HOUSE OF COMMONS

Environmental Audit Committee

Oral evidence: The UK and the Antarctic environment, HC 499

Wednesday 11 December 2024

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Watch the meeting

Members present: Mr Toby Perkins (Chair); Julia Buckley; Ellie Chowns; Barry Gardiner; Anna Gelderd; Sarah Gibson; Pippa Heylings; Chris Hinchliff; Martin Rhodes; Blake Stephenson; Alison Taylor; Cameron Thomas; John Whitby.

Questions 408 - 477

Witnesses

I: James Gray, Former Chair, Environmental Audit Sub-Committee on Polar Research (2023-24).

II: Professor Dame Jane Francis DCMG, Director, British Antarctic Survey; and Dr Iain Williams, Director of Strategic Partnerships, Natural Environment Research Council.

III: The Lord Vallance of Balham KCB, Minister of State for Science, Research and Innovation, Department for Science, Innovation and Technology; Stephen Doughty MP, Minister of State for Europe, North America and Overseas Territories, Foreign, Commonwealth and Development Office; and Jane Rumble OBE, Head of the Polar Regions Department, Foreign, Commonwealth and Development Office.

Written evidence from witnesses:

British Antarctic Survey

FCDO

Examination of witness

Witness: James Gray.

Q408 **Chair:** Welcome, everyone, to the latest meeting of the Environmental Audit Committee. I am very pleased to say that this session will be looking at the evidence heard by our predecessor Committee in the previous Parliament on polar research in British Antarctica. We are delighted to be joined by the Chair of the Environmental Audit Sub-Committee in the last Parliament, James Gray. Mr Gray, thank you very much indeed for coming back to speak to us. I know that the Antarctic is an area you have had tremendous interest in, in the past. Can you explain where your interest started and what got you to persuade the previous Committee to consider the UK's relationship with Antarctica?

James Gray: Chair, can I first of all thank you very much indeed for having me back. I am delighted that the Committee is looking into the report. We did a lot of work on it and it is useful that the work will be carried on in the new Parliament. Thank you very much for doing that and for doing me the great honour of asking me back. I will tell you, it is pretty frightening being the gamekeeper turned poacher.

The answer to your question is twofold. My own personal interest goes back a long way. I have been personally involved in the Arctic and the Antarctic for many years, the reason being that I discovered many years ago if you are interested in Parliament in education or health or the economy, so is everybody else. The thing to do is to find a little thing that nobody else knows anything about. No one else knew anything about the Arctic and the Antarctic and, therefore, I was able to make myself a mini-expert in it, so that is what I did.

The second part of your question was how did I persuade the EAC to take a delegation down to Antarctica and to engage in the inquiry, and that answer is in two parts. The first part is that prior to that we had done an inquiry into the Arctic and it seemed logical to consider the other half of the equation, which was the Antarctic, but that is a rather secondary consideration. The main reason for it, which will not surprise members of this Committee, is that we were exceptionally concerned about climate change and about two things really, first the effect that that was having on Antarctica, the effect on biodiversity and all the rest of it, and, secondly, the effect that a worsening of ice melt in Antarctica would have in the northern hemisphere. We felt that it was right, first, to go and see what was happening with climate change in the Southern ocean. We were pleased not only to be in Antarctica, down the Antarctica peninsula, but we also had a look at South Georgia and the Falklands and a little bit in Chile as well. It was a quite broad-spread inquiry.

We were pleased to go and see what was happening with ice melt, and I will come back to that in a moment, but also to see how Britain was contributing to its consideration and how it was contributing to doing something about it. Simply analysing the fact that we have climate

change and the ice melting is fine, but I think everyone agrees about that. It is more difficult to know what we are going to do about it now. We were keen to see how Britain was contributing to that. We were proud of the fact that Britain is one of the biggest single contributors to Arctic and Antarctic science in the world. We were proud of the fact that the British Antarctic Survey and NERC—less so NERC—were doing such great work down there and we wanted to see what they were doing. We were proud of the fact that we have had RRS Sir David Attenborough launched and it is now down there.

We were given the opportunity of a flight to Falklands, going round South Georgia on an RAF plane, then going on to the SDA as we call it, the Sir David Attenborough, travelling down to the Antarctic peninsula, visiting the much improved scientific research base Rothera, which is halfway down the peninsula, and seeing the work that the British Antarctic Survey does. We also had a chance to visit HMS Protector, which happened to be there at the same time, and see what it was doing. We came back out via Chile and had a word with the Chilean Government, which has great concerns about Antarctica. We were seeing what is happening there and seeing what we are doing about it and the contribution we are making to it.

Chair: Excellent, thank you. On that subject, I will bring in Julia Buckley.

Q409 **Julia Buckley:** Could you share with the Committee what your key takeaways were from the Committee's visit to the Rothera research station?

James Gray: There are several. It is a very broad question and I do not mean to talk too much and, therefore, prevent you all from asking more questions.

The first thing is through our visit to Rothera and our trip on the SDA and our visit to Cambridge—we have a facility in Cambridge—and in the evidence sessions that we held here, we were enormously impressed by the expertise of all the scientists, and particularly the British Antarctic Survey, who I know you are seeing later today, and the fantastic work that they do. We are lucky with the absolutely outstanding capability that we have, the Americans have and one or two other people have. It is world-beating capability and we are enormously proud of that. Our visit reconfirmed that, seeing the work that will be done in Rothera. It is halfway being restored or rebuilt and there was not that much going on with science, but we could see that as soon as that work was completed there would be an outstanding contribution to the science at Rothera. Item 1 is we were impressed by what we saw.

Item 2 is we were depressed by what we saw on climate change. I was very struck, for example, when flying with the RAF from the Falklands around South Georgia. I was on South Georgia about nine or 10 years ago and it was an absolutely ice-free zone. South Georgia is slightly warmer because of the Southern ocean and there was no ice there at all.

When flying around it last April, there were huge icebergs. These are megabergs that have broken from Antarctica. One of them was just about the same size as the island of South Georgia itself. It was a gigantic piece of ice, and this can't be right. There must have been hundreds and hundreds and hundreds of icebergs off South Georgia.

The same applied in—I have forgotten the name of the strait, which is bad of me—the strait that goes down the inside of the peninsula to get to Rothera, which was again ice free. We could see looking up at the mountains either side of the glaciers that they had been much more icy but the ice was now in the strait. When talking to the scientists we met down there and the people from BAS and other organisations, they were able to describe to us some shocking evidence of climate change and the effect on the ice in Antarctica.

Item 3 was, and this is a consequential, the effect that that is having on biodiversity and animal life. The emperor penguin is the one that always catches the news but all the animal life and sea life in the south Atlantic and Southern ocean was pretty dramatic.

Those are three positive takeaways. At the risk of upsetting my friends in the British Antarctic Survey, I want to also raise with you a little question mark, which I think is worth asking. The EAC report into the Arctic came to the conclusion that we are spending comparatively little money in the Arctic and Arctic science compared to an enormous amount of money in Antarctica. There are very good reasons for doing that and I am sure you will quiz Dame Jane later on this subject. The fact is that we are only 400 miles away from the Arctic and we are 10,000 miles or so away from Antarctica, but we spend a vast amount of money in Antarctica. Linked to that, and the reason, I suppose, that the Foreign Office would give you, is that we have a big geopolitical interest in the Southern ocean. We have the Falklands, South Georgia, the Antarctic Treaty System, CCAMLR and all that.

It is very important that we should be there flying the flag and we use science as a way of flying the flag. I just slightly raise my eyebrows and say: is the funding that goes down from UKRI through NERC to BAS and which is then used for the SDA and Rothera really the best way of Britain flying the flag? If BAS's job is to do the science, and it does an outstanding job of doing it, to what degree can it justify spending money on the infrastructure?

Chair: We will cover these issues when we get a chance to speak to them.

Q410 **Julia Buckley:** To follow up quite briefly, how did the experience shape your understanding of the logistical and scientific challenges that are faced by BAS?

James Gray: You can't know what is happening unless you go there, so the Committee was very keen to go there. Of course, the logistical

challenges are enormous, just getting there. Flying to the Falklands is quite tricky but then getting from the Falklands down to Rothera was a major operational difficulty. We were very lucky that BAS found some slots for us on the SDA. We were also lucky that the Southern ocean was fairly flat, fairly calm when we crossed it, but it is not normally. It is normally one of the wildest seas in the world and you can't fly there at the moment because the runway at Rothera is closed. The logistical challenges are huge.

The logistical challenges with science are huge. Most scientists sitting in a lab in Cambridge have a nice time, but if you are out there on a Ski-doo device, if you are down there out in minus 20 or 30 with huge winds, it is a seriously difficult thing to do. The logistical challenges of doing science down there are extremely high. That is why we are so pleased that we are doing the rebuilding of the infrastructure in Antarctica to take account of that. It is worth doing, it is good stuff, but I am slightly questioning the way in which we fund it.

Q411 **Anna Gelderd:** Based on your observations during the inquiry, where do you believe Government action is most urgently required to ensure that climate change, biodiversity threats, fishing and tourism are given sufficient consideration under the Antarctic Treaty System?

