

Royal Society talk by Viscount Ridley – 3rd May 2016

Let's get one thing out of the way to start with. I am enthusiastically in favour of international collaboration, international funding and international organization in science. You won't get a cigarette paper between me and Peter on that.

I love the way science is a global activity, that every time you go to a lab you meet people who originated everywhere and anywhere, yet all speak the same language, by which I don't mean English, I mean reason! I mean a love of evidence, a passion for truth.

Discovery and invention are collective processes that happen in networks, not in ivory towers. In conversation, not in isolation.

Britain's been a fantastically welcoming country for scientists and I want it to be even more so in the future. Our labs are more diverse even than premier league teams. And I want Brits to fan out across the world in the same way.

We must get the best and the brightest from wherever they live, mix them together and – to coin a phrase – watch their ideas have sex. That way we will promote economic growth, yes, but even more important we will generate knowledge.

Consider the career of Britain's greatest twentieth century scientist, born 100 years ago next month – Francis Crick. His main collaborators were Kreisel, Perutz, Watson, Brenner and Koch – not one of them British. The only Brit he collaborated with was Leslie Orgel and that was in California.

I want to explain why I think membership of the EU is not much help to British science and technology overall, and may actually be a hindrance.

Let me begin with an embarrassing admission of ignorance. Before we began this inquiry, I was under the impression that the main EU science programmes were only available to members of the European Union. FP7, and Horizon 2020.

And I find that I am not alone. Last week I was talking to a distinguished psychologist and he said "but if we left the EU we'd lose access to their science funding".

I used to think that too: if we left the EU we would lose access to those programmes, which provide 3% of our R+D budget.

Then it dawned on me that Switzerland, Norway and Iceland were in these programmes too. And Israel, Tunisia and Turkey.

Altogether 15 countries are in the EU science funding programmes but not in the EU. It was 14 when we published our report, but another country joined last week: Georgia.

And according to the press release from Brussels its researchers will operate "under the same conditions as their counterparts from EU Member States".

The three countries with the greatest funding per head of population from Horizon 2020 are non-EU: Iceland, Norway and Switzerland.

The country with the most project coordinators per head of population is Iceland.

The idea that we have to be in the EU to be part of this program is just a myth, an urban legend. Sure we have to pay money in to get money out, but so does everybody. These programs are simply membership clubs.

The same is true of the main scientific collaborations. The European Molecular Biology Organisation, the European Space Agency, EUMETSAT – these are pan-European, not EU projects.

The particle accelerator at CERN actually crosses (beneath) a border between an EU and a non-EU country. The Higgs bosons do not have to show their passports or pay tariffs as they pass. CERN gets less than 2% of its budget from the EU.

As Peter can testify, I became a bit of a bore on our committee about this, a pedant even – I kept asking witnesses to clarify if by Europe they meant the EU, the EEA, the continent or the European Research Area.

And I kept asking them if their own organisations included non-EU members.

At one point we had three witnesses in front of us from different organisations: EMBO, ITER, and the LERU.

I asked them if they had non-EU members. All three of them had non-EU members.

Ah yes, I was told, you can have European money, and you can join European organisations, and you can coordinate European projects, but you cannot set policy – you are not at the table when science policy is set.

Really? Why?

Well, they told me: you would not be represented on the commission or in the European parliament.

Sorry? You mean to say the European parliament or the commission is deciding how the money gets spent in Horizon 2020, in EMBO, in CERN, in the European Space Agency?

If so, that's a scandal. In Britain we have the Haldane principle to insist that scientists set their own priorities. Is that principle abandoned at the European level? If so, now I am really worried.

Let's run through a list of Brussels's greatest hits affecting science:

There was the clinical trials directive, which destroyed clinical trials in this country and according to Morris Brown of Cambridge University "threatened patients' lives". We used to have 12% of world clinical trials, but we now have 1%. Sure the directive was eventually reformed so it was more reasonable, but it took ten years and the clinical trials industry had long since fled to India and elsewhere by then.

There was the data protection directive, which made many kinds of research much harder here than on other continents.

There was the deliberate release directive, which has killed off this country's leading role in agricultural biotech. True, the home grown green fanatics started it, led by lords in white boiler suits, but ask scientists what's holding it back now and they say the EU approval process for releasing GM crops or GM insects is so cumbersome, so uncertain and so unscientific that most scientists have given up even applying.

In two weeks time we become subject to the tobacco products directive, which contains a disastrous own goal for public health, which will make it harder for smokers to give up by taking up vaping.

Why did this happen? Because big pharmaceutical companies lobbied hard in Brussels in favour of their prescription-medicine alternatives, patches and gums, while subsidized tobacco growers and the tobacco industry lobbied hard to have vaping devices included in a tobacco directive, even though they are not tobacco products.

Fifteen years ago diesel car makers successfully lobbied for the European Commission to favour diesel cars as a way of cutting CO₂ emissions, with the result that particulate and NO_x emissions are far worse than they could be – resulting in thousands of unnecessary deaths.

