



House of Commons
Science and Technology
Committee

**Future programme:
'My Science Inquiry'**

Ninth Report of Session 2016–17

*Report, together with formal minutes relating
to the report*

*Ordered by the House of Commons to be printed
22 February 2017*

Science and Technology Committee

The Science and Technology Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Government Office for Science and associated public bodies.

Current membership

[Stephen Metcalfe MP](#) (Conservative, South Basildon and East Thurrock) (Chair)

[Dr Roberta Blackman-Woods MP](#) (Labour, City of Durham)

[Victoria Borwick MP](#) (Conservative, Kensington)

[Stella Creasy MP](#) (Labour (Co-op), Walthamstow)

[Jim Dowd MP](#) (Labour, Lewisham West and Penge)

[Chris Green MP](#) (Conservative, Bolton West)

[Dr Tania Mathias MP](#) (Conservative, Twickenham)

[Carol Monaghan MP](#) (Scottish National Party, Glasgow North West)

[Graham Stringer MP](#) (Labour, Blackley and Broughton)

[Derek Thomas MP](#) (Conservative, St Ives)

[Matt Warman MP](#) (Conservative, Boston and Skegness)

Powers

The Committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via www.parliament.uk.

Publication

Committee reports are published on the Committee's website at www.parliament.uk/science and in print by Order of the House.

Evidence relating to this report is published on the relevant [inquiry page](#) of the Committee's website.

Committee staff

The current staff of the Committee are: Simon Fiander (Clerk); Marsha David (Second Clerk); Sean Kinsey (Second Clerk); Dr Elizabeth Rough (Committee Specialist); Martin Smith (Committee Specialist); Amy Vistuer (Senior Committee Assistant); Julie Storey (Committee Assistant); and Shagufta Hailes (Media Officer).

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Open call for proposals: 'My Science Inquiry'

1. During this Parliament we have sought to widen our external engagement with the public as well as the experts and institutions who are usually involved as witnesses to our inquiries. Previously we initiated an 'evidence check' process which invited comments on the evidence behind various Government policies through an online forum.¹ We also held an inquiry into *Science communication*, and this prompted us to reinforce our own strategy for public engagement.²

2. In December 2016 we launched the 'My Science Inquiry' process, which invited the public to suggest potential inquiries for our future work programme. This process built on the *Subjects for scrutiny: have your say* exercise undertaken by our predecessor Committee in 2009³ and provided an opportunity for the science and technology community and the general public to alert us to topics deserving greater parliamentary scrutiny.

3. We asked submitters to describe, in 200 words or a short video, the nature of the issue that might be explored, why it deserved attention, and how Government policy in the area could be developed or improved. The responses were numerous, of excellent quality and covered a broad range of potential subjects, spanning both 'policy for science' and 'science for policy'. We received 78 written and video submissions,⁴ all of which are available on our website.

4. We shortlisted nine submissions on the basis of the potential of the subject matter, and invited those submitters to deliver a 10-minute 'pitch' to us, in public, on 1 February 2017. We published the transcript as formal evidence, so that their words could reach a wider audience beyond the Committee, and be entered into the permanent parliamentary record.

5. We have selected two of the 'My Science Inquiry' pitches as the basis for new inquiries. In the first instance, we will launch an inquiry into Algorithms in decision-making. Later this year we will launch an inquiry into Hydrogen and fuel cells.

6. We also intend to make use of the ideas pitched to us through other aspects of our work and liaison with other Committees:

- **Human embryo research:** Sandy Starr (Progress Educational Trust) suggested that we should hold an inquiry into extending the '14-day rule'—a limit on the length of time human embryos can be used for scientific research. He explained that when the rule was first proposed in 1984 no researcher had successfully kept a human embryo alive in a laboratory for much longer than a week, but recent scientific advances meant that it was now possible to keep embryos alive for up to and possibly beyond this limit. Some aspects of the ethical issues highlighted in this proposal are relevant to those in our current inquiry into Genomics and

1 For details of the 'evidence check' approach see Science and Technology Committee, Sixth Report of Session 2016–17, *Evidence check: Smart metering of electricity and gas*, HC 161

2 Science and Technology Committee, '*Science communication inquiry*', accessed 16 February 2017

3 Science and Technology Committee, First Report of Session 2009–10, *The Work of the Committee 2008–09*, HC 103, para 46–48

4 See Annex.

genome editing and we will look into these. The broader question of whether there should be a public inquiry on the 14-day rule on the scale of that conducted by Baroness Warnock in the 1980s⁵ would require more detailed consideration, however, so we will return to this issue once we have undertaken our work on Genomics and genome editing.

