

Speech: Britain's new unique selling point (USP): the go-to place for science and innovation

It's an honour to be here today to open the Schrödinger Building here at the Oxford Science Park.

A vision of optimism

The Science Park is a remarkable symbol of vision and why it matters. Thirty-odd years ago, all this was fields. And the world of science and innovation was very different. No one had heard of dot-coms, big data, CRISPR, cryptocurrencies or graphene. The Human Genome Project had only just begun. A 35-year old British scientist working at CERN had just published something he called a web-page.

But the owners of this land, Magdalen College, believed in the power of ideas. They saw that this could be a place where ideas came to life. That these ideas could become ventures, and that those ventures could grow and prosper. Some of these ventures have gone on to change the world: Powderject, which transformed how we develop and deliver vaccines. Oxford Nanopore, which revolutionised DNA sequencing. Circassia, which uses immunology to fight respiratory disease.

The Schrödinger Building that I am opening today will play host to the ventures of the future, and I am confident they will make an even bigger splash.

Today, I'd like to talk about what the next thirty years holds for science and innovation. And I'd like to pose a question: what could the spirit in which the Oxford Science Park was founded offer for the country as a whole?

Making our way in the world

After all, this is a good time to ask ourselves some fundamental questions about the UK and our economy. What are we going to do to provide a prosperous future for ourselves and our children? How will Britain make its way in the world?

Brexit has thrown these issues into sharp relief. Of course, at the moment it is right that the government's attention is focused on the immediate priority of the withdrawal process.

But we also face a longer-term question: what should our post-Brexit economy look like? And we cannot wait till the Brexit deal is done to answer it. Some people have argued that Brexit is the most complex political task the UK has undertaken since World War 2. But let's not forget that while fighting that

war, Britain was preparing for the future.

While Rommel and Montgomery were vying for control of North Africa, William Beveridge was setting out his vision of the modern welfare state. As Allied troops were fighting their way through the hedgerows of Normandy, Keynes was in Bretton Woods, planning the future of world's financial system.

Even when beset by the most urgent challenges, the government in World War 2 had the vision to plan for the future. In a similar way, the time to plan for our post-Brexit future is now. This is a shared endeavour for all of us, whether we voted 'leave' or 'remain', and it's one that requires us to be at once tough-minded, optimistic and resolute.

With the City less profitable today than it once was, and North Sea output naturally declining, the search is on for the next wave of world-leading British businesses. Bank of England research suggests that it's the fall-off in growth of Britain's leading companies that explains the majority of our poor productivity growth since the 2009 crash. And poor productivity is not just bad for our prosperity as a nation. If we do nothing to address it, it risks undermining the legitimacy of our wider economic system.

The implication of this is clear: we need to take a long and serious look at the structure of our economy. We need new sources of growth, and a vision of how to succeed. And we need to set a direction that will sustain us not just for the next 9 months, but for the next 30 years.

For a very compelling answer to that, just look around you. I believe that the spirit of optimism and of 'can-do' that inspired this science park and the ventures in it is what we need to harness if we are to prosper as a nation. That's why I think it is essential that we put innovation at the heart of our industrial strategy.

The businesses of the future will be based on science, research and technology. The world is changing, and the UK needs to take advantage of this. Research shows us that high-growth businesses are the main engine of job creation in the economy – the 6% of fastest growing firms punch significantly above their weight when it comes to job creation; they also drive job creation and wage growth in the wider economy.

Innovation can also help change society for the better. Today we are celebrating the 70th anniversary of the NHS. The greatness of the NHS is in part a result of the labours of generations of doctors, nurses and staff. But it is also the result of seven decades of breakthrough science – from CT scanning to IVF. As part of the government's Industrial Strategy, we are using innovation to tackle some of the Grand Challenges of the present and the future, from how to achieve clean growth to how to harness the power of AI.

The potential of innovation to drive our future economy is more than just an aspiration: it's something we're already seeing in practice. Take Artificial Intelligence – the UK is already home to some of the biggest names in the business, such as Deepmind, Swiftkey and Babylon, and we have seen an

acceleration of VC investment in UK AI businesses that will provide the next wave of world-class businesses.