James Gray: The ATS is superb and our contribution to it is brilliant. Jane Rumble from the Foreign Office was with us on the trip and she is the commissioner, I think I am right in saying, if that is the right expression, in charge of ATS. We punch above our weight on the Antarctic Treaty System and on CCAMLR, which is a very complicated organisation because it operates on unanimity. Getting the Russians and the Chinese and even the Norwegians to agree with us on anything to do with fisheries is quite tricky. What we do in ATS and CCAMLR and flying the flag is extremely successful. I think we should be proud of it and agree it is an important part of the thing that Britain plc does, and we do it exceptionally well. The second part of your question has just slipped my mind.

Q412 **Anna Gelderd:** It was where is required action most urgent and the topics of climate change, threats to biodiversity, fishing and tourism. I was going to follow up with a second question about providing effective support for UK scientific research on the continent.

James Gray: We have been the lead in the COP process and it is quite right that we should be. However, recent experience was not encouraging, to say the least. By far our first duty must be to fight the battle against climate change and meeting net zero by 2050. That has to be what we are about. Presumably, this Committee is very committed to that and we must not let that slip.

I sometimes get worried when you look at America and President Trump arriving, or even this country where one or two political parties take the view that climate change does not exist or, if it does exist, we cannot do

anything about it or if we can do anything about it, it is too expensive. We have to fight against those easy truisms. It is not true; it is wrong. From what we saw in the environment in Antarctica, it will get worse but it will get a heck of a lot worse unless we do something about it. The first thing has to be CO_2 and methane as well.

The second thing is that we need to think carefully about how we target our money. We are spending a lot of money on science. I am glad that we are and it is money extremely well spent, but I think we are possibly coming to a stage where analysing whether climate change is happening or not or even analysing how bad climate change might be is historical. We are all agreed on that front; that is dealt with. I would much rather see a lot more money, effort and energy spent on considering what the world can do about it as part of the COP process but also in lots of other ways. For example, there is very little co-ordination—and more to do with the Arctic than the Antarctic—among the 70-odd universities in Britain who have some form of Arctic scientific department. I don't know what they do but at least theoretically they don't know what each other is doing.

I think it is much more co-ordination and much more big science. Dame Jane, who you will be seeing later on, is a very great advocate for big science. We can't do things, little Britain, let's do more with America. There have been a couple of very successful transnational operations that we have done with America and with others. I think that much more of that needs to be done. We need to find a way of spreading the burden across and persuading other people to step up to the plate and do their bit.

Q413 **Anna Gelderd:** Thank you very much. To follow up on that, where do you see the most urgent action needed to provide effective support for the UK's scientific research on the continent?

James Gray: I don't want to be complacent but I think everyone would probably agree with me that the money we spent in building the Sir David Attenborough and the Rothera upgrade is a lot of money well spent by UK plc. Asking for more money all the time might not be the right thing to do. Those are debates we had, and you will need to ask others about this. We have gone down from two ships to one ship, and there was great debate as to whether or not the Sir David Attenborough alone is enough of a ship. A lot of people thought we ought to perhaps charter a second ship for the logistics of carrying stuff from the Falklands and South Georgia to Antarctica while the SDA could focus on the science, which is what she was built for at £250 million or something. There is some discussion to be had about that. I think the answer you will get from the Treasury will be that there is no money and, therefore, don't waste time asking for a new ship, but none the less that does not stop us thinking that might be a good thing to do.

I am a bit of a controversialist and I like stirring things up a little bit. I slightly wonder whether or not the science needed to be done down

there. Science nowadays is all about big data and, of course, we have people on the ground, people in the field, but could more not be done in labs in the UK and, therefore, less spent on getting people there? Equally, a third thing on this front is that all the money now is being spent on climate change science. That is the sexy beast and if you are a climate change scientist you get the grants, but if you are an old-fashioned bioscientist looking at fisheries and things you find yourself being slightly left behind, or that is what we were told by a number of people we met down there. We need to think about that. You can only look at emperor penguins when you are there, or largely; you can do a bit by video. We need to possibly think about the split between bioscience and climate change science.

Q414 **Cameron Thomas:** Is there any other key evidence that you would like the Committee to consider beyond the scope of that?

James Gray: It depends how fundamental you want to be. I think I would differ from other people in this to say my own personal view—I ought to declare an interest that I am halfway through writing a book about the Arctic.

Chair: Mr Gray, I am sorry, the question is about the evidence we need to look at rather than your view on this one, if you don't mind, the particular evidence you heard that you want to make sure we have not missed.

James Gray: It is hard to list that without bringing one's own opinion into it. It seems to me that the evidence we received was an enormous amount of money is being spent on Antarctica, on science or particularly on the infrastructure supporting science, whereas a relatively small amount of money is being spent on the Arctic and, therefore, maybe we ought to think carefully about UK plc carrying out Arctic-type science.

Q415 **Chair:** You have made that point strongly. We will be speaking to Ministers later in this session. You made the point about the funding, which we may well consider. You said at the start of your evidence that part of the question is what are Government going to do about it. Is there anything specifically that you think now we have a new Government we should be expecting Ministers to do as opposed to what we found?

James Gray: I would say that Ministers' hearts are probably in the right place. I had the good fortune of being at the Arctic Circle conference with Minister Doughty about a month ago and he really is committed to this cause. I think—and this is a machinery of government question rather than anything else—that the structure that goes from the Department through UKRI down to BAS is complicated and I am not quite sure how Parliament would scrutinise that. It is hard to know who is spending what money where and on what. It may be a PAC question: does BAS, at the bottom of the heap, get the right money and where does the money that is up here from the Department go to? There are 3,000 civil servants currently up here.

I think steady as she goes, by and large, with Ministers. We are not going to change the environment overnight. Britain does punch above its weight in it and I am glad that the Government made a good contribution to the COP process last month. Keep it up and hold toes to the fire and be ready to make a sacrifice in this country. We have to lead by example. It is no good us saying that we are only 1% of the world and, therefore, we can't do it. We have to lead by example and do stuff here and Ministers have to be robust. If that means putting up petrol prices or gas prices or things that might be unpopular, maybe you have to do that to achieve. Be tough and robust.

Chair: I am tempted to say that sounds like the sort of thing someone would say who had just lost an election, but I won't be so unkind.

Q416 **Barry Gardiner:** I agree with you about being tough and robust, Mr Gray. I want to explore some of the things that you have said. On the one hand you say we are doing world-class science here, but then you said that is all historic and we should just be focusing on what to do about it. You say there is not enough money here but maybe we should be spending more on an extra ship. It seems to me that there are real contradictions in the evidence that you are giving to the Committee. I know from our time together on the Committee how passionate you are about the Antarctic, but I want to get you to give us a clear line here. The work that is being done in the Antarctic is important. You do not just stop science because you say we now know that we have a lot of other things to do that result from that science. You keep on going with the science, don't you? The key thing here is how we can influence the way in which that science helps us tackle the problem. I think that comes to the question that my colleague asked you about the Antarctic Treaty System and how we can best influence that. Can you focus along that line?

James Gray: First, I plead guilty in the sense that I want everything. If we could have a second ship and 500 scientists, let's go for it, but I know we can't. I plead guilty to your allegation that my evidence or my personality is slightly split on the matter.

All the bureaucracy and the structures and the internal matters must not allow us to lose sight of the fact that the ice is melting at an alarming rate at both ends of the world and that is having a significant effect on wildlife and fisheries and biodiversity in every way. All these discussions about whether BAS is better to do it or whether somebody else should be doing something must not obscure that central truth. The Antarctic Treaty System is important in the sense that it prevents the use of Antarctica for anything other than science, although whether all the signatories are being quite as robust on that front as we are—I was not able to visit the nine, or some such number, Chinese bases there are currently in Antarctica—but the treaty system works well.

There are interesting questions, one of which we discussed quite a bit when we were down there, which is supposing you pick up one tiny pebble or a little piece of germ and you use that here for commercial

purposes to build a new medicine preventing cancer, are you allowed to do that and to what degree can you export the science that you find in Antarctica? There are things of that kind that the Antarctic Treaty System can address itself to.

One of the things that slightly worried me, and why I am delighted that the Committee is doing the work that it is doing, is that the whole question of Antarctica and the Arctic is a very small world. A number of us have been much involved for donkey's years and know a little bit about it—I am busy writing a book about it and all that great stuff—but the wider world doesn't. If you spoke to most people in this building and said, "What do you think about Antarctica?" they would go, "Polar bears". Do you know what I mean? There is a remarkable lack of interest and understanding in the population. One job that you as politicians can do is get the message over to the wider world that something really, really, really bad is happening in Antarctica and if we keep going the way we are going at the moment it will be a catastrophe.

Q417 **Barry Gardiner:** If you were still chairing the sub-committee, what is the one recommendation that you would insist was in our report?

