

A SCIENCE LEGACY FOR THE NEXT PARLIAMENT

Meeting of the Parliamentary and Scientific Committee on Tuesday 24th February

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The Baroness Finlay of Llandaff

Baroness Finlay is Professor of Palliative Medicine, Cardiff University School of Medicine and is involved with the following All-Party Parliamentary Groups: Cancer (vice-chair); Clinical physiology; Global health; Carbon monoxide (co-chair); Cardiac risk in the young; Alcohol misuse; Smoking and health (vice-chair); Ovarian cancer; Brain tumours; Suicide and self-harm (vice-chair); Thrombosis; Continence; Parkinson's disease (vice-chair); Antibiotics; Surgery; Dentistry; Dying well; Hospice and palliative care (vice-chair).

The past five years have seen some astonishing advances in science in the UK, and yet we still see even the simplest application of science failing in some communities and never reaching some of the most vulnerable, who would benefit greatly.

The frontiers of knowledge advanced almost exponentially recently. Although some may question the investments in space exploration, the adventure of the Philae probe landing on comet 67P/Churyumov-Gerasimenko was a breath-taking moment. It also revealed that the earth's oceans' waters may have come from asteroids, making us rethink the origins of the world we now live in.

This mystery was compounded by the amazing discovery that a significant percentage of DNA (around one third) on the outside of a spacecraft can survive atmosphere re-entry after a thirteen minute low earth orbit trip. Perhaps science fiction may not be too far-fetched after all.

Then there was the discovery that Saturn's moon Enceladus has a liquid ocean beneath its icy surface and that the Milky Way galaxy can be mapped in a supercluster of 100,000 galaxies across 500 light years; this galactical cluster, Laniakea, is beyond our comprehension.

Nearer to home, the threat of water shortages and fossil fuel exhaustion has been investigated at Glasgow University, where the production

of hydrogen fuel from water is looking more viable for the future. As ocean overfishing threatens the whole of our food chain, those creatures living under phenomenal pressure in the darkest of our oceans are being investigated; a Black Sea Devil anglerfish has been filmed and captured. Is this one step towards greater respect for our fish stocks?

DEADLY INFECTIONS

In our daily lives we have taken antibiotics for granted. Now we face the threat again of even the simplest infection proving resistant to antibiotics

... ocean overfishing threatens the whole of our food chain ...

and therefore potentially fatal. Our abuse of antibiotics through indiscriminate prescribing in both medicine and in veterinary science, has encouraged resistant strains of bacteria to become a widespread threat. The investment in novel infection control methods and in new antibiotic drugs is lagging behind the looming threat that might return us to the horrors of the world in the first half of the 20th century.

Vaccines, such as one that totally blocks HIV infection in monkeys, may bring new

approaches to the worldwide disease. But there will inevitably be other new deadly infections as well as the re-emergence of known ones such as Ebola, initially contracted by the child Emile Ouamouno in Guinea from tree bats.

A less known but critically important fact is that five of the fifty dedicated scientists involved in tracing the Ebola epidemic died pre-publication. The dedication of so many British healthcare professionals volunteering to care for those infected and to work to contain the epidemic has been an

amazing act of generosity in the face of great personal risk.

SOME RECENT SUCCESSES FROM THE UK

New technology and simple novel ideas are able to transform healthcare. The next Parliament must maintain pressure for widespread adoption of such advances, particularly those developed here.

Terrible trauma from warfare is a fact of our age. Research in Sheffield is harnessing 3-D

printing to try to create nerve guidance conduits for regeneration of nerves – a process that until now has seemed unachievable. Prosthetics too are developing so the bionic3 hand, produced by RSL Steeper, is so sensitive that Sean McHugh, a user, can sign his signature with his artificial limb.

Marc Kosta's smart syringe is another UK initiative that could change the futures of millions, preventing the dangerous reuse of syringes. A WHO study found that in 2010 alone, reuse of syringes with consequential transmission of blood borne infections accounted for 1.7 million new cases of Hepatitis B, 315,000 cases of Hepatitis C and 33,800 cases of HIV.

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ONE-OFF SURGICAL INNOVATION TO SAVE LIFE

But there is another type of innovation in the science of medicine that occurs in the UK and must be fostered, not stifled by financial arguments about tariffs for care. With narrowly defined tariffs in the NHS, there is a risk that the care costs around lifesaving innovation will not be funded.

In a thought provoking Hunterian lecture on surgical innovation, Professor Martin Elliott discussed the ethics of risks and the difficulties of defining innovation through hope in those situations that are so rare that any standard methodologies of clinical assessment are impossible.

He explained the high risk

associated with early innovation, as was seen with early organ transplantation. He cited the case of a baby born with long segment tracheal stenosis who, at the age of 12 years, required ground breaking experimental innovative interventions as his only hope of survival. Yet after care costs of £360,000 in that year, he now lives normally and

... high risk associated with early innovation ...

his care costs are no higher than any other teenager, and his quality of life measures are excellent.

