PUMPHANDLE LECTURE-PROMOTING MEDICAL SCIENCE IN AN AGE OF SCEPTICISM
4th September 2019

When I was asked to give the Reith Lectures in 2011 (I no longer usually mention alongside Aung San Suu Kyi), I was flattered and accepted at once. There following months of scribbling and scratching out, of trying to avoid platitudes and clichés and to say something of interest, my hand held all along by a kindly and patient BBC editor. I was frightened by the BBC's prediction of audience size-10 million-and also made the error of foolishly looking at the list of previous lecturers. That was thoroughly alarming.

There have been some echoes of that experience this time round. Jimmy Whitworth invited me to speak to your Society. I was pleased and, not learning from the Reith precedent, accepted at once. I then, again, looked at the list of previous speakers. That did little for my self- confidence, comprising, as it did, an array of distinguished scientists. I pointed out to Jimmy that I was a retired spook, and that my grip of science was feeble. Bored by the amoeba (what was the point of that??), not to mention levers, fulcrums and petri dishes, I had abandoned it all in my early teens. I could rabbit on for hours on intelligence, terrorism, espionage and so on but was not sure I could hold your interest on anything even vaguely scientific. I am still not! But his silver tongue, combined with the bribe of home-made cider for my husband and medlar jelly for me, persuaded me that some people might turn out to listen to me. So I should like to start by thanking you very much for doing so.

My title is "Promoting Medical Science in an Age of Scepticism". Trying to be accommodating I offered Jimmy the alternative of "Selling Science to the World." That was rejected. I think he thought that sounded too commercial. The one we agreed on is an umbrella title, chosen so that I can talk about a range of issues which I think are relevant to medical science, starting with some analysis of problems then moving on to some tentative solutions:

1. The political backdrop.
2. Public opinion.
3. Public expenditure choices.

   Then some necessary tools:
4. Political skills
5. Public engagement with science.
6. Science diplomacy.
7. Science Leadership

1. I start with the political backdrop. We are in a world, not just a country, of political instability. That instability has become acute at a time when we face the existential threat of global warming. At the very time when we need governments to work together to tackle joint problems, climate yes but also other problems, we are increasingly focussed on what

divides us, our differences not our agreements. Common ground is not sought and compromise is mocked .International organisations are disregarded, underfunded and often pilloried. The mechanisms for international co-operation are rusting over.

At the same time social discourse has become intolerant. Offensive rhetoric, which would have recently been condemned, is too often standard. How else could we have successive Foreign Secretaries labelling the European Union as similar first to Nazi Germany and then to the Soviet Union? Being offensive gives evident pleasure to too many, a poor example being set by our politicians. Manners no longer make the man. People in public life, especially women, who do not retaliate in kind, apparently have to learn to live with serial abuse or retire wounded from the fray.

And then there is the disregard for truth and for facts. It seems that many politicians have given up telling the truth. The cynical among you may mutter under your breath that it was ever thus but I disagree. I come from a political family. Both my father and grandfather on my mother's side were in the Cabinet. I know that both would be horrified by politics today seeing it as a distortion of what that privilege, public service, should entail. It seems to me to be increasingly tricky for anyone to judge where the truth lies when we are bombarded on all sides by lies and false assertions. Indeed it may be that Michael Gove's hyperbolic claim that the British people had had too much of experts had some truth in it. At this stage I should recommend the excellent Nature paper last month on how to help people assess evidence, think critically and make informed choices. The government won't read it.

2. That brings me onto public opinion. In the last three years since the referendum I have avoided making any observation on public opinion having read all wrong the referendum result and both the US and British elections. My only consolation is that very few pundits made correct predictions. And that is the point. We don't know enough about what people believe, think and fear. We too often live in bubbles, in echo chambers listening to our close family, friends and trusted colleagues. Elections, and even more so referenda, are a crude indication of opinion and subject to myriad interpretations. But I shall narrow it down to opinions on science on which we have some fresh, international evidence. In 2018 Wellcome commissioned Gallup to conduct an opinion poll by talking to a cross section of people round the world, one thousand in each of 140 countries. Our purpose was to acquire data to help researchers, funders, policy makers and all those who engage with the public on science. I won't go in detail through the mixed picture it presents but 72% of those polled had a medium or high trust in science, and more, 82%, not surprisingly believed what they heard from doctors rather than government. 70% thought that while they themselves had benefitted from science, only about 40% of their compatriots shared that benefit. A third of those polled in North Africa, Southern Africa, Central and South America felt excluded from any benefits science can bring. And many of you will have seen the data on vaccines but for example only 1% of those questioned in Bangladesh thought vaccines were dangerous while 33% did in France. We all know of cases where vaccinators, most recently in the Democratic Republic of Congo, have been murdered on the basis that they were spreading rather than trying to stop the disease, in this case ebola. But the poll shows that there is more

