Dec 9th 2009.* They emphasise the need for scientists who advise the Government to be free to publish and promote their work: "In the context of independent scientific advice, disagreement with Government policy and the public articulation and discussion of relevant evidence and issues by members of advisory committees cannot be grounds for criticism or dismissal". The spirit of the Principles was accepted by Lord Drayson, who said on 23rd November: ".. it is (so) important for the Government to reiterate the importance of the independence of scientific advice, and to have clarity between the scientific community and the Government on the rules of engagement between the two." Following this a document: *Principles on scientific advice to Government* was published on 15th December by the Government Office for Science which has invited views on it as part of the consultation on *The Guidelines for the Use of Scientific Analysis* (published earlier) which runs until 9th February. These principles meet many of the points covered by Lord Rees' document. However it contains one paragraph which is not compatible with these: "The Government and its scientific advisers should work together to reach a shared position, and neither should act to undermine mutual trust". It is difficult to reconcile this with true independence for scientific advisers whose findings may well point in a different direction to current Government policy. For example, the policy of the "shared position" had a serious effect in delaying effective action in the BSE epidemic. It is to be hoped that when the new guidelines are published this paragraph will have been altered so that the independence of scientific advisers is properly protected in the future.

At the time of going to press Professor Nutt has announced the formation of a new Independent Scientific Committee on Drugs, which will be completely independent of Government. The Committee will include those who have resigned from the ACMD as well as other scientists expert in the drugs field. Its findings and reports – and the Government's response – are awaited with great interest.

*Ref: House of Commons Science and Technology Committee: *The Government's Review of the principles applying to the treatment of independent scientific advice to government*. Third Report of Session 2009-10, Vols I and II

THE ROLE OF THE CHIEF SCIENTIFIC ADVISER, MINISTRY OF DEFENCE

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Since the Second World War, scientific advisers have played a critical and integral role in Britain's defence. The strength of the relationship between military commanders and defence researchers was recognised in the creation of the post of Chief Scientific Adviser (CSA), which has existed for as long as the Ministry of Defence itself. The formal responsibilities of the role have hardly changed since then.

As well as the core remit of providing scientific advice to the most senior members of the Department and the Armed Forces, the CSA chairs both the Research and Development Board and the Investment Approvals Board. The breadth of the role offers the opportunity to inspect, investigate and interrogate almost any programme to almost any level, placing the CSA at the very heart of MOD's Science and Technology programme.

At the same time, however, the detail of the role has changed dramatically, and continues to change, and the other privilege that the job carries is having both the ability and the duty to shape its exact nature to the specific challenges of today – and tomorrow. At a time of rapidly changing threats to Britain and to our Armed Forces abroad, as well as of the ever-increasing pace of scientific development, it is crucial that MOD remains at the very forefront of defence technology.

There are new challenges for us to respond to. In the coming years it will be vitally important for Britain's Armed Forces to reduce their dependence on fossil fuels, for operational reasons as well as to combat climate change, so research into alternative sources of power are high on our agenda. The threat from Improvised Explosive

Devices in Afghanistan has prompted a large and on-going programme to rapidly develop better ways of detecting and neutralising such devices, to protect soldiers from them when that is not possible, and to improve medical care for those harmed by them. At home, the threat from terrorism requires an ever more sophisticated scientific response, particularly where the possibility of biological and chemical attacks is concerned.

The other challenge facing defence research at the moment is financial. The current situation is liable to affect everything from funding for individual projects to discussions of the goals and purpose of MOD research itself, and it is vital to plan accordingly. This does not necessarily mean reducing the scope of our efforts, but instead we must ensure that we use the resources that we have as effectively as possible. Such a goal will require flexibility, efficiency and, perhaps most importantly, creativity. We must expand and diversify the sources for our ideas so that we have the broadest possible range – the wider we cast our net, the greater the variety of ideas we will gather. Defence must adapt the technology made available through the considerable investment made by Government through the science budget and by the commercial sector. The same measures will better equip us to face the growing unpredictability of future threats.

As well as new challenges for us to face, there are new technologies for us to utilise. Among many others my own area of expertise, nano-technology, has the potential to be of great use to defence in coming years. Military uniforms that can adapt their camouflage to their surroundings and their level of insulation to the weather, monitor soldier's health and transmit diagnoses to doctors, and detect bio-chemical weapons, could all be possible. The breadth of the role that emerging technologies can play is limited only by the uses we can imagine for them. Encouraging new ideas and developing them from the drawing board to the battlefield as quickly and efficiently as possible is more important than ever.

This means that we have to change the way we do business. In particular, MOD is currently working to make our technological requirements as clear as possible, and to involve as many sources as we can, from established suppliers through new small enterprises and academia to individuals with bright ideas. For the first time, we have publicly announced our detailed research needs to the entire UK science and technology community, in the Defence Technology Plan (DTP). The DTP provides clear direction to the R&D community on investment in defence technology and seeks fresh, innovative thinking. Its Capability Visions identify ground-breaking options to address long-term defence challenges by stimulating new work and new applications for existing technologies.

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We have also established a new first point of contact for anyone with an innovative defence-related idea, the Centre for Defence Enterprise (CDE). Since its inception the CDE has received over 1000 submissions and funded over 200 of them. Importantly, almost two-thirds of these funded proposals have been placed with small or medium-sized enterprises, many of which are new to defence. The CDE brings increased speed and agility to the defence research supply chain. By encouraging anyone with a good idea to step forward, they provide a unique and innovative entry point into the defence market.

This commitment to a new level of openness in the way that MOD does business with the scientific community reflects my own concerns. My independence as a scientist is vitally important to me, and I believe it allows me to do my job better. When proposals are independently scrutinised and decisions on them made based on independently-assessed evidence, those decisions are far more likely to be the right ones. Reducing bureaucracy, including being careful to classify material only where it is absolutely necessary, speeds up that process. And widening the interaction between MOD, Britain's scientific community, and society more broadly will, I believe, reap considerable dividends.

At the moment we are succeeding. But new trials will always emerge, and staying one step ahead of the game is going to become ever more difficult, so MOD must constantly seek new ways of maintaining its technological advantage. It is an exciting and a testing time, but I believe that MOD and the scientists it depends upon will rise to the challenge.