After the failure of Lord Saatchi's Bill, discussion is now turning to whether the medical Royal Colleges should maintain registers of innovation, both to disseminate lessons learnt and

to provide a benchmark to encourage NHS Trusts and Commissioners to fund innovation, while simultaneously guarding against quackery.

For the next Parliament to build on the achievements in medical innovation in the past five years, the transfer of clinical information will need to be revisited.

... an era of unprecedented poisoning of our planet ...

Public education about the reality of what can and cannot be achieved by clinicians is needed to foster realistic hope, rather than false hope, in patients. Medicine needs to define what we do and do not do. And those commissioning services need a new costing

framework to understand the true costs of failing to innovate and failing to intervene.

On the world stage the legacy of medical sciences becomes meaningless if we fail to meet the most basic pain relief needs across the globe. Currently 80% of the world's population cannot access adequate analgesia. Morphine is unavailable in many

countries because ignorance of how to prescribe it safely is linked to fears of diversion into the addiction market. This leaves many of the world's poor, both children and adults, to suffer terribly and to die in unrelieved pain.

... Morphine is unavailable in many countries ...

It was Cicely Saunders who said that the way a person dies lives on in the memory of those left behind. All the evidence suggests that those children who are traumatically bereaved and who have no support fare far worse in all domains. The legacy of good care is found in lower morbidity and better personal and social attainment in the bereaved.

The medical innovations of recent years have often come

about through collaborative efforts of a wide range of scientific and technological disciplines. That creative free-thinking is essential for future advances across all aspects of society; the legacy of good science is a benefit to all in our society.

Here at home, our NHS needs innovation and research to move into cost effective patterns of service delivery and lower-cost interventions and treatments with greater efficacy. Without active science in every area of medicine, health care will stagnate.

But the debate is far wider than our shores. Whoever comes into power must take a fresh look at the data around agrichemicals and their safety profiles. Worrying data are emerging on the herbicide glyphosate, which may be a carcinogen. We need to look at contamination of our food supply, our atmospheric pollution and the effects on wildlife and the food-chain.

The UK can and should lead the way in exploring safety. Failure to do this will mean our legacy will be an era of unprecedented poisoning of our planet. No amount of science will reverse that. Extinct species cannot be revived, depleted fish stocks take decades to recover and environmental pollutants will remain poisons into the next century.

Political policies towards the poorer or politically unstable nations must not leave our science legacy unshared. National security will be enhanced by leading by example, through good science.

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Andrew Miller MP
Chairman, Parliamentary and Scientific Committee
Chair, House of Commons Select Committee on Science and Technology

At my last meeting of the Parliamentary and Scientific Committee I stood aside as Chair to enable me to become one of the presenters.

I wanted to cover a number of key points and to look at how Parliament handles scientific issues touching on:

- the House of Commons Select Committee,
- things that are now embedded in the annual diary such as, "SET for Britain", "Voice of the Future" and "Parliamentary Links Day",
- the role of POST,
- the P&SC,
- Parliament's engagement with learned societies,
- the Royal Society Pairing Scheme
- the House of Lords Select Committee.

... Relationships with the learned societies ...

On the last point I invited the audience to think about the consequences either of the House of Lords becoming a fully elected chamber, or if it were to be abolished. I argued that

election. I am not arguing against change, but making the case for determining purpose before form, something that in my experience in Parliament rarely happens!

THE SCIENCE & TECHNOLOGY SELECT COMMITTEE IN THE COMMONS

During the current parliament the committee received written evidence from over 1900 organisations or people as part of the production of some 40 reports involving 661 witnesses, 74 inquiries and 170 meetings. A number of other things have also been done including revamping the website and piloting an (almost) paperless select committee meeting system. I think the Committee was pretty effective and has benefited from the consequence of the direct election of the

chair. I stress that is not because I was the winner, but it gives the role considerably more authority than had my predecessors. It has also been helped by having a number of committee

The committee produced a Legacy Report designed to leave some thoughts for our successor committee to consider, gaps that we identified, and also to look at the strength and weaknesses of the current system.¹

POST

The Parliamentary Office of Science & Technology² had an interesting genesis and I played a role in helping it become a formal part of the Parliamentary system. In the early 90s I was a member of the House of Commons Information Committee (in those days as a pressed man not a volunteer!) and it was that committee's recommendation to bring POST formally into the House. POST was created by members of the P&SC when Margaret Thatcher was the Prime Minister. She would not give the project any money but gave it her blessing and as a consequence a number of charitable foundations supported the creation of the original body. All of this was achieved by way of an intermediate charity, the Parliamentary Science & Technology Information Foundation (PSTIF). This still exists under the chairmanship of the Earl of Selborne. Its most recent significant role was to act as the funder of POST's work in Africa.

