

# The Climate Emergency: "...this year the answers are different."

Thank you for inviting me to give this lecture. It's an honour and a privilege to be here at the Royal Holloway.

I was once told by a distinguished diplomat that to understand any big issue you need to know only two things: history and the map. So when I got this invitation I studied both. The map was easy – I live not too far away. And the history of the Royal Holloway was inspiring.

I'm struck by how forward-looking were the founders of this institution.

Forward-looking about women, because the two colleges which formed the Royal Holloway were among the first places in Britain where women could access higher education. I've spent a lot of my life living and working in developing countries. And while there is debate about precisely what interventions work best to fight poverty and promote sustainable development, there is overwhelming evidence that the most powerful thing you can do can be summed up in just two words – educate girls.

Forward-looking about black rights, because Sarah Parker Remond, one of the first students here, was the first black woman to undertake a round Britain lecture tour to tackle slavery.

Forward-looking about mental health, because your founder Thomas Holloway's first venture was to build a sanatorium in east London to support people with mental health problems.

I was also struck by how forward-looking your Geography Department is, and how focused on the climate emergency. Examples:

- The recently published study on Human Health in an Era of Global Environmental Change by your Dr Jennifer Cole, which explores the idea that the health of the environment and the health of humans is inextricably linked. There's a message there for the Treasury in how best to spend money on health – putting some of it into creating a better environment is likely to give you a greater return on investment than putting all of it into the NHS.
- A new briefing, co-authored by your Dr Bethan Davies, which warns that if we fail to restrict global temperature increase to 1.5°C by the end of the century, the Antarctic will experience irreversible and dramatic change. As we know, that isn't just bad news for the penguins: it's bad news for the planet.

I learnt two other things while I was preparing for this lecture. First, how successful the geography department is: a score of 96% for overall student satisfaction in the national league tables is hugely impressive. And coming first in the UK league table for satisfaction with teaching in the latest

Guardian University Guide is even better, and a huge tribute to Professor Crang and the whole faculty here.

Second, I now know who Gordon Manley was, in whose name this lecture is given. I now know that he was a British climatologist who was Professor of Geography at Bedford College which subsequently became part of Royal Holloway. And I know that his life's work was compiling the Central England monthly temperature series which runs all the way back to 1659 – the longest instrumental record for any location anywhere in the world. And that matters: that record is news we can use, because it allows us to understand whether, how and why the climate is changing.

All that means, I think, that I am in the right place to talk about the future and about climate. And I'd like to think that I am the right person from the right organisation to do that. For those of you who don't know the Environment Agency, the clue is in the name. We are Europe's biggest environmental protection organisation. Our purpose is simple: to create a better place, for people and wildlife. We have 10,000 people up and down the country who do just that.

We protect the environment by regulating the industries – waste, energy, farming etc – that could damage it. We work to ensure that our water, soil and air stays clean and the life that depends on them is not harmed. When pollution happens, we respond to limit the damage and clean up the mess – and in serious cases we take action against those who have caused it.

We enhance the environment, by planting trees, restoring rivers to their original natural state, and working with others to create new and better habitats.

We protect people from flooding, by building and operating flood defences on our rivers and coasts, by warning and informing communities when floods threaten and by coming to their aid when they happen.

And we create better places, by working with planners to design and build cities which are life-enhancing to live in, with the blue and green spaces people want and the sustainable infrastructure we all need for the future. And we are working particular to create the kind of places and the kind of country we will need to cope with what is by far the biggest challenge of our time: the climate emergency.

## **The climate emergency: what's happening**

I won't presume to lecture you about the fact or the causes of climate change: most of you will understand it better than me.

I will just say this: that the rise in global temperature over the last several decades is a matter of public record; that there is an overwhelming scientific consensus that it can only be explained by one thing – the rise in greenhouse gas emissions caused by human activities; that this is having precisely the effect the science predicts, which is a rise in global temperatures; and that this in turn is causing more extreme weather and

rising sea levels.