New statistics published earlier this month by Tech Nation show that the UK is maintaining its lead as Europe's tech hub. We play host to 13 of Europe's 34 tech 'unicorns' (startups with a valuation of over \$1 billion). More venture capital is invested here than in Germany, France and Sweden combined. In 2017, our tech sector grew 2.6 times faster than the economy as a whole, increasing by 4.5%.

To tackle the grand challenges our society faces, and to move up the economic league table, we need to double down on our strengths in science, technology and innovation.

Doubling down on innovation

This is partly a matter of investment. A decade ago, the idea that government investment had a role to play in fostering innovation was contentious, even controversial. But when we look around the world at countries like the US, Germany, Israel or Singapore, we see that strong, focused public investment is a necessary condition for a thriving innovation economy.

I am proud that the government has delivered the biggest increase in public funding for R&D for 4 decades, backing the ingenuity of our scientists, researchers and innovators. And it's not just about investment today. It is also about a longer term commitment, 2.4%. The eyes glaze over. So let me put it a different way. The increase we are aiming would represent for is the equivalent of 4 new Rolls-Royces, 4 new GSKs and 4 new Oxford Universities, together with making Manchester and Birmingham as R&D-intensive as the East of England. And a new Tech City for good measure. In short, it represents a transformation of the economy for the better.

But as you know here at the Oxford Science Park, investment is about much more than just public money. For every pound of public R&D in the UK, business contributes 2. And it takes more than R&D to build successful businesses. That's why we are also working hard to create the conditions for greater long term private investment.

Now is the right time to ask ourselves some big questions when it comes to our public R&D investment. How can we do more to ensure our investment crowds in private money? Have we struck the right balance between funding for basic and applied research?

More than money

But creating an economy based on the power of science, research and innovation is not just about spending money or a vague enthusiasm for technology. Serendipity is an important part of science, but countries that are really successful also have a plan, and a keen sense of how their plan fit, both with their own capabilities and with their position in the wider

world.

Not long ago, I was in Israel. Like many visitors, I was struck by how a small country of 8 million people has carved a place for itself on the world stage by becoming the start-up nation. Israel lacks the UK's universities or our blue-chip firms. But it has built on its own particular advantages, including an abundant pipeline of deep tech talent, and a strongly international outlook. Or take Ireland, with its burgeoning tech sector: it has built on foreign investment to develop a skilled tech-savvy workforce. In both cases, public investment had a role to play. But it was just part of a bigger and more strategic picture.

Britain learnt in the Olympics that having a realistic strategy works better than muddling through. It's the same when it comes to science and innovation.

With these examples in mind, let's ask what Britain's relevant strengths are. I think there are three things we are unusually good at.

First of all, as a country we have a long history of openness. British people like new technologies. Our research labs and businesses are full of people from around the world who have chosen to work here. We're open to ideas too: as the historian Joel Mokyr reminds us, many of the best ideas of the Industrial Revolution from chlorine bleaching to gas lighting and from canned food to the Jacquard loom were originally invented by the French, but were put in practice by the British.

Our second advantage is strong but agile institutions, from our capital markets, our widely admired legal system, or our world-class universities for example. Others get less recognition: our intellectual property regime, for example, which is increasingly important in a world of growing intangible investment, or our standards bodies, professional bodies and learned societies, whose influence is global.

Our third advantage is entrepreneurship. William Blackstone called us "a polite and commercial people". Napoleon called us "a nation of shopkeepers". Either way, Britain's entrepreneurial spirits are strong. A new business is started in the UK every 75 seconds. And a disproportionate number of those businesses go on to thrive, with the UK playing host to half of Europe's top-10 fastest growing companies.

These three advantages were essential to our old economic model: the City of London, for instance, would not have thrived the way it did without openness, entrepreneurship and supportive institutions. And it's clear to me that our future plans for a tech-driven, high-growth economy will only succeed if we can take advantage of them.

The UK as a platform for innovation

To understand how this might work, let us take a look at the tech giants of today's global economy. Google, Apple, Amazon, Facebook and the rest all have their own clever technology. But they have more than that: they are unusually good at working with, borrowing, acquiring and adapting the technologies of

other companies, partners and competitors like. Apple profits not just from selling iPhones, but by running the App Store, where over half a million developers offer their apps. Amazon acts as a shop-front to five million sellers, a web host to countless sites, and even as bank.