acceptance of and trust in vaccines in low and middle income countries than in wealthier Europe. So we must never assume that what seems to us as self-evident, namely medical research leading to treatments is a public good, is shared by all. Indeed a minority disagree and not just anti-vaxxers. You may be interested to learn that we plan to commission another poll next year. We shall retain the core questions on trust in science, confidence of healthcare and benefit of science but expect to add some, for example on mental health rather than vaccines and on global warming. We may add one on belief in evolution. But that is as yet undecided. The main point is that we consider that we must continue to try to find out more of international public opinion.

3. The third of my introductory themes is the choices for public expenditure. There are high demands for public expenditure in all countries. Here we need to fund health services for an ageing population, social care which is struggling, infrastructure, defence and security (I would say that wouldn't I), education including in the new skills we desperately need to ride the wave of the technological revolution, housing, energy and above all more policies to address the climate emergency. The list goes on and I have not yet mentioned the tremendous value of diplomacy, even if our current government neither practises or values it, and our aid programme. In the UK, faced by a no-deal Brexit, as you know better than me, we are already losing the foreign nationals whom we need for our economy to thrive and our science to flourish. The departures from our labs and from our universities and the refusal of visas to those seeking short term visits, apart from those deciding not to come here in the first place, are all having a chilling effect. As I said in the Lords before one of our Brexit votes, unkindly but accurately described as "meaningless", that is the vote, not, I hope, my speech, some people do not want to be in the narrowly nationalistic country we risk becoming. But we can't counter this by wishing to go back to 2016. The government has made some positive noises on science and immigration for scientists for which we should give it credit but we should also recognise that it will make a number of expenditure choices without being bothered by evidence. Fresh policies are regularly launched (this isn't a new phenomenon, some of us recall the poll tax) on the basis of whim, ideology, prejudice or someone's bright idea in the bath, without proper argument or analysis or piloting. If you tried to argue for a change in clinical practice without some evidence you are unlikely to make progress. Not so government. What that means, I think, is that we must never presume government support, any more than public support, for the things we hold dear in public health and medical science and which we assume are self-evident. There are plenty of other things for the government to spend cash on. I give you one example. While it seems obvious to me that there are few better cases for expenditure than education, including of further education colleges as well as universities, there are those who think that the universities in particular have money sloshing about which they don't deserve or spend responsibly. That came out in the Augar Review, which also reflected a wish to give more central direction from government to universities.

So, to sum up so far, the analysis part of my talk.

1. Politic are unpredictable and unstable. Like many of you I suspect, I hope that what we are seeing is transitory, that after these eruptions and shocks, we will return at some stage not to a sunlit upland which never existed but to some political calm, respect for difference and courtesy so that we can focus together on the big issues of our time including the things that unite us. But I doubt it. I fear that we are seeing a new norm which gives me shaky confidence in our or indeed most other large governments' ability to tackle climate change or prepare us for the technological revolution. The second Civil War in the UK looks like continuing.

2. We know too little of what members of the public think. Not enough people have the tools to help them discriminate. They are bombarded by information and it is a mammoth challenge to tread a well-judged and critical path through the overload of facts and claims including on medical science.

3. Finally governments feel free to introduce new policies without any information that they are actually needed and may work. You will have spotted the Gadarene rush to legislate. It is a myth that adding thousands of new laws, and new crimes, to the statute book makes us safer and happier. It would often we better just to concentrate on implementation and delivery of existing policies.

   At this stage I need to apologise for adding to any gloom you may feel about events outside this hall. It is my hope that the second half of my talk will be more positive.

   So what does this mean for you and me, the wider British science community and our international friends and colleagues? How should we react? What should we do?

   Well we should try to avoid being too gloomy and cynical and wringing our hands. Look at Greta Thunberg.

