerable zones while minimising losses to the wider environment – this is of increasing importance given the rising cost of oil and fertilisers."

The pasture field acts as a vast solar panel, capturing solar energy in the chloroplasts of leaves and using it to build sugars from atmospheric carbon dioxide, he explains.

Grassland produces copious amounts of home-grown food and has the capacity to remove carbon from the air into the soil thereby slowing climate change.

The Royal Society estimates that better management of the world's farmlands could capture as much carbon as is accumulated in the atmosphere each year.

"While BBSRC should be applauded for retaining North Wyke as a toehold in this extremely important area of research for the economy, it is to be regretted that IGER, an integrated Institute, was broken up and its research effort diluted," says Nigel.

"It is ironic that the UK has lost intellectual and physical capacity at a time when food security has returned to the top of the political agenda."

Long road to employment rights

OVER THE last three years Prospect has published 15 case studies to illustrate the range and value of work undertaken by public sector scientists. Over half the scientists featured have since left UK science, including one young researcher who felt that emigrating to Australia was the only way to secure adequate resources and recognition for their research effort.

The story of another Prospect member, who works in Scotland, illustrates only too clearly the reasons for this disturbing rate of attrition.

A specialist in ecology, they had to work unpaid as a post-doc researcher to secure publication of papers that are crucial for career development.

Their first post was limited to less than 12 months to exclude their access to full employment rights and pension entitlement. Various post-doctoral posts eventually followed supported by government-funded grants but which were punctuated by short breaks between contracts, again to avoid staff acquiring full employment rights and at a lower rate of pay than permanent staff doing equivalent work.

This scientist finally gained a permanent contract shortly after two decades of post-doctoral contracts. However, further disruption looms due to organisational restructuring.

This scientist has worked on high political projects which are of great importance as they relate to food security and the mitigation of climate change.

In recent times they have contributed to external grants income that has a gross value that totals millions of pounds and was achieved despite working with virtually no technical assistance. These externally funded contracts are fulfilled while also supervising student projects and delivering the core funding remit for the Scottish Government.

The scientist is concerned that universities have emphasised biomedical research which has a better chance of support from the government, pharmaceutical industries and health charities even though patents from non-natural/ manufactured therapeutics are declining.

More than half of medicines and health-benefiting therapeutics are derived from natural sources such as wild plants. These plants also provide essential germplasm for crop breeders to improve existing crops, such as those which are more environmental friendly and nutritious.

Forensic science helps fight crime

JOHN PAGE is a forensic scientist working for The Forensic Science Service Ltd. He joined the Forensic Science Service (then part of the Home office) in 1977 as an Assistant Scientific Officer and worked his way up through the ranks to his current job, forensic specialist. The salary range for his job is: £28,525 to £52,975.

John is currently in a team that provides scientific expertise to the police investigating violent crime. His skills include:

- examining items and crime scenes for evidence to help determine a possible sequence of events at a murder scene
- helping to devise strategies for evidence recovery to identify possible suspects
- obtaining evidence to assist in the conviction of an offender and the elimination of the innocent.

His areas of expertise include interpreting the following evidence types; DNA profiling, blood pattern analysis, body fluid transfer (blood, semen, saliva etc.), damage, hair comparison and fibre transfer.

Major cases that he has worked on include the Ipswich serial murders where the offender was initially identified using forensic science.

John says cuts of 25% and 40% would mean that FSS Ltd would investigate fewer crimes, and it would reduce even further the capacity for research.

"The current thinking is not just wrong, it's mad. That is why I count myself among the angry mob that is prepared to defend science to the utmost from muddled political thinking."

Robert May, president of the Royal Society 2000-2005 and chief scientific adviser to the UK government from 1995-2000

On the future of science in government, John says: "Lack of funding will stifle research to the point of extinction and reduce the provision of services.

"It is essential that science increases it's profile in government since it is the only independent source of information.

"If we allow regulation and research to be carried out be business only, there can be no faith in the results due to bias and no research without a guaranteed commercial output.

John believes two things need to be addressed to help to attract young scientists into government science:

1) Stop bashing civil servants – cushy jobs, overpaid, safe employment, huge pensions etc. "It simply is not true."

2) Improve pay and conditions. Many science graduates go into industry and many others stay away from a science career altogether and enter the world of finance or similar.

His qualifications: BA. MSBiol. CBiol Post Grad Dip Science & Society.

