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Official Report

MEETING OF THE PARLIAMENT

Tuesday 21 May 2013

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[The Deputy Presiding Officer *opened the meeting at 14:00*]

Time for Reflection

The Deputy Presiding Officer (Elaine Smith): Good afternoon. The first item of business this afternoon is time for reflection. Our time for reflection leader today is the Right Rev Christine Sime, Minister at Dalgety Parish Church.

The Right Rev Christine Sime (Dalgety Parish Church): This week there are debating chambers and governing bodies meeting at each end of Edinburgh's Royal Mile, yet their work is not miles apart. Each of them is making policies that change life for the better, leave folk in their difficulties, or add burdens to people already hauden doon, without lifting a finger to help.

Each one of us is given the privilege and responsibility to look after people from all walks of life, to be a place of hope for now and for the future. Today's World Mission Council report recalled David Livingstone's theology that every person of every nation is equal in the eyes of God who made them. He described slavery, which deemed one to be better than another, as

"an open sore on the face of Africa".

Most now see the error of past ways regarding slavery, apartheid, gender and sexuality. Those divisions really should no longer exist. More healing is still required. There are pains that run deep, when people are told that they are not good or not as good as others, or when rich-world Governments refuse to pass laws that would allow the hungry to be fed.

That is not the way of the gospel; nor should it be the way of ecclesiastical or national governance. Rather, we in church and nation are called to stand with the marginalised, seeing needs, hearing cries for help, bringing justice, being the voice of the voiceless, being fair and treating all people exactly the same. It is the presence of justice and compassion that proves any Government's worth, and the decisions it makes that bring dignity and equality and shout loud and clear that every life is precious that brings honour.

That is Jesus' radical gospel of love. He calls us to the margins, to take risks, face challenges, use opportunities and be out there on the slippery slope with those who are struggling to hold on, rather than holding on to the power that we have ourselves.

On Sunday, the Church of Scotland celebrated her faith at "Heart and Soul" in Princes Street gardens. We also celebrated Pentecost, which is receiving God's spirit in a new way, fresh and invigorating, stirring us out of complacency to be the people of his radical, wonderful and inclusive gospel. May that spirit of hope stir us and lead us all, wherever we may be.

Let us pray.

Lord Jesus, bless this Parliament with wisdom and compassion; with care in speech and action. Bless each one with mercy and humility; may your peace, justice and love prevail.

Amen.

Topical Question Time

Breast Cancer (Genetic Risk)

14:04

1. Jackie Baillie (Dumbarton) (Lab): To ask the Scottish Government what criteria are used to test patients to identify their genetic risk of developing breast cancer. (S4T-00360)

The Cabinet Secretary for Health and Wellbeing (Alex Neil): Cancer remains a top clinical priority for the Scottish Government. Through the implementation of the better cancer care action plan, we are committed to ensuring that people with cancer in Scotland receive the best possible treatment and care. The chief executive's letter issued in 2009 sets out the criteria for the management of women with a family history of breast cancer, and in April the Scottish genetics consortium agreed that it would be right to implement the National Institute of Health and Care Excellence proposals and extend genetic testing for people at risk of developing breast cancer to bring the risk estimation level down to 10 per cent. As with the NICE recommendation, it is planned that that will be implemented in June.

That said, it is important to stress that patient care is ultimately a matter for discussion between the clinician and the patient. This is an excellent opportunity for us to encourage people who have concerns to go to their general practitioner, who will advise as appropriate.

Jackie Baillie: The cabinet secretary is obviously aware of concerns that women in Scotland might somehow be disadvantaged as a result of NICE's decision to make more women in England with a genetic predisposition to breast cancer eligible for screening. I therefore very much welcome his confirmation that that will also be available in Scotland. That is very helpful indeed.

Given that the cabinet secretary and I agree that early detection and treatment are essential in treating cancer, will he consider how we can work together to implement Labour's policy of halving the current waiting time for seeing a cancer specialist and getting results in two weeks?

Alex Neil: First of all, the detect breast cancer early campaign, which was fronted by Elaine C Smith, has already led to a very welcome 50 per cent increase in the number of women presenting at their GPs. Secondly, I point out to Jackie Baillie that we have made substantial progress in reducing cancer waiting lists and waiting times as a result of the additional oncologists, clinical cancer nurses and radiographers who have been recruited in recent years. We will continue to ensure that our targets of 31 and 62 days

respectively are met; indeed, they are being met and exceeded.

Jackie Baillie: I share the cabinet secretary's aspiration to do all that we can and very much welcome the additional staff who have been put in place. However, we can go further than that and I am sure that the cabinet secretary also agrees that swift treatment of those with cancer is essential the whole way through the system. Does he therefore agree that it is not acceptable for cancer patients to be left waiting for follow-up treatment with no guarantee of being seen quickly and no information on how long patients wait beyond that initial period of treatment, and does he agree that improvements should be made in this area?

Alex Neil: We are making improvements all the time. However, once the initial period of referral, diagnosis and then referral for treatment is over, it is up to the clinicians and the patient to determine the pace of any further treatment that is required. That issue is already covered in great detail by clinical guidelines and, although we do not have targets for turnaround times as they do south of the border, we are absolutely sure that clinical guidelines are the way to go, because they are very patient centred and focused on a particular patient's needs. Of course, one patient's needs will be different from those of another patient and we must ensure that the whole system is patient centred.

I also point out that the mortality rates for all sorts of cancers across the board has fallen by 10 per cent over the past 10 years or so and 6 per cent in the past five years. That is a welcome development.

Aileen McLeod (South Scotland) (SNP): Given that, as we all know, it is important for breast cancer to be detected and diagnosed as early as possible to give greater chance of more successful treatment, can the cabinet secretary provide an update on what impact the groundbreaking breast cancer campaign featuring Elaine C Smith that he mentioned earlier has had in raising awareness of breast cancer symptoms since its launch last September?

Alex Neil: As I have said, the number of GP consultations relating to breast symptoms increased by approximately 50 per cent during the successful detect breast cancer early campaign. Approximately 21,000 women consulted their GP with regard to breast symptoms such as lumps, pain or infection. That is a significant increase on the figure for the same period in 2011, when there were approximately 13,900 consultations. Although it is too early to say what impact these consultations have had on the rate of diagnosis, we will publish an evaluation in due course.

The Deputy Presiding Officer (Elaine Smith):
That concludes topical question time.

Public Science Engagement Initiatives

The Deputy Presiding Officer (Elaine Smith):
The next item of business is a debate on motion S4M-06643, in the name of Dr Alasdair Allan, on supporting a science nation: celebrating Scotland's public science engagement initiatives.

I ask members who wish to participate in the debate to press their request-to-speak buttons. I also remind the chamber that debates on Tuesdays are follow-on debates. We do not have present all members who are supposed to be in the chamber for the opening speeches, but we are just going to have to go ahead with the debate and hope that those members join us.

I call Dr Alasdair Allan to speak to and move the motion. He has around 14 minutes, although at this stage of the proceedings we have some time in hand for interventions.

14:10

The Minister for Learning, Science and Scotland's Languages (Dr Alasdair Allan):
Science, engineering and technology are shaping the world in ways that we would not have recognised just 10 or 15 years ago. The debate is timely, giving us an opportunity to celebrate the work of the organisations that help the wider public to make sense of the science in their everyday lives and, therefore, contribute to the positioning of Scotland as a science nation.

What do we mean by a science nation? I think that we all want to see a Scotland that continues to embrace science; a Scotland that recognises and celebrates our rich tradition of science, discovery and innovation; a Scotland where our young people build on that legacy and see their future in science and engineering, in research and in turning that research into economic benefit; a Scotland where new scientific developments can be debated and discussed by the wider public without prejudice; and a Scotland where there are opportunities for people to explore science and find out something new, whatever their age or ability.

Admittedly, much of that will always rely on the strength of our education system and research base, as well as the economic development levers that nurture business, innovation and industry. However, there is a wider issue at the heart of the debate. How do we ignite that initial spark of interest in science? How do we encourage adults, who may have been let down by science at school, to re-engage with science issues that affect them, which can be as diverse as climate change, healthy eating and vaccinations? How

can we encourage debate and discussion of new and often contentious science developments that will shape Scotland in the future, from stem cells to energy use?

That is where science engagement comes in. From science centres and science festivals to outreach tours taking Scottish research to schools and communities across the country, Scotland has an impressive network of organisations that take a more informal approach to science learning. By making science accessible to a wide public audience of all ages, the science engagement sector is making a valuable contribution to Scotland.

Let me explain in more detail what science engagement means, as it is separate from the formal education system. Science engagement involves scientists and science communicators meeting and interacting with the public in informal settings to explore and discuss science and its importance and relevance to everyday life. It can take place in cafes, pubs, theatres, cinemas and museums. It can include debates, hands-on activities and workshops, shows and films. Scotland's four science centres and almost 20 science festivals provide a strong focus for making science, technology, engineering and maths—STEM—accessible to families, young people and adults.

It is, therefore, relevant to focus on the role of the science engagement sector in highlighting Scotland's science strengths; in encouraging debate and discussion of topical or ethical science issues; in supporting science learning for all ages; and in promoting STEM careers. Of course, there will always be overlap with the formal education system. Indeed, many initiatives complement the curriculum and support science learning and teaching in schools. However, the focus of the debate should be the opportunities for people to engage more informally with STEM.

It should be said that, in that context, there has been a sea change over the past decade or so. There has been a move away from the "public understanding of science", which implies that people just need to know a bit more about science, towards more active engagement and dialogue between the public and the scientist. That two-way encounter has the potential for reflective learning on both sides—by the science community as well as the public.

Why do we want the public to engage—to use that overused word—with science anyway? What benefits are there for society in a thriving science engagement sector? The benefits include encouraging science careers and science skills development, both of which are essential for our future economic growth. Members of all parties

have raised that in the context of encouraging women into the world of science.

Another useful activity is the demystifying of science through researchers opening up their work.

Neil Findlay (Lothian) (Lab): The minister mentioned encouraging women into science. Why has he mentioned that only briefly? Why does his motion not elaborate on the problems that we face in bringing women into science?

Dr Allan: To be fair to myself, I have only just mentioned the issue, so in saying that I have mentioned it only briefly the member does not take account of what I will say later in my speech. However, he makes an important point about the need to ensure that we redress the imbalance that exists in areas such as physics. It is certainly fair to say that, across the science sector, there is a greater opportunity for women to engage in careers, but I accept that, particularly in physics and engineering, a great deal more work needs to be—and is being—done.

We also need to demystify science. That is particularly important given that much science research is publicly funded. People have a democratic right to know what they are paying for. Science engagement activities can also highlight Scottish science strengths. We should all feel proud of areas in which we lead the world—for example, through our contribution in surprising areas such as space science, as well as in plant and animal science.

All that work can encourage debate and discussion on current and ethical issues, such as energy use and climate change, or health-related issues. I hope that such debate can lead to positive behaviour change on travel choices, recycling and diet and exercise, as well as having a democratic function if public dialogue is linked to public policy development processes.

I also believe that it is good for scientists to be reminded that their work does not exist in a vacuum—although I suddenly realise that the work of some scientists probably does exist in a vacuum; I was speaking figuratively. Public reaction to and interaction with emerging scientific developments is part of the research process, and the science community must remember that, too.

What is the Scottish Government doing to support science engagement? First and foremost, we have a comprehensive package of annual funding, which we believe is unique in the United Kingdom. I am pleased to announce that, in 2013-14, we will continue to support the four science centres in Scotland with funding that is worth a total of £2.53 million. Our Dynamic Earth across the road in Edinburgh, Glasgow Science Centre, Dundee Science Centre and the Satrosphere

science centre in Aberdeen are major hubs for science engagement.

Neil Findlay: Could the minister tell us how much it costs for a child to get into Our Dynamic Earth?

Dr Allan: I will be honest and say that I do not have that figure before me. I understand that there is an entry charge, but I should say that, although the Government funds the science centres, we do not run them—they are run by independent trusts. There are comparative organisations and museums that are free, but it is not the case that the science centres are run directly by the Government.

I accept that it is necessary to ensure the maximum level of access. That is why we encourage—indeed, we do more than that; we promote—access to the science centres through the schools.

Iain Gray (East Lothian) (Lab): Will the minister give way?

Dr Allan: I have already taken two interventions. If the member will allow me to make some progress, I may take one from him in a moment. [*Interruption.*] I beg your pardon?

The Deputy Presiding Officer: It is entirely up to members whether they wish to take interventions and at which points. If members wish to make progress, that is entirely their decision.

Dr Allan: I think that I heard a sedentary intervention, but I am prepared to take an intervention if the member has one.

Hugh Henry (Renfrewshire South) (Lab): We have got all afternoon.

The Deputy Presiding Officer: Could we stop having sedentary interventions? I would prefer it if members did not respond to them.

Dr Allan: Okay.

The science centres attract around 650,000 visitors every year with a mix of exhibitions, shows and workshops for families, young people, school and nursery groups, students and adults.

Although the science centres reach a significant proportion of the Scottish population, they are not easily accessed by everyone. That is one of the reasons why we are continuing to support science festivals in towns, cities and islands across Scotland. From Orkney to Edinburgh and from the Western Isles to Fife, Caithness and Dumfries and Galloway, the events provide a more localised, grass-roots focus to science engagement, attracting a combined audience of around 200,000 every year. Many festivals are organised by volunteers and charities and could not survive without input from local scientists.

I am delighted to confirm that in 2013-14 we will support 19 festivals with £251,000 and that individual festivals will see no decrease in the funding offered for their events compared with that received in previous years. Indeed, the success of the Scottish science festivals and of our wider science base and science engagement sector was instrumental in the British Science Association choosing to hold its annual British science festival in Aberdeen last year, attracting 43,000 visitors.

We recognise that there are still significant parts of Scotland that are less well served by festivals and science centres. Audiences in rural areas can feel remote from the nearest hub for science engagement. Even in our cities and towns there are many people who would never consider visiting a science centre, a festival, a museum or other venue where science engagement activities take place.

With that in mind, in the past year we have pioneered a new approach to encourage science communicators to think more widely about their audiences. The new talking science grant scheme is an annual competition that challenges the sector to take science directly into communities in rural or deprived areas. In 2013-14, £250,000 will support 14 new projects that are expected to reach 78,000 people, as well as 16 projects continuing from last year.

This year's new projects include the Clipperton project's floating lab, which is a converted boat that will tour Scotland's canals this summer with activities that bring engineering and nature to life; and the University of Edinburgh's hope beyond hype project that sees stem cell researchers working with patient groups and the wider public in rural areas, but especially young people, to explain the potential opportunities presented by that area of science.

I said earlier that the focus of the debate is not on science in schools. However, I want to spend a moment to acknowledge that in 2013-14 we will continue to support a number of initiatives that provide schools with a way to help bring science learning and teaching to life in the classroom. For example, Edinburgh International Science Festival's generation science tour takes workshops and shows to more than 50,000 primary pupils every year; the Institute of Physics lab in a lorry takes physics activities to 10,000 secondary pupils every year; and there are STEM clubs in schools, through the Scottish Council for Development and Industry's young engineers and science clubs, and STEMNET's advice service, both of which help teachers set up and run a science club.

In addition, the big bang Scotland event that will be held in Glasgow next month will give young people a unique opportunity to explore STEM

subjects in a fun and inspiring environment. It is coupled with the Scottish finals of a number of Scottish and UK STEM competitions. In 2013-14, we will provide more than £200,000 to support those and similar initiatives.

Supporting the science engagement community is not just about funding. As well as our work with the organisations already mentioned, the Scottish Government works with a number of other science engagement providers by making connections and helping to drive partnerships and collaborations. That includes work with STEMNET—the UK-wide charity that promotes STEM in schools—and the Edinburgh Beltane at the University of Edinburgh, and regular liaison with our universities and research institutes to ensure that they are aligned with other initiatives. For example, partnerships in the science engagement community are embracing the 2013 year of natural Scotland, with a number of themed events and activities taking place across the country to highlight some science aspects of our natural landscapes and habitats.

There is a great deal to celebrate about our science engagement community, but there will always be challenges, particularly in funding and how to increase audiences. That is especially the case in relation to communities that are less able or willing to engage with science.

There is clearly a role for science communicators, industry and academia to play their part, and I know that there are many initiatives that involve collaborations between these three main areas. There is also a role for colleagues in the Scottish Parliament. We can help to raise awareness of the opportunities available, many of which are free of charge, for our local schools and communities to find out more about science.

Colleagues in Inverness, Glasgow and the Borders may be interested in attending science festivals in those areas over the coming few weeks, and I am sure that many members will want to encourage schools in their constituencies to attend the big bang Scotland event in Glasgow on 14 June, to compete for prizes or just have a great day out, immersed in science.

The science engagement sector in Scotland is clearly thriving and playing an important role in helping scientists and the public come together. By making science more accessible and exploring the opportunities and challenges posed by current research and new developments, we can help ensure that the wider public has the tools that they need to make informed decisions on issues that affect their everyday lives. That is an important aspect of building a science nation, and I look forward to continuing to support our diverse science engagement sector in achieving that.

I move,

That the Parliament values Scotland's science centres and science festivals; notes the efforts made by them and other organisations to make science accessible to a public audience of all ages, and welcomes the Scottish Government's continuing support for a range of public science engagement initiatives through annual funding.

The Deputy Presiding Officer: Thank you very much, minister. Before we move on, I am pleased to advise the chamber that all members are now present. However, some clarification is required.