James Gray: That is a rather difficult question to answer. I think the report, if I was still chairing it, would be overwhelmingly positive and say we are doing great stuff but be ready to answer some very difficult questions about the structural things that I mentioned. If we are trying to produce first-class science and win the battle over climate change, you cannot do it with the wrong structures. Some of the structural things and funding things are questions that should be asked and I think the Committee might do a lot of plain asking.

Our overall impression, and I speak for the other people on the sub-committee as well, is we have been hugely impressed. Great work is being done and we are punching above our weight as a nation. It is fantastic that we are and we should be proud of that. That is the main story and that with the really serious things that are happening, only by doing that can we have some effect on it, but there are things in the short grass that might need teasing out a little bit. I hope that your inquiry will result in some of those things.

Chair: Thank you very much indeed, Mr Gray, for coming back. We very much appreciate the evidence that we have heard and thank you also for the substantial amount of work you put into this inquiry in the last Parliament.

Examination of witnesses

Witnesses: Professor Dame Jane Francis DCMG and Dr Iain Williams.

Q418 **Chair:** We are joined for the second panel today by Professor Dame Jane Francis and Dr Iain Williams. I invite you to introduce yourselves and your organisations.

Professor Dame Jane Francis: I am Jane Francis. I am Director of the British Antarctic Survey.

Dr Williams: Good afternoon. Iain Williams. I am Director of Strategic Partnerships at the Natural Environment Research Council, part of UKRI.

Q419 **Chair:** Thank you to both of you for your assistance today. Dame Jane, if I may start with you: what are the most significant climate and environmental changes that are currently occurring in Antarctica?

Professor Dame Jane Francis: If you had asked me that question on Antarctica about five years ago I would have said Antarctica is a big chunk of rock on a big chunk of ice. The word that all the scientists were using was inertia, that it was so big and so cold in the southern position that nothing much was happening in climate change. I am absolutely going to completely dispel that now. For the last couple of years we have seen phenomenal changes in Antarctica. The important thing about what is happening in Antarctica is that it doesn't stay there. It is changing the whole world. It has a global impact because of the scale of it.

There are about five things that are happening now that we are focusing on in the science, not just the UK but the whole of the Antarctic science community. First, the ice shelves are melting. Glaciers are on land. They are streams of ice that come down and then they float on the ocean and they fringe the whole of the Antarctic continent. The important thing about those ice shelves is that they keep the glaciers back on land and it is the glacier ice that is causing sea level rise. The ice shelves are the buttresses that keep the ice back on land and we know that the ice shelves, which we are doing a lot of science on, are beginning to melt from below, not from above but from below.

The UK was involved in a big project called the Thwaites Glacier project. It is one of the glaciers that we saw from satellite images was thinning quite rapidly. That was a joint collaboration with the US, UK, Germany, Sweden and Korea and we worked together to do some frontier science, looking underneath the ice shelf to understand what was happening. That science is now being repeated around the whole of Antarctica by different nations because this is quite critical.

We could melt some of the big ice sheets very quickly with that underwater melting. The challenge is to find out when and how fast that will happen and what the global impact will be. If all the ice in Antarctica melted, there would be about a 65-metre sea-level rise, which would drown this building completely and all the ice on the planet would go. Antarctica holds about 90% of the world's fresh water, so it is a big chunk of ice. The ice is melting from above.

Another thing has been happening in the last couple of years. We have noticed through long-term monitoring that in Antarctica it is very important to understand what the variability is. In the last couple of years, we have seen that the sea ice around Antarctica has been

beginning to shrink. The sea ice forms every winter when it gets cold, cold and dark, and it almost doubles the size of the continent. That sea ice is quite critical. It is a home where the emperor penguins breed on the edge of this sea ice. Underneath the sea ice, there is an ecosystem: there is sea ice algae, there are krill that live on these algae, and they have a nursery area underneath the sea ice. The sea ice also keeps the cold in the ocean. It acts as a blanket and it stops the storms reaching the ice shelves. That is beginning to shrink so that is concerning a lot of us about what is happening there. What is happening in the oceans fundamentally influences climate and oceanography and this affects the whole planet.

The other thing that is happening is in the ocean. The ocean around Antarctica, the Southern ocean, is very important to the rest of the planet. It is the biggest and deepest ocean on the planet. All the man-made heat and carbon that we are generating is going into the ocean; a lot of it, 90% of it, is going into the ocean, and at least half of that is going into the Southern ocean around Antarctica. The heat is being taken down. There are some estimates that about 36 degrees worth of man-made heat is being stored in the ocean around Antarctica. One of the things that we are looking at is where that heat is going deep into that ocean and how stable it is. You can imagine that if the ocean suddenly overturns and that heat comes up again, that is really going to accelerate our warming.

Carbon is also being buried into the ocean and buried in deep, deep layers of the Southern ocean around Antarctica. We are concerned that that is changing. We see that the surface of the ocean around Antarctica is becoming much fresher because a lot of ice is melting in Antarctica, and that ocean and Antarctica play a critical role in the ocean circulation across the whole planet. Cold, deep, salty, dense water comes from the Antarctic continent. It slides straight off the continent, deep into the ocean, and then it flows all the way through, across the equator, up to the northern hemisphere, and then it starts the ocean circulation. So it has a fundamental impact on the whole ocean circulation. What we are really worried about is that the melting of the ice in Antarctica is freshening the surface, so there is fresher water, it is changing the density of the water, and it will change ocean circulation radically and that will affect us all in how it affects the climate.

Q420 **Chair:** Thank you. That was a very detailed answer to the question and covered several of our other questions. Could you touch a little further on the ocean currents that you just mentioned? What is our best knowledge about the potential impact of those potential changes in the ocean currents to us and to the wider world?

Professor Dame Jane Francis: The ocean affects our climate. The ocean is one of our climate drivers, and so has a magnitude of influences.

Also, if the ocean is less strong, there is a possibility that it starts changing some of the currents, particularly the Gulf Stream, as you may

know, and might weaken the Gulf Stream, which will change the climate in the Arctic regions and around Europe. The scientific questions are linked across the planet. As the ice melts, sea levels will rise and that will affect everybody on the planet.

Q421 **Chair:** You explained that this has become substantially worse over the last couple of years. Given that some of that melting is already irreversible due to past carbon emissions, what are the projected long-term impacts on the UK of further melting? What do you expect that we will see here from what has already happened?

Professor Dame Jane Francis: The ice is melting, so the sea level is going up millimetres, four millimetres a year. A component of that is from the Antarctic ice sheets. That has been continuing and is now becoming more cumulative and it probably will accelerate into the future. That means that all the coastal areas, not just around the UK but around the whole world, will be impacted. What is happening in Antarctica will affect the climate across the whole world and that will affect the UK as well.

Chair: Do you want to add to that, Dr Williams?

Dr Williams: No, I don't think so.

Chair: That was a good analysis. Thank you.

Q422 **Cameron Thomas:** You mentioned some of the impact that climate change is going to have on biodiversity in Antarctica. I read recently that avian influenza has also been transferred to Antarctica. What are your thoughts on the implications of avian flu for biodiversity and the stability of Antarctic ecosystems, particularly for vulnerable species?

Professor Dame Jane Francis: There is some avian flu in Antarctica at the moment, particularly in the sub-Antarctic islands. It is pretty bad, I think, in the Falklands. We have a station called Bird Island, which is near South Georgia. There has been some avian flu there. We have a specialist team in our station in South Georgia—not on Bird Island—that is doing specialist research on bird flu and genetic sequences. The team is specifically looking at and watching very carefully what is happening there. So far, avian flu has not taken hold very badly on that island. We now know about some reports of avian flu on the Antarctic Peninsula, going south. We do expect that it will just naturally, through bird contact, be seen further down the peninsula.

In our Rothera station, which is further south, we are very conscious of biosecurity. We take this very seriously with all the people that we take to Antarctica. In Rothera, the instructions are very clear. Nobody is to touch any dead animal or bird. There are specialist teams that are trained to deal with avian flu and they would be the people who deal with any dead animals or birds with special protective gear.

Q423 **Cameron Thomas:** I have quite a personal connection to the Falkland Islands. Can you tell me what activities are going on there? I seem to

remember being taken on various tours in the armed forces to the outlying island. That could potentially have a significant impact on some of the penguin species. Do you know what activities are being undertaken in the Falkland Islands?

Professor Dame Jane Francis: Not specifically, no. I do know that there is quite a lot of avian flu, or there has been, on the Falklands, and that came across. There was definitely a movement coming down South America and across to the Falklands, but I am not sure how they are handling it now.

Q424 **Cameron Thomas:** Thank you. What steps ought to be taken to protect species from the spread of avian flu?

Professor Dame Jane Francis: We take biosecurity very seriously. Anybody who goes to Antarctica is given a lot of training in biosecurity. We have special facilities in Cambridge and in the stations to make sure that everything is checked. We make sure that people do not take muddy boots into Antarctica, particularly seeds or anything that is literally alien into Antarctica, as much as we can possibly manage.

Q425 **Cameron Thomas:** It sounds as if it might be quite difficult to manage, given the increasing tourism that takes place in Antarctica.