And all of these companies are continually acquiring, copying, learning from a constellation of startups, researchers and entrepreneurs. The days of the monolithic industrial whose every idea comes from its in-house R&D lab are long gone. We see the same change in the world of life sciences, the same in the manufacturing sector, and even in services industries. Companies, that can develop platforms and bring people to them tend to prosper.

Perhaps the same is true for countries – and particularly for the UK, given our tradition of openness. The way for us to be a tech nation is not tech-nationalism, but by becoming a platform, a place where the best ideas from the UK and the world can become reality, and where the best businesses can find markets, create jobs and grow. To do this, we need to make the most of each of the three advantages I mentioned: our openness, our entrepreneurship and our institutions – the advantages that have been the basis for the UK's economic success in the past.

Openness

We should be proud that so many of the best and brightest from other countries choose to bring their knowledge and skills to Britain, and we should recognise that our economy is stronger for it. I don't believe that the vote for Brexit was a vote for the UK to close ourselves off from the world. That's why we recently announced an investment of £900 million in UKRI's Future Leaders Fellowships, which is open to the best researchers and innovators from both the UK and the wider world. But there is so much more to do to convince they world we are truly open for business. As we think about our post-Brexit immigration system, we should design it in a way that makes Britain a place where the sharpest minds can come to work on the biggest challenges. If you are, in the words of the musical Hamilton, "young, scrappy and hungry", with the desire and talent to change the world, you should find a welcome here. Because countries with the insurgent mindset are the ones that succeed.

We also need to make the most of our openness to ideas. We should learn from the sharp-eyed heroes of the Industrial Revolution and think not just how we commercialise our own technology, but what we can learn and borrow from the best research around the world.

We are already active in this field. Our India tech partnership, brings together businesses, universities and tech institutions, and has developed new UK-India Tech Hub in Delhi. The UK-Israel Tech Hub is driving R&D partnerships between British businesses and Israeli tech leaders. And our Global Challenges Research Fund has built strong research relationships with partners in many of the world's fastest growing economies, focused on global issues like water, clean energy and agritech.

I want us to build on this by continuing to develop collaborative

partnerships in research and innovation across the world. This includes our near neighbours in Europe. To succeed we need to be competitive but also open to collaboration with the brightest and the best wherever they are.

Institutions

It is also time to ensure our institutions are playing the most effective role they backing innovation.

Our universities are an intrinsic part of our innovation economy. Our best universities are not just powerhouses of research – they are also deeply connected to their local and national businesses, and to their community. There is an important geographical angle to consider. It is no surprise that many of the UK's most successful publicly funded labs and institutions are in the Oxford-Cambridge-London triangle, because we rightly fund research on the basis of excellence and not political patronage, and one corollary of that is that the most successful universities have consistently punched above their weight in winning further research funding. But it is important that we recognise that, when it comes to innovation, there is life outside the Golden Triangle.

Indeed, sometimes the private sector seems quicker to realise it than public research funders. As the innovation expert Tom Forth has pointed out, there are parts of the West Midlands and the North West where business invests heavily in R&D but the public sector seems not to. I want to see to N8 Alliance of Northern Universities become powerhouses of economic growth in their area, and to ensure we back innovation wherever it may be. That's how we build real strength in places across the country.

But universities are not the only institutions that are can drive innovation. We should also consider how our regulatory systems can encourage innovation, by making sure that our rules keep up with the pace of technology and business change.

Emerging technologies can be especially challenging for regulators. But tech-savvy regulation, like the Regulatory Sandbox pioneered by the FCA for fintech innovations, can provide the space for new ideas to grow. The regulatory sandbox has now been copied in 20 countries.

We want to do more in this vein. So today, we are launching the new £10 million Regulators' Pioneer Fund, as an integral part of our Industrial Strategy. The fund will invest in initiatives to support businesses that are bringing innovative products to market, and put us at the forefront of the industries of the future. I want to make sure that Britain's rules for industries from insurance to utilities are open to innovation and disruptive business models, and that outmoded red tape doesn't stand in the way of new ways of doing things. Appropriate, tech-savvy regulation can create the conditions for the next Spotify, Google or Ocado to grow and thrive.