   And my suggestions are personal and not meant to be prescriptive. There will be plenty that we can do that I have not thought of but you have. But I do think we need

1. Greater political skill, to frame our arguments in varying ways, recognising that the production of compelling data in support of an argument is generally insufficient to win it in politics and even with the public. We need to develop more people who can describe imaginatively the economic and societal benefits of medical science, not as sometimes happens believing that they are so blindingly obvious that you would only be a fool not to recognise that. We need to make the case repeatedly, to the government but also to others. We need to be better at celebrating success. At the same time we should be careful to avoid anything that looks a special pleading for our own interest rather than those we serve in society. I have been a bit disheartened by those who have thought that it was enough to state that Brexit is damaging British science, and that leaving without a deal will compound that damage immeasurably. We need to come up with mitigating policies, with reassuring

our international colleagues, with building new networks and strengthening old ones. In other words we have to do what we can to shore up and protect what we value because we can't depend on Government to do so. In the same way that we should plan for continued global warming while doing everything in our power to advance the dramatic reduction in emissions that is essential, we need to do what we can to minimise the damage to science from Brexit by constructive suggestions and proposals which we can do without government.

And when politicians do something which looks positive, we need to praise and encourage. I cite two examples, the much increased investment in UKRI and the recent announcement of visa policy for incoming scientists. If we never acknowledge or thank, admittedly sometimes through gritted teeth, largesse may not come our way again. Imagine a conversation within government

"But we gave them £x last time round and the response was a series of grumbles. Don't let's bother this time round." You may believe that funding decisions are made with great care. If you do I am afraid that you are wrong.

In anticipation of a reaction that we must be true to ourselves, even if others are not, I agree, and I am not arguing that we should muzzle our protests but in sticking to our principles we need to recognise, although not necessarily accept, the wider context of today's political realities, and the demands on public expenditure when the pound is plummeting.

And by the way think yourselves of going into politics. In the Lords there are some who are outstanding scientists. We desperately need some in the Commons.

2. That brings me to public engagement with science. This has never been more important in my view. The public vote and are patients and we need their help both in supporting investment in medical research and in participating in it. And we need them to trust us with their data. When I joined Wellcome eleven years ago (don't worry –I shall be gone soon!) some of the public engagement which we then funded seemed to me formulaic and patronising, one-sided- "here you are"-rather than fully joint and participatory. I think that we have all become wiser, in particular in working with the communities we serve in partnership so that we strive together to generate social benefit and improve health, rather than assuming that we all know what they need. It is hard not to live in an isolating bubble as I said earlier. We need to start early. If you have not seen it do look at Wellcome's on-line resource to help primary school teachers sow excitement for science. It's called "Explorify". I recently went to a school in Camden, close to Wellcome, which is using it. I met a class of seven year olds, few of whom spoke English as their first language. Sitting cross-legged on the floor, proudly wearing their lab coats, they were entranced by the lesson. When I asked them how many intended to become scientists all hands shot up. If I had had a lesson like the one they had I would have learned that science is exciting, creative and imaginative, as we discover more about the world we live in and ourselves. It was fun. As it was I drew the amoeba. Our Project Enthuse, done with the Department of Education and business, offers

high class CPD to science teachers and their technicians. And universities are doing some brilliant outreach work with schools in their communities. At Imperial, where I was the chair of the council, we had labs which were fully booked by local schools who came in to engage with our staff and students. At the other end of the scale I have sat under a mango tree in Kenya and been questioned by elected representatives of a cohort. I've watched street theatre with a health theme in the slums of Mumbai and listened to a male voice choir in Kwazulu Natal, advocating, if I remember contraception, all funded by us. So we need to go on bursting the bubble, listening and responding to what people tell us they want. And we should not be in the least bit afraid to try things out and fail.

3. The third of my subjects on which we can make a difference, regardless of government, is science diplomacy. By this I mean ignoring, as far as possible, the disruption caused by all the things I mentioned earlier, the erosion of international organisations, the increasing divisiveness in international relations and trade, abusive public discourse, an absence of truth and barriers to discovering it, and the reluctance to meet halfway. But we don't have to leave diplomacy to the professionals, although I have a high regard for those in the FCO who are still permitted to practice it. The science community is international, its collaborations extensive, its links worldwide, no more so than here at the London School of Hygiene and Tropical Medicine. You have made those bridges for years. In your commitment to global health you have been the exact opposite of narrowly nationalistic, one of the reasons I am proud to stand here tonight. It was very refreshing when I arrived at Wellcome to find that it was staffed by people from all over the world. In my last job, naturally enough we could only employ British citizens and not new ones as we needed to be able to vet them throughout their lives. I realise now that while we were good at diversity, for example topping the Stonewall index in 2016, after my time, we missed the diversity that you get from working with someone in or from Belarus or Myanmar or Senegal. The British Museum can ease international hostility by putting on an exhibition, as it is about to, called "Inspired by the East-how the Islamic world influenced Western Art." You too have the capacity to promote wider understanding through science in many different ways, large and small. With governments putting up walls and barriers, richly ironic after the years when we spent billions trying to tear down the Iron Curtain, we can and must surmount them. If we are excluded from some networks we must show our values and our principles in others. We need to counter together the view that the UK does not welcome foreigners or wish to work ever more closely with them.