Professor Dame Jane Francis: Some of the Antarctic ships are very good at biosecurity and they do take care about how their passengers behave, making sure that they clean their boots, and really look after where the passengers go. I think that bird flu will be transmitted from bird to bird. It will be quite difficult to stop.

Q426 **Pippa Heylings:** Picking up on the issue of increased vulnerability of species, biosecurity is one aspect. The other is the role of marine protected areas. Would you say that we have sufficient research to establish the marine protected areas necessary now to give that greater resilience, not just from avian flu but from all the other impacts? You mentioned krill and fishing and whatever. Do we have sufficient grounds for being able to define and establish those marine protected areas?

Professor Dame Jane Francis: That is a question you should ask Jane Rumble when she comes from the Foreign Office because her territory deals with CCAMLR, the marine living resources.

We have scientists in the British Antarctic Survey who work specifically on looking at things such as fish stocks, breeding areas and nursery areas. They go to the CCAMLR meetings with Jane Rumble to add the scientific evidence to where fishing should take place or where it can take place, what the stock levels are and the areas that we need to preserve. So, yes, we do the more pure research that looks at the ecosystems, the food chains and how climate change is affecting the ecosystem in Antarctica. Then there is specific work that goes on to look at fish and the fishing industry and the resources that are required there.

Q427 **Pippa Heylings:** We heard from a previous speaker, Mr Gray, that perhaps this is work that could be done in Cambridge, at BAS. Would you like the chance to say whether some of this needs to be done in situ?

Professor Dame Jane Francis: I do not think we know how climate change is happening and I do not think we should stop our work on climate change. I will say, though, that we collect huge amounts of data so we can do a lot of work in Cambridge on that data. We do collect data in different ways now. We use satellite information, a huge amount of satellite information. We use autonomous vehicles that we set off from the ships to collect data. Data is our rich source of information, which goes into computer models that do future forecasting that then can help policies. That is the link. We still need to make these measurements. We still need to monitor. If we do not do long-term monitoring in particular, we will not know where the changes are and what has changed.

Q428 **Martin Rhodes:** Dame Jane, what is your assessment of how well positioned the UK is to meet its scientific priorities in Antarctica? Does the British Antarctic Survey have the necessary resources, staffing and infrastructure to support those priorities?

Professor Dame Jane Francis: I would always say that we would like more money, wouldn't I?

We have an MOU with DSIT, UKRI and FCDO, the Government basically, to say that there are two missions. One is to do world-class science and the other is to support the presence of the UK in Antarctica. That means UK scientists. That is what we do with our logistics. We support UK science.

The UK is a leader in world-class science and is particularly an influential leader in Antarctic science. The data shows that we produce the second highest number of papers. The US is No.1 because they have far more scientists who go to Antarctica than we have.

We have a huge influence on the Intergovernmental Panel for Climate Change reports. We have a lot of what they call authors and lead authors in IPCC. We are a partner of choice for many scientific collaborations. Certainly, in the Antarctic Treaty, Jane Rumble is one of the most respected voices in the treaty at the geopolitical level. We have a leadership position that we are working very hard to maintain.

Q429 **Martin Rhodes:** Moving to the summer research season, what are the current key projects reflecting developments that the Committee has been made aware of since evidence was last taken?

Professor Dame Jane Francis: The topics that I mentioned just now are really new. We are beginning to do research in all those topics. We have a major topic—BIOPOLE—which all the research centres of NERC are involved in. BIOPOLE is looking at how melting ice is taking nutrients from the land, from the ice, into the ocean and how that is changing. As the ice melts and as there are more melt water and climate changes and

the ocean is warming, there are huge, phenomenal changes in ocean circulation, in the ecosystems that live in the ocean. We are using the ship, which is doing fantastic science, to look at how the ocean is changing and responding to climate change.

Q430 **Martin Rhodes:** Dr Williams, what specific action is NERC taking to prioritise international research collaboration that will strengthen our understanding of climate systems and ecosystems?

Dr Williams: Let me just take a step back for a moment to talk about the research funding and how it all flows through, because that part-answers your previous question as well.

NERC funding covers costs for all environmental sciences, which is about £330 million a year. That is split between our NERC centres, of which British Antarctic Survey is one, to do long-term big science and a lot of the long-term monitoring activities as well as also providing infrastructures. Then 60% is competitively let, and any university research institute can apply for that. BAS wins a good number of programmes but so also do a lot of universities, particularly in the Antarctic. The University of East Anglia, Leeds, Southampton, and Cambridge are the top universities there, driving research, bottom-up through curiosity research. That drives a lot of our research programmes as well.

Specifically on international programmes and what we are doing there, we work closely with our funding council partners across the world. We are always looking to develop agreements, sometimes MOUs, which are called lead partner agreements. These are very important because if we talk about competitively funded research, which is peer reviewed and goes through the process, there is a risk with international research that it has a double jeopardy. It has to be approved in the UK and if you are partnering with somebody in the US, for instance, it has to be approved by US authorities. So we have agreements where it only has to go through that process once and we agree that the processes are equivalent to ours. Our agreement with the National Science Foundation in the US is probably our strongest in that area. Over the last eight years, we funded 19 different projects, £4.5 million, leveraging about $12 million from the US. It is a very good way of working and facilitating researchers to work internationally.

We also have a call out at the moment called the Global Partnerships Seedcorn Fund, which enables or facilitates researchers to develop new partnerships with new partners and develop some funding to, again, help encourage the right environment for international research.

Q431 **Martin Rhodes:** Obviously, there are some financial benefits to collaboration, but you are saying that there are also scientific benefits to collaboration.

Dr Williams: Yes, very definitely.

Q432 **Martin Rhodes:** Looking particularly the Antarctic Infrastructure Modernisation Programme and going into the details of this, what are the key strategic objectives of that programme?

Dr Williams: The key objectives are about advancing our scientific capabilities and enabling the science to be undertaken in the Antarctic. Continuing to advance and improve on safety is very important, reducing our environmental footprint in the Antarctic, reducing our carbon emissions, and through all sorts of ways improving the facilities in that way are the three main primary objectives.

Q433 **Martin Rhodes:** Dame Jane, Mr Gray mentioned in his evidence earlier the work going on at the Rothera research station. When do you expect that to be completed?

Professor Dame Jane Francis: At the moment, mainly what we are doing is building a new science support centre. That is all about modernisation. Some of the buildings in Rothera were built in the 1970s and 1980s, were built of wood, and they are not insulated. Safety is my top word. We are building very safe buildings now. The Discovery Building will be finished this season. In March 2025, it will be technically handed over from the construction teams to the BAS teams to run it. Then there will be another season when we work together to make sure it all works, all the snags are found and it works properly. Then it will be officially opened.

Q434 **Martin Rhodes:** How will the new building add to the research capabilities?

Professor Dame Jane Francis: It is a new, state-of-the-art modern building. It supports science, but it also supports all the functions of supporting science that go in there. This is where scientists go. If they are going into the field in Antarctica, they will come here first and spend some time to prepare all their field camps and all the things that they need for safety in the field. There are offices for science as well and a medical centre. We have phenomenal new telemedicine. This is where you wear goggles. The doctor can wear goggles and talk to a doctor back in our centre in Plymouth. We have much more efficient energy resources. This comes with a renewable energy package as well. The building is coated in solar panels. It only works for six months of the year and then it goes dark. We are also looking at other different kinds of energy to make being in Antarctica much greener and as safe as possible.

Q435 **Sarah Gibson:** James Gray mentioned earlier that he felt, perhaps in his slightly more conflicted views, that perhaps there was too much money for Antarctica compared with the Arctic. How do you feel the about balance between Antarctic and Arctic research?

Dr Williams: I will pick up that question.

As far as competitive research is concerned—the research that is funded by open competition with universities and research—taken over a long

period, the number of grants and the amount of funding between the Arctic and the Antarctic is very similar. There has been very little of a trend to say that it has been going up or down in either of those locations. There is very little difference in terms of competitive research.

The difference applies with the infrastructure costs. Undertaking research in the Antarctic is more expensive, of course, as are some of the longer-term programmes that we fund at the British Antarctic Survey that Jane mentioned earlier, to support the long-term observations and big science to understand what is happening in the Antarctic.

I would just say that you have to be careful as well that we do not focus too much in some respects, with all due respect, on the British Antarctic Survey and the Sir David Attenborough when we talk about Antarctic research. NERC owns two other ocean-going research vessels—which are operated by the National Oceanography Centre—RSS Discovery and RSS James Cook. They are not ice-strengthened but they do go into the Arctic when it is free of ice and do a lot of research through those methods as well.

Professor Dame Jane Francis: We do also work in the Arctic, not just BAS, but UK universities as well. We have just come back from a northern summer taking the first trip of the Sir David Attenborough ship into Greenland to look at the glacier melting in Greenland. This is the first time the ship has gone there, only the second season when the ship has been used for science. It was phenomenally successful and the scientists were absolutely raving about it because the full capabilities of the ship were being used. We have state-of-the-art labs on there. If you know the Crick building in London, it is like the Crick on the ship. Phenomenal laboratories. We had helicopters that were taking people to do geology and research on the land, and we had small boats out looking at the ocean as well. It was like three, four, five projects in one on the ship. It was incredibly successful and we are going to follow that up. There is a new funding source, ARIA, a new Government source of funding, and we are well into working with ARIA to do another Greenland trip to look at tipping points in the Arctic.