And we should not forget the global dimension. As we have found out in the case of GDPR, sometimes rules and regulations go global whether we want them to or not. But this presents an opportunity for the UK here. We have a long

track record of setting world-class regulations, standards and ethical norms. If we can be take the lead on setting these standards, regulation and ethics, we have the chance to take a global lead – and to realise our vision of being a global platform.

To get this right will require technological expertise, but also expertise in the social sciences and the humanities. By coupling innovation In fact, it draws on many of the talents that Britain is so good at.

There are a number of fields of technology where we are already pushing forward in designing the rules and norms. Take the new Centre for Data Ethics and Innovation, or our self-driving car testbeds. I believe we have the opportunity to take the lead in setting standards for other new technologies and their applications. This offers a promising way for us to build on our strengths, influence the international rules and norms of the future, help high-tech entrepreneurs, and take a global lead. I will be asking the Government Office for Science to work with UKRI and the Better Regulation Executive in the coming months to develop this.

Entrepreneurship

The third advantage we must build on is our strong streak of entrepreneurship.

The UK is lucky to have a number of world-beating programmes that are helping entrepreneurs turn their businesses from start-ups to scale-ups. Take Entrepreneur First, which backs young tech-savvy entrepreneurs. It has a powerful track record: its 1,000 alumni have raised \$250 million of follow-on funding and achieved \$300 million of exits to date; the business is growing in the UK and has now expanded to Singapore. This is just one of many great programmes helping entrepreneurs scale up: I could equally have mentioned the London Stock Exchange's ELITE programme, Seedcamp or TechStars UK, or the government's own new Business Basics Fund.

These programmes don't just help businesses to grow: they also build our talent pool, creating cohorts of people with experience of life in an entrepreneurial business, which is just as important to our ecosystem as technical talent.

We also need to ask ourselves how the way the government does things can help innovative entrepreneurs grow. Are universities' rules on the ownership of intellectual property encouraging entrepreneurship? We need to consider whether we have struck the right balance between encouraging spin-outs and maximising university revenues.

How can we use government procurement to help innovative small businesses to grow? We need to look at how we build on the Small Business Research Initiative and the recently announced GovTech Catalyst to give more business to innovative firms working on government problems. We could start by ensuring that startups are linked into the four Grand Challenges at the heart of our industrial strategy, and that they can benefit from opportunities that these challenges provide.

But just as importantly, we need to celebrate entrepreneurs and wealth creators. We need to unashamedly pro-business, pro-enterprise and pro-endeavour, without feeling like we are kowtowing to business. Because it is the entrepreneurs, those who take risks try and try and try again till they succeed. They will be the true heroes if we are to succeed in future.

Can-do spirit

Openness, entrepreneurship and strong institutions: these are the 3 strengths that have made Britain successful in the past. They should form the basis for a strategy for keeping the UK at the cutting edge of technology, and making us a true global platform for innovation.

But there is one other attribute we will need to draw on – and that is ambition, and the can-do spirit. Emanuel Macron makes no secret of his ambitions to make France a tech hub. There is competition to attract talent and ingenuity. But I believe that Britain's fundamentals are strong, and the opportunity for us is real. To seize it, we need to suspend our traditional British reticence, and have confidence in the UK's potential as a place for innovation to flourish, and tell the world about it.

There has been a lot of talk in recent years about the idea of relaunching the Royal Yacht Britannia as a way of establishing Britain's international credentials. I appreciate the ambition of this project, and the desire to embrace a global economic role. In its day, the Royal Yacht symbolised our shipbuilding prowess and our mercantile tradition. But in 2018, a yacht is not going to cut it. We cannot rely on a nineteenth century technology to sell the promise of twenty-first century Britain.

If we are to make our way in the world, we need to show that we are a place where talented people can turn great ideas into reality, grow great businesses and prosper. Some of the manifestations of this vision will be visible and tangible: like our great universities. Other will be harder to see, like our startup visa programmes, or the joint tech hubs we run with India and with Israel. But they will send a powerful signal for our future.

By drawing on our national strengths of openness, entrepreneurship and strong institutions, we can make the UK a true platform for innovation. This in turn will help establish the UK's place in the world, and our future prosperity.