I received an apology from Sandra White MSP, for which I am grateful. I think that, like others, Sandra White thought that the debate started at 2.20 pm. I clarify that, on Tuesdays, the meeting begins with topical questions at 2 o'clock. We may have no topical questions, we may have one, or we may have two. We have no idea how many supplementary questions there may be. Therefore, the business bulletin clearly states that everything else follows on from topical questions. There are no times, so a Tuesday afternoon debate does not have a start time of 2.20.

I call Hugh Henry.

14:27

Hugh Henry (Renfrewshire South) (Lab): The minister mentioned the big bang event on a couple of occasions. I suspect that the two hours and 50 minutes that we are devoting to this debate will be slightly less educational and entertaining than two hours and 50 minutes spent watching reruns of "The Big Bang Theory", which might be commended to people.

We have missed an opportunity today. Just a few months after a debate on science, we had the opportunity to do something that had a focus, intent and purpose. There is nothing in the minister's motion that I would disagree with and, indeed, there is nothing that the minister has said that I would disagree with. The problem is that I am not sure that that takes this Parliament or anyone else further forward, other than with us all standing up and saying how much we agree with each other about the significance and importance of science.

We as a Parliament might want to reflect on whether we can do our business and engage with the public in different and better ways. Given the significance that the minister says that he and the Scottish Government attach to science, some of our committees could have held an investigation—indeed, there could have been joint committee investigation—into different aspects of science. For the people here today, two hours and 50 minutes could have been better spent in a round-table meeting, with scientists, academics, teachers and, indeed, students and pupils, to find out the

issues that worry people and what can be done to drive forward the encouragement of science and the debate on it.

Sandra White (Glasgow Kelvin) (SNP): The member has a business manager, who obviously meets the business team. Why did he not give the idea that he is putting forward to his business manager so that he could propose it to the Parliament, instead of waiting until now and basically rubbishing the debate? I have some worthwhile things to say about my Glasgow Kelvin constituency and its involvement in science.

Hugh Henry: Sandra White might not understand how the Parliamentary Bureau works—I do not know—but she might want to talk to her business manager about in-built majorities and how the Parliament's business is determined.

I am trying to suggest that we could find better ways of having a specific focus and coming back to a debate in which there is something relevant and pertinent that could move the debate and agenda forward. I have no doubt that Sandra White will have a lot of interesting things to say, and I am sure that other members will have interesting things to say, but I suspect that they will all stand up and agree with one another on the significance and importance of science and ponder how we can encourage more people to engage in it. We are missing an opportunity to take things another step forward from the debate that we had just a few months ago.

I cannot disagree that we need to encourage more young people into science. I accept that that is partly about looking at how science is taught in schools, and I think that some of the initiatives that will no doubt flow from the curriculum for excellence will make a significant contribution to that, but there is also a challenge for us all in making young people see the relevance of science in academic study and as a career path to follow.

We have said that in previous debates, and that accounts for part of my frustration. We are still not doing enough. That is despite the sterling work that is being done in our universities, many of which are thriving despite problems at an earlier stage. We have a problem that starts from the early years and goes through our whole education system. Young people do not see the necessity and value of science and, worse, they do not see the opportunities that it can bring. It requires investment, focus and a change of emphasis to address that situation.

My colleague Neil Findlay asked about women and why the motion does not pay more attention to the need to engage women in science. That is a glaring weakness in everything that we do and say. When we look at the number of women who come out with suitable qualifications but do not

follow them through in academic or career pursuits, we must ask ourselves why that is and what it means in respect of wasted opportunity for our country.

We can have all the debates in the world about inward investment, call centres and our financial services, all of which make a significant contribution to our economy, but there is no doubt that, if we are to thrive as a successful country in the 21st century, we need to do more to improve engagement in science, technology and engineering. Coming up with cutting-edge ideas, being able to develop them here, and selling them abroad will make this country successful. When it comes to engagement in science and technology, we cannot afford to ignore women in the way that we continue to do. There is a fundamental, structural problem in our country that we are not addressing properly.

The first Prime Minister of India, Nehru, stated:

"Who indeed could afford to ignore science today? At every turn we have to seek its aid ... The future belongs to science and those who make friends with science."

That is true for 21st century Scotland, and the people who are engaged in science in our universities know the significance of that.

The minister has mentioned a number of innovative projects in our universities. A whole list of what is going on right across the country could be reeled out, and it needs to be given significant and added status. I would much prefer it if we could do that not only by holding a two hours and 50 minute debate but by embedding that into the work of the Parliament's committees, so that parliamentarians have the opportunity to go out and engage. That work could happen across party lines because I agree fundamentally with the minister on the matter and, as I said, there is nothing that I would disagree with in his motion.

It is in the interests of everyone in the country that we do things better than we are doing right now. The significant worries about funding science festivals and centres and ensuring that science has a future must be addressed. That future comes not only from investment but from access to research council funding for our universities. We cannot ignore the worries that many academics have about access to research council funding. It is not good enough simply to say to them that it will be okay or to tell them not to worry about the constitution because the money and the access will still be there. Those worries need to be answered soon because they know the significance of research council funding.

The debate is about the value of something that should be fundamental to our education system but which in some cases is unfortunately not. That means that we need to invest in, resource and

empower our teachers. As I have said, curriculum for excellence will give us opportunities in that direction. However, we cannot ignore the damage that has been done by the cuts in continuing professional development funding and access to CPD courses that many teachers face. Teachers need to ensure that they are up to date with developments so that they are confident and empowered to teach their pupils. If they do not have the enthusiasm, knowledge and wherewithal, they will not enthuse and motivate the next generation of scientists that we so badly need.

Perhaps we should take the debate as a wake-up call that science is important and that we should not devalue and underestimate it. Let us see whether we can—perhaps in private and not within the confines of the chamber—sit down and discuss how we can move the agenda forward, and then come back with debates that will engage people and maybe even fill the gallery with people desperate to know what we want to do in the advancement of science.

Without that commitment or understanding of the significance of science, we will face a bleak future. However, when I look at the enthusiasm, techniques, knowledge and skills that are available in our colleges and universities, I am confident that we can do something that will make a difference.

The Deputy Presiding Officer: I would be grateful if members who wish to speak in the debate could press the request-to-speak buttons. That is particularly important for any member who makes an intervention, because they will need to re-press the button.

14:38

Liz Smith (Mid Scotland and Fife) (Con): I apologise to the Presiding Officer and other members in the chamber for the fact that both I and Nanette Milne were late for the debate. Part of the explanation is that no *Business Bulletin* was available when we left for committee meetings this morning and, when we checked again at lunch time, none was available, so we were unaware that the debate had an earlier start time.

I regret that an amendment to the debate was not selected. On Thursday last week, several members were privileged to listen to a group of pupils from Perth high school who had come to Parliament to press their case for a higher in geology—one of the subjects that is under threat of being discontinued by the Scottish Qualifications Authority in 2015. They argued strongly that geology is a subject that brings together so many different aspects of scientific inquiry, and one which could hardly be more important when it comes to the future of earth

sciences and the Scottish economy. Indeed, I felt that their case was persuasive.

Despite the fact that I am firmly wedded to the social sciences, I cannot stress enough the intrinsic educational value that the study of science brings to our students throughout our schools, colleges and universities. Science—as opposed to the arts and social sciences—provides a distinctive discipline of positive inquiry that is quite different from that in other subject areas.

It is abundantly clear that Scotland is at the cutting edge of many research projects in science. However, it is also abundantly clear that we need to do much more to encourage a greater uptake of the STEM subjects—particularly by women, as members on the Labour benches have pointed out—and to ensure that there is a greater understanding of how those subjects can be applied in modern industry and commerce.

Science encapsulates what is around us as human beings as well as what is around the planet. The growing breadth of its inquiry, thanks largely to the application of increasingly sophisticated technology, is in great demand and is both exciting and creative. With greater diversity required in the energy industries, the debates about climate change, rapid changes in communications and transport and the significant challenges within the health industry, there is no end to the need for well-trained scientists and engineers.

Dr Robin Wallace, head of the institute for energy systems at the University of Edinburgh, has spoken about collaboration and about how it is so crucial. He says:

“in addition to advances made in wave and tidal energy at Edinburgh, Heriot-Watt and Robert Gordon Universities, researchers at the University of St Andrews have made exciting new breakthroughs in energy storage”.

He talks about the collaboration when it comes to

“developing new types of lithium batteries”,

which he is of the opinion will

“have a major impact on the future ... of scientific application.”

There is similar success at the University of Dundee. According to the latest Thomson scientific rankings, it has achieved the greatest impact in molecular biology and genetics and in biology and biochemistry of all UK universities. That is a significant achievement.

Those are just two areas that will significantly enhance Scotland's prospects for the future and we must do everything that we can to ensure that those institutions can recruit top-quality science students and staff. Our colleges and universities, as well as our industries, play a crucial part in

developing the groundbreaking ideas that are so essential to Scotland's economic growth.

Likewise, we all know that the future success of an increasing number of companies in Scotland is underpinned by scientific knowledge and its practical application. Electronics has become a vibrant and dynamic industry, significantly contributing to meeting the changing needs of other industries such as automobiles and defence. Seventy per cent of Scotland's exports come from the science, engineering and technology-related sectors and yet the oil and gas industries have expressed their concerns about skills shortages, and a recent OPITO survey of companies in Aberdeen identified finding talent and skills shortages as the number 1 challenge to their future competitiveness. That is an important warning.

Scotland's science centres and festivals play a crucial role in making science more accessible to all age groups and for that reason we are happy to support the Government's motion. Nonetheless, we believe that we need to enhance that attraction and do more to ensure that there is a stronger and more diverse science qualifications network that will meet the academic needs of pupils and students right across Scotland. It is about not just boosting the profile of science within the curriculum but ensuring that we make it as easy as possible for students to gain qualifications and work experience in the related industries.

To return to the question of geology, it is a subject that ought to lead to a wide variety of degree options and professional training for graduates for a range of industries, many of which are critical to Scotland's long-term plans—particularly in the fields of oil and gas, mining and renewables. Job prospects and graduate employment for those students are high, with above-average salaries, yet very disappointingly the SQA is looking to discontinue the geology higher in 2015. That decision is based—probably not surprisingly—on the very low numbers of the SQA candidates in 2011 and 2012.

The argument is that attention should be focused elsewhere, on the subjects where there is much greater demand. However, we should be very careful about how we make such assessments—a point that was put to us by Ruth Robinson of the University of St Andrews last Thursday. She has made plain her view that the low uptake is driven by the very low numbers of teachers supporting the subject. Remarkably, no new teachers have been trained since 1985. That statistic is deeply worrying, particularly given the growing scope for earth sciences within the curriculum for excellence and the number of pupils who would like to do the subject if only they could be given the chance.

If we dig a bit deeper, we find that 13,000 from just over 100 schools have been involved in the geobus outreach programme that is run by St Andrews university. That is much more akin to the ratios that we would expect if we look at Wales, Northern Ireland and England, or at some European countries, such as Norway.

One pupil made the interesting point that there is hardly a more interesting and exciting country for geology than Scotland, so he rightly posed the question of why our uptake is so poor. If there are latent reserves in our mineral ores, there is also latent talent in our pupils, and it would be a great pity if they could not be allowed to develop those talents just because there is insufficient support for staff who want to teach the subject. I hope that the SQA might be persuaded to review its decision.

I conclude by noting that science is hugely important to us all. It is encouraging to see a growth in the number of conferences and festivals showcasing the best in Scottish scientific achievement, but that in itself will not be enough to deliver for pupils whose futures will be in the science industries. Those pupils and their teachers need to know that the curriculum for excellence will provide opportunities that are supported in the same way as other subjects are. Everything possible must be done to provide the relevant qualifications so that we have both the number and the quality of science graduates that Scotland needs for the years ahead.

The Deputy Presiding Officer: I thank Liz Smith for the apology that she made on behalf of herself and her colleague Nanette Milne. I will look into the issue about the *Business Bulletin*, but I reiterate that the debate did not start early. Topical questions can last up to a maximum of 15 minutes, but they may take significantly less time, so that needs to be clarified. Once again, I thank the members for their apology.

We now turn to the open debate. Speeches should be of a generous six minutes, but I can give members back time if they wish to take interventions.

14:46

Stewart Stevenson (Banffshire and Buchan Coast) (SNP): At the outset, I advise colleagues that I will not be deploying my ever popular Rev I M Jolly imitation this afternoon—others do it so much better than I do.

In his opening remarks, the minister said that he was not speaking in a vacuum. Of course, a vacuum is an entirely theoretical thing, rather like infinity. Given the Heisenberg uncertainty principle and the reverse temporal connection that is associated with the Higgs boson, it is impossible for there to be any part of the universe that is

wholly empty of matter. Of course, the Heisenberg uncertainty principle means that we do not know whether there is anything in a particular space until we test it and, after testing and detecting it, it may no longer be there.

That sort of language, while fascinating in a superficial way, is meaningless to a great many people, so we need to speak in more simple ways using simpler examples.

Iain Gray: Will the member give way?

Stewart Stevenson: Before coming to a former mathematics teacher, I want to give just a little story about my mathematics teacher, Doc Inglis. He was a wonderfully bluff Lancastrian, who in our first year at school took us round the school searching for infinity. We took the blackboards down, but we could not find it. We looked in the school dustbins, but we could not find it. We went out into the playing fields, but we could not find infinity. To this day, I remember that exercise and infinity means something to me.

Iain Gray: Perhaps the moment has passed, but I wanted to point out that it is not possible to talk in a vacuum because sound does not travel in a vacuum. The advantage of that, Mr Stevenson, is that nobody would be able to hear the scream.

Stewart Stevenson: The scream of Schrödinger's cat no doubt—that is a rather private reference.

Neil Findlay: Will the member take an intervention?

Stewart Stevenson: I will make some progress, if I may, before thinking about taking another intervention. The bottom line is that we need people who can inspire and link science to real life.

I want to mention some women in relation to science. Let me start with Mary Queen of Scots and cryptography, which is a topic that I am particularly interested in. Mary Queen of Scots used a method for corresponding with her lover that, in structural terms, is exactly the same as the method used in the public key cryptography on the internet and elsewhere that protects our highly sensitive data. She had a box with two locks, of which she had the key to one and her lover had the key to the other. She would put her message in the box and lock her lock; the box would go to her lover, who would lock his lock. The box would then come back to her and she would unlock her lock; it would go back to him and he would unlock his lock. There was only one key each, which never left the respective people, because compromising the key would make things difficult. Hundreds of years later, that is the basis of how we protect modern financial information. So Mary

Queen of Scots gives an historic hook, but an important one that lives on in modern cryptology.

A few politicians have been scientists. Indeed, Isaac Newton was a member of Parliament for a period, although I must say that his contribution to Parliament was relatively modest. He made only a single contribution, when he asked if the window could be shut because there was a rather disturbing draught blowing along the back benches, but at least he was in Parliament and the opportunity was there.

Another woman, Ada Lovelace, was Charles Babbage's programmer. Charles Babbage had a lot of public money to develop the difference engine and the analytical engine, which were mechanical computers that it was impossible to engineer to the required standard. Ada Lovelace developed the algorithms for those machines. In the modern age, another woman, Rear Admiral Grace Hopper, developed COBOL, a language that is still used in commercial programming today. She retired three times and was brought back to the United States navy, because she turned out to be indispensable. She was brought back and died in harness as a researcher at the age of 86. So there are plenty of women around; we just have to get the message out.

The relationship between scientists and public discourse is often a little uncomfortable. We think of the first computer being made in the United States but, actually, the first computer that was capable of being programmed was built by a Post Office engineer called Tommy Flowers, who was based at Dollis Hill laboratory in London. He developed it in 1944. It was available six days before the D-day landings and was an indispensable tool for that. However, he had to pay for it himself and the state never fully compensated him.

There are good examples from good scientists. Richard Feynman was able to show, without speaking a single word, why the Challenger space shuttle failed. Live on television during a congressional hearing, he took a rubber ring like those on the solid booster rockets on Challenger—which had been the point of failure—dipped it in liquid nitrogen, tapped it on the desk and it shattered. He did not say a word, but he found a way of illustrating how science can affect real life. I hope that we have lots of people who can do that.

I can think of a few ministers who have been scientists. I have Iain Gray on the list, as well as Richard Simpson and Sam Galbraith. Of course, Jack McConnell introduced tobacco legislation because he understood many of the scientific arguments. It is not all good news, however. Margaret Thatcher was the first and only Westminster Prime Minister who was a chemist,

but one of the first things that she did was to cut grants for chemistry research.

Another woman, Dorothy L Sayers, put a very important point about science into the mouth of Peter Wimsey, the detective that she created. She has him say:

"The only ethical principle which has made science possible is that the truth shall be told all the time. If we do not penalise false statements made in error, we open up the way for false statements made by intention. And a false statement of fact, made deliberately, is the most serious crime a scientist can commit."

Scientists are the guardians of truth and knowledge. We should do everything that we can to support them and to encourage others, especially women, to follow in their illustrious footsteps.

14:54

Iain Gray (East Lothian) (Lab): Nokia once ran a series of advertisements in which an overblown voice-over followed ordinary-looking people doing ordinary things quite anonymously, such as taking the bus home from work. The point was that they were the scientists behind the communication technology that was daily revolutionising our lives. They were of course not the celebrities that the narrator implied, but were completely unknown. Nokia technology might at a certain point in time have changed the world, but it did not change the public's disengagement from the science behind it. Scotland is certainly guilty of that, too. After all, we are ranked third in the world for peer-reviewed papers, but none of those responsible for those papers would be recognised in the street. That is unlike, for example, our celebrity footballers, whose efforts—much as I support them—have left us languishing in 78th equal place in the world.