Sarah Gibson: Can I ask a quick follow-up question on that?

Chair: Yes.

Q436 **Sarah Gibson:** James Gray also mentioned the distance. Is the distance between us going to the Arctic as opposed to us going to the Antarctic a serious additional cost? Also, when is that ship likely to go north again?

Dr Williams: I will pick up the second part first. The Sir David Attenborough does not have a schedule to be in the Arctic Ocean planned at the moment. We recently published when all our marine infrastructures will be available for use. It is available for use in the 2026 Arctic summer. I was referring to competitively let funding. We have calls open at the moment, the Pushing the Frontiers call, for example, and the

research community can bid into proposals. They know, because we publish it, what capabilities are available for use and in what time windows. There is opportunity for them and we look forward to seeing the research proposals from the community.

Professor Dame Jane Francis: Distance does not really matter. The ship normally starts off from its dock at Harwich in October. It goes to Antarctica, does the summer season in the Antarctic, and then comes back to the UK, does its servicing—gets its MOT, if you like—for a week or two, and then it has the summer, the northern summertime, to work in the Arctic. Then it comes back and goes south again. There are two different time windows and there is plenty of time to do both poles.

Q437 **Julia Buckley:** I did want to ask you exactly about the ship and I am pleased to hear some of those details coming forward. I was going to ask when the Sir David Attenborough will return to the north, but you seem to imply that that would depend on funding. Have I understood that correctly?

Dr Williams: It will return to the northern hemisphere on its servicing and refit schedule. When it does research activity in the north will depend on the research grants that are proposed and funded.

Q438 **Julia Buckley:** Individual applications, piece by piece, so if none come forward, it will not be doing any trips?

Professor Dame Jane Francis: We have the proposal in for the ARIA funding for Greenland, so I would imagine that might be the next one. We are waiting to hear about the funding for that.

Q439 **Julia Buckley:** My other question was about balancing two roles. You touched on them. Given the significant investment that went into that vessel, how does NERC maximise its use, balancing the roles between supporting logistics and conducting the marine research that you mentioned?

Professor Dame Jane Francis: Everybody asks, "Why don't you want two ships?" Well, I do not want two ships. They are very expensive to run. I would rather have one really good ship that does very good science, and it is a big ship. It takes 60 scientists, and we can do far more better, high-quality science on the Sir David Attenborough than we could on the two smaller ships with old-fashioned facilities that took fewer scientists.

Our programme has always been one-ship-plus, and the plus is that if we need another ship to do some logistics support or to do some science support, we charter it for a short time, so we are not paying for two ships, two lots of fuel, two extra crews. They are very expensive to run, and that would be a real waste of money, to be honest, so we are focusing on just taking the facilities that we need. This last season, we hired a ship jointly with the Germans and other nations to do some cargo to our Halley station, maximising the efficiency, the funding and the ship.

Q440 **Julia Buckley:** Dr Williams, do you agree with that assessment? What are your views?

Dr Williams: Yes, certainly. We have increased the number of charter ships since we went from two ships to one ship, and charter aircraft to support with logistics as well. The flexibility that provides is both welcomed and more efficient.

We have published the criteria that we use for prioritising the activities and use of the Sir David Attenborough. They are overseen by a board that I chair and Jane is on it as well as members of the research community. We are completely open and transparent about how we use the ship, how we prioritise it for logistics and research activity.

Just to be careful, when we say logistics, a lot of it is supporting terrestrial-based science as well. It is all scientific activity. You have to be careful about that.

Q441 **Julia Buckley:** I can hear how carefully you have analysed the value and the benefit. There is also an implied growth there, growth of the research, and we are hearing about the growing demands. Do you think that that will continue to sustain the one-plus or one-plus-plus? Do you think that will sustain us going forward? Will we ever need to or can we keep adding to the one?

Professor Dame Jane Francis: The limiting factor for the science that we do is the funding. It is not about capabilities.

Julia Buckley: It is the revenue for the delivery.

Professor Dame Jane Francis: Also, a lot of our work is done in collaboration. Antarctica is a big place, it is an expensive and difficult place to work, it is remote, so the best science is done in collaboration. We do nearly all our projects with other nations.

The structure of Antarctica, especially through the Antarctic Treaty, is set up for international collaborations. A body called the Scientific Committee on Antarctic Research brings together the 57 nations—or the ones that want to join—that work together and provides the structure for people to collaborate and work together. It is a very collaborative environment. We do very few programmes that do not have international partners on them.

Q442 **Blake Stephenson:** That is a perfect bridge, bringing in both funding and collaboration. Since we were talking about collaboration, Professor, could you perhaps walk us through some of the challenges that exist in ensuring effective work?

Professor Dame Jane Francis: Iain mentioned double jeopardy. One of the things that we have to work hard on is working with other nations to plan these collaborations so that we ensure that there are pots of funding that balance how we bring the research together, timing of grant rounds

and so on. There are practical problems but, on the whole, we make them work.

I want to tell you about the biggest Antarctic programme that is ever going to happen. It is very exciting. It is called Antarctica InSync and 26 nations are involved. The plan is to establish where Antarctica is now in terms of climate change. We all do our bits, but we are going to all work together in the Antarctic season 2028-29. We will all be around Antarctica with our icebreakers and working on projects on land in the stations, in the air and from satellites. ESA is going to turn its satellites towards Antarctica so that we have the data from them. We are planning this now, and there will be a huge number of nations, a huge number of research projects working around Antarctica at the same time, taking synchronous measurements so that we can understand where the Antarctic nation is. We will be collecting huge amounts of data that will be synthesised and presented for modelling, forecasting and policy in International Polar Year, which is planned to be 2032-33, which is when there will be a lot of focus on the poles as well. Keep a watch for Antarctica InSync. It is a massive part of planning at the moment, but every nation in Antarctica will join in.

Q443 **Blake Stephenson:** That sounds amazing. It sounds like a fantastic and very complicated piece of work. Are there any specific challenges in that project to tease out that might be useful for us to know about?

Professor Dame Jane Francis: Funding; how do we fund it? I am working with NERC to understand how we can make longer-term funding available because a lot of the funding pockets at the moment are quite small. We have short-term spending reviews at the moment, which are a bit of a challenge to planning ahead. We need to understand where the funding goes. We can do five years, but going longer than that would be much more helpful.

Q444 **Blake Stephenson:** My final question is for Dr Williams, and it is about the grant funding. Are the grant funding levels of £4 million to £5 million from NERC sufficient to support these ambitious long-term projects?

Dr Williams: I have a couple of comments on that. First, of course, the grant funding for Antarctic research does not include all the logistics that go into doing it. It does not sound very much if you think of the logistics, but that all comes out separately from what is actually a budget that is separate from NERC's budget, called the Antarctic Logistics Infrastructure Partition, which funds the infrastructure and fuel for the ship and those sorts of things. That enables the grant size to be comparable with another grant in another domain in environmental science.

Timeframes are a matter of balance for people like me. The longer the term of a long-term project that I commit to, it reduces our flexibility into the future because it forward commits our budget. There will always be scientists talking to me saying, "I have new ideas, great new techniques and new challenges" and we have to balance that very carefully between

long-term science to make an impact while also ensuring that we maintain flexibility to react to the latest technologies, policy positions and, of course, scientific investigations. We find that the longer-term funding at BAS enables that in a different way and we provide longer-term funding for the British Antarctic Survey.

Q445 **Blake Stephenson:** I have one final question. Are there any changes to the funding mechanisms that you would really like to see that would support your projects into the future?

Dr Williams: We are always looking at our funding mechanisms to ensure that they are the best available to support the community that undertakes our research. We made some changes a couple of years ago around pushing and exploring the frontiers to enable new ideas to come in at a small level but to really encourage some innovative and exciting ideas. We are continually flexing our model to explore the best opportunities for science.

Q446 **Barry Gardiner:** Dame Jane, would it therefore be one of the recommendations that you would like to see this Committee put forward in its report that the Government should permit that five to 10-year funding regime?

Professor Dame Jane Francis: Yes, please. I think the science Minister will say the same because he understands that there is the challenge that Iain mentioned about committing for such a long time, but for big projects you really do need a long time.

Barry Gardiner: For InSync, for instance.

Professor Dame Jane Francis: Absolutely.

Q447 **Barry Gardiner:** I hesitate here, but at the beginning, in your introduction, which was a fantastic introduction, I think you said that Antarctica contained 90% of the fresh water and it is 70%, isn't it?

Professor Dame Jane Francis: Yes, 70% of the fresh water and 90% of the world's ice. That is right, yes. Those are the two numbers.

Barry Gardiner: Just in case anybody is watching and writes in to us.

Professor Dame Jane Francis: Yes.