At the beginning of the 2010 parliament there was an internal POST Note *Thinking About the Next Five Years*. I challenge anyone not to recognise the importance of the issues POST raised, and point out there was not an item in the document that wasn't subject of policy



Recent POST documents

either would produce a science vacuum as people who have reached the peak of their career are hardly likely to stand for

members who have served throughout the parliament and have contributed significantly to its working.

discussions during the last Parliament.

PARLIAMENTARY & SCIENTIFIC COMMITTEE

Reflecting on the role of the Parliamentary and Scientific Committee over the last 5 years I would point to improvements in *Science in Parliament* and the web site. I would also praise the team that has made SET for Britain³ a formal part of the calendar. We had some amazing entries for the last competition

... serious issues for the international community ...

on 9th March. This year's SET got a very wide coverage in local, national and specialist media and, thanks to David Dent, a significant amount of social media coverage. This is a key event in the Parliamentary calendar at which MPs can

scientists find it invaluable to discover how Parliament actually works!

Relationships with the learned societies have gone from strength to strength. During the last Parliament leaving aside the huge benefit that comes from the energy and drive of people like Dr Stephen Benn there have been further steps forward. I would highlight improvements with the mathematics community. David Youdan and others who have driven the

creation of the Council of Mathematical Societies⁵ deserve a lot of credit as it is clear that a more co-ordinated approach that they now bring for mathematics has had a worthwhile impact.

issues that will not go away, like anti-microbial resistance, climate science, and funding. The consequences of the Nurse Review⁶ either side of two Triennial Reviews and alongside a Communications Review being undertaken within the Research Councils by the Cabinet Office remain for the future.



There are some serious issues for the international community. We need genuine freedom of movement amongst our top scientists. If we allow the current Daily Mail style condemnation of all migrant labour to continue we will be doing profound harm to our science base and to our universities.

... do more to help individual MPs ...

Neither can we ignore some of the key science issues in education, whether it be

- the shortage of teachers with science qualifications in our primary schools,
- the number of girls going on to do A Level physics,
- the unsatisfactory way in which Ofqual are handing the whole issue around science practicals,
- funding technical apprentices,
- HE & FE.

PUBLIC ENGAGEMENT

Alongside these challenges there are some really positive things for us to consider; how do we grow the STEM Ambassador⁷ network; how do we give support to the Science Media Centre, CaSE⁸, Sense about Science⁹, and the British

Science Association? The need for Parliament to work with these organisations to help improve public understanding of the complex issues that we face today is overwhelming.

Finally going back to my comments in terms of the Royal Society pairing, I am passionately of the view that we need to do more to help individual MPs create their own network of contacts covering all of the key science and engineering disciplines to ensure that we are an even better informed and better equipped parliament to deal with the challenges of the next five years.

The Parliamentary & Scientific Committee is a mature organisation now past 75 years of age. Indeed we celebrated our birthday in 2014 at Buckingham Palace under the patronage of our past president HRH The Duke of Edinburgh. Nevertheless we need to continue to refresh the ways in which we work. I hope that

newly elected Members will play their part.

For my part, it has been a pleasure to chair the P&SC for the last five years. It would have been impossible without our staff, our volunteers and members, all of whom have worked so hard.

References

- 1 This report has now been published at <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmsctech/758/75802.htm>
- 2 <http://www.parliament.uk/post>
- 3 <http://www.setforbritain.org.uk/background.asp>
- 4 <https://royalsociety.org/training/pairing-scheme/>
- 5 <http://www.cms.ac.uk/>
- 6 <https://www.gov.uk/government/publications/nurse-review-of-research-councils-terms-of-reference>
- 7 <http://www.stemnet.org.uk/ambassadors/>
- 8 <http://sciencecampaign.org.uk/>
- 9 <http://www.senseaboutscience.org/>



Andrew with Professor Sarah Coupland, Director of the NWCR Cancer Centre at the University of Liverpool, his Royal Society "pair" in 2014.

improve connections with scientists in their own constituency as well as providing a unique setting for early career scientists to display their work.

EXTERNAL LINKS

The Royal Society Pairing Scheme⁴ has been in existence since 2001. This model really works and most importantly provides a means for a Member of Parliament to create a long term relationship with scientists with whom he or she is paired. I have been involved from its inception and I know that

SCIENCE IN THE 2010-15 PARLIAMENT

Having reflected on the tools available to Parliamentarians to keep abreast of science and engineering I now pose the question, "What should we be saying to parliamentary colleagues who find themselves in this place on the 8th May this year?" Well, first of all congratulations!

Our Select Committee legacy report is going to be part of that advice. Some of the issues that we covered included really big