Our appreciation of science tends to be of the dishcloth variety. We have an ability to recite Scottish inventors of the past but a complete unawareness of the science that is happening right here and right now. However, Scotland is still profoundly a science nation. Last year's Institute of Physics report showed that

"Physics-based businesses in Scotland, from electricity generation ... to transport, contribute £8.5 bn to the national economy, and employ more than 100,000 people".

That is significantly more than, for example, the financial services sector.

It would be good if science was more widely understood, and members will not find me arguing against anything that we can do to raise the level of public engagement with science. Only last week, I was delighted to be able to open a tremendous visitor centre at a major science-based enterprise in my constituency—an enterprise that provides 700 high-quality, science-

based jobs, supports 33 full level 4 apprenticeships and pumps £30 million every year into the local economy. However, it was a nuclear power station—science from which the Scottish Government specifically wants us to disengage.

Happily, just down the road from Torness, Dunbar primary school has created its own remarkable science event—the Dunbar science festival. It was initiated entirely by a group of parents and, this year—its third year—attracted 6,000 people to participate in a week of science-based events.

That festival was timed to coincide with science and engineering week, in which I also participated by going back to my first profession and teaching a science class in Law primary school in North Berwick. In that lesson, we calculated the speed of light using chocolate buttons and the microwave oven from the staff room. I had a great time, and the pupils loved it when I set the microwave on fire.

It is good that both those events were supported by the Scottish Government. Funding for science week was £23,000 split between 47 schools and 30 public science sessions. Dunbar science festival got a £6,000 share of £121,000, which was split eight ways, with half of it going to Edinburgh science festival.

That is good, but it adds up to £144,000. In the same year, the Government found £7 million to promote a movie that already had the corporate power of Disney Pixar behind it, £500,000 to send the First Minister to America to promote the Ryder cup and even £250,000 to pay for a re-enactment of the battle of Bannockburn next year, but its celebration of science for science week commanded £144,000.

I listened to some of the figures that the minister outlined in his opening speech and I am glad that the funding will be more this year than last year, but the additional £100,000 or so hardly constitutes a game-changing new investment in public science engagement. What does that say about the real priority that ministers give to science?

Only last week, the Royal Society of Edinburgh commented on qualifications for primary teachers. The RSE is clear that the suggestion, which is current, that primary teachers should need a higher in a foreign language but not in a science sends completely the wrong signal and says absolutely the wrong thing about the real priority that we give to science. It also flies in the face of the recommendations of the Government's own science advisory group.

Clare Adamson (Central Scotland) (SNP): Does Iain Gray recognise that part of the reason for teaching two foreign languages to pupils

between primary 1 and primary 6 is that the changes that it makes to the neural connections in their brains improve academic outcomes at all levels for those young people?

Iain Gray: I do understand that, but I think that the member will also understand, because we have debated the subject before, just how important it is to inspire young people about science at the earliest possible stage. The later we leave it, the harder it gets. In order to do that, primary teachers must have confidence in their own ability to teach science and to inspire the youngsters in their charge as early as possible. The same advisory group recommended that primary schools be properly equipped for science. After all, one can only do so much with an old microwave oven, but the Government simply rejected that idea, saying that it was a matter for councils.

The group also recommended support for a science media centre in order to build public understanding and confidence in Scottish science and scientists—exactly the objectives that the minister talked about—but to that suggestion Scottish ministers responded that there is already a UK science media centre based in London, which has a list of Scottish scientists.

We can pass the Government motion today—after all, what is there to object to in it? However, in doing so, we are really damning the Government with faint praise for a faint-hearted effort. Until we have a Government that really understands that this nation's future depends more on science than it does on "Brave" and Bannockburn, until we have ministers who respect the views of the science and engineering community on issues such as energy supply, and until we have an education system that values science at least as much as languages or Scottish studies, in truth we are kidding ourselves that we are protecting this country's legacy and securing its future as a science nation.

The Deputy Presiding Officer (John Scott): Before I call George Adam, to be followed by Clare Adamson, I draw members' attention to the fact that we have copious amounts of time in hand at this stage, so interventions will be welcomed, as will the full and detailed expression of your views on science.

15:01

George Adam (Paisley) (SNP): No pressure, then, Presiding Officer.

Science is a real priority for the Scottish Government. I would like to use some of the time that I have to increase that argument. All of us in the Parliament and beyond know the important roles that science and innovation have played in

our nation's past and their value to its future. We can all reel off the innovations and the advances that have been made and the economic importance associated with them. Scotland has been particularly blessed with significant figures who have made breakthroughs in scientific fields. That might be chance or it might be that some social or educational trait has somehow been encouraged in an unidentifiable way. Or is it to do with the importance that we have attached to education throughout the centuries?

Iain Gray: In looking at why Scotland has done so well in the past, it is interesting to note how many of the great figures and their discoveries and ideas came at the time of the enlightenment immediately following the union. Perhaps that is the explanation that Mr Adam is looking for.

George Adam: If Mr Gray will let me develop my points further, maybe we will get to some of the answers to his questions.

The importance that we attach to science and the results of exploration in the field have meant that we have had a wealth of individuals who have made not only science and maths more understandable but all our lives easier and in some cases much less hazardous.

The National Library of Scotland asked the public to vote on the top 10 scientists who have made a contribution to people's daily lives. They probably include many of the individuals that Mr Gray was talking about. It is a major achievement for any nation to have such a list of scientists, but when we look at their innovation, we can see just how special they were. The Scottish science hall of fame reads like something from a boys' and girls' own adventure tale, as it captures young people's imaginations. John Logie Baird used a coffin lid and a biscuit tin to create his first television. If only we could do that now to create 50-inch plasma screen televisions. James Clerk Maxwell made discoveries about Saturn and about electricity and magnesium. John Napier invented logarithms.

Neil Findlay: The member mentioned the science hall of fame and said that it is like a boys' and girls' whatever—I cannot remember how he referred to it. However, there is not one woman in the top 10 scientists. Is that not the problem that we are trying to address?

George Adam: If Mr Findlay is going to intervene on someone, it would probably be a good idea to listen, so that he knows what the person has said.

The top 10 were voted for in a National Library of Scotland initiative and all of them made a difference. They worked with vision and spirit, and their stories encourage young people, including

those who are sitting in the public gallery today, to think about pursuing the sciences in future.

The development of science lies not only in the past; it continues. The Scottish Government recognises its importance. Investment in our nation's future—its people—continues, with investment in Scotland's four science centres in Aberdeen, Dundee, Glasgow and Edinburgh, as the minister mentioned.

When I went along to the Glasgow Science Centre with my children when they were a lot younger, they had already been there. They knew more than I did about some of the things there. That is a classic example of engagement with science and of using everyday situations to encourage children to understand things. Indeed, the occasion was the first on which I saw an IMAX movie. All those things are connected.

There is positive investment in science, with 19 Scottish science festivals and the new grant scheme for activities that take science to communities throughout the country. We all know that standing still is not an option. We have only to look at our mobile phones from 10 years ago to see the developments that have been made in our everyday lives.

Science is a part of the Government's economic strategy—improving public services and quality of life, including health and the environment. An Institute of Physics report states that 10 per cent of Scotland's economic output comes from physics-based sectors alone, and that is a very impressive figure.

No one will be surprised and members will be interested to hear about the university in my home town of Paisley. The University of the West of Scotland has its own innovation and research office, which facilitates relationships between the university and outside organisations, providing consultancy and contract research options for businesses. That is a prime example of how academia and economic development can develop together, working closely on shared areas of research and development. UWS has a distinguished history of research in some particularly important areas: applied computing, business management and leadership, creative and cultural industries, education, engineering, health, nursing and midwifery, science, social science and thin film and sensor technologies.

We need to fill our university and college places with people who are interested in science and who have a vocation to work in the sector. The University of the West of Scotland has a reputation for enrolling undergraduates from a wide range of backgrounds, who are keen on making science their chosen career. Getting people to that stage of enrolment requires them to be enthused and

encouraged to consider science as the employment option that they wish to pursue. That is why the Government has invested in our four science centres, which is unlike the lack of investment south of the border; that is why funding is being provided for the 19 science festivals across Scotland; and that is why the talking science grant scheme is funded by the Government, bringing science direct to our communities.

It is with such initiatives that Scotland will move ahead. In 100 years, we might have different members of the Scottish science hall of fame—and many of them could be women. It is with that ambition and focus that the nation of Scotland will continue to flourish. Hopefully, this debate will not put the young people who are attending today off the idea of a career in the sciences.

The Deputy Presiding Officer: Clare Adamson has a generous six minutes.

15:08

Clare Adamson (Central Scotland) (SNP): I will endeavour to speak "To infinity and beyond!", Presiding Officer.

I start by taking issue with my colleague, Mr Stevenson. I feel compelled, in the interests of truth, to clarify that Richard Feynman used iced water to demonstrate that the O-rings had failed at the time of the Challenger disaster, thereby making the point that atmospheric conditions led to the failure. Although he revealed to the world what had happened, it is now commonly known that he was tipped off by the female astronaut Sally Ride as to the cause of the disaster.

Many of my colleagues in the chamber enjoy the Blipfoto phenomenon and go round taking photographs of things that they see in their daily lives—the flowers, fauna and landscapes of Scotland. I follow Chris Hadfield, the recently returned Canadian National Aeronautics and Space Administration astronaut, who also took photographs daily on his mission, and shared them with the world via Twitter.

Having inspired Mr Macintosh to fly to his computer last week to view the horse head nebula, I hope to inspire members today to seek out some of Chris Hadfield's photographs. They include "Hot smokestack exhaust streams in the harsh wind across a central Asian winter landscape", "Clouds swoop in on Crimea, a white bird on the Black Sea", and my favourite, which is an absolutely spectacular view simply entitled "Canada rocks."

There is no doubt that astronauts such as Chris Hadfield, who has captured the imagination of the world, can inspire and enthral our young people. I

was delighted to attend a recent event at the Royal Society of Edinburgh that featured Nagin Cox of NASA's jet propulsion laboratory—which has recently been made famous among young people by “The Big Bang Theory”—who has undertaken a series of talks around the world about her involvement in NASA, and specifically her part in the mission that operated and flew the rover to Mars.

On her trip to Scotland, Nagin Cox also visited primary 7 audiences from Bellsbank, Littlemill, Dalmellington and Patna primary schools, and pupils from Doon academy's astronomy master class. The P7 pupils have been attending the academy as part of their transition project, which has focused on astronomy and the local dark sky observatory.

I am pleased that we in Scotland also have world-class academics and scientists who are prepared to do all that they can to inspire our young people. We have a wonderful role model in Anne Glover, who is the first-ever scientific adviser to the European Commission. Scotland's budding scientists—whether they are young women or young men—have a great opportunity to look to such role models in our society.

As I mentioned earlier, Chris Hadfield says that “Canada rocks”, but we all know that it is Scotland that rocks. James Hutton was a pioneer in geology during the enlightenment, and he was also a physician, chemical manufacturer, naturalist and experimental agriculturist. He is known as “the father of geology”. We also have Maria Gordon, who was born in Monymusk and was the first woman to gain a PhD from the University of Munich. She published more than 30 papers on the geology of the South Tyrol region of Italy, and was the first geologist to show that limestone peaks were formed by the movement in the earth's crust.

It was with great delight last week that I attended the event in the Parliament that Liz Smith mentioned. Students from Perth high school, professors and a teacher were there, and the students spoke about their experiences of studying higher geology. It was exactly the type of round-table event that Hugh Henry is looking for, so it is a pity that he missed it.

I will quote some of the comments from the young people of Perth high school on their experiences. They said that they

“were given a ... stunning tour of Dynamic Earth with its friendly Scientific Director, Prof. Stuart Munro”

and that they

“flew to distant planets in search of alien life, and ... over all the beautiful biomes on Earth”

looking at

“the tundra, deserts, and tropical rainforests.”

I did not see all of their presentation, but I know that it was very well received by those who were there. They also said that Fraser, from Our Dynamic Earth, brought along

“a range of rock samples, including obsidian, pumice and, sandstone. He explained the stories rocks can tell us about past climates and environments that existed in Scotland on our journey north from the equator over millions of years. Craig, Brooke, and Fraser then spoke about the wide variety of topics that are covered in Geology, and enthused about the ‘Scotland Rocks’ conference that they organised for Higher Geology pupils from all over Scotland in March. They even included a personal message from Prof. Iain Stewart.”

Of course, Professor Stewart is one of Scotland's foremost scientists, and a great inspiration to young people.

I share some of the concerns that Liz Smith has eloquently raised today, but I am sure that the cabinet secretary and the minister will take those on board.

Annabelle Ewing (Mid Scotland and Fife) (SNP): I, too, had the pleasure of attending the excellent event that Liz Smith organised. All credit goes to her for doing so. We listened to the enthusiasm of the school pupils in their pursuit of science.

One of the pupils whom Clare Adamson mentioned made the memorable comment that he wanted to make lots of money for the Scottish economy in pursuing a science career. That is an important point, because the application of science is a growing and important industry for Scotland, which I think we would all recognise and wish to encourage.

Clare Adamson: I agree with Annabelle Ewing; geology has been highlighted as being hugely important to oil and gas and to renewables technology, as we investigate those areas in Scotland.

The Scotland rocks event that Perth high school organised was an excellent example of engagement with the community. It involved a large number of people from across Scotland who have an interest in geology, including 35 students from Bannockburn high, Fortrose academy, George Heriot's school and West Calder high. The event was held to celebrate and raise awareness of the profile of geology in Scottish schools. It was an excellent event, and an excellent example of engagement with the community.

15:15

Mark Griffin (Central Scotland) (Lab): I welcome the opportunity to participate in today's debate on Scotland as a science nation. I am an

engineer by trade and I know the important role that the STEM sector plays in a modern Scotland.

Scotland has produced some of the world's greatest inventors, scientists, mathematicians and engineers—pioneers who have led the way in innovation and whose imaginative thirst for knowledge and technological advancement has helped to shape the modern world. John Logie Baird, Alexander Fleming, Alexander Graham Bell and James Watt are just a few of the people who paved the way for the scientists, engineers, inventors and mathematicians of today—although it should be noted that, as Mr Findlay pointed out, the top 10 list of scientists contains no females. That is a point to which I will return.

Science plays a pivotal economic role in Scotland and will continue to do so. It is predicted that the energy sector alone will create between 5,200 and 9,500 jobs per year to 2020. It is important that we do everything in our power to promote science in order to make it fun, interesting and accessible. Places like Our Dynamic Earth in Edinburgh, the Glasgow Science Centre, the Sensation Science Centre in Dundee and the Satosphere science centre in Aberdeen do excellent jobs in presenting science differently, thereby capturing the imaginations and interest of aspiring scientists, young and old.

As excellent as those facilities are, and as welcome as the Scottish Government's support for the 18 science festivals that will be held in Scotland this year is, a lot more needs to be done. The real question that faces the Government is how to bridge the gap in science learning across Scotland in order to ensure that young people in the less-affluent communities have access to good-quality science education in schools, and to broaden the appeal of science and technology to females as much as to males. It is important that ministers work closely with local authorities to ensure that primary and secondary schools have the necessary equipment to provide a positive learning experience from an early age.

It is equally important that guidance is given to teachers, particularly at primary school level, on science teaching. Last year the Government-commissioned science and engineering education advisory group expressed "major concern" at the lack of confidence among primary teachers when it comes to teaching science.

I also have a number of concerns about the Government's strategy in respect of colleges—a matter that I have raised in the chamber repeatedly. The Government's science and engineering education advisory group highlights that

"Provision in science and engineering is resource intensive and therefore vulnerable to cuts in expenditure, which

presents a threat to expensive laboratory and workshop-based facilities."

By cutting college sector funding, the Scottish Government risks the quality of science teaching in our further education centres. Furthermore, with the forced merger of colleges, including two in North Lanarkshire, the Government will make it more difficult for students to access courses locally.

As I said earlier—and as has been mentioned by previous speakers—the Scottish Government must do more to remove the barriers that face women who seek to work in the sciences or engineering. When I was studying mechanical engineering at university, I was in a class of about 120 students, of whom about 10 were female. That is less than 10 per cent of women in a class that was studying for a profession that has perhaps the best job opportunities and growth in Scotland—as was highlighted earlier through the projected job figures in the energy sector alone.

Stewart Stevenson: I suggest that one of the things that we are not doing very well is searching for good female role models. The Government could do more; we could all do more. I was slightly surprised that when my colleague Clare Adamson talked about space flight, she failed to mention that the first civilian to fly in space was a woman—Valentina Tereshkova, in June 1963.

However, we do not know how many other female role models we have failed to search out and identify in order to equip teachers—who are not necessarily specialists in science and STEM subjects—with that knowledge. I suspect that Mark Griffin will agree with me on that.

Mark Griffin: There is not necessarily a lack of role models, but I agree that a list of identified role models who might inspire young people does not come to mind easily.

We have also to challenge supermarkets and other retailers on how they market materials for youngsters. Only recently, Tesco was challenged on the fact that its toys for boys section contained a chemistry kit; apparently, Tesco decided that the toy was fit only for young boys and was not appropriate for young girls. That is something practical that we could do to challenge the problem.