- **Use of evidence by the Cabinet Office:** Bob Ward (Grantham Research Institute on Climate Change and the Environment) was concerned that the Cabinet Office was not considering an appropriate range of evidence when making major decisions, and was lacking a dedicated Chief Scientific Adviser (CSA). These issues are relevant to our recent scrutiny of the Government Office for Science's annual report and our subsequent correspondence with the Government Chief Scientific Adviser regarding existing CSA vacancies.⁶ We intend to write to the Cabinet Office to draw its attention to the issues raised specifically about its policy-making.
- **The role for hydrogen and fuel cells in a holistic energy system:** Amanda Lyne (UK Hydrogen and Fuel Cell Association) proposed an inquiry to explore how the development of hydrogen and fuel cells could be better coordinated in order to provide benefits to the energy system. We have decided to undertake an inquiry into this subject later this year.
- **Scientific research careers in UK universities:** Dr Bryn Jones highlighted issues relating to research careers in the UK, including an imbalance in the number of PhD studentships compared with long-term academic positions, and an emphasis on short-term contracts for postdoctoral scientists. This topic will be kept in view during our ongoing inquiry programme planning.
- **Algorithms:** Dr Stephanie Mathisen (Sense about Science) proposed that we investigate the use of algorithms in decision-making. She highlighted issues such as the extent to which algorithms can exacerbate or reduce biases, and the need for decisions made by algorithms to be challenged, understood and regulated. We have decided to undertake an inquiry into this subject, and to incorporate the themes raised in the pitch on 'Pre-emptive regulation of emerging and converging technologies' (see below).
- **Pre-emptive regulation of emerging and converging technologies:** Professor John Finney (British Pugwash Group) highlighted the challenges of attempting to regulate new technologies whose implications or potential civil and military applications may not yet be fully understood. This will be incorporated into our new inquiry into algorithms in decision-making.
- **Is Net-Positive Manufacturing a realistic goal?** Professor Shahin Rahimifard (Loughborough University) told us that net-positive manufacturing involved ensuring that there was an overall benefit to the environment and society from the manufacturing process. He suggested that there was a need to understand

5 Department of Health and Social Security, *Report of the Committee of Inquiry into Human Fertilisation and Embryology*, Cm 9384, July 1984,

6 Letter to Sir Mark Walport, Government Chief Scientific Adviser, regarding [Departmental Chief Scientific Advisers and the GCSA](#), 9 February 2017

better the scientific and engineering challenges associated with this. We have passed the material in this proposal to the Environmental Audit Committee, which has a significant ongoing interest in sustainable development issues.

- **Early stage cancer diagnosis:** Dr Michael Brand (Sensor 100) explained that early diagnosis of cancer was an effective means of improving outcomes for patients, and that funding for research into biosensors was needed, alongside commercialisation efforts. We will follow up this issue as part of our regular sessions with the UK Chief Medical Officer, Dame Sally Davies.
- **Science research in schools:** Professor Becky Parker drew our attention to the work of the Institute for Research in Schools, which facilitates school children undertaking science research themselves. The points raised will be incorporated into our ongoing inquiry into the STEM skills gap.

7. In addition, two of the original written submissions, from Jack Neville⁷ and Sarah Jakes,⁸ addressed issues around the increasing use of e-cigarettes. We have considered in the past whether to undertake an inquiry in this area. **We have decided that the time is right to hold an inquiry into e-cigarettes. We will be calling for written evidence in due course.**

8. We are grateful for all the written and video submissions we received, and will seek to incorporate the ideas contained in them in our work where possible. We have also sent details of all of the submissions to the Parliamentary Office of Science and Technology for possible use in their briefing papers for parliamentarians.