Not only is global warming happening, it may be speeding up. The 20 warmest years on record have all come since 1995. The five warmest years have all been in this decade, the 2010s. 2016 was the hottest year since records began. 2018 saw the joint hottest summer on record in the UK.

## **The climate emergency: what we're seeing now**

So we all know the general climate issue. But let me bring it to life a bit by telling you what my teams in the Environment Agency are now seeing on the ground.

We are seeing more extreme rainfall and more extreme flooding. In 2015 a gauge at Honister Pass in Cumbria recorded 341mm of rain in 24 hours, a new record: that rain caused some of the worst flooding in living memory.

In 2017 there were flash floods at the Cornish coastal village of Coverack. They were caused by an extreme rainfall event which set a new UK record for 3-hour rainfall intensity.

We are seeing more extreme heat. Last summer's prolonged dry weather caused local droughts, environmental damage, fires, pollution, and the death of wildlife. Our teams responded to three times the normal number of pollution incidents – including by going out and rescuing fish that were in distress because of low water or oxygen levels. And despite a lot of recent rain, if we have a third dry winter now then next year we will be facing water shortages in the South East.

We are seeing rising sea levels. The Thames Barrier, a few miles downstream from where we are now, which we own and operate, protects London against flooding from high tides. It has that predicted sea level rise designed in, and will be sufficient until around 2070. But we are already planning its successor, which will have to cope with the significantly higher tides and sea levels we know will happen as a result of climate change.

We are seeing impacts on national infrastructure as it comes under greater pressure from climate change. A few weeks ago Toddbrook Reservoir in Whaley Bridge nearly failed after heavy rainfall. A disaster was narrowly averted – and the Environment Agency was at the heart of that operation. But like Toddbrook, much of our infrastructure is Victorian: it's aging and it wasn't designed for the more extreme weather climate change is causing. That is bringing greater and greater risks.

## **The climate emergency: what will happen if we don't tackle it**

The science also tells us what will happen if we don't tackle the climate emergency. There will be:

- more frequent and more extreme flooding and coastal erosion, caused by

wetter winters, heavier rain, stronger storms and rising sea levels. That threatens all of us, because floods destroy: lives, livelihoods, communities.

- more water shortages and higher drought risk, caused by the hotter drier summers and less predictable rainfall. That would do deep damage to our economy and our environment.
- more frequent and more extreme fires and wildfires, such as we saw in the UK and around the world last summer, often with terrible cost to humans and wildlife.
- more air and water pollution, due to those longer, hotter summers. That will threaten plants and animals, our wider environment and our own health.
- more damage to wildlife and the habitat on which it depends. In many cases that damage may be existential. If we continue to emit greenhouse gases at the same rate as today, then by 2050 one million species across the globe are likely to vanish.

The climate emergency will damage something else too: human rights. Because climate change is not just an environmental challenge. It's also a human rights issue. It directly threatens people's economic and social rights – to life, water, food etc. And it threatens their civil and political rights, because diminishing access to water can cause conflict, for example.

Worse, climate change exacerbates inequalities and does most damage to the rights of the most vulnerable – women, the poor, those in developing countries – because they have the least capacity to adapt to its consequences. They are also the people who bear least responsibility for causing the problem in the first place. So the fight against climate change is also a fight for climate justice.

## **What we need to do about it**

So we know the problem. We also know the basic solution.

We need to mitigate the damage from climate change, by reducing or stopping the human activities which are causing it. We can do that in particular by cutting our emissions of greenhouse gases.

And we need to adapt to the changing climate, so that the planet is resilient to its effects, for example by designing infrastructure that can cope with the more extreme weather we know is coming.

And at its most basic, we need to live differently. We need to reduce, replace or stop the human activities that are driving climate change.

All that is everyone's problem, and everyone needs to contribute to the solution.

## **What the EA is doing**

The Environment Agency is stepping up what we do ourselves. We have now made tackling the climate emergency our top priority.