"A thin layer of soil lies between man and starvation"

"NONE OF us goes into science for money. However, there is a basic principle involved and when I hear that bus drivers in the South East get more money than I do, it causes me to question my life choices fairly strongly."

So says one scientist – a soil ecologist at the Centre for Ecology and Hydrology, with more than ten years' experience at the organisation.

CEH, which has sites in England, Scotland and Wales, is the UK's centre of excellence for integrated research in terrestrial and freshwater ecosystems and their interaction with the atmosphere. It employs over 2,400 people.

"The current moves by government mean that all our futures look bleak, and demonstrate, for scientists, that despite being 'vital for the country's future economic growth' we are little more than people being paid lip service to, and does make us question the validity of our profession."

"I have a degree in a numerate discipline and have been in my current job for nine years. Adjusted for the cost of living I am now paid less than when I started."

"We are continuing down a path where profit comes before any other values. How much longer can this continue? We must maintain our capacity to manage the health of people and planet simultaneously. I hope this government gets it."

Why soil ecology matters

- Soils are critical for life, yet are vulnerable to pollution and unsustainable exploitation. They provide the nutrients and water to grow our food and regulate floods and droughts.
- Soils store 10 billion tonnes of the UK's terrestrial carbon, reducing greenhouse gas emissions, while enhancing structure.
- Soil organisms recycle nutrients, clean our waste and water and provide a biodiverse resource.

One project in the Peak District looked at the effect of climate change (warming and summer drought) as well as recovery following pollution on an area of moorland above Glossop.

The experimental set-up was unique and will lead to a more detailed knowledge of how fast, and well, our uplands will recover from pollution.

A similar project is under way near Aberystwyth on the mid-Wales coast

But the typical salary for a project manager at the top of their pay scale is just £30,000. Such people may have three degrees including a PhD, and be thousands of pounds of debt.

Expert soil ecologists need a huge range of knowledge and skills – for example, measuring carbon flux in terrestrial communities (soil respiration, litter decomposition, litterfall, root biomass, plant growth, photosynthesis, whole ecosystem carbon dioxide flux, etc); soil microbial community analysis; stable and radioactive isotope protocols; and plant physiological measurements.

Many CEH employees work closely with colleagues at the Environment Centre of Wales, part of the University of Bangor. Located in the university campus, ECW brings together 120 environmental scientists and students from CEH and the university, whose combined scientific knowledge and experience cut across traditional scientific boundaries.

"When I joined the public sector from private industry in 1986 the pay differential for my specialism was about 15%. Now it is between 60 and 100%. The reduction in redundancy protection and the attack on pensions means that any positive things about the public sector pay and compensation structure have disappeared."

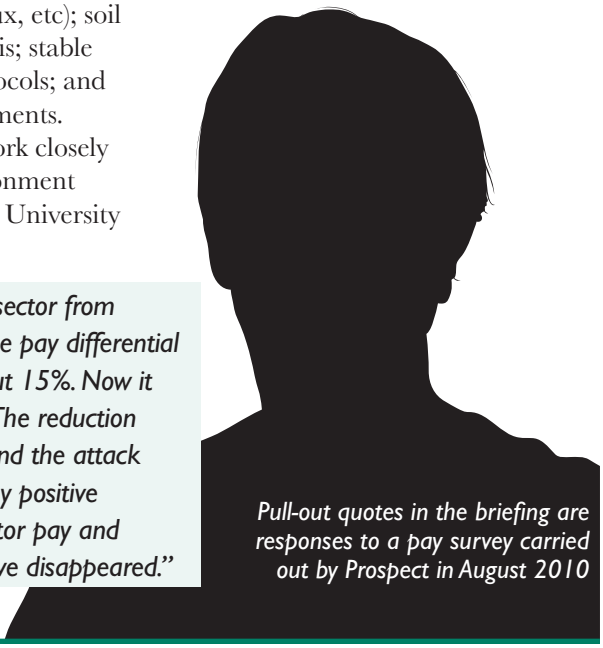
"Pay for physicists has slipped behind the cost of living for many years now, to the point that jobs overseas are extremely attractive. In the past six months, out of a staff of 50 in my department, two have left for jobs in the US and Canada."

But research staff from the university can earn £9,000 more than CEH colleagues with comparable experience and qualifications.

In June 2010, the chancellor George Osborne announced a two-year public sector pay freeze for all public sector workers earning £21,000 or more.