Q448 **Cameron Thomas:** I am a scuba diver. I have spent some time diving in the Indian Ocean and I recall—I am trying to go as fast as I can—just how loud diesel-powered ships can be from a mile away. To your knowledge, what assessment has been made of impact of noise pollution as experienced by marine life, by polar research and tourism?

Professor Dame Jane Francis: There has been quite a lot of research projects around the world, in different areas, on the noise from ships. We have not done it specifically on our ship but there has been a lot of research on the impact, particularly on whales and ocean animals.

One thing we are doing with our ship, though—partly because of the carbon footprint and to stop using so much fuel—is to try to use the ship as a mothership.

In the old days, we used to go here and there to collect data. The idea now is to position the ship in one place and launch a number of autonomous vehicles from there. We use drones up in the air. We have little sailboats that go along the surface, directed by GPS. I can run one from my office, from my iPhone. They collect data and can go for hundreds of kilometres just using wind power. We also have autonomous vehicles, marine robots, that go in the ocean and use the buoyancy of the ocean to collect data. We use the ship less. That is the way forward for science.

Chair: Thank you ever so much, Dr Williams and Professor Dame Jane Francis, for your evidence. It has been very helpful. Thank you for helping us today.

Examination of witnesses

Witnesses: The Lord Vallance of Balham KCB, Stephen Doughty MP and Jane Rumble OBE.

Q449 **Chair:** Thank you very much to our third panel of today, Jane Rumble, Minister Stephen Doughty and Minister Lord Vallance. May I ask you first to each introduce yourselves and your role in relation to the study that we are doing.

Jane Rumble: I am Jane Rumble. I am head of the Polar Regions Department in the Foreign, Commonwealth and Development Office.

Stephen Doughty: I am Stephen Doughty. I am Minister of State at the FCDO, with responsibility for the polar regions.

Lord Vallance of Balham: Patrick Vallance. I am Minister for Science, Research and Innovation in DSIT and a lot of the research funding comes through that Department.

Q450 **Chair:** Excellent. We will start with you, Minister Vallance. Do the Government recognise, as we were hearing in the previous panel, that the impacts of climate change on Antarctica and therefore on the rest of the world are accelerating?

Lord Vallance of Balham: Absolutely. I think that the Antarctic Peninsula is one of the fastest warming places in the southern hemisphere. We know that there have been extreme weather events in the Antarctic region and that we can see the consequences of that on the ice shelves, on glaciers, on erosion of coastal ice and the consequences that follow in some of the effects on the biodiversity in the region as well.

Q451 **Chair:** What is the Government's assessment of the broader

consequences, both to the region and globally, from what we are witnessing in Antarctica?

Lord Vallance of Balham: Globally, as the melting continues, if we had a big fracture of an ice shelf, the West Antarctic Ice Sheet, it would be huge in terms of sea level rises. Thwaites Glacier would be big in terms of sea level rises. We have sea level rises but, even before that, the warming of the oceans is leading to a change in circulatory patterns, which can be pretty important and have much bigger distant effects from Antarctica than the ones just around Antarctica itself. These things are going to have global consequences. Under some models, actually, the sea level rises turn out to be higher in the UK than they do in other parts of the world because of the gravitational effect, depending on what happens to the ice shelf. This is a profound global issue.

Q452 **Chair:** What would those rising sea levels mean to coastal communities in the UK?

Lord Vallance of Balham: Well, it depends how far they go. Clearly, there are situations in which levels go very high, and that has major consequences around the coast. At the moment, we are seeing much more minor increases but they are still having effects in terms of erosion, flooding and other consequences.

Q453 **Chair:** Minister Doughty, if I could turn to you, we have heard that sobering evidence. I do not know if you heard the previous panel but, if you did not, I would encourage you to see the evidence that we heard, which I am sure has worried everyone.

Do the UK Government plan to push for stronger environmental protections within the Antarctic Treaty System to address the impacts of climate change within Antarctica's unique ecosystems and to ensure the longer-term sustainability of the region? If so, what is it that we are pushing for?

Stephen Doughty: Thank you very much for inviting us to be here today. We take these issues extremely seriously, both within my own responsibilities but also working across government, particularly given the missions that the Prime Minister has set out on climate change, on energy and on green transition and nature protection. Those elements are at the core of the Foreign, Commonwealth and Development Office's missions, both for the Foreign Secretary and for me particularly, with that responsibility for the polar regions. This is an important part of our work. That is why we are bringing together Ministers from across government as part of a Polar Regions Ministerial Group, an innovation to ensure co-ordination across teams and a range of interests in the Antarctic and the Arctic. We hope that provides an assurance to the Committee about how seriously we take these issues.

Climate change is a standing item at Antarctic Treaty Consultative Meetings and CCAMLR meetings. There was a declaration on climate change at the Helsinki meeting in 2023. We are very clear about the

global implications of climate change and the need for urgent action to protect Antarctica, as Patrick Vallance just set out very clearly, and the consequences. The protocol to the treaty establishes Antarctica as a natural reserve dedicated to peace and science and a comprehensive framework for the protection of the Antarctic environment. That means that activities in Antarctica can be pre-planned and conducted with minimal environmental impact, plus there are some additional things in there about mineral resources other than for scientific purposes. The protocol also established a committee on environmental protection, which advises the ATCM meetings, and we have worked closely with others.

Jane Rumble has been key in that work. I will bring her in to address the impacts of climate change, non-native species and presence. We also propose the creation of visitor-site guidelines, which protect the most popular tourist sites. We will continue to advocate within the treaty system for dealing with the impacts of climate change, enhanced protection for climate-vulnerable species, particularly, as you will have heard, the huge and devastating consequences for emperor penguin colonies, for instance, which I am sure has been brought to the Committee's attention before now. This is on every level. It is about the species on land, the underwater species—krill, fish and others—and the impacts on wider ecosystems.

This is also part of a wider approach that we are taking to our overseas territories more generally. We take our obligations to the British Antarctic Territory, South Georgia and South Sandwich Islands, and indeed the Falkland Islands as adjacent, very seriously. I will be working closely with overseas territories leaders more generally on a series of initiatives around climate change and environmental conservation.

Perhaps Jane will say a little bit more about our involvement in the discussions in the treaty system.

Jane Rumble: The Minister has covered it pretty comprehensively. The role of the Antarctic Treaty Consultative Meeting is to implement the treaty and its protocol on environmental protection. It is looking very much at how we manage Antarctica and how we keep it safe.

There is also the separate question of the science that is done in Antarctica, which is quite global in scale. A secondary objective is making sure that we can facilitate the message about what is happening in Antarctica and what it means globally.

Q454 **Barry Gardiner:** Professor Vallance, if I can come to you first, we heard from Dame Jane Francis that thinking about the rate of change in the Antarctic has radically altered in the last five years, I think with Robert DeConto's paper from, if I remember, back in 2022-21.

That rethink about the impacts of climate change, we are talking, as Dame Jane Francis said, about 70% of the fresh water in the planet and 6 million cubic miles of ice. It is very difficult for people to get their heads

around just what the implications of that melt could be. Can you lead us through what the latest thinking from the intergovernmental panel has been and how they have set out the different impacts that might come? You already spoke about the impact of sea-level rise, but tell us about the impacts that there might be at various threshold temperatures and how the intergovernmental panel is now looking at that.

Lord Vallance of Balham: This goes beyond just the Antarctic.

Barry Gardiner: But particularly with reference to the Antarctic.

Lord Vallance of Balham: It is clearly a global issue for all sorts of reasons, and I think there is now a pretty wide consensus that 1.5 degrees is likely to be breached in the mid-2030s, that keeping it down below 2 degrees is also at risk, and that by the end of the century it may be as high as 3 degrees. So there is a very clear understanding that this is headed in the wrong direction, if nothing changes. It is still technically feasible to keep below 1.5, but I think most people think that is extremely unlikely.

The consequences of that are the ones that have been well-articulated. We know that above 2 degrees we start to see very serious effects, including the rise in sea levels, which I have mentioned, which could become catastrophic for some low-lying islands.

Barry Gardiner: Well, actually, not just for some low-lying islands. If all that ice went, we would be—

Lord Vallance of Balham: Clearly. No, I meant 2 degrees centigrade. I mean that if all the ice goes, then there is metres of rise. If the West Antarctic ice shelf goes, that is a huge increase, which has catastrophic effects in all sorts of places.

Q455 **Barry Gardiner:** The science that has been done in the past five years in the Antarctic has specifically shown, has it not, that things are happening much faster than we had previously thought?

Lord Vallance of Balham: Yes.

Q456 **Barry Gardiner:** Take us through what the Government's takeaway should be from that. Here we are making recommendations to the Government about this science. What should our key recommendation to the Government be as a consequence of that?

Lord Vallance of Balham: I think it is very clear that, while mitigation is essential, adaptation is also essential. Adaptation has been the poor cousin of mitigation for a long time, and it is now not responsible to ignore the needs of adaptation right the way around the world, and that requires much wider thinking around what is needed everywhere.