We are working actively with those we regulate – industry, farmers, the energy sector – to ensure they reduce or eliminate their greenhouse gas emissions.

We have a statutory role in planning decisions. So we are working with local authorities, planners and developers to create better places, designed for the climate we now anticipate.

We are working with the water companies to manage the risks and short term consequences of drought, and to ensure that the country will have better water security in the long term.

As we build new flood defences up and down the country, we are ensuring that they are explicitly designed for greater climate resilience.

And in the face of the climate emergency we are producing a new national strategy to manage the risk of flood and coastal erosion between now and 2100.

Our strategy will say that the climate emergency is a game changer. We can no longer plan for a maximum temperature rise of 2° by 2100 but for a possible rise of 4°, and the even more violent weather and higher seas that will mean.

It will also say that we need a new response to this. We need to move from a narrow concept of protection (essentially building walls round things to stop water getting at them) to a broader one of resilience. That will still include building flood defences to protect communities. But we will need increasingly to focus on strengthening their ability to cope with flooding and coastal change when it does happen, and on building back better afterwards, rather than just recreating what was there before. And where communities are cannot be defended in the long term we will need to move them.

Gandhi said: “be the change you want to see in the world”. And we in the Environment Agency do think that as an organisation we need to walk the walk in how we operate ourselves.

That is why earlier this month the Environment Agency announced that we will set ourselves the goal of becoming a net zero organisation by 2030. That means that by then we will be taking as much carbon out of the atmosphere as we are putting into it, so that we are no longer contributing to climate change ourselves.

This is going to be very difficult. Much of what we do, like building flood defences, pumping water, and moving goods and vehicles around the country, puts out a lot of carbon. We will need to find different ways to do those things that don't contribute to the climate emergency. We don't yet have all the answers. So net zero by 2030 is already a very tough challenge.

So we have done the obvious thing, and decided to make it even harder for ourselves. We have done that by setting an even more ambitious aspiration for 2050: we will explore whether we can become, by then, an absolute zero organisation – one that does not produce any carbon at all. We know of no

other major organisation that has done that – and there may well be a reason why. But we think it is right to challenge ourselves.

As President Kennedy said when he announced that the US would seek to put a man on the Moon even before NASA had any idea how to do that, we choose to do these things not because they are easy, but because they are hard.

## **What the government is doing/should do**

The government has a big role in tackling the climate emergency.

The 25 Year Environment Plan launched last year is an important step forward. It commits the government to take all possible action to mitigate climate change, including by continuing to cut greenhouse gas emissions; to adapt to reduce its impact; and to ensure that all government policies and investment decisions take it into account. And the new environmental watchdog announced in the Environment Bill will have a role in holding this government and future governments to account on their climate performance.

Perhaps even more significant is the example that government and Parliament have set by adopting the target of making the UK as a whole net zero by 2050. In June the UK became the first major economy in the world to pass laws to end its contribution to global warming by that date. That builds on the foresight and cross-party support that gave us the world-leading Climate Change Act, the basis for the UK's approach to climate change, which required that emissions of greenhouse gases are reduced and that climate change risks are prepared for.

And the government has another great opportunity to show global leadership when the UK hosts the next UN Summit on climate change next year.

## **What business can/should do**

Business has a critical role to play too. Each business will either be part of the problem or part of the solution. The key to ensuring that most businesses are in the second category is to re-frame the issue: to recognise that tackling the climate emergency properly will not impose unacceptable costs on business but will actually save money and generate new growth. This climate emergency is also a huge investment opportunity, in particular in those sectors which are the backbone of the economy such as housing, transport, retail, utilities and industry.

And I do think business increasingly gets it. The insurance companies are pricing climate change into their policies and looking to help their customers become more resilient to its effects, not least because that can cut insurance payouts when things like flooding happen. The water companies, energy companies, retail sector and others are recognising the business sense in investing in their businesses now to ensure resilience later. As the Chief Executive of a large water company said to me recently: if I don't have water, I don't have a business.