If the number of women who started my university course was bad, the number who actually graduated was even worse. Of the 120 students who began the course, only three females graduated at the end of the four or five years. The picture did not change when I entered employment. In the company that I worked for, which manufactured crushers and screeners for the demolition and quarrying industry, only one of the approximately 50 staff in the design room was

female, and on the factory floor there was only one female employee—a health and safety officer—among hundreds of skilled male technicians. That is not to say that the company had a poor record of employing women; there were plenty of women in secretarial and senior human resources, finance and marketing roles, but there was a clear divide between the technical side of the business and the rest of the company.

The Scottish resource centre for women in science, engineering and technology has recently been awarded close to £500,000 from the Big Lottery Fund Scotland for its step up! project, which offers assistance to women who are entering or returning to the sector. However, I think it appropriate to highlight that the fund granted the award because, according to the fund's director, Jackie Killeen,

“barriers and discrimination ... are very real”.

It is therefore incumbent on Scottish ministers to take action to remove the barriers that women face.

I welcome the commitment and dedication of scientists, engineers, mathematicians and innovators and hope that the Scottish Government will do all that it can to provide the best opportunities for future generations of scientists from all genders and backgrounds across Scotland.

15:22

Willie Coffey (Kilmarnock and Irvine Valley) (SNP): Scotland has a continuing reputation in the world for scientific innovation and creativity and for punching far above its weight and numbers in the world. We have the highest rankings of citations of our scientific papers anywhere in the world relative to our gross domestic product, and we excel in the agricultural sciences, pharmacology, toxicology, space sciences and plant and animal sciences. Moreover, our scientific collaborations with the United States, Germany, China, France and India are increasing. Indeed, the president of the Institute of Physics, Sir Peter Knight, has said that physics-based businesses drive the economy of Scotland, that we lead the UK in that respect and that

“Now is the time to build on this advantage.”

In a minute or so, I will illustrate how two distinctly different countries—Estonia and China—are successfully growing their own economies through science and innovation and how that might be something of which we in Scotland should be aware.

Even with our rich history of achievement in science, it is regarded as being slightly unusual for people with a science background to serve as

members in this Parliament. I think that I might be one of the few members with a science honours degree—in my case, it is in computer science—and I recall the Royal Society of Edinburgh reminding us some time ago that much more scientific knowledge exists outside than exists inside government. We should be mindful of that in the years ahead.

How has Scotland come to be so highly regarded by the world's science communities? Clearly, our long history of scientific achievement and the excellence of our universities have played a huge part in maintaining our reputation for science. That reputation draws gifted people to work and study here and we all reap the benefits.

However, in this modern era there is much more going on that will, I hope, give Scotland our science heroes of the future. Members around the chamber have cited examples of that, including the vital role that the science centres play in reaching out and providing engagement. There are also about 19 science festivals throughout Scotland, and there are moves within schools to give kids more practical science experience and to provide professional development for our primary teachers in STEM subjects. The minister mentioned careerwise Scotland initiatives and so on.

Europe plays its part, too, in providing some £30 million a year of valuable research funding for our institutions. All those initiatives play their part in nurturing new Scottish talent and encouraging people to take up science as a career. Scotland will need such initiatives to continue if we are to maintain any kind of leading position.

What is happening in other parts of the world? A recent article on developments in Estonia showed that even the smallest independent countries have invested heavily in encouraging new generations of software engineers—a subject that is close to my heart. Estonia is a country of only 1.3 million people and was part of the Soviet Union as recently as 20 or so years ago. It has, however, embarked on a programme to train and develop new generations of software engineers. We have all heard of Skype, the interactive video, voice and text environment that we are told is for

“doing things together, whenever you're apart.”

It keeps many of us in touch with each other around the world. Skype was invented by Estonian software engineers and sold to Microsoft only two years ago for \$8 billion. It is estimated that, at peak times, there are some 40 million people online at the same time using Skype. Estonia, as it is becoming known, is very much at the centre of innovation in software design and looks like maintaining that position for some time to come.

That is an incredible achievement of which Estonia can be very proud.

Let us move on from one of the smallest countries to the biggest country in the world. Thirty years on from Deng Xiaoping's economic reforms, China has developed from being a relatively poor agricultural country to being the second-biggest economy in the world. Its aim was to make the transition from being agricultural to industrial, and then on to being an innovative society with science and technology as the centrepiece in achieving that.

China still has some way to go, but the signs are good—or ominous, depending on your point of view. At the start, very few of the major commercial technological breakthroughs came from China and only five of the Chinese universities were ranked in the top 500 in the world, but its investment in research and development has increased tenfold in only 10 years and now stands at over \$135 billion a year. Chinese students are now outstripping their American counterparts and, by 2015, China will be the number 1 publisher and quoted source of scientific papers in all fields of science—a certain inevitability that China has planned well to achieve.

From Estonia and China, let us return to Kilmarnock. In my constituency, we have recently set up Kilmarnock Engineering and Science Society, which I have mentioned in the chamber before. It has been meeting in Kilmarnock for over a year, and its aims are to promote science and engineering and to attract school pupils, in particular, and the public to its lectures. We have been graced by some wonderful contributions from the likes of Professor Colin McInnes, Dr Peter Hughes, Professor Martin Hendry and Dr Victoria Martin—a Kilmarnock woman who is doing some particularly important work on the Higgs boson experience.

How do we, in Scotland, with our long history of innovation, invention and excellence in science, maintain our reputation and continue to compete in the world of science? We will not do so because of our wonderful reputation, nor will we do so without considerable effort. We must enthuse our youngsters with the possibilities of what science can do and the opportunities that it provides. That is why the Scottish Government's science engagement programmes are crucial. We must back up the enthusiasm with the investment that makes it all possible and the expertise that makes it all happen. Money is not everything, but it helps. Creativity, ingenuity and inquiring minds are the real keys to success. Scottish scientists have always had those traits, and I am convinced that our current generation of scientists will continue to lead the way.

15:29

Sandra White (Glasgow Kelvin) (SNP):

Yesterday, I attended Glasgow Science Centre to present awards to pupils on behalf of the Prince's Trust. The morning started off with a number of experiments that the pupils joined in with and it ended with them having the opportunity to participate in all that the centre has to offer. The pupils who were there and the others who were queuing up to come in certainly enjoyed the experience. I will give the centre a wee punt—just under 800,000 people visited it in 2010-11 and 2012-13, which is the largest number of visitors that any of the science centres in Scotland has received. That is fantastic.

Members might recall that I asked the Cabinet Secretary for Education and Lifelong Learning about the Scottish Further and Higher Education Funding Council's announcement of innovation centres and the participation in those of businesses. I requested a list of the businesses involved, which I have with me. I will not read out the names of all of them; I just want to make a point. The 20 or so organisations that are involved in the sensors and imaging systems innovation centre include the University of Glasgow, the University of Strathclyde, Glasgow Caledonian University and the Scottish universities physics alliance. The industry partners include BP International and IBM, and the small and medium-sized enterprise partners include Gas Sensing Solutions. Other public partners include the UK Astronomy Technology Centre.

Members of the stratified medicine Scotland innovation centre include Health Science Scotland and GlaxoSmithKline. I would be happy to send anyone a list of all the various organisations; I am sure that the cabinet secretary would be, too.

I read out the names of those organisations to make the point that science does not operate in a vacuum—if members will pardon the pun. Science is a very wide-ranging discipline. Mention has been made of the need to encourage more women into science. Mark Griffin's remarks were spot on—it is terrible that science toys are designed for boys. In encouraging women into science, we should make more of the fact that it covers a number of disciplines.

I am glad that Hugh Henry is back in the chamber, because I wanted him to hear this. After I asked Mike Russell about innovation centres, I received an email from a researcher, who was very pleased that I had asked my question. They went on to say:

“the Medical Innovation Centre is particularly exciting as the partnership between university research, industry and healthcare ... should bring great benefits and advances in healthcare.”

That is what I meant when I said that science is a wide discipline.

The researcher also said:

"I am delighted that the Scottish Government has allocated time to debate the importance of science and technology in Scotland, and on identifying good practice in public engagement in science. As a researcher, I have benefited from access to the Inspire and Challenge training programme at Glasgow Science Centre, which gives researchers the skills to design activities to get young children interested and excited by science".

That is what the debate is all about. We want to encourage that and to let people know what is happening.

The researcher—who is not involved in politics—mentioned the meet the expert days that the centre hosts, and said:

"I will be putting those skills into practice with a group of primary school children who are coming to visit our lab at Glasgow University to explore plant pigments on Tuesday (as part of a wider programme of activities to celebrate Fascination of Plants Day)",

which I think the minister touched on. The researcher said that they were also

"participating in more public engagement activities at the Botanic Garden on 11th June, also organised by the Plant Science group at Glasgow University. Hopefully these local examples highlight how scientific researchers are engaging with the wider community in Glasgow ... and beyond."

It is important that we highlight the community engagement aspect. What better way of getting people interested in science is there than to go out into the local community and to have members of the community come and visit the labs. That includes all genders—not just men—and we have to start at a very early age on that.

I think that the proposed Conservative amendment to the motion would have highlighted that primary school teachers should have scientific qualifications before they enter the profession. However, we should take note of the comments by Susan Quinn, who is president of the Educational Institute of Scotland, who said:

"We want our teachers to be as well qualified as possible. But there is an argument that if you start looking and being prescriptive about particular subjects at Higher, other than English, then you close down looking at potentially good teachers".

I think that people should consider that point.

Liz Smith: Sandra White has made a good point, but this month's advice paper from the Royal Society of Edinburgh makes the strong point that there is a happy balance to be struck, and it refers in particular—Mr Gray is not in the chamber just now, but he will like this—to mathematics being the language of science. The RSE makes an important point when it asks for primary school staff in Scotland to have a balance of qualifications

across the disciplines of science, the arts and social sciences.

Sandra White: That intervention clarifies the RSE's point, because it came across that the RSE and others were asking for primary teachers to have a higher in a science subject before they enter teacher education. Liz Smith's point was well made and I am sure that it will be taken on board. However, we must consider the issue carefully, because we cannot turn away perfectly good teachers simply because they do not have a science higher. However, as Liz Smith said, it is about qualifications in all disciplines.

This has been a very good debate. I am not, by any manner of means, a scientist. However, I certainly look at the discipline of science in its wider context. I think that we should have more debates like this, particularly when there are younger people in the gallery who can take on board what has been said so that they do not always think that, for example, to be an astronaut they have to have science qualifications; there are other things that they can do with science qualifications. We should have more debates on the issue and we should make them much more wide ranging. Perhaps then we will then encourage more women to come into science.

The Deputy Presiding Officer: I now call Liam McArthur, to be followed by Nigel Don. You have a generous six minutes.

15:37

Liam McArthur (Orkney Islands) (LD): Thank you very much, Presiding Officer. I welcome the opportunity to participate in the debate. Despite the copious amounts of time available, there are probably innumerable issues that I will not have time to cover. A number of members have been right to focus on one of those issues: the problem that we still experience, despite successive initiatives and a determination that spans the political parties, in encouraging more women not just to get into, but to remain in, the STEM subjects. The numbers have improved in certain instances, but we still have not cracked the ability to retain women and encourage them to remain in particular careers in the STEM environment, in private enterprise, academia or wherever. In an excellent speech, Iain Gray highlighted a number of our strengths in Scotland in the science that is being undertaken not just in our universities but more broadly.

I will concentrate my remarks on three areas that I think are pretty fundamental to the public engagement strategy for science: first, festivals; secondly, science centres; and thirdly, scientists themselves. Referring to science festivals is a shameless way for me to segue into referencing

the Orkney international science festival, which is one of the 19 supported festivals around the country. Welcome though that funding is, the driving force behind the Orkney science festival—the one who has made it happen over the past 15 years—is Howie Firth; I am indebted to him for his insights ahead of the debate.

The Orkney experience demonstrates science's breadth of cover. We have only to look at the programme for the Orkney science festival to realise what is involved: lectures, films and events that cover the broadest possible range. It tells us something about the magnetism of Howie Firth that he managed to persuade me to sit through a lecture on quantum physics entitled, "Did the earth move for you?" first thing on a Saturday morning a couple of years back. The festival itself reaches far further. Not only has it helped to extend the shoulders of the tourism season in Orkney, but a key component of it has been schools engagement.

In Scotland, we have a fairly strong story to tell about science festivals. The tradition has run for a fairly long time, although we probably take for granted the acceptance of science festivals, which was not there not so long ago. At the time of the Edinburgh international science festival, it was seen as fairly radical to suggest that science was something that could be savoured and enjoyed by the general public. Indeed, earlier this year Dr Ian Wall gave a lecture at the science festival entitled, "It is impossible to have a science festival", which was derived from a remark that an academic made to him 25 years ago.

We have a proud tradition in that area. Science festivals are a key component of the engagement strategy, and funding for them is absolutely critical. That funding has been there pre-devolution and over successive Governments since devolution. Iain Gray made a very valuable point about the quantum of that funding. There is always more that we could have done or wished to be able to do, and we need to look at the relative areas of spend and ask ourselves whether we always put funding in the right areas and to the right extent.

Festivals vie for the same pot of funding as our science centres, which are another part of our engagement strategy. I know from my experience in the Scottish Executive that the financial underpinning of our science centres has been precarious at times. We are well served with the four centres that we have. I was a long-time member of and regular visitor to Our Dynamic Earth and I have visited the Glasgow Science Centre. During my visit to the Dundee Science Centre, I was struck by how very varied the centres are, and how they engage the public.

In the past year I have had an opportunity to visit Questacon in Canberra, which appears to be

on a different scale entirely. That comes at a cost, some of which is paid up front by those who visit the centre. In turn, what that cost helps to deliver—the quality of the exhibits, the interpretation and the support to help people explore the exhibits and scientific concepts—was very marked indeed.

At the other end of the spectrum, earlier this year I visited a science centre in Malmö. It has simple concepts and all of it is hands on. Its capacity to engage and enthuse is fantastic. It was one of those occasions on which my youngest child ran around, getting the most out of it, and his parents were somewhat grateful that the organisers and those who ran the science centre had not assumed a level of knowledge among the adults that would have taken some of the interpretation beyond them.

The third component that I would like to touch on is role models—scientists themselves. Clare Adamson made a very fair point about the role that Anne Glover has played, and we need to seek out more such role models. I recall very well a recent visit that I made to a school, at which it was explained to pupils that some of the key technology in the development of the iPod had been developed by Wolfson Microelectronics in Edinburgh and that that whole strand of technology would have been impossible but for the science that takes place here in Scotland. That is the sort of thing that captures the imagination.

On wider personalities, it appears that Brian Cox is ubiquitous at the moment, so it might therefore be a bit of a stretch to argue that we should have more science on television, but there is an argument that more could be done. That does not necessarily mean stuff on a huge budget; it is about giving the right people the right opportunities to sell the message.

I accept the point about current science and the work that is done now, and I make a plea for us to give wider acknowledgement to some of our historic personalities and draw on some of the traditions that Scotland has. Remarkable people are doing remarkable things, and we have an excellent and captivating story to tell.

In that regard, I cite Dr John Rae, the greatest Arctic explorer of all and an Orcadian to boot. Amundsen's exploration in Arctic Canada drew enormously on what he described as the incalculable value of the work that was done by Dr Rae. Any understanding of science, medicine or the earth sciences will draw on the work that was done by Dr John Rae. Orkney museum is heavily involved in promoting that, but in his bicentenary year, there does not seem to be any sign that Scotland as a whole is highlighting Dr Rae with any degree of pride.

I know that James Clerk Maxwell has been the subject of a debate in the Parliament. The 150th anniversary of his great paper on electromagnetism and light will be in 2015. There is a great focus on events that are coming up in 2014, but I rather suspect that they are likely to generate more heat than light. What better antidote than to look to 2015 and the work of James Clerk Maxwell? I think that the idea of designating that year the international year of light has already gained some support in the United Nations Educational, Scientific and Cultural Organization.

There are a number of things that we are doing reasonably well in our public engagement, but it is clear from the contributions that we have heard that there is a lot more that we can and should do.

15:46

Nigel Don (Angus North and Mearns) (SNP): I recognise that I am relatively far down the batting list, and as usual, I do not want to repeat too much of what has been said.

I will take a parochial view, as constituency MSPs tend to do, and reflect on the fact that Aberdeen is just up the road. I recall taking up a techfest invitation from one of the oil companies a couple of years ago, and Richard Noble—he of the very high-speed Thrust car—was there. I suspect that Nanette Milne was there at the same time. I remember Mr Noble's wonderful statement that he had a project that he wanted to do and they did not have any money, but they did it anyway. I do not know how it was finally paid for, but I presume that somebody paid for it somehow. The man's huge enthusiasm for what he was trying to do came across to me, and it struck me that that is one of the primary requirements of a good teacher in any capacity—professional or otherwise. If a person is not enthusiastic about what they are trying to do, they are not likely to succeed. We have previously discussed teachers' qualifications. I would not want to make any comments about the appropriate qualifications, but I know from my childhood and from watching what happened with my children that, if a teacher is not enthusiastic, it will not matter how well qualified they are, because that will not come through. We must be careful that we do not confuse the education of our teachers with their enthusiasm for the subject and what they can communicate to their children.