Q457 **Barry Gardiner:** Can I ask you to focus now on the effects of these changes on the Southern ocean, and specifically on what is happening to the biodiversity in the Southern ocean as a result of that accelerated rate

of change?

Lord Vallance of Balham: We are seeing a movement of krill further south. That is, of course, going to change patterns of the fish and the sea mammals around islands. They are seeing more whales off Antarctica as a result of that movement. There is definitely a shift in the pattern of where fish are and where sea mammals are as well. That will continue. Not only do we see that change in pattern of the marine life, we are also seeing changes closer to shore because of the loss of sea ice around the edges of Antarctica. We are also seeing changes in the ability of the ocean to store CO_2. There is a rather dangerous positive feedback mechanism where, as the sea warms, less CO_2 can be contained in the sea. Therefore, we get more CO_2 emissions into the atmosphere. This is a very serious situation where we are seeing this feedback loop.

Stephen Doughty: I might add that when you look at, for example, the impact on emperor penguin colonies, the low sea ice cover in 2022 resulted in the total breeding failure of four out of five of the emperor penguin colonies. We see a very direct and immediate impact on key species that we all want to see protected.

Barry Gardiner: Yes, and principally as a result of the fact that we are getting rain in the Antarctic desert, which we have not previously had, which then causes a problem.

Lord Vallance of Balham: I was in the Antarctic Peninsula in January 2023 and it rained. That should not be happening.

Q458 **Barry Gardiner:** One more thing, if I may, Minister Vallance. You spoke about the gravitational effects of the mass of ice being lost and the impact that that would have. Research from the University of Delft a few years ago now suggested that—because this will happen in tandem with what has been going on in Greenland—the impacts around the UK coast would be to lower the sea level around the UK coast. That is, again, because of the gravitational influence. If you go from the Arabian Gulf through to Iceland, you are going up by about 80 metres. It is not distributed evenly around the planet because of that gravitational pull. Can you just source where the research on the shelf—

Lord Vallance of Balham: I was referring to the ice shelf itself. If that happened in isolation, then what I said becomes true, I think, that you get the effect where you have a bigger sea-change rise than expected, but I am not going to battle with the experts on this. It is not my area of expertise. If you have had academics giving strong evidence to the contrary, I am happy to bow to their knowledge on this.

Barry Gardiner: I was just asking for the source of the research on the shelf.

Lord Vallance of Balham: I can get that to you because that comes from British Antarctic Survey, actually.

Stephen Doughty: The only thing I would urge the Committee to consider, as well as small island states around the world and, indeed, the global sea rise and erosion effects globally, is that in our British family we have a number of small island states. I was just in the OTs in the Caribbean speaking with them directly about what they were seeing: sea level rise, changing weather patterns and erosion.

Q459 **Barry Gardiner:** Sorry, Minister, that is understood. No, I was simply referring to the comment that Minister Vallance made about the impact on the UK from the gravitational impact, which was countered by the University of Delft.

Minister Doughty, the UK sees itself as a global leader on environmental issues. Apart from Resolution 5 back in 2019 on plastic waste, what specific legislative measures are we advocating now and how will we put them into effect, given that the environmental protocol cannot really be modified for another 24 years?

Stephen Doughty: Specifically on plastics?

Barry Gardiner: No. What proposals do we have now? We put forward Resolution 5 on plastics, but if we are taking a leadership role on environmental matters in the Antarctic, what are we putting forward and how are we going to implement it? We have no means, effectively, of amending the protocol until 2048 because unanimity is unlikely to be forthcoming. I think I see that Ms Rumble's smile agrees with me on that one.

Stephen Doughty: I will defer to Jane. She was in the conversation just a few minutes ago.

Jane Rumble: Yes, thank you. First, the date of 2048 in respect of the protocol is simply a review mechanism. It is not necessarily instigating anything in particular. If we wanted to have additional legislation, we would just simply need to get that agreed by consensus.

Barry Gardiner: By consensus.

Jane Rumble: Yes. In 2048, any modification to the protocol still requires a three-quarters majority, and that does not mean that you can amend the Prohibition on Commercial Mining because you can only amend that provision if you have already got in place a regime to govern commercial mining, and that in itself would need consensus. So the date is slightly academic in respect of whether we want to strengthen the protocol. We do that all the time. A lot of it, to be fair, is done through guidelines because it is quite hard to get agreement to new legislative instruments internationally at the moment. However, most countries do follow guidelines and we have quite comprehensive guidelines. At the moment, the Antarctic Treaty Consultative Meeting has just agreed to commence negotiations on a new regulatory binding framework for tourism. Quite a lot of the waste issues come from either tourists or the science. That is where most of the waste is coming from. That will be

picked up at that point. There are already quite strong provisions about tourism activity and the dumping of waste and so on in the protocol anyway. Yes, we will be looking to amend that if we can.

Q460 **John Whitby:** Lord Vallance, what are the UK Government's key priorities for Antarctic science? How will those priorities align with the UK's efforts to address global challenges such as climate change?

Lord Vallance of Balham: There is an overarching aim, which is planetary sustainability, relating to the polar regions. Clearly, those things link to other work on climate change and adaptation as well. The bulk of the funding comes through NERC. To be more specific, climate and climate change is one priority. Glacial and cryospheric systems, including the question of the loss of ice and the risk in the polar regions, and ocean circulation are the three major areas that they cover.

However, there are many other pots of funding coming through UKRI and others that cover other things as well. There is work going on in biodiversity. Most of the biodiversity work is marine biodiversity work, but if you take the Rothera facility, it is used by other countries as well. The Netherlands is there doing lots of work on land-based biodiversity loss as well. There is work going on beyond those three areas, including on sea level rise, as we have discussed, and indeed on space weather, because it is quite a good region from which to understand some of the effects of solar flares and space weather as well.

Q461 **John Whitby:** How is the UK-led research informing international discussions on global climate change mitigation to ensure more protection for the continent?

Lord Vallance of Balham: Historically, the UK has been profoundly important, and the work in the Antarctic region has been crucial. It was the place that the hole in the ozone layer was first identified, and that led to the Montreal Agreement, which had a significant effect to reverse that hole. Historically, we have been important.

If you look at the IPCC reports and ask what percentage of the citations in there are to UK-funded research, it is very high. We remain influential, and obviously the chair of the IPCC at the moment is an eminent UK scientist. The work that is done from the UK is highly influential. We have a disproportionately loud voice in this around the world, and the work that goes on through the British Antarctic Survey, and indeed the facilities it provides for others to come there, is influential everywhere.

Q462 **John Whitby:** That is good to hear. This is a question for Minister Doughty or Ms Rumble. What assurances can the UK Government provide regarding continued funding for the Blue Belt Programme beyond 2025 and how will you be ensuring continued protection of marine environments around the British Antarctic Territory and other UK overseas territories?

Stephen Doughty: We remain huge supporters of the Blue Belt Programme. Indeed, we discussed this at the Joint Ministerial Council with the overseas territories leaders just a few weeks ago, and we have been encouraging further sign-ups.

As you know, all government spending is part of the spending review processes, and it is not for me to prejudge those at the moment. However, at the moment I can say that marine conservation and the incredible work that has gone on in that scheme is something that we recognised previously and want to continue. We are working with partners across the overseas territories to make sure that that work can continue and that we are working and co-ordinating with others on that. It is as crucial in the south Atlantic as it is in the Caribbean and in other Atlantic territories.

I was with the Mayor of Pitcairn the other week, talking about the fact that the ocean area around Pitcairn is the size of France. These are hugely important issues but I do not want to prejudge funding allocations.

Q463 **Pippa Heylings:** A declaration: I did a little bit of work supporting the Blue Belt Programme in a prior life before becoming an MP.

Just on that, however, we have not talked about marine protected areas. I did put a question earlier to Dame Jane Francis, and perhaps Jane Rumble can mention them now. Do we have sufficient research to be able to justify the creation of marine protected areas? What do you think the possibilities are now, given the tensions and consensus-building approach, for the delivery of some of those marine protected areas, given our 30 by 30 ambitions?

Stephen Doughty: I will say a little introduction and pass to Jane, who has been part of some of the important discussions on this.

We secured agreement on the first CCAMLR marine protected area in 2009 and we supported the Ross Sea region MPA designation in 2016. We have continued to advocate for a network of MPAs within the CCAMLR convention area as a whole. We are a co-proponent of three of the current MPA proposals, two in the Weddell Sea, one in east Antarctica, and we have also been active in the discussions about strengthening krill fishing measures and establishing MPAs in the Antarctic Peninsula. MPAs are an important part of our collective effort, and we are involved in discussions in many places around the world.

I used to work on a marine protected area declaration myself in Canada years ago as a young student doing marine ecology. They can play a crucially important role in our efforts. Perhaps Jane can say a little bit about the current discussions on this.