"CEH's wages are already low," says another scientist. "Freezing pay is bad enough, and represents a pay cut in reality, but directly cutting pay it is entirely unacceptable. People will start looking for overseas work or more likely, leave science completely."

www.ceh.ac.uk/news/news_archive/documents/Bitesizescience.pdf



Pull-out quotes in the briefing are responses to a pay survey carried out by Prospect in August 2010

Nobel laureates say don't close the door on global science

"NOBEL PRIZE-WINNERS in science... have been enriching and enhancing British science and society for decades. They add to our store of knowledge, and inspire countless young researchers to follow in their footsteps."

So said eight Nobel laureates who signed a letter which was published in *The Times* in October about the government's plan to cap migration to the UK.

"These benefits are jeopardised by the Government's plan to cap migration to the UK. It would damage our ability to recruit the brightest young talent, as well as distinguished scientists, into our universities and industries."

"The UK must not isolate itself from the increasingly globalised world of research – British science depends on it.

"The Government has seen fit to introduce an exception to the rules for Premier League footballers. It is a sad reflection of our priorities as a nation if we cannot afford the same recognition for elite scientists and engineers."

■ **http://www.sciencecampaign.org.uk/index.htm**

Questions government should ask before axing public bodies

PROSPECT BELIEVES that before abolishing public bodies, the government should set out for each body:

- What it does and why
- What it actually costs
- What functions, if any, will transfer elsewhere
- The genuine net cost or saving from abolition of each body, after redundancy and the cost of delivering services elsewhere
- An independent analysis of the net wider economic, social, cultural or other costs of abolishing the quango.

TABLE 1 – Net Government expenditure on SET by departments in real terms 1997-98 to 2007-08

Source	1997-1998 £m	2001-2002 £m	2005-2006 £m	2006-2007 £m	2007-2008 £m	% change 1997-98 to2001-02	% change 2005-06 to 2006-07	% change 2006-07 to 2007-08	% change 1997-98 to 2007-08
Biotechnology and Biological Sciences Research Council	234	245	331	366	361	4.7%	10.6%	-1.4%	54.3%
Natural Environment Research Council	199	201	384	361	353	1.0%	-6.0%	-2.2%	77.4%
Science and Technology Facilities Council[1]	244	558	430	421	535	128.7%	-2.1%	27.1%	119.3%
Total science budget	1656	1955	2954	3006	3467	18.1%	1.8%	15.3%	109.4%
Total HE funding councils SET	1285	1688	1984	2085	2181	31.4%	5.1%	4.6%	69.7%
Total science and engineering base SET	2941	3643	4938	5092	5648	23.9%	3.1%	10.9%	92.0%
Defra[2]	177	260	296	299	146	46.9%	1.0%	-51.2%	-17.5%
Department for Transport[3]	192	89	90	89	89	-53.6%	-1.1%	0.0%	-53.6%
Department of Health	573	578	646	673	689	0.9%	4.2%	2.4%	20.2%
Department of Health excluding NHS	74	68	46	50	49	-8.1%	8.7%	-2.0%	-33.8%
Department of Business, Enterprise and Regulatory Reform[4]	427	420	308	265	1	-1.6%	-14.0%	-99.6%	-99.8%
Scottish Government[5]	90	164	215	214	214	82.2%	-0.5%	0.0%	137.8%
Welsh Assembly Government[6]	22	42	34	10	12	90.9%	-70.6%	20.0%	-45.5%
Total civil departments	1685	2035	2021	1918	1379	20.8%	-5.1%	-28.1%	-18.2%
Ministry of Defence research	702	638	615	632	615	-9.1%	2.8%	-2.7%	-12.4%
Ministry of Defence development	2178	1719	1976	1492	1457	-21.1%	-24.5%	-2.3%	-33.1%
Total defence	2879	2356	2582	2124	2072	-18.2%	-17.7%	-2.4%	-28.0%
Grand total	7927	8481	9926	9510	9455	7.0%	-4.2%	-0.6%	19.3%
Grand total excluding NHS	7428	7972	9326	8887	8815	7.3%	-4.7%	-0.8%	18.7%

Notes – 1 Formerly PPARC & CCLRC; 2 Formerly MAFF; 3 Formerly DETR; 4 Formerly DTI; 5 Formerly Scottish Executive; 6 Formerly Welsh Office.

Source: 2009 SET Statistics Table 2.2

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