To continue to think about what has happened in Aberdeen and Aberdeenshire, I noticed that there was a national science and engineering week in March, which included all manner of workshops. There were workshops on aerodynamics, birds, forces and fire, digital technology, explosions and implosions—vacuums seem to get everywhere—fantastic fungi, and

gunge chemistry, which I am sure that I would have enjoyed, and several other workshops. I noticed the one on 3D science, which I have seen and would recommend to anybody. It was at a University of Aberdeen open day. By putting on the appropriate specs, I got to see blood vessels in the brain in glorious 3D, which was mind boggling. The experience is fantastic, and that is a wonderful way to teach the 3D structures of the brain to those who need to know about such things.

I have also seen the Institute of Physics lab in a lorry, and commend it. The pupils really enjoyed it, partly because it was hands on in a way that some of what happens in schools is not and reportedly because of the enthusiasm of the volunteers, who were not all teachers; they came from local industries.

I am a great fan of the science centres. Satrosphere in Aberdeen was over my back wall for several years. I went in once, but the interesting part about it was seeing the exhibits being offloaded in the yard immediately underneath our living room window. Strange and funny things emerged and disappeared through the doors.

I also recall the Sensation science centre in Dundee. This will prove that science is not for everybody. My daughter went there as a volunteer. She showed youngsters who were rather younger than her around at weekends and promptly went off to college to read law, so we cannot win with everybody.

All that has to do with science, but what I really want to discuss is engineering. Our oil and gas industries and, indeed, a great number of our other industries, require not only people who understand science, but people who can do things with tools. I am therefore grateful to Mark Griffin for raising that matter.

I am not at all convinced that, in our school system, we introduce our youngsters to tools early enough. I understand well that it would be extremely difficult for primary schools to have some of the sharp tools around that we might want youngsters to learn about; I also recognise that our secondary schools are much better placed to deal with that. However, to reflect on my upbringing, by the time that I was 10—possibly a year or two earlier—I had done carpentry in school. I made an artefact—it was a wooden boat—that, sadly, I no longer have, although I could have reproduced it if I had had a bit more warning. To make the boat's hull, I needed to cut round a piece of timber. To get the shape of the hull, I used a plane, and I certainly used a coping saw to cut round it. I cut the dowelling to make the mast, and I used a hand drill to drill the hole for the mast. To put the keel in, I had to cut out

another bit of three-ply, which required a coping saw and a rasp. I then sandpapered it all before gluing the boat together. An eight, nine or 10-year-old who has had the opportunity to do that—it was not especially difficult—maybe has some enthusiasm for making and doing things and gets the idea that tools are things to pick up and use. If people know how to use tools carefully, the sharp bits are where they are always sharp, so they just keep their hands out of the way. We probably cannot develop those skills in our children early enough.

Liz Smith: I thank Nigel Don for his insightful comments. Some people argue that engineering ought to be a compulsory subject in the curriculum. Does he agree?

Nigel Don: I have great difficulty in regarding anything as compulsory, save perhaps teaching maths as far as it can be taken because people should be pushed on maths until they cannot cope with it any longer. The difficulty I have is that some people are made differently, and not everything is absolutely required for everybody. However, I would very much like us to teach more engineering.

Gender has been mentioned, as has the fact that there are apparently no women yet in the list of the 10 most famous Scottish scientists. I make the same point about one of my alternative careers in music. If one looks at composers—this is nothing to do with genre—one finds that, historically, all famous composers are men. Why is that? Expectations. That is beginning to change because we have changed the expectations. It cannot be that men can write music and women cannot—that is just not true. Equally, if someone were to look in on our national orchestra, they would find exactly what would be found in schools—girls are much more likely to play the stringed and high woodwind instruments, such as the flute, and boys are much more likely to finish up playing the brass and percussion instruments. Obviously, there are exceptions but, as I say, one would not need to look any further than professional orchestras to see that that is still how it works to this day. I simply suggest to members that that is about expectation. Therefore, what we must do is change the expectation. That is not only about role models, but about how we teach and speak.

Neil Findlay: It used to be the expectation that politicians were men. However, if people look at this side of the chamber when it is full at question time, they will find that there are more women because we put in place systems to ensure that that happened. That was not about expectations; it was about positive action.

Nigel Don: I am quite prepared to address that subject—I addressed it as a convener of the party

that I represent in the city that I once represented—but I will pass on that for the moment, because it is a big can of worms that we perhaps need to address on other occasion.

I have observed that we need enthusiastic teachers; that there are expectations; and that we cannot get people using tools too soon. I also make the point that science does not always just follow—it needs an opportunity and insight. To be utterly parochial, Robert Watson-Watt, the inventor of radar, who has born in my home city of Brechin, is much celebrated and will, shortly, I hope, get a statue. It seems to me that his invention of radar would have happened—yes, he thought about it—but the arrival of the second world war gave him an opportunity to develop it in a way that might not have happened quite so quickly without those particular circumstances around him. We need to understand that science is not just about having good ideas or understanding; it is about having an opportunity to put one's insight to practical use at a point in time.

I commend the thought that we need more good science on television. I still remember an absolutely fascinating programme about how the pyramids were built and how the artefacts inside could possibly have finished up where they were; it all revolved around the fact that absolutely dry sand behaves like a liquid, not like a solid. If the right flow pipes and the right valves are put in the right places and there is a little bit of pressure from on top, sand will flow like a liquid. I got that from TV.

15:55

Aileen McLeod (South Scotland) (SNP): I welcome the opportunity to speak in the debate. I welcome Clare Adamson's and Liam McArthur's points about the need for more female role models in science. That is why I was pleased to see that the National Library of Scotland recently celebrated some remarkable Scottish women of science—most of whom remain largely unknown today—during the Edinburgh science festival.

I want to focus on a number of areas, not least scientific research, which is one of the key drivers of economic growth. Scotland boasts some of the world's finest scientific research facilities—in our universities, our specialist research centres and high-tech and innovative companies, many of which are small and medium-sized enterprises—and the world-class nature of Scotland's scientific research also attracts world-leading companies to invest here, further enhancing our economic opportunities. However, the real challenge that we face is to transform the excellence of our scientific research into commercial opportunities that translate into jobs and growth for Scotland as a whole. That is one of the Scottish Government's

key priorities and it is one in which it is having considerable success.

Science and scientific research can play a major part in reviving and energising our communities. We can see that at work in the south-west of Scotland. The first week in May saw Dumfries and Galloway's own science festival, which included a wide variety of events and demonstrations that were run by the University of Glasgow, the Glasgow Science Centre, Heriot-Watt University and the Glasgow science festival at a variety of locations across the region. The festival—now in its fourth year—is one of those that are funded by the Scottish Government to raise the profile of science with children and young people and also to encourage greater engagement and enthusiasm about the future in their own communities.

Dumfries and Galloway was also home for one of the less well-known figures of Scottish science—one who had a truly international reach and significance. I refer, of course, to James Clerk Maxwell, who grew up at Glenlair house near Corsock, returned there in later life and is buried in Parton kirkyard. As far as physics is concerned, Maxwell is up there with Newton and Einstein. Einstein himself said of Maxwell's work that it was

"the most profound and the most fruitful that physics has experienced since the time of Newton".

Both Galloway and Scotland should be proud of someone who was acknowledged by the towering figures of science as one of their own. I hope that we can work wider recognition of Maxwell's achievements into the already substantial list of notable Scottish scientists and engineers as a further way to encourage our young people into science and enhance their understanding. I certainly concur with Liam McArthur's earlier comments about James Clerk Maxwell and the international year of light.

In the present, too, Galloway has much to offer, particularly in the natural sciences and astronomy. Galloway is, for example, the only part of Britain to have dark skies park status. Imagine how entrancing it would be to look at the stars with the sort of clarity, detail and freedom from light pollution that the Glasgow Science Centre's planetarium offers, but to do so on a warm summer night in the Galloway countryside. It is that sort of experience that might inspire Scotland's next James Clerk Maxwell.

We also have the Galloway and southern Ayrshire biosphere. As a project that is designed to examine how people interact with the natural environment, the biosphere has huge scope for embedding scientific research and development into the wider considerations of landscape, rurality and economic development. The biosphere also has natural synergies with the Crichton Carbon

Centre and the recently launched Crichton institute, which has as a key aim the creation of

"a portfolio of high quality, regionally focussed and internationally significant studies."

Such ventures are important, because the clearer it is to our young people that Scotland is the place to be for research and innovation, the easier it will be to encourage the next generation of scientists.

We know that internationally recognised research leads to investment in economic growth. In biosciences alone, there have been very substantial investments into research and development. The recent announcement of £30 million for three innovation centres for stratified medicine, the development of state-of-the-art imaging equipment and the development of digital health technologies illustrates how Scotland is recognised as a country in which serious research and development of international significance is happening. Given the £100 million investment in the partnership between BioCity Scotland and the University of Dundee that will result in Scotland being at the heart of international efforts to discover new drug treatments, one has to conclude that Scotland is a natural destination for top-quality research and development.

Of course, there is always more that can be done and there is further potential for Scotland to lead the way by creating a knowledge and innovation community focused on healthy and active ageing. The demographics of the western world—not just Scotland—make that a vital area of research. The KICs are part of the European Institute of Innovation and Technology, and their purpose is to integrate higher education, research and business in areas of high societal need. So far, there are only three KICs, which are focused on climate change, information technology and sustainable energy. To my mind, there is a clear gap in the market there that Scotland is ideally placed to fill.

In conclusion, we have a great deal to offer the world in natural and life sciences, whether through innovation centres or through a world-leading knowledge and innovation community on healthy and active ageing. All of that matters because one reason for promoting science through all the projects that the minister mentioned is that science is fundamentally important to the future of our nation.

I support the motion in Alasdair Allan's name.

16:02

Neil Bibby (West Scotland) (Lab): There is no doubt that Scotland is a nation with a proud history in science. As many members have highlighted, Scots have been at the forefront of some of

science's greatest achievements, from those of James Watt to those of John Logie Baird and through to the creation of Dolly the sheep at the Roslin institute in Edinburgh.

I do not for a moment doubt the importance of science and of making it accessible to people of all ages. Of course I support that goal, but, like Hugh Henry, I question the lack of details from the Government on the specific changes that it is proposing in order to make the positive difference that we seek for the science sector.

In last December's debate on the role of scientific evidence and advice in public policy, I put on record my acknowledgment of the importance of engaging people with science. During that debate, I also highlighted some of the challenges and obstacles that the science sector faces, and I think that it is important to recognise those challenges and obstacles again this afternoon.

As many members have highlighted, there is a need to address the lack of women graduates in STEM subjects who work in the field in which they graduated. Although the increase in the number of female graduates in STEM subjects is welcome, the reality is that women are underrepresented at every level of STEM education and careers. For women in science, the glass ceiling still exists.

The Royal Society of Edinburgh's "Tapping all our Talents" report—

Clare Adamson: Obviously, the "Tapping all our Talents" report concurs with the member on that point, but does he agree that some great work is being done in Scotland? For example, girl geek Scotland, which is a network for women involved in computing that is run from the University of Edinburgh, encourages and supports women at all stages of their careers, including when young women are starting out in a career in computing.

Neil Bibby: I had not actually heard of girl geek Scotland, but I will certainly look into it. Clearly, more needs to be done to encourage women to take up their chosen career path.

As I was saying, the report by the Royal Society of Edinburgh stated that, in university, women are lost at every level of the academic career structure and continue to be underrepresented in top posts. The report also highlighted the loss of qualified female scientists to the public and private sectors in Scotland. That represents not only a loss of individual opportunity, but a cost to the Scottish economy.

I repeat a quote from the report that I read in the debate last year:

"Scotland fails to realise the full potential of its research base, and will continue to do so if it systematically fails to cope with the debilitating loss of talent represented by the

high attrition rate of highly-trained women from employment."

That is the key challenge that we face. It is concerning to hear that 73 per cent of female graduates are lost from STEM careers—in comparison, the figure for male graduates is less than half. We absolutely need to ask why that is and examine the reasons why female graduates are discouraged from pursuing a career in their field of study.

On encouraging people to engage with science, it is clear that involvement and activity from a young age are key. We know that people are more likely to consider studying and pursuing careers in STEM subjects if they have engaged with science from a young age. A number of members have made that point. It is equally important to ensure that pupils from schools in disadvantaged areas have the same opportunities to engage with science and scientists as pupils from schools in more advantaged areas. We need to encourage young people from all backgrounds to develop and pursue interests in science subjects and potential careers as engineers and scientists.

As many members have pointed out, our colleges and universities play a key role in science and public engagement. The Universities Scotland briefing for the debate, which members will have received, says that every one of Scotland's 19 universities and higher education institutions is committed to public engagement with their scientific research. The research that is carried out at universities is a fantastic resource that has the potential to benefit a wide range of people. The challenge that they face is to communicate how directly relevant the research is to people's lives.

In my area, the school of science at the University of the West of Scotland is active in applied research in a wide variety of areas—George Adam mentioned that in detail. It would of course be remiss of us not to acknowledge that the University of the West of Scotland received £3 million in research grants from the UK research councils, the European Commission and UK charities. Obviously, I believe that Scotland benefits greatly from being part of the United Kingdom. One reason for that is the research funding that we get from the UK research councils. Scotland has an 8 per cent share of the UK's population, but receives 15 per cent of UK research funding. It is important to put that on the record.

Fiona McLeod (Strathkelvin and Bearsden) (SNP): Funding for science is international. The figures that you give are all very well, but are you saying that, post independence, we will lose all the funding that we get from bodies such as the European Union and American companies?

Neil Bibby: Are you saying that we will continue to get 15 per cent of the UK research councils' money?

The Deputy Presiding Officer (Elaine Smith): Could members speak through the chair, please, and not directly to each other?

Neil Bibby: Sorry.

That is the detail that we are looking for from the Scottish Government.

Dr Allan: Given the figures that he has just given, does the member acknowledge that science research funding is awarded on the basis of excellence? Scotland outperforms on excellence, which is why we get more money.

Neil Bibby: Absolutely—excellence in the UK. I have asked the Scottish Government to give a commitment that Scotland would maintain the equivalent of 15 per cent of UK research funding, but we did not get that reassurance.

It is also important that we support the role that universities play in working with schools and directly with young people and their parents to stimulate an interest in science and technology from a young age and to keep young people engaged as they make their subject choices at school. Evidence suggests that we do not have enough scientists and engineers coming through to meet demand, so we must do all that we can to encourage more STEM students.

I welcome the role that the Scottish science festivals play in engaging young people with science. A number of young people from across the west of Scotland have attended the Glasgow science festival, which does an excellent job in offering events for adults, families and schools. I would of course welcome more such events taking place in the west of Scotland.

I reiterate my acknowledgement of the importance of science and my support for making it as accessible as possible to people of all ages. There are challenges in the science sector that need to be addressed and which my Labour colleagues and I have highlighted. I urge the minister to listen to what has been said and to act to address the concerns that have been raised.

16:10

Jim Eadie (Edinburgh Southern) (SNP): Science has never been so important to Scotland's future. Science education is critical if we are to inspire and nurture the next generation of scientists, researchers and innovators, all of whom are vital to the development of our knowledge economy. How we inspire future generations of scientists, engage with young people and give them the confidence to realise

their true potential is the challenge that our society must face up to.

Scotland's contribution to science is without parallel for a nation of our size. That was recognised by the Scottish Government in its consultation "Building a Smarter Future: Towards a Sustainable Scottish Solution for the Future of Higher Education", which stated that, in comparative terms, only England, the United States and China fare better. We punch above our weight in research, making Scotland-based research the most cited in the world relative to our GDP—a point that Willie Coffey made earlier.

Professor Sir Jim McDonald and Simon Jennings sum up the opportunity that we have and the challenge that we face. Writing in the recently published compendium of essays, "Scotland's Future: The economics of constitutional change", they state:

"Scotland's universities, their staff, students and graduates represent a major advantage for Scotland. As economies around the world look to generate competitive advantage in order to secure and retain high-value, high-wage economic activity, Scotland starts from an enviable position."

New scientific discoveries, inventions and innovations constantly emerge from Scotland's scientists and engineers. Those ideas have the power to change the way that we view the world. Those innovations push the boundaries of understanding and discoveries and drive change, challenging others in the global scientific community to follow Scotland's lead.

We achieve that by focusing on our strengths as a nation, supporting our most talented individuals to reach the highest levels of academic achievement, inspiring young people—particularly young women—to enter science, and supporting engagement with the public through our science centres, campaigns and festivals. We also do it by encouraging a higher rate of participation among the population in clinical trials to develop the new medicines that will treat the diseases that are endemic in Scotland. In developing those medicines, we also have the potential to benefit people throughout the world.

That engagement also includes engagement between business, stakeholders and academia. Scotland has five universities in the world's top 200. They produce a stream of highly educated graduates who engage in the cutting-edge research about which we have heard much this afternoon. They engage in that research in our academic institutions or work for businesses of all sizes, supporting knowledge exchange and the commercialisation of research.

It is my privilege to have the University of Edinburgh King's buildings in my constituency.

Work there on renewable energy resources, such as offshore wind, wave, tidal and hydro power, is at the forefront of European and global research.

The university is also a world leader when it comes to engaging research with business. Flowave TT has created a groundbreaking combined current and wave test facility that I have had the opportunity to visit. NGenTec, which is a company that was spun out of the University of Edinburgh, produces the lightest and most compact wind turbine in the world. Those are two good illustrations of the point that Liz Smith made in highlighting the role of science at the heart of our knowledge economy.