7 Jack Neville ([MSI 25](#))

8 Sarah Jakes ([MSI 51](#))

Annex: 'My Science Inquiry' submissions

Reference	Name	Topic
MSI 1	Ms Alice Gray	Women in STEM
MSI 2	Mr Tony Osborne	GMO proliferation in the foodchain
MSI 3	BIKAL	Data analytics
MSI 4	Dr Duncan Astle	Cognitive enhancement technology
MSI 5	Dr Kylie Baldwin	Social-egg-freezing
MSI 6	Dr Joe Grove	Scientific Evidence Communication
MSI 7	Mr Andrew Mcshane	Investigatory Powers Act 2016's impact on the UK's Digital Economy
MSI 8	Ms Sophia Collins	Breastfeeding training
MSI 9	Brightwake Ltd	Novel therapies to reduce antimicrobial resistance
MSI 10	Mr Simon Ball	Immigration and careers in IT
MSI 11	Brightwake Ltd	Impact of UK Notified Bodies performance on industry
MSI 12	Brightwake Ltd	Plans for life science regulation following Brexit
MSI 13	SKIL—Stanford Knowledge Integration Lab.	Outlook for UK energy supply
MSI 14	Grantham Research Institute on Climate Change and the Environment	Use of evidence by the Cabinet Office
MSI 15	Mr Dan Wrench	Biological complexity in human mediated systems
MSI 16	Ms Isabel Webb	Biological solutions to the global nitrogen crisis
MSI 17	Sensor100	Early Stage Cancer Diagnosis
MSI 18	Osamu Ide	Electromagnetic Induction
MSI 19	Northamptonshire Biodiversity Records Centre	Meeting Natural Environment Evidence Demands
MSI 20	The University of Manchester	Space heating and improving insulation
MSI 21	Tyndall Manchester	Role of bio-energy with carbon capture and storage for climate mitigation
MSI 23	People and Land Ltd	A New Model for Public Health
MSI 24	HSAC	Environmental protection and monitoring in the UK post-Brexit
MSI 25	Jack Neville	E-Cigarettes
MSI 26	Cardiff University Otter Project	Water quality evidence base
MSI 27	Mr Samuel Lane	New Breeding Techniques Policy in Plants
MSI 28	Kent Inventors Forum	Commercialising inventions and supporting inventors

Reference	Name	Topic
MSI 29	Professor Francis L Martin	A proposal lottery
MSI 30	Miss Tessa Burrington	Agroecology, geopolitics, scrutiny of drugs companies/holistic health
MSI 31	Mr Nick Ross	Evidence based policy making
MSI 32	Professor Emeritus Peter Dobson	Science behind air quality
MSI 33	AsSIST-UK	Social Science and its contribution to Science and Technology Policy
MSI 34	Dr Jon Copley	Deep Sea Mining
MSI 35	The Tyndall Centre for Climate Change Research	Circular business models for SMEs
MSI 36	School of Health Sciences	Nutrition of University Students
MSI 37	Dr Rachel Freeman	improvement in socio-technical systems
MSI 38	Dr Tadeusz Jones	The impact of low levels of research and development spending in the UK and regionally
MSI 39	Progress Educational Trust	Human Embryos and the 14 day rule
MSI 40	Dr Miles Parker	Scientists' understanding of policy
MSI 42	Dr Keith Baker and Ron Mould	Reporting and use of statistics and terms in government publications and the media
MSI 43	Scientists for Global Responsibility	Military influence on UK research and development
MSI 44	Centre for Parenting Culture Studies, University of Kent	Evidence in support of early years intervention policy
MSI 45	The Institute for Research in Schools	Impact of greater opportunities for students to engage with real science on science careers education and science teacher retention
MSI 47	Dr Bryn Jones	Scientific research careers in UK universities
MSI 48	CBMNet—The University of Sheffield	The use of bacteria in Industrial Biotechnology and Bioenergy
MSI 49	Professor Toby Bruce	Crop protection
MSI 50	The University of Leeds	Energy demand reduction
MSI 51	Sarah Jakes	E-cigarettes and the consequences of the Tobacco and Related Products Regulations
MSI 52	PHG Foundation	Impact of citizen generated data on healthcare
MSI 53	PHG Foundation	The policy impact of blockchain
MSI 55	British Pugwash Group	Pre-emptive Regulation of Emerging and Converging Technologies
MSI 56	Sense about Science	Algorithms
MSI 57	Dr Conor Farrington	Social and political transformations resulting from wearable technologies

Reference	Name	Topic
MSI 58	Dr Nick Davis	Interventions to enhance cognitive performance
MSI 59	The Physiological Society	How policy should evolve to deal with the stress relating to (i) aging population, (ii) employment, (ii) identity theft and (iv) financial problems
MSI 60	UK Hydrogen and Fuel Cell Association	The Role for Hydrogen and Fuel Cells in a Holistic Energy System
MSI 61	HISL Limited	21st century government needs 21st century software
MSI 62	Babraham Institute	Epigenome editing in plants, animals, and humans
MSI 63	British Pugwash Group	Preparations for a warmer world
MSI 64	Mr David Hill	Biological Recording
MSI 65	Centre for SMART (Sustainable Manufacturing and Recycling Technologies)	Is Net-Positive Manufacturing a realistic goal?
MSI 66	British Pugwash Group	Hinkley Point C and beyond
MSI 67	Babraham Institute	The future of peer review
MSI 68	British Ecological Society	Science and the Great Repeal Bill
MSI 69	Imperial College London - Horizons students	Relationship between UK research and immigration and the possible policy solutions
MSI 70	Association for Science and Discovery Centres	Climate Change: Are we teaching our children opinion or evidence?
MSI 71	Association for Science and Discovery Centres	Equity in Science and The Unconscious Bias
MSI 72	Royal Society of Biology	Interdisciplinary research landscape in the UK
MSI 73	Royal Society of Biology	Managing Conflicts of Interest
MSI 75	Neem Biotech	Role of innovative biotechnology solutions to post-Brexit Food Supply and energy resource requirements
MSI 76	UCL	Valuing the role of expertise in society
MSI 77	UCL	Rethinking the research careers pipeline
MSI 78	James Biscoe	Various
MSI 79	Internet Society UK England	Trust and internet policy
Video	Professor Timothy Leighton, University of Southampton	Tackling Antimicrobial Resistance with NAMRIP
Video	Dr Tom Oliver	Quantifying current habitat loss in the UK
Video	Prospect Union	Science and visa rules, including pay for postdoctoral researchers
Video	Professor Toby Bruce	Crop protection