And forward-thinking companies are factoring climate into their operations to

beneficial effect. Example: the Thames Tideway Tunnel, currently being built for Thames Water.

The Tideway is a new 25km sewer that will run from west to east London under the River Thames. It will address the problem of overflow from London's Victorian sewers, which currently dump sewage into the Thames after high rainfall. When the Tideway is completed, those sewage overflow discharges will instead be stored and treated properly. The Tideway is one of the biggest infrastructure schemes in the country. It will also bring the biggest single change to the quality of the Thames in generations. The Environment Agency is working closely with the company to ensure we get it right.

Last week I went down the Tideway Tunnel, now well under construction. Tackling the climate emergency is designed into the project. It will increase London's resilience to the higher rainfall that will result from global warming. It is a low carbon design: 95% of the carbon emitted in the project's 120 year life will come from the construction – it uses low carbon concrete, and the parts are designed to last for 120 years so there will be no need for (carbon heavy) replacement. It uses low carbon transport: most of the project's supplies come in and most of the spoil goes out by barge rather than by truck. And it creates new green spaces which will act as carbon sinks.

## **What you can do**

So as we confront the biggest challenge of our time, there's a role for the Environment Agency, for government, and for businesses.

And I'm here tonight to tell you that there is also a role for you.

There's a role for you as students or academics. As they say in Silicon Valley, the best way to predict the future is to invent it. We don't yet have all the answers about climate change and how to tackle it. We may not even yet be asking all the right questions. We need the best evidence, the best analysis, the best predictions, the best new ideas – that's what institutions like this, and students and faculty like you, can offer.

For the students here tonight, there's a role for you in whatever future career you take up. Whether you go into professional geography, wider academic research, finance, construction, IT, politics, health care, planning, the law, the creative sector, tech startup, services, food and farming, or all those new jobs that haven't been invented yet, what you do and don't do will make a difference to whether we can or can't live sustainably and tackle the climate emergency successfully.

And if you don't fancy any of these career options, you can always consider joining us in the Environment Agency. We are always on the lookout for talent. There is a lot of it sitting in front of me right now. If we are to tackle the climate emergency and create the better place we want this world to be in future, we need your energy, commitment, insight and readiness to think different.

I quoted President Kennedy on why he launched the Apollo programme. When he came to power sixty years ago, the space programme was the new frontier. Today the new frontier is not leaving Earth but saving it. I'd like to invite all of you to consider doing that with the Environment Agency.

And finally, whatever you do in your future careers, there a role for all of us as humans now.

The Environment Agency's offices in London were recently surrounded by protesters from Extinction Rebellion. I support most of their aims even if I disagree with some of their methods. Last week I saw an XR poster I hadn't seen before. It said: "The biggest threat to the planet is the belief that someone else will save it".

And on that XR are unarguably right. If we are really to win the fight against climate change we all need to change how we behave. We need to live differently: so please have less stuff, share what you have, consume less, reuse more. We need to travel differently: so please walk, cycle or use public transport wherever you can, and reduce your car use and flights. We need to eat differently: that means less and better meat and dairy. We need to use less energy: so turn your heating down, insulate your home, switch things off. Most of all, we need to influence others: so please encourage your family, friends and colleagues to make a change too.

## **Conclusion**

Since this is a scientific institution, let me close by quoting the most famous scientist of all, Albert Einstein. As a Professor he set his students annual exams, and one year as Einstein was distributing the exam papers a clever student noticed something. He put his hand up and said: "But Professor Einstein, these questions are the same as we had last year". And Einstein replied: "Yes. The questions are the same. But this year the answers are different".

We know most of the questions we have to address to tackle the climate emergency. And we already know some of the answers. But some answers we don't yet know, and some of the answers we have today will be different in future. All of you, and all great institutions like the Royal Holloway, can play a role in delivering those answers. Please do. There will be no greater gift to science, or to this planet.