The Scottish Government has recognised that basic and applied scientific research is key to addressing the major global and local challenges of our time, including dealing with climate change, the need for sustainable energy and combating life-threatening disease. Aileen McLeod spoke knowledgeably and eloquently about the role of knowledge and innovation in Scotland and investment by major global companies into Scotland. I will give two further examples from the life sciences.

The previous First Minister, Jack McConnell, launched an initiative called the translational medicine research collaboration, which involved the company Wyeth, which is now part of Pfizer. There was significant investment in a collaboration in Scotland that involves four of our universities—the medical research centres at the University of Glasgow, the University of Edinburgh, the University of Dundee and the University of Aberdeen. It is funded by the public purse and collaborates with national health service boards and a global pharmaceutical company. That investment in Scotland has continued with a second phase of funding of about £5.2 million. Through the project, we have an opportunity to link up the data that is available through the Scottish national medical records database with the research that is being conducted in the universities and across our health service.

Another example is that of GlaxoSmithKline, which is the biggest funder of academic research in the UK, with Scotland punching above its weight. There are more than 50 separate collaborations between that company and research teams in Scottish universities, including the kinase consortium at Dundee and the Edinburgh BioQuarter.

In thinking about how to support and sustain all that research activity, we come back to an issue that has been highlighted time and again this afternoon. The STEM subjects—science, technology, engineering and maths—are fundamental to our success in all these areas. Scotland's schools, colleges and universities

provide distinctive advantages and supply Scotland with the intellectual capital that we need to meet our scientific ambitions. However, more needs to be done. It is imperative that the Scottish Government acts to ensure that Scotland's young people engage with STEM subjects, and we must create the opportunity for young people to build their awareness and move into STEM-related careers.

Industry engagement with young people is required to enable them to see the career pathways that exist and to encourage and motivate them to pursue those opportunities. The science and engineering education advisory group recommended more practical, hands-on science learning for young people and said that teachers, particularly in primary schools, need high-quality professional development—a point that Iain Gray made in his speech and one that, later in the debate, stimulated a useful exchange between Sandra White and Liz Smith on the qualifications that primary teachers require.

On the back of the science and engineering education advisory group report, careerwise Scotland was launched at the first women's employment summit. That has been a recurring theme in our debate this afternoon. Clare Adamson highlighted the importance of female role models such as Anne Glover, who was the chief scientific adviser to Scotland and is now in a key role in the European Union. That important point was well made. I also acknowledge the comments from Mark Griffin, Hugh Henry, Neil Findlay and the minister that more needs to be done to encourage women into engineering and science subjects.

There is also a need for better understanding of the various initiatives that exist and better co-ordination between them. I encourage the minister to update us on further progress that is being made in that area.

The Scottish Government has set out a vision of Scotland as a nation of world-class scientific achievement and a powerhouse of technology and innovation that can drive sustainable economic growth. The challenge for the Parliament and for Scottish society is to ensure that science education is at the heart of realising that ambition, and we as a Parliament should unite to achieve it.

The Deputy Presiding Officer: That brings us to the closing speeches. There is still time left for interventions, and if members wish to take a bit of extra time for their speeches, they may do so.

16:18

Nanette Milne (North East Scotland) (Con): Presiding Officer, I apologise for my late arrival in

the chamber this afternoon, as explained earlier by my colleague Liz Smith.

I begin by associating myself with everything that Liz Smith said in her wide-ranging speech. However, having heard the debate, which on the whole has been interesting, I nonetheless agree with Hugh Henry that more could have been achieved by a much wider discussion outside the Parliament about practical ways in which to properly engage young people, particularly young women, in the stem cell—I mean the STEM subjects. I am getting my stem cells and STEM subjects muddled up.

It goes without saying that science, coupled with engineering and technology, impacts on almost every aspect of the quality of our lives and is vital for the future wellbeing of our planet. Investing in science is investing in our future and helps to power the Scottish economy. It also helps Scotland's global reputation. Iain Gray, in an excellent speech, showed that science provides an unparalleled basis for our nation's development that is not matched by any other discipline.

In my region, the University of Aberdeen has been at the cutting edge of medical imaging and diagnosis, particularly in magnetic resonance imaging, thanks to the pioneering work of its medical physicists. Further down the coast, Dundee is home to a cluster of leading computer animation studios—the University of Abertay is the UK's first ever university centre of excellence for computer games education.

From wave power to food security and population challenges, science has a key role to play. We need continuing engagement with science. Schoolchildren need to be shown the benefits of science and technology, which can be fun and rewarding. That will involve science education, financial investment in research and industry backing.

Scotland is a small country, but one that has a heritage of learning and invention. We have already heard about many famous people from the past: John Logie Baird, Lord Kelvin, James Clerk Maxwell and James Watt—all are testament to that fine innovative legacy, and there are many more. We need to retain our excellent skilled scientists. Our research productivity, when one considers papers and citations, is highly ranked across the world, as Iain Gray pointed out.

Liz Smith began her speech by telling us about last week's visit from pupils of Perth high school and their strong arguments in favour of retaining geology as part of the higher curriculum. I, too, attended that meeting, and I was hugely impressed by pupils' enthusiasm for that subject and the clear excellence of the teachers who had generated their interest.

We have heard many examples of excellent initiatives and projects that aim to involve the public and raise interest in the wide range of collaborative scientific activity that takes place in Scotland today. I will focus on the area that I know best.

Over many years, I have seen the University of Aberdeen's very close involvement with the sciences and its continuing efforts to stimulate scientific interest in all age groups, from primary school pupils to the elderly. I well remember the impact of a series of Christmas lectures that were laid on for senior pupils as far back as 1958 and 1959—I am giving away my age—when I first learned about some of the then recently discovered elements. If I remember correctly, I had my first encounter with biochemistry then, with a graphic illustration of our digestive system using the state-of-the-art technology of the time. The lectures were the brainchild of the late, great Professor Roy Strathdee, who was well ahead of his peers in his efforts to enthuse people about science at as early an age as possible.

Moving forward to the oil and gas era, Satrosphere opened in Aberdeen in 1988. It was the first science and discovery centre in Scotland, and was soon replicated in Dundee, Edinburgh and Glasgow. Aberdeen's annual techfest has already been mentioned. It is a joint venture between universities and councils that brings primary and secondary pupils to the Beach ballroom every September to take part in a wide range of interactive science experiences. It was dreamt up in the early 1990s by my fellow councillor, the late Bob Rae, who wanted to share his enthusiasm for the sciences with the younger generation. It has been a very successful festival ever since.

Stewart Stevenson: Does the member agree that one of the traditional strengths of the Scottish education system has been the breadth of students' knowledge of subjects outside their core competence? I use as an illustration the fact that the body scanner, which is now omnipresent in medicine, was first demonstrated by people borrowing equipment from the shipyards on the Clyde to detect what was going on inside the human body. If such connections between different disciplines had not existed in people's minds, such important breakthroughs would not have happened. The example is a good one.

Nanette Milne: I accept that—it is an interesting point. I know Professor Mallard very well, but I was not aware that that was how the MRI scanner started off.

The zoology department at Aberdeen has been open to youngsters for many years, allowing them hands-on experience of biological science. Just over a week ago, the University of Aberdeen

hosted its first—and very successful—May festival, a multidisciplinary event, including science, which had the aim of stimulating the interest of people in all age groups, including children. The university also has an initiative called science and spokes—realising rural research, which consists of a series of science discussions and debates linking the public with scientists who are involved in research of particular relevance to a rural audience. That initiative aims to reach more than 6,500 in Aberdeenshire and Inverness-shire.

My home city and alma mater have built up a wealth of experience in promoting science to the local population, and I am very proud to celebrate their efforts today. However, despite all that, there are seriously worrying shortages of appropriate skills in North Sea industries. Many of the jobs are science based, but people outside the north-east are unaware of the many openings that are available. We must enthuse children throughout Scotland about science at an early age and let them see the opportunities that it can offer.

Science-based work in the oil industry does not have to mean working in a dangerous, dirty environment, but the perception that it does is often a turn-off for girls in particular. The industry is desperate to attract more women into its workforce—as engineers, for example, although many other science-based careers are also available.

The industry works closely with schools in the local area to encourage pupils' interest, but there are many excellent employment opportunities for young people from other parts of Scotland who do not even know about them. We should encourage people in some of the more deprived areas to take much more of an interest in the science subjects.

When they visit schools, every MSP should encourage children to develop an interest in science and look at the many opportunities that it offers, not least in the oil and gas industry. Sadly, however, I find that most MSPs from outwith the north-east perceive oil to be an Aberdeen issue and therefore of no interest to them.

Just yesterday afternoon I visited Portlethen primary school in my region for the usual question-and-answer session, this time with around 50 pupils from primaries 6 and 7. I asked how many of them liked science, and to my surprise very nearly 50 hands, male and female, shot enthusiastically into the air. The teacher explained that those pupils benefit from regular teaching visits from a science specialist, and they love them.

My grandson was similarly encouraged in primary school, and, now that he is in his first year of secondary school, he enthuses about his science subjects and dreams of an engineering

career. To cheer up Nigel Don, I can tell him that my grandson's subjects include practical technical subjects. Such early enthusiasm must be kept alive and career opportunities brought within reach by teachers at both primary and secondary level who are qualified to stimulate interest in the sciences.

The day after the UK Government's announcement of financial support for a British astronaut, I urge the Scottish Government to resist any moves to drop science subjects from the higher curriculum. The world revolves around science and scientific discovery, and we must allow as many young people as possible to become familiar with it in whatever scientific discipline appeals to them by giving their teachers the training and support that are necessary to generate and nurture the scientific skills that Scotland requires now and in the future.

The Deputy Presiding Officer: I call Neil Findlay. Again, we have time in hand for interventions and extra speaking time, if it is required.

16:27

Neil Findlay (Lothian) (Lab): It was a pleasure to listen to Iain Gray's speech, which was very good and thoughtful, as was Mark Griffin's speech on his experience at university and in the real world of work. I was also struck by the contributions from Jim Eadie and Nigel Don, and especially by Mr Don's reference to the fact that young people should be using tools more and building things.

In one of my primary school teaching courses only a few years back, that is exactly what we did. I was the eco-schools co-ordinator—I know that it is hard to believe, but it is true—and we built greenhouses and raised beds. We built bird boxes with cameras in them so that we could see what was happening to the birds, and we grew plants and all the rest of it. That ensured that the young people were not only doing good active stuff, but were learning about science, technology and maths—and they did not even know that they were doing it, which was all the better.

I was interested to hear Willie Coffey's tour of eastern Europe and the far east—and, of course, the far west; or, at least, as far west as Kilmarnock.

Science and scientific development, discovery and innovation are vital for our social and economic progress as a nation, and more broadly for the development of humanity around the world. We all know about Scotland's rich scientific heritage, which many members mentioned, and about the leading role that Scots have played down the centuries, which continues to the present

day and which will, no doubt, continue in the years to come.

Willie Coffey said that Scotland has punched above its weight. We are rightly proud of that fact. I am setting out our great achievements and my respect for the work of the scientific community because I do not want what I am about to say to be misconstrued or misrepresented.

Many of us begin our speeches by saying how pleased we are to be contributing to such an important debate et cetera, et cetera. On this occasion, I am sorry, but I cannot bring myself to say that. That is because of the motion that was lodged by Dr Allan, which is banal and self-congratulatory and which has all the substance of a blancmange. Yes: we value science centres. Yes: we support Scottish Government public funding for science initiatives. Yes: we think it is vital that science should be accessible to all, especially young people. Who could disagree? It is a bit like saying, "Fresh air is good. We value it. We think that all people should breathe it in. Oh, and by the way, while we are breathing it in, the Scottish Government is absolutely terrific."

Of course, it is only a few months since we had the last non-debate on science and scientific issues. It looks to us as though we have a Government that is shying away from the real debates and the real issues that we should be here to discuss. Instead, the minister has been told, "We're struggling for a debate topic, so get your hand in the unlucky dip bag", and he pulled out the ball marked "science" once again.

Jim Eadie: I know that I, like Neil Findlay, am a relatively new member of this place, but is it not incumbent on the Labour Party to either lodge its own motion, for debate in its own time, or to lodge a reasoned amendment to the Government's motion, which would allow Neil Findlay to discuss all the issues that he thinks are pertinent to the knowledge economy, to science and to creating the right environment for Scotland to be competitive when it comes to scientific advance?

Neil Findlay: It is my understanding that this is a Government debate. However, we will introduce some of the issues that we want to discuss.

When the Government says that science must be accessible to all, we have to ensure that it really means it. That has to include the people who do not have the financial wherewithal to access the science centres that we are championing today. Science centres should not be the preserve of those who can afford what are often quite high admission fees. If we are going to inspire young people from across society to be the scientists, astronauts, physicists and chemists of tomorrow, perhaps the Scottish Government could

look at the pricing structure for entry to those centres.

I asked the minister about the centre across the road, Our Dynamic Earth, which costs £7.50 for a child to enter. At the Glasgow Science Centre it costs £7.95, at the Dundee Science Centre it costs £5.50, and at the Aberdeen Science Centre it costs £4.50. When salaries are being frozen and benefits are being cut, many families will find it difficult to afford those prices, which will result in many children missing out on the potential spark that could ignite a lifelong interest in science and science-based research.

Hugh Henry mentioned the curriculum for excellence. I am sure that we all hope that it will spark an interest in science and develop a whole new generation of scientists who will serve Scotland well in the future.

In the debate in December, we raised the issue of the underrepresentation of women in science—Mark Griffin talked today about the low number of female students in his university class. There are real issues with recruiting and retaining women in science disciplines. That has historically been a problem, and it remains a problem. The minister referred to it only fleetingly, but we have to get into the guts of these hard issues, which have been a problem for some time. We need a plan for redressing the imbalance. Perhaps the minister will bring that forward, should there be a future debate on the subject.

I also suggest that the issue of constitutional change has to be considered when discussing this topic. There have been genuine issues raised by some eminent scientists who are concerned about the impact of constitutional change on science, scientific funding and research and development. If Scotland should separate from the United Kingdom and the UK research bodies, what will happen to science funding?

Annabelle Ewing: I am most grateful to Neil Findlay for taking an intervention. On his previous point, it is instructive to note that no female Labour members sought even to listen to the debate, far less to participate in it.

On the second point, we have heard in the debate that the key point about the excellence of Scottish education and research is that the funding follows excellence. Is that a point with which he would disagree?

Neil Findlay: I do not raise these issues to make a party-political point. *[Laughter.]*

Members might laugh, but they cannot laugh at the scientists and research councils that are raising the issue. That is what is happening. I am not scaremongering.

Iain Gray: Is Neil Findlay aware that this is not just about research funding? In Ireland, the Wellcome Trust funds at a level of 50 per cent compared with projects that it funds in the UK. That is a further disadvantage that many scientists are concerned about.

Neil Findlay: Iain Gray raises a good point, but the minister does not address those issues and nobody across on the SNP seats will address them either; they just do not want to. I am not scaremongering or making party-political points; I am raising the genuine concerns of people in the sector.

Sandra White: Perhaps I can address some of the issues that Neil Findlay raises by quoting Professor Tim O'Shea, the principal of the University of Edinburgh. He says:

"I don't see there's any reason why any form of constitutional change should preclude participation in higher order research councils. There is a multiplicity of research mechanisms. For example, we now get £30m a year from European research bodies."

If Neil Findlay's Westminster partners want to pull the UK out of Europe, there will be no research funding for anywhere.

Neil Findlay: So, that is fine; everything will just stay the same. If members read the briefings from the Royal Society of Edinburgh and the comments from Hugh Pennington and others, they will see that they are raising those issues.

If we want to raise the quality of the debate over our constitutional future, it is no good people raising concerns and then being barracked because they have done so. We must address the issues because the people expect us to address them. They do not expect a baying mob shouting them down every time they raise an issue.

The Royal Society also raises the issue of the science community's not being involved in policy discussion and development at an early stage in the policy process, which results in—in the society's opinion—the input of the science community not being as effective as it could be. Ministers need to address that point, too.

I find myself moved to remind members that we raised many of these points in December when we had a science debate, but the Scottish Government has made no reference to them. To refer back to my opening remarks, today's debate adds very little to what we discussed in December. It is clear that it serves no purpose other than to fill valuable parliamentary time. There has been no policy change, no announcement, no proposed bill and no plans for legislation. That makes me ask: why this debate now, and why is Parliament not debating matters that are, arguably, more pressing to the scientific community?

I stress again that science is very important to Scotland, and our proud history of achievement shows that. We knew that before this debate and not one thing has or will have changed following today's proceedings. I do not think that I will see our scientists punching the air and high-fiving each other with delight following the debate. It is more likely that they will be scratching their heads and asking, "What was all that about?" I fear that that question might even be beyond our brightest scientists.

The Deputy Presiding Officer: I call Dr Alasdair Allan to wind up the debate. Dr Allan, as before, there is time in hand if you wish to extend your speech and take interventions.

16:38

Dr Allan: I will do my best.

I realise that Mr Findlay could not be pleased to take part in the debate. I realise that he feels that, somehow, the fact that I am speaking about science today means, in his words—I hope that I do not misquote him—that I drew science out of the "unlucky bag". I do not know what he means by that, but he had the opportunity to amend the motion, which I am sure would not have caused his face to crack.