Homeopaths have successfully lobbied in Brussels to be excused from the need to prove their medicines are efficacious.

Big green pressure groups have lobbied the commission to get neonicotinoid pesticides banned despite clear scientific evidence that they are less of a risk to bees than the alternatives,

Greens lobbied the Parliament last month to get roundup herbicide banned despite clear scientific evidence that it is one-tenth as carcinogenic as coffee.

I am sorry, but if we are to leave science policy to the European Parliament, a hotbed of anti-scientific gullibility and big business lobbying, then we'll set science back.

Our witnesses mostly agreed with me on this. They said the parliament is often anti-scientific, that its interpretation of the precautionary principle is stifling innovation by holding the new to a higher standard than the old and by ignoring the potential benefits of innovation, focusing only on the hazard.

Brussels is not very good at evidence based policy making, but it's great at policy-based evidence making.

The centralized, top-down, lobby-ready nature of the European system is one of the main reasons that BASF is abandoning Europe for America,

New EU internet rules, which the Economist says will hurt the continent's start-ups are one reason that Spotify – one of the very few European digital start-ups of any size -- is abandoning Europe for America.

For me, in the end, it's all about innovation. The European Union is bad at doing it, good at discouraging it, repeatedly sides with those who have vested interests in resisting it, and holds Britain back from achieving it. Where are the European digital giants to rival apple and amazon, google, facebook and Wikipedia?

Britain needs to be setting scientific pace at the global, not the regional level. It needs to be an international scientific superstar like Singapore only 13 times bigger. Singapore left the Malaysian federation and thrived.

Britain – for its size – is probably the world's leading scientific country. We have less than 1% of the world's population, but 15% of the most highly cited scientific papers, and more Nobel prize winners than any other European country. Our biggest science collaborator is America. The only EU universities in the world's top 20 are British.

We are world leaders in biotechnology and digital technology and our greatest potential collaborators and potential rivals in both fields are in Asia and America, not Europe.

So it is vital that we remain open to the world. A regional customs union protected by tariff walls and run from a central bureaucracy is a 1950s idea – an analogue project in a digital era, as Michael Gove puts it.

In an age when container shipping has collapsed the cost of intercontinental trade; when the internet and budget airlines and Skype have made it as easy to collaborate with Asia and America and Africa as in Europe, regionalism makes less sense.

Harmonising standards is a good idea, yes, but doing so at the regional level makes no sense. In fintech, in car making, in ag-tech, in digital, in biotech – the

action is at the global level, where our voice is just 1/28th of a seat. We could be chairing these bodies.

What about free movement of people?

I suggest that continuing membership of the EU, not departure from it, carries the greater threat to free movement of scientists and technologists. I say that based not on speculation but on what is already happening now.

Universities are quite rightly complaining about how much harder it is to get visas for students and professors to come here from India, China, America, Australia and elsewhere. The academic world is rife with stories about us missing out the best talent because of visa problems.

I recently heard tell of a brilliant New Zealand physicist at Oxford who wanted to stay, partly because he loves cricket, but has had to go to Stanford because it is just too hard to get a visa to stay here.

I talked to another scientist who advertised for a post-doc under a European funding grant and had one outstanding and several mediocre replies, but the outstanding one was hoping for a higher salary than advertised. My friend was told by his university that he could give more than the advertised salary if the applicant was European, but not if he was not. The applicant has an Indian passport. That's discrimination.

I talked to a friend in India who was barely able to contain his rage at Theresa May for making it so hard for his most talented students to get to UK institutions.

Why is Mrs May making it so hard for scientists from outside the EU? It's really very simple. Her government promised to reduce net migration below 100,000 and is failing to meet its targets. Since it cannot stop unqualified Poles and Romanians coming here seeking work then instead it is trying to stifle entries by non EU citizens.

[Now I've nothing against unskilled immigrants, either, but I do see the argument that unskilled mass immigration is fine for the wealthy because it provides cheap labour, but not so great for the poorest people who are already here because it undermines their wages and puts pressure on schools and health services.]

So the difficulty universities are finding in getting talented people from the rest of the world is directly related to our membership of the EU. The connection could not be clearer. We have clamped down on Indian scientists because we cannot clamp down on Romanian fruit pickers.

The same is true for students. The least qualified Spanish student has more right to subsidized fees than the most qualified Argentinian student.

America, Canada and Australia have a higher proportion of overseas researchers than Britain, Germany or France – and have stricter immigration policies.

If we left, took control of immigration and adopted a points system like Australia we would be able to open up to more skilled migrants from America, Asia and just as many from Europe. To have an expedited academic talent visa, like America has. There is not a cat in hell's chance that Brexit would be followed by restrictive visas for European scientists. Nobody's calling for that.

Here's a fact to leave you with: 90% of the STEM graduates in the world in 2030 will be from outside the EU. Do we really want to be isolationist little-Europeans and turn our backs on them?