Formal Minutes

Wednesday 22 February 2017

Members present:

Stephen Metcalfe, in the Chair

Victoria Borwick	Carol Monaghan
Jim Dowd	Derek Thomas
Chris Green	Matt Warman
Dr Tania Mathias	

Draft Report (*Future programme: My Science Inquiry*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 8 read and agreed to.

Annex agreed to.

Resolved, That the Report be the Ninth Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till Wednesday 1 March at 9.00 am

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the [inquiry publications page](#) of the Committee's website.

Wednesday 1 February 2017

Question number

Sandy Starr , Communications Officer, Progress Educational Trust,	Q1–3
Bob Ward , Policy and Communications Director, Grantham Research Institute on Climate Change and the Environment	Q4–8
Amanda Lyne , Chair, UK Hydrogen and Fuel Cell Association	Q9–12
Dr Bryn Jones	Q13–16
Dr Stephanie Mathisen , Sense about Science	Q17–21
Professor John Finney , British Pugwash Group	Q22–26
Professor Shahin Rahimifard , Professor of Sustainable Engineering, Loughborough University	Q27–29
Dr Michael Brand , Sensor100	Q30–34
Professor Becky Parker MBE , Institute for Research in Schools	Q35–39

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the [publications page](#) of the Committee's website.

The reference number of the Government's response to each Report is printed in brackets after the HC printing number.

Session 2016–2017

First Report	EU regulation of the life sciences	HC 158
Second Report	Digital skills crisis	HC 270 (HC936)
Third Report	Satellites and space	HC 160 (HC 830)
Fourth Report	Forensic Science Strategy	HC 501 (HC 845)
Fifth Report	Robotics and artificial intelligence	HC 145 (HC 896)
Sixth Report	Evidence Check: Smart metering of electricity and gas	HC 161 (HC 846)
Seventh Report	Leaving the EU: implications and opportunities for science and research	HC 502 (HC 1015)
Eighth Report	Setting up UK Research and Innovation	HC 671
First Special Report	Satellites and space: Government Response to the Committee's Third Report of Session 2016–17	HC 830
Second Special Report	Forensic Science Strategy: Government Response to the Committee's Fourth Report of Session 2016–17	HC 845
Third Special Report	Evidence Check: Smart metering of electricity and gas: Government Response to the Committee's Sixth Report of Session 2016–17	HC 846
Fourth Special Report	Digital skills crisis: Government Response to the Committee's Second Report of Session 2016–17	HC 936
Fifth Special Report	Robotics and artificial intelligence: Government Response to the Committee's Fifth Report of Session 2016–17	HC 896
Sixth Special Report	Leaving the EU: implications and opportunities for science and research: Government Response to the Committee's Seventh Report	HC 1015

Session 2015–2016

First Report	The science budget	HC 340 (HC 729)
Second Report	Science in emergencies: UK lessons from Ebola	HC 469 (Cm 9236)
Third Report	Investigatory Powers Bill: technology issues	HC 573 (Cm 9219)
Fourth Report	The big data dilemma	HC 468 (HC 992)

First Special Report	Royal Botanic Gardens, Kew: Government Response to the Committee's Seventh Report of Session 2014–15	HC 454
Second Special Report	Current and future uses of biometric data and technologies: Government Response to the Committee's Sixth Report of Session 2014–15	HC 455
Third Special Report	Advanced genetic techniques for crop improvement: regulation, risk and precaution: Government Response to the Committee's Fifth Report of Session 2014–15	HC 519
Fourth Special Report	The science budget: Government Response to the Committee's First Report of Session 2015–16	HC 729
Fifth Special Report	The big data dilemma: Government Response to the Committee's Fourth Report of Session 2015–16	HC 992