Despite the criticisms that have been made of the debate, I—and most of the members who have participated—feel that it has been useful and a good opportunity to highlight not just the work that the Government is doing but the work that the science community is doing to engage with the people of Scotland. Whether we are talking—as we have been—about science centres, museums, universities, colleges or community groups all organising their own events, a wealth of activity is taking place to make science more accessible to a wide public audience of all ages.

The Deputy Presiding Officer: Dr Allan, may I stop you for a moment? There is an unusual event in the chamber: I notice that the sun is shining in members' eyes. If members feel that that is inhibiting their ability to take part in the end of the debate, they should feel free to move seats.

Dr Allan: I did not arrange that as some sort of Christmas lecture experiment, but I welcome the fact that the sun is shining.

The science engagement sector will continue to play an important role in helping us to make sense of the world around us, the latest developments and the impacts—both good and bad—of new technology.

Members made a number of useful speeches, to which I will try to refer in the short time that I have left. Liz Smith and Nanette Milne talked about geology qualifications. I appreciate the points that

were made and the spirit in which they were put. The SQA makes independent assessments about the provision of qualifications, although it has to take some account of the use that is made of those qualifications. I understand that 44 people made use of such a qualification at all levels in the past year, and the SQA must take some account of that. However, the SQA has made efforts to address the concerns that have been raised about earth sciences by ensuring that aspects of geology feature in or are subsumed by other qualifications, such as those in geography and biology.

Liz Smith: I appreciate the concern that the minister has shown over the issue, and I thank the members who turned up at the event last Thursday. People do not deny that there is a demand-led scenario and that geology numbers have been rather low. The point that they make is that, with the development of earth sciences and the curriculum for excellence, it is a problem that insufficient teachers are trained in some of those areas, given the latent demand that exists. I ask the Government to address that.

Dr Allan: In the continuous professional development of teachers, the science centres—particularly Our Dynamic Earth—have a beneficial role in ensuring that teachers have the confidence to talk about earth sciences. I hear the points that the member makes. I hope that she accepts in good faith the reasons that I have given, but I have no doubt that the debate will continue.

Stewart Stevenson did not disappoint. The last time that we debated science, he told us that—I do not think that I am misquoting him—in his spare time he plugged himself into a Van de Graaff generator. This time, he told us about his search for infinity, about Mary Queen of Scots's lovers and latterly—possibly most relevant—about Professor Higgs. I recently had the pleasure of meeting Professor Higgs. I hope that we can find ways of exploiting, in an academic and a science engagement way, the benefits that come from the pride that is felt in his achievements.

Stewart Stevenson: Does the minister agree that, even in the modern era, there remains scope for the autodidact? I cite two examples. First, Patrick Moore ended up as a professor of astronomy without ever completing a university course of any kind. Secondly, in a subject that the minister has just covered and going further back, Hugh Miller was a self-taught geologist from Cromarty. Perhaps the fundamental thing that we need from the education system is that it should inculcate into its students not learning but an ability to learn so that, as new subjects and new opportunities to learn emerge, people are equipped to be autodidacts.

Dr Allan: The member touches on one of the founding principles of the curriculum for

excellence, on which all of us across the Parliament are agreed, which is that the education system must inculcate in people enthusiasm and skills. If they have enthusiasm and skills, they will be able to cope with new knowledge in an ever-changing world.

Iain Gray rightly highlighted the role that parents have in inculcating that enthusiasm and knowledge. He compared the funding of various events. I do not want to get too drawn into that, other than to say that we could trade figures on the funding of individual events in the arts and the sciences. Suffice it to say that I think—as I hope that he does—that the arts and the sciences are equally important to the school curriculum. I do not completely understand why he keeps raising the spectre that, because I am keen on Scottish history, the importance of science is somehow being relegated in our schools.

Iain Gray also rather laboured the point that the scientific era took off in Scotland only after 1707. It is possible to make that argument, but it is also possible to argue that the internet did not really take off in England prior to that date either, and I am not sure what that proves.

Fiona McLeod rose—

Stewart Stevenson: Will the minister take a further intervention?

Dr Allan: I was going to say that I need to make some progress but, looking at the clock, I see that I do not, so yes, I will.

Stewart Stevenson: Does the minister remember that one of Edinburgh's most famous sons is John Napier, who was the inventor of logarithms? He may care to note that John Napier was born in 1550, which is somewhat before any dates to which Mr Gray referred.

The Deputy Presiding Officer: Were you going to take the intervention from Fiona McLeod, minister?

Dr Allan: I will deal with Stewart Stevenson's intervention first. I will resist the temptation to claim that the fact that the discovery of logarithms predates the union proves much about politics. I will try to steer clear of such analogies.

Fiona McLeod: As a historian entering a science debate, I know that there is definitely an argument in the history community that it was the fact that we had the union that allowed the brightest brains in Scotland to flourish, because the union took away our ability to have our own politics, so we had to drive our intellect into science and technology.

Dr Allan: Similarly, I will resist the temptation to which that intervention gives rise. I will simply say that all arguments about science 300 years ago

involve a fair amount of speculation. However, the member makes an interesting point.

As we tackle today's big science issues, from climate change to dealing with an ageing population, science engagement activities have the potential to provide a safe space for the discussion of topics that might be controversial or have an ethical dimension. Contentious topics usually provide the best opportunity to get to the nub of people's hopes and fears about the place of science and technology in the modern world. That is a healthy debate and one that is desirable in a mature democracy. Whatever the Scottish Government's view is on a topic, we should support the public's right to find out more and to engage directly with scientists and others who have an interest in an issue.

That process is likely to include discussion of issues such as nuclear and wind power and the balance of energy in the wider context of climate change. Debates about food security will no doubt refer to the potential—good and bad—of genetically modified crops. *[Interruption.]* Whatever the policy position of Governments or of members who make noises around the chamber—

The Deputy Presiding Officer: Perhaps, instead of making noises from a sedentary position, members could ask whether you would be kind enough to take their interventions.

Dr Allan: I was not criticising the members concerned for making noises but, if they wish to make them while standing up, I will gladly listen to them.

Alex Johnstone (North East Scotland) (Con): You will be glad of the time, minister.

Dr Allan: It is important for all politicians and Government officials to keep abreast of public opinion on a range of issues as the science develops.

A number of members made useful points on various issues. Clare Adamson, Neil Bibby and Nanette Milne all highlighted the point that was made throughout the debate about the importance of women in science. It is worth adding that Angela Constance's strategic group on women and work is looking at the skills gap in terms of gender and that the Royal Society of Edinburgh's report "Tapping all our Talents—Women in science, technology, engineering and mathematics: a strategy for Scotland" has challenged all of us not only to ensure that female role models for science are developed but to take continual action to ensure that such role models are presented early in people's education, particularly at school.

Mark Griffin and Neil Bibby made the important point that, if we are going to promote engagement

with science, it must include the less-affluent areas of Scotland. A great deal of that has to do with school leadership, of which there are very good examples in many of our most deprived communities, as I have seen, and it has to do with having high ambition for everyone and their potential careers.

It should be said that the science centres are doing good work in promoting the work of the science community in some of our most deprived communities and making connections between the work of the scientist and some of the issues that affect all of Scotland, but particularly those communities. I have seen a great deal of work done in schools, for instance, through the science centres on smoking, diet and other social issues that affect all of Scotland, but particularly the most deprived areas.

Willie Coffey raised interesting questions about small and large companies investing in science and the role of science in the Government. Sandra White talked about some of the achievements of the Glasgow Science Centre and its work as an outreach facility for schools and communities in Glasgow. She also made good points about the higher and other qualifications that are required of people who go into primary teaching.

Possibly the best thing to say about the debate that erupted over whether a science higher or a language higher is the most important in that context is that perhaps it is most important to ensure that the people who go into teacher training or teacher education courses get the opportunity to study those subjects once they get in. The GTC and others are debating whether people who do not have certain qualifications should be turned away, but I think that there is unity on the need to provide opportunities for people to do new subjects in languages and science once they get on to teacher education courses.

The Government supports the sciencewise initiative, whose goals are to have evidence-based policies that are informed by research on attitudes and behaviours among stakeholders and the public; to increase awareness and understanding by policy makers of the value and role of public dialogue; and to embed public dialogue experience and expertise in public bodies with responsibility for policy that contains a major science and technology element. Through our involvement in the sciencewise steering group, we are exploring such projects with policy officials who work in areas as diverse as marine management and climate change behaviour.

Members raised other interesting issues. For example, Liam McArthur talked about ensuring not only that careers in science are open to women but that we retain women in science. He referred

to the cultural change that is necessary to ensure that the public have a role in all that. Interestingly, he said that talking about Scotland's contribution to science—in his case, it is specifically Orkney's—can facilitate enthusiasm and learning about Scotland. Of course, it need not be learning about Scotland in the abstract, as some people seemed to fear, but learning about things in Scotland, one of which is science—the local connection can bring that alive. Jim Eadie talked about the achievements of the University of Edinburgh and other Scottish universities, not least in power and renewables.

I hope that science dialogue is a two-way process. Sometimes, the existing Government policy agenda drives the topic of debate, public engagement, dialogue and consultation about the scientific aspects of emerging issues, and that may lead us to focus some of our public science engagement funding on initiatives to support and inform that. Sometimes, it is the other way around. Public dialogue can drive the development of new or improved policies that are influenced or underpinned by science.

Since becoming science minister I have visited a number of our science festivals and centres and I have seen at first hand how they make science accessible, fun and exciting for all ages. Today's debate has confirmed that many of us value the science engagement sector. As part of Scotland's cultural mix, there is certainly a place for science-related events and activities alongside areas that we would perhaps more traditionally class as the arts. I think that we agree that science engagement is more than just nice to have; it has a real impact, particularly on our young people.

Among the myriad of influencers on learning, attainment and career choice, is there any evidence that science engagement makes a difference? I think that it does. It may be hard to measure the direct impact over the medium to long term—that fact is acknowledged by those who work in the sector and by the Wellcome Trust's review of the UK's informal science learning sector, which was published last year. Although regular and sustained access to innovative and exciting activities may have an influence, the views of parents and peers are also likely to feature prominently, as is the experience of STEM subjects in the classroom.

The Deputy Presiding Officer: Minister, please draw to a close.

Dr Allan: I did not think that I could do it, Presiding Officer.

Despite the reservations that some members offered, I believe that the debate has been useful. Engagement with the science world and the public is useful and it is part of our drive to support

Scotland as a science nation. We have all recognised the importance of our continuing funding of science centres, science festivals and other initiatives, especially in these difficult economic times. They truly ensure, in every real sense, that Scotland is that science nation.

Children and Families Bill

16:57

The Deputy Presiding Officer (Elaine Smith):

The next item of business is consideration of motion S4M-06645, in the name of Aileen Campbell, on the Children and Families Bill, which is United Kingdom legislation.

The Minister for Children and Young People (Aileen Campbell): The motion allows for the provisions in the UK Government's Children and Families Bill to be extended to Scotland.

The amendments in the UK bill carve Scotland out of the UK-wide statutory adoption register provisions in the Adoption and Children Act 2002. They relate to devolved matters of children and adoption, and they alter the executive competence of the Scottish ministers. For that reason, a legislative consent motion is required.

The proposals in the bill do not affect and indeed are entirely consistent with our plans to establish a national adoption register for Scotland, as provided for in the Children and Young People (Scotland) Bill.

I move,

That the Parliament agrees that the relevant provisions of the Children and Families Bill, introduced in the House of Commons on 4 February 2013, which amend the provisions in the Adoption and Children Act 2002 relating to the establishment of a statutory adoption register for the UK, in so far as these matters fall within the executive competence of the Scottish Ministers, should be considered by the UK Parliament.

The Deputy Presiding Officer: The question on the motion will be put at decision time.

Public Bodies (Abolition of Administrative Justice and Tribunals Council) Order 2013

16:58

The Deputy Presiding Officer (Elaine Smith):

The next item of business is consideration of motion S4M-06644, in the name of Roseanna Cunningham, on the Public Bodies (Abolition of Administrative Justice and Tribunals Council) Order 2013.

The Minister for Community Safety and Legal Affairs (Roseanna Cunningham): The Administrative Justice and Tribunals Council and its Scottish committee were established by section 4 of and schedule 7 to the Tribunals, Courts and Enforcement Act 2007.

The AJTC, including its Scottish committee, is to be abolished under provisions included in the United Kingdom Public Bodies Act 2011. The UK Government wishes to abolish it, including its Scottish committee. That is apparently as part of its commitment to reduce the number and cost of arm's-length bodies.

The Scottish Government does not object to the abolition of the AJTC and we have brought forward alternative proposals. We are required to agree to this public body consent motion.

I move,

That the Parliament consents to the making of the Public Bodies (Abolition of Administrative Justice and Tribunals Council) Order 2013, a draft of which was laid before the UK Parliament on 18 December 2012 and which makes provision that would be within the legislative competence of the Parliament if it were contained within an Act of that Parliament.

The Deputy Presiding Officer: The question on the motion will be put at decision time.

Parliamentary Bureau Motion

16:59

The Deputy Presiding Officer (Elaine Smith): The next item of business is consideration of a Parliamentary Bureau motion. I ask Joe FitzPatrick to move motion S4M-06661, on substitution on committees.

Motion moved,

That the Parliament agrees that Jayne Baxter be appointed to replace Rhoda Grant as the Scottish Labour Party substitute on the Health and Sport Committee.—[Joe FitzPatrick.]

The Deputy Presiding Officer: The question on the motion will be put at decision time.

Decision Time

17:00

The Deputy Presiding Officer (Elaine Smith): There are four questions to be put as a result of today's business.

The first question is, that motion S4M-06643, in the name of Dr Alasdair Allan, on supporting a science nation: celebrating Scotland's public science engagement initiatives, be agreed to.

Motion agreed to,

That the Parliament values Scotland's science centres and science festivals; notes the efforts made by them and other organisations to make science accessible to a public audience of all ages, and welcomes the Scottish Government's continuing support for a range of public science engagement initiatives through annual funding.

The Deputy Presiding Officer: The second question is, that motion S4M-06645, in the name of Aileen Campbell, on the Children and Families Bill, which is United Kingdom legislation, be agreed to.

Motion agreed to,

That the Parliament agrees that the relevant provisions of the Children and Families Bill, introduced in the House of Commons on 4 February 2013, which amend the provisions in the Adoption and Children Act 2002 relating to the establishment of a statutory adoption register for the UK, in so far as these matters fall within the executive competence of the Scottish Ministers, should be considered by the UK Parliament.

The Deputy Presiding Officer: The third question is, that motion S4M-06644, in the name of Roseanna Cunningham, on the Public Bodies (Abolition of Administrative Justice and Tribunals Council) Order 2013, be agreed to.

Motion agreed to,

That the Parliament consents to the making of the Public Bodies (Abolition of Administrative Justice and Tribunals Council) Order 2013, a draft of which was laid before the UK Parliament on 18 December 2012 and which makes provision that would be within the legislative competence of the Parliament if it were contained within an Act of that Parliament.

The Deputy Presiding Officer: The fourth question is, that motion S4M-06661, in the name of Joe FitzPatrick, on substitution on committees, be agreed to.

Motion agreed to,

That the Parliament agrees that Jayne Baxter be appointed to replace Rhoda Grant as the Scottish Labour Party substitute on the Health and Sport Committee.

The Deputy Presiding Officer: That concludes decision time.

Electrical Safety in the Private Rented Sector

The Deputy Presiding Officer (John Scott):

The final item of business today is a members' business debate on motion S4M-05955, in the name of Clare Adamson, on electrical safety in the private rented sector. The debate will be concluded without any question being put.

Motion debated,

That the Parliament is committed to raising housing standards in the private rented sector (PRS), particularly with regard to electrical safety; understands that tenants in the PRS in Central Scotland and across the country are more at risk of electric shock than those in other tenures; believes that this is due to a number of factors, including poor maintenance and a lack of knowledge among landlords of their responsibilities; considers that this issue will be exacerbated if PRS tenure continues to grow without any changes to sector governance; commends the work of the Electrical Safety Council and other organisations in educating tenants and landlords about electrical safety, and, in order to protect tenants against death and injury through electric shock or fire and improve electrical safety in PRS homes, welcomes the continuation of the dialogue between the Scottish Government and the PRS, including that in relation to the forthcoming Housing Bill.

17:02

Clare Adamson (Central Scotland) (SNP):

When I was first elected to North Lanarkshire Council, I was nominated to be on the Scottish Accident Prevention Council's home safety committee. I did not have any expertise in or knowledge of the area at all, but I soon engaged with people who were expert in it. I engaged with home safety officers from across Scotland, the Royal Society for the Prevention of Accidents, home safety Scotland and the Electrical Safety Council in Scotland, and I soon learned about the many dangers that exist for people in their own homes. Obviously, the issue has become of particular concern as we move towards many people renting privately.

I vividly remember visiting an event that was hosted by Fife Fire and Rescue Service, which was then actively engaging with the Polish community in its area and offering fire safety visits. In many cases, when it visited private rented properties it became aware of poor maintenance and innovative methods of getting the electricity supply to work. Not the right plugs were used, as the people came from a different part of Europe. The service worked very hard on engaging with the community on the right of people as tenants to expect the properties in which they live to be of a reasonable and safe standard.

Recently, I hosted a round-table event in the Parliament, which was attended by fire and rescue services, the Electrical Safety Council, Select—

which is the corporate organisation for electricians in the country and which accredits them—estate agents, private landlords and the City of Edinburgh Council's housing department. All of them shared their concerns about issues to do with privately rented properties.