4. My final point is leadership. There is no template and we need a range of leaders with different skills. Above all we need scientists who wish to explore and learn how they can lead in their field and beyond. This is now well-recognised with the provision of various courses, most recently a highly regarded one designed and run by the Academy of Medical Science. We need people to head Institutes, Wellcome Trust Centres, Universities, the MRC and other parts of UKRI, act as science advisers to government departments, even run Wellcome, not to mention doing all those things elsewhere in the world. We need scientists on the boards, not just of bioscience start-ups but as non-executive directors in FTSE companies. And, as I have said already to lead in parliament. I expect that suggestion to

have fallen on very stony ground as it always does, but we desperately need people of principle and integrity from a science background to go into politics. Above all we shall continue to need those who can anchor science and medical research in the centre of our public life, who are excellent communicators and able to find their route through the minefields of today's world. And promote the medical research which is vital to our health and well-being.

We also need leaders who are passionate about improving the way we do things, discovering breakthroughs for human health but also handling change, priorities, pressure and uncertainty.

You will have your own thoughts on leadership having observed those you can learn from and those whose behaviour you wish to avoid. I have always been hostile to the idea of role models largely because it is my gender which is usually told it needs them. But we all observe and I have tried to copy subtle and skilled leadership while rejecting authoritarian approaches. There are those who say that leadership is lonely. That is only true if you stick yourself on a pedestal, to which suitors come to hear from the oracle. If you realise that you are privileged to lead and that many junior to you will be cleverer than you with better ideas you won't be lonely at all. It is after all a strength to admit ignorance not a weakness.

Leadership can be practised at all levels. How you support and steer a junior technician may be as important in the long run as tramping along the No 10 passages to try and twist a Prime Ministerial arm. It is never too soon to hold up a mirror and think about how you might lead, seeking frank feedback from your colleagues and own leaders.

That brings me to the rewards of coaching and mentoring junior colleagues. Thanking, praising, encouraging are all important and are too often overlooked. Leaders need to stop people working as well as inspire them. They need to stimulate and welcome challenge and dissent. They need to listen. It helps if they have humour and use it for perspective and to lighten pressure. They must challenge bad behaviour, give honest and constructive feedback and not duck the difficult. The mantra" Our People are our greatest Asset" needs to be more than a mantra. Leaders need to be fair but that does not mean treating everyone the same. Different people need different leadership, whether leaving them alone to get on with things or offering lots of reassurance. And leaders need to adapt to different circumstances as we are all forced to do now with a no-deal Brexit looming.

Before I end I would just like to touch on research culture. Some of you will recently have seen a letter sent by Chris Whitty, Jeremy Farrar and Fiona Watt, addressed to Vice-Chancellors, Deans and Principals of Medical Schools and universities. It is headed "Repeated failure by certain institutions to support trainees and mid-career staff." It is strong stuff and it reflects a broader concern that while of course, there are outstanding institutions, individuals and departments who nurture medical scientists, some ignore the obligations they were contracted to meet when they secured funding. We cannot hope to influence politicians, work with the public, conduct science diplomacy or lead if bits of our own house are severely neglected. Apart from anything else the talented men and women

who we want to stay in this field and become the leaders of the future, ready in turn to promote medical science, will not do so if they are not encouraged and helped.

I do not want to end on too downbeat a note.

There are lots of things to celebrate and I remain optimistic. In my lifetime I have seen staggering medical advances, many of them down to people like you with a public health focus, millions brought out of poverty, greater acceptance of difference, of race, of gender, of sexuality, less stigma attached to mental illness, an explosion in this country of higher education and very many things to cherish and celebrate. Despite the climate emergency which we are only half facing, and despite regression on some of our advances, I remain an optimist and believe that this period too will end and that scientists, through politics, engagement, diplomacy and leadership will be key to that. You only have to listen to a group of young scientists, anywhere in the world, describing their work in a poster session, to share my optimism.

When I finished laboriously typing this speech (I refused to learn typing fifty years ago for fear of a career as a secretary) my husband asked me if I was happy with it. I said no. But I hope that I have not too much lowered the standard of the John Snow lectures and I am grateful to you for not falling asleep.