There is no electrical safety standard for privately rented properties, other than the expectation that good landlords should be looking after their tenants. There is a particular issue with residual current devices—or RSDs, as they are known—that can be fitted to a fuse box. That device is not available in a lot of council and other homes. It prevents an electric shock in the case of standard problems that we might imagine, such as a child putting something into a socket or an electricity surge. The device cuts off the electricity supply and prevents serious harm under those circumstances. The Electrical Safety Council has been active in promoting the fitting of the devices in all our homes, and I believe that they are available in new-build properties.

Fire safety is a huge problem in Scotland. We have one of the worst fire incident records in the European Union. The Government has tackled some of the issues. Considering the major causes of fire, we understand that alcohol and drug addiction can cause problems. A serious problem also exists from electricity fires through poor maintenance.

I commend the work that is being done on the issue across Scotland. For example, when North Lanarkshire Council trading standards looked at the statistics for people who have been burned by electric blankets that developed faults, it offered a facility for people to bring in their blankets and have them electrically tested, free of charge, at local libraries to ensure that they were not dangerous. People were then given a chance to purchase new blankets and to replace ones that were potentially harmful.

Our private tenants are in a difficult situation. It became apparent from the round-table discussion that many landlords are not registering with their local authorities. Although the good landlords are probably the ones that are registered and have bought in to the idea of ensuring the safety of tenants, we must recognise that there is an element who are not participating or conforming to what is expected of them under the legislation as good landlords.

I am pleased to bring the motion to the chamber because electrical safety in our homes is a huge issue for us all. We have benefited from the installation of smoke alarms and detectors, which have been effective in preventing house fires. However, in the private rented sector, some people—not all of them, but some of the poorer

landlords—are not taking into consideration what is required.

The Electrical Safety Council has produced a leaflet for potential tenants explaining what their rights are as tenants and what is expected of them when they are looking into what is available in properties. It has brought to the fore the importance of electrical safety—from checking white goods that are in the property to looking for the RSD that would prevent a dangerous electrocution. It has also helped to raise awareness about how important electrical safety is in properties and how vulnerable some people can be. I commend it for its work on the matter.

17:09

Malcolm Chisholm (Edinburgh Northern and Leith) (Lab): I congratulate Clare Adamson on securing this important debate. Like her, I commend the work of the Electrical Safety Council, including its submission to the recent consultation on the private rented sector to which I will refer in a moment.

A general point to make at the beginning of the debate is that the Scottish housing quality standard has done great work for the social rented sector. We need to have, as soon as possible, a similar standard for the private rented sector. Clearly, issues to do with electricity should be an important part of that standard.

A number of striking facts come through in the Electrical Safety Council's response to the Government consultation that I just referred to. Although praise is given for the work of the PRS strategy group thus far, the council is keen to highlight that stronger emphasis is needed on improving safety conditions within the sector and encouraging landlords and tenants to access information. As the ESC points out in its response:

"a Populus study in February 2012 found that 29% of landlords and 40% of tenants do not know who is responsible for electrical safety within their properties."

When there is so much scope for wear and tear, particularly in properties with a high turnover of residents, there is also scope for poor maintenance and serious injury, therefore standards must be more explicit and enforcement must be more effective.

One way to ensure that standards are properly enforced is to provide a mechanism through which tenants may access support when the landlord fails to meet their pre-stated obligations. That could be done by strengthening the private rented housing panel, which was set up in the Housing (Scotland) Act 2006—with which I had a little to do. That measure is supported by the Electrical Safety Council and would go some way towards enforcing standards. The private rented housing

panel already provides a vital mechanism for tenants to seek redress if their landlord fails to meet the repairing standard, but it could go much further in ensuring that the standards are more explicit and detailed. That would give out a clear message to landlords that compliance will be strictly enforced when the safety and wellbeing of tenants are put in jeopardy.

The council goes further in suggesting that it might be advisable to allow third-party referrals for tenants who might not have the confidence to come forward to the panel with a case. I am inclined to back that suggestion, as it means that the issues of those who might not complain—for whatever reason—will be acknowledged and addressed. It is important that a new strengthened private rented housing panel has the ability to process cases efficiently and quickly, ensuring that any failure to meet the repairing standard is challenged with the threat of removal from the register for landlords.

The tenant information pack could also be an important part of the way forward. The new tenant information pack, which was introduced as part of the Private Rented Housing (Scotland) Act 2011, requires that landlords provide a standard document when each lease is initiated. It was a welcome improvement. The TIP not only reinforces the responsibility of the landlord to provide clear and fair information at the commencement of a tenancy but gives residents a reference throughout their occupancy that helps them to hold landlords to account. Clear guidance such as that is essential in providing reassurance to residents, particularly if they feel that they have a case to refer to the private rented housing panel.

In the TIP, there is reference to electrical safety and to the ESC recommendations. However, little detail is given on the frequency of inspections and electrical tests. In its response to the TIP, the ESC suggested that a rule of five-yearly inspections be set, but that is not reflected in the body of the TIP as finalised by the Government. The council, in its response, suggested that the pack should include questions around that as well as specific information about portable appliance testing and residual current devices. The Scottish Government would do well to heed the advice of the Electrical Safety Council. I support all the council's recommendations and I hope that they can be included in the minimum standards for private rented housing that we hope to see soon.

17:13

Richard Lyle (Central Scotland) (SNP): I thank Clare Adamson for securing a debate about an issue that we should all be concerned about. I, too, associate myself with the comments about the Scottish Parliament's commitment to raising

housing standards in the private rented sector, in particular with regard to electrical safety.

Electrical safety is a priority and has recently been a storyline in a national soap—a character nearly died from messing about with electrical equipment. In her opening remarks, Clare Adamson alluded to some of the factors that can increase the risks that are associated with poorer electrical safety. Poor maintenance is one; lack of knowledge among landlords about their responsibilities to tenants is another. Landlords have a duty of care towards and must safeguard their tenants.

On landlords' lack of knowledge, I agree that more should be done to ensure that landlords are made aware of their responsibilities and the implications of not fulfilling them.

In February, the Scottish Government published the tenant information pack, which provides important information to tenants who rent their homes privately. Since 1 May, landlords have had a legal duty to provide new tenants with the pack. That action and others highlight the Scottish Government's commitment to this serious issue.

Poor maintenance was mentioned. The Housing (Scotland) Act 2006 made provision for the repairing standard, setting out requirements that landlords must meet, including a requirement for water and heating installations and fittings to be in reasonable condition and proper working order. Ignorance of the law is not an option; those are requirements. The approach is important, because it will ensure that clean running water and the means to heat a home are present. Those are basic necessities.

Under the 2006 act, if a landlord fails to meet the repairing standard, their tenant may take the case to the private rented housing panel. The aim is to make it quicker and easier for tenants to make landlords meet their legal obligations. Such measures must be implemented and enforced more stringently, to protect Scotland's people from the dangers of poor electrical safety.

Members should acknowledge that the Scottish Government is doing its bit to fix problems and safeguard Scotland's people. The Scottish Government will publish a strategy document on the private rented sector later this month. The document has been worked on in partnership with the Scottish private rented sector strategy group and will fit well with the Government's overall housing strategy. I am sure that the minister will assure us that the work is on-going.

I pay tribute to the Electrical Safety Council in Scotland and other organisations for all their work to protect tenants from death or injury from electric shock or fire and to improve electrical safety in

privately rented homes, in my region, Central Scotland, and throughout the country.

I thank Clare Adamson again for bringing the issue to the Parliament. I have known Clare for years, so I know that the subject is close to her heart. I look forward to listening to the rest of the debate.

17:17

Alex Johnstone (North East Scotland) (Con):

As many members said, including Clare Adamson, safety in the home is vital. We should all be concerned about the issue and not least about electrical safety, given the potential for serious accidents and even death.

Clare Adamson mentioned Polish wiring—or rather, Polish electricians. I have heard similar stories, but in all honesty I must say that members need only ask my wife and she will tell them that a little knowledge is a dangerous thing, whoever has it.

It is important that we acknowledge that there is a genuine desire across the board to achieve the objectives that are set out in the motion. Not only the Government and the Parliament, which have responsibility in that regard, but landlords' representative organisations are extremely keen to make progress on the matter.

However, we must be careful to do so in the right way. It is easy to make regulations or devise procedures that should be observed, but if we do not get people to act on them we might inappropriately inspire overconfidence. Similarly, a system that is put in place to enable the victims of poor or inappropriate standards to get redress is not a cure-all, because people who have suffered as a result of bad wiring would rather that that had not happened at all.

When we consider the practices that most concern us, it is easy to see that good landlords are already doing what they should be doing. The bad landlords, whatever proportion they constitute—I suspect that it is relatively small—are the cause of the problem. If we regulate further, however, the good landlords will apply the new regulations while the bad landlords might not, just as they failed to apply the previous set of regulations. So enforcement is the key.

It is important that we do not force people into a kind of black market in the provision of property. We need to get landlords, whoever they are, to be willing to engage, which is why I encourage the Government to consider ways to ensure that, wherever possible, regulation is light touch and does not add to the burden and cost of becoming a private landlord to the extent to which it encourages some to operate outside the market or

the regulations in an illegal way, because that would give us a disadvantage.

In recent years in Scotland, we have come to understand the important contribution that private landlords can make to solving many of Scotland's housing problems. It is important that we acknowledge that private landlords have a great deal to contribute to that. We must work hand in hand with private landlords. We know that they are willing to do what is necessary to achieve higher standards, and we must never make the mistake of demonising those in the private sector who are providing property for rent, because they are vital to what we are trying to achieve. It is not a case of private bad, public good; it is a case of everybody pulling together to encourage appropriate high standards of safety in the home so that we do not get the problems that we have experienced in the past.

It is my pleasure to support the Government in its intention to increase safety levels in the private rented sector. I look forward to contributing to that process by ensuring that we work with landlords, not against them.

17:22

Bob Doris (Glasgow) (SNP): As other members have done, I thank Clare Adamson for bringing the issue to the chamber and for hosting a round-table discussion in the Parliament on electrical safety. I found the frank and constructive exchange of views at that meeting useful and informative.

Members have mentioned the tenant information pack. We should acknowledge that the Electrical Safety Council was a constructive partner in the pack's formation in relation to the safety aspects, as were the Scottish Association of Landlords and others. Many good landlords were keen for a tenant information pack to be created.

I will put one or two quotes about the pack on the record. Margaret Burgess, the Minister for Housing and Welfare, said:

"The introduction of the pack will contribute towards ensuring that the private rented sector provides good quality and well managed accommodation, where both landlords and tenants understand their respective rights and responsibilities."

I stress that the key word there is "responsibilities", and that responsibilities come in conjunction with rights. The Scottish Association of Landlords said:

"We are encouraged by the possibility offered by the Tenant Information Pack to improve and maintain landlord-tenant relationships. The pack is also a helpful resource which will raise awareness of both landlord and tenant rights and responsibilities."

There is that word "responsibilities" again. We have partnership working with the private rented sector on improving standards and responsibilities.

On electrical safety, the tenant information pack states:

"Your landlord, in accordance with the Repairing Standard for private rented properties ... must ensure that the electrical installation and appliances provided with the property are in a reasonable state of repair and in proper working order."

It goes on to say a bit more, but I will not quote it, because of time constraints. However, there is no great detail on what an acceptable standard and acceptable working order are. We need to scratch beneath the surface and flesh out some of the issues.

When the weather improved in the past week or so, I was out cutting the grass—[*Laughter.*] I know that it is surprising that I do any physical exercise, Mr Johnstone. I cut the cable, but I was perfectly safe, because of the residual current device that is fitted in the new-build house where I live. Tenants in the private rented sector surely deserve similar protection when they go about their business. I was mindful of that when that happened to me just the other day.

How can we take matters forward? The Electrical Safety Council is asking for proof of an inspection of electrical installation every five years by a qualified electrician. It is also asking for portable appliance testing on electrical appliances provided by the landlord every five years and a statement on whether residual current devices are installed.

Instinctively, I am tempted to say that we should agree to all of that, but I am also mindful of Mr Johnstone's comments about the possibility that we might put further regulatory burdens on well-performing landlords and that the cowboys will ignore them all. Therefore, before we make any commitment to introduce further regulation of the private rented sector—incidentally, I think that we should have further regulation, but we must introduce it in a planned and evidence-led manner—we must ensure that a business impact assessment is made of the effect on good, well-performing private landlords.

How can we incentivise good, well-performing private landlords to do a lot of those things in preparation for further regulation that may be introduced? More important, if we are not able under current rules and regulations to crack down hard enough on the cowboys, we will have to think again.

In the previous parliamentary session, I was involved in the scrutiny of various pieces of legislation that increased fines for unregistered landlords. We are seeing some success coming

from that—but only some. The Parliament has shown some willingness to legislate on the matter, but we must think about it again.

I make one suggestion. The Scottish Government is funding many energy efficiency initiatives in the public and private rented sectors and in private dwellings. Many households in Scotland are being contacted right now about energy efficiency and anti-fuel poverty measures. Surely it is not outwith the realms of possibility to fit a residual current device or give a leaflet on electrical safety as part of that work. We need some joined-up thinking. If the Scottish Government is going through hundreds of thousands of households—as it is—perhaps it can weave in some electrical safety as it goes along.

Let us do something about electrical safety in the private rented sector, but let us ensure that it is evidence based and does not cause an undue burden for the good performers in the sector.

I thank Clare Adamson once more for bringing the subject to the chamber.

17:27

The Minister for Housing and Welfare (Margaret Burgess): I, too, thank Clare Adamson for bringing the issue for debate. She has highlighted the importance of ensuring that private tenants are able to live in safe homes with a reduced risk of electric shocks and fires from poorly maintained installations and appliances.

A number of speakers have mentioned the work of the Electrical Safety Council. The council should be commended for raising awareness of the issue and actively campaigning for improvements in safety standards. I know that the points that have been raised were recently discussed at the round-table event that Clare Adamson and the council held in the Parliament.

As Alex Johnstone said, the private rented sector in Scotland has more than doubled since 1999, and current projections suggest that it will continue to increase its share of the housing market.

There is also an increase in the number of home owners moving up the housing ladder who are becoming landlords, often because they are unable to sell their home due to problems in the housing market caused by the recession. Those landlords, who are sometimes called reluctant or accidental landlords, are not professional landlords with large property portfolios, so we need to ensure that they understand their responsibilities as landlords. We also need to ensure that the bigger landlords know about and carry out their obligations to their tenants. It is particularly important that both landlords

and tenants are aware of the dangers of electrical fires and electrocution.

One of the responsibilities of private sector landlords is to ensure that the homes that they let comply with the statutory repairing standard that is set out in the Housing (Scotland) Act 2006. They should ensure that their homes meet that standard before a tenancy begins and at all times throughout the tenancy.

One part of the repairing standard is that landlords must ensure that the electrical installations and appliances that they provide are in a reasonable state of repair and in proper working order. If landlords are unwilling to carry out the work that should be done to meet the repairing standard, tenants can get help with enforcement from the private rented housing panel, as has been said. The best way for landlords to demonstrate that the homes that they let comply with the electrical safety elements of the repairing standard is to provide tenants with a certificate from a qualified electrical engineer.

In relation to gas safety—I note that health and safety is reserved—it is true that private landlords have a statutory duty to carry out regular annual inspections to make sure that gas appliances, fittings and flues are safe. I know that the Electrical Safety Council would like to see a similar duty for private landlords in relation to electrical installations and appliances.

However, members will be aware from recent news reports of the survey carried out by Shelter and British Gas, which suggests that one in 10 private landlords does not know about, or does not comply with, their statutory duty to carry out safety checks. That demonstrates to me that more than regulation is required: we need education and awareness. All of us should highlight that whenever we can, as the Electrical Safety Council is already doing.

It is for such reasons that we introduced the tenant information pack, about which Bob Doris and others have spoken. Private landlords now have a legal duty to provide new tenants with that pack, which contains a summary of the legislation that applies to them and includes information on property condition and the rights and responsibilities of landlords and tenants. The pack ensures that tenants are made aware that electrical safety is important, that they should ask their landlord about the electrical safety of their home, and that they can ask for a copy of any current electrical safety certificate.

That is important, because this is about responsibilities, although when people are aware of their rights, they can exercise them. It is important that everyone is aware of the matter and works together. The private rented sector will

continue to play an important role in meeting Scotland's future housing needs and in delivering our vision that everyone should live in high-quality, sustainable homes that are safe to live in.

As was said earlier, later this month the Scottish Government will publish a strategy for the private rented sector. We know that we need to create a regulatory framework that works for both tenants and landlords: one that is effective, proportionate and sets the right standards to ensure quality, but which is also affordable and does not constrain the growth in private rented housing that is needed. We want to encourage tenants to think of themselves as consumers who can drive improvement within the private rented sector and support landlords to deliver the improvements that are needed.

Before the summer recess, we intend to respond to our recent consultation on a sustainable housing strategy. The Scottish Government sought views on our vision for warm, high-quality, affordable, low-carbon homes. Part of that vision is for people to value and take responsibility for the condition of their home. The vision will cut across tenures: it will engage with the private rented sector, social housing and owner-occupiers. It will cover energy efficiency, physical condition and the need for safe and secure homes.

We will continue to work with all stakeholders, including private landlords, tenants and the Electrical Safety Council, to raise housing standards and to deliver our vision, because we want people to live in homes that are warm, comfortable and safe.

Meeting closed at 17:33.

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