Jane Rumble: Yes, the Convention for the Conservation of Antarctic Marine Living Resources, CCAMLR, sets out a framework for the Southern ocean. It includes quite a lot of measures that have already been agreed

by consensus, which include areas that you are currently able to fish and areas that are currently closed. If you wanted to try to fish in a closed area, then you would need to submit a research proposal, which then comes to the commission. In many areas, that has to be agreed by consensus. CCAMLR already provides a very comprehensive framework. Although it is incredibly frustrating at the moment that we cannot move that framework on, we would not want to suggest that we want to get rid of it, because it already provides this very good framework.

Within the Southern ocean, the main things that we are looking at are protection from climate change and to improve resilience, and then managing tourism and fishing. We do not have all the pressures that you would have around the UK on the marine environment. I do not want to sound like I am arguing against MPAs, but the threat analysis is not as immediate as it might be in other areas. We do have mechanisms to prevent unrestricted fishing. However, there is extremely good evidence that suggests that large-scale marine protected areas do provide this better resilience. There is a lot of reasons why you want to protect around Antarctica, from unique benthic foram, fish nests, all sorts of things.

This is why the UK advocates very strongly for marine protected areas and we would like to have them enshrined and established in this consensus mechanism. We have also made very clear in our interventions at CCAMLR to Russia and China that we are not going to be in a position to agree to any development of fishery in areas that we think are worthy of protection. We need to somehow break the impasse so we can move on. There are mechanisms by which we can enact marine protection. Although we would like to see it strengthened, we can have some marine protection, and that is what we are pursuing.

Stephen Doughty: The bottom line, more generally, is that we are a fishing and a conservation nation, and the key thing is to be led by the science and be led by the data. That is why we put so much into that, and that is what should guide our approach going forward and will guide our approach engaging with others, too.

Q464 **Ellie Chowns:** This is a question to Lord Vallance about Government support for UK science in Antarctica. The Antarctic Infrastructure Modernisation Programme is valued, I think, at £670 million. Could you comment on how the Government are evaluating the impact and effectiveness of that investment, in terms of both advancing scientific understanding and enhancing our logistical capabilities in Antarctica?

Lord Vallance of Balham: Yes. We are in phase 2 at the moment and there is a phase 3 to come. Phase 1 was the ship and the facilities to enable the ship to be able to dock in the right places. Phase 2 related to the new facilities at Rothera in particular, but in other areas as well. Both of those are very important. The ship has allowed research to take place that would not have been possible before. It has allowed multiple programmes of research to go on at the same time, which is important

because in the past it was possible to do one thing and then you had to stop and then somebody else had to come and do another one. Now you can have multiple experiments and multiple teams there working together.

The new centre that is opening at Rothera will provide state-of-the-art laboratory facilities, which it urgently needs in order to be able to do the work that is now possible. Those are progressing well. We can see the impact of the ships already. We cannot yet see the impact of the new facilities because they are not yet open, but they will be shortly. There is a third phase that also includes looking at things such as the support from the aircraft and so on.

We have a very good set of facilities in the Antarctic. It is a real research base. Some of the research bases there are not doing real cutting-edge research. They are in Antarctica and, as I said, it is not just the British Antarctic Survey team; it is academics who are able to use that and fly in to do specific projects. Other countries are using that facility as well. This is an important modernisation programme and one that will stand us in very good stead for the future.

Q465 **Ellie Chowns:** Can I just press you gently to elaborate a bit more on the Government's process for evaluating that impact? You were saying we can already see the impact of the ship. We have heard stories of that already. What is the formal process for evaluating that?

Lord Vallance of Balham: There will be an appraisal through NERC and through the assessment of what research they can fund. There will be an appraisal of the overall cost and the impact on the running, including the environmental impact of what is going on there. I do not have the precise programme of how that evaluation works.

Ellie Chowns: Personally, I would be quite interested in a written response on the format and timeframe for that.

Lord Vallance of Balham: Okay. We can do that.

Q466 **Ellie Chowns:** We have heard in the previous session about the limitations of NERC funding, and I know the previous committee heard about NERC's ability to fund the long-term research programmes that are needed, particularly given the significance of the research that we have heard about here. Do the Government plan to ensure that larger-scale, long-term projects can receive adequate financial support? To increase the positive impact of the capital investment that we have put in, we need to be able to do the long-term funding for the scientists to do the work over multi-year programmes, surely?

Lord Vallance of Balham: That is why the Government have said that we will look at 10-year funding programmes for certain activities. Not for everything, but for certain activities, because you do need that long-term view. I will say, though, that like our own budgets, with the Treasury giving annual budgets, we plan far longer than that, of course, so NERC

does have very long-term programmes. BAS gets its funding every year, so although it is an annual funding cycle, it does not assume that we are going to stop it next year. Indeed, if you look at UKRI funding, one of the reasons that UKRI is difficult to make changes in stream is because the programmes that are funded go well beyond the actual funding allocation to UKRI.

There are long-term programmes. It is understood that they need to be long term, but we do want to look and see whether in some cases getting an agreed 10-year funding would give a greater stability to do that. I will add one risk. The danger of putting 10-year funding cycles in place is you cannot predict what the need is going to be, and as long as that is a floor and not a ceiling, it is okay.

Q467 **Ellie Chowns:** Regarding the RRS Sir David Attenborough, can you comment on how the UK Government plan to optimise the use of this significant investment and significant ship, bearing in mind its different roles in supporting scientific research, logistical support and so on? Would you consider investing in an additional icebreaker? We have heard comments from previous panels on that. I would just like to invite the Government's view and your thoughts on proposals for a second similar ship.

Lord Vallance of Balham: There are no proposals for a second ship. If you look at what other countries are doing, many of them are moving to a single ship model. The advantages of having one really good ship are being seen now rather than two that were not able to do some of things that needed to be done. It does mean there is a logistics challenge in terms of what is done when, and there are some quite sophisticated ways being looked at as to how to model that use in order to optimise the efficiency. The initial reactions to what has been seen so far is far more science can be done in a well-equipped ship of the type that David Attenborough is than was ever done with two ships.

Stephen Doughty: I think it is worth also pointing out, of course, that multiple projects can go on at any one time on David Attenborough. It is an incredible facility, a first-class research ship with incredible crews. I have had the pleasure of meeting some of them in the Arctic a few months back, where they had been doing their work around Greenland as well. We must recognise they are doing work at both poles and doing it very well and are able to do multiple projects simultaneously.

Lord Vallance of Balham: The Minister has kindly pointed out to me that the answer to your previous question about assessment is that there are a series of gateway reviews that are planned for all the spend, but I do not have the details of exactly what is in each of those.

If I can answer the earlier question about the gravitational effect, it is the Met Office Hadley Centre, that is where that came from.

Q468 **Chris Hinchliff:** Minister Doughty, we have recently heard from Jane

about frustrations and impasse in the state of international relations. Evidence heard from the previous committee during its inquiry raised substantial concerns around the management of fisheries in Antarctica. Reports from the 43rd annual meeting of CCAMLR criticise a substantial step backwards on krill fishing management. Given all that, how are the UK Government addressing obstruction in setting fishery catch limits based on scientific data? How is the UK working to ensure the sustainability of fishing practices in the Southern ocean?

Stephen Doughty: If it is helpful, I will just say a little bit about the wider geopolitics and what is going on here. The treaty itself has been in force for 65 years. It is often described as one of the most effective international treaties. The aim of it is conflict prevention and peace in Antarctica. It has kept Antarctica as the only continent, the actual continent itself, never to have seen military conflict. The Antarctic Treaty, CCAMLR and the environmental protocol have very strong international foundations to protect and conserve the continent.

The reality is that where you might have once seen Antarctic exceptionalism before, that is no longer accurate. We see Russia and China prosecuting their wider aims and their behaviour in those environments and particularly in some of the forums, and we see that replicated in other areas, including at the opposite end with the Arctic Council as well. That is a wider geopolitical shift that you see. Russia and China in particular consider that the treaty system is tipping too far towards environmental protection, and they are using their rights to utilise Antarctica for fishing and tourism and so on. There is a wider context there.

In terms of the specific discussions that went on at the recent CCAMLR, I will defer to Jane because she was there. There was some difficult behaviour. I will let Jane provide some further detail on that.

Jane Rumble: One of the key points that we were trying to negotiate in October was how to take the current precautionary trigger level of krill, which is a figure that is established well below what would be the precautionary catch limit that CCAMLR might set, so krill is already capped. That cannot be changed without consensus, so we have a first safeguard. That figure was subdivided into four different locations around the Antarctic Peninsula and up to South Georgia.

The scientists have been working on how you might increase the amount that you could take around the Antarctic Peninsula—which is one of the places that a lot more krill has moved into—in a way that does not concentrate the catch such that you could have a local depletion effect on penguins and seals. That science advice was not entirely definitive. It is not a question that you can have a particular number to, so there were a range of ideas coming forward. China wanted, of course, the most maximalist approach to the krill number. They wanted it immediately, and they were not prepared to discuss any marine protection as a safeguard around this. We did not get agreement on how to change it.

Unlike the previous three years where we had rolled over the original best guess at what would be a precautionary limit, China blocked the rollover of that, subsequently supported by Russia, which means that all the catch can now, in theory, be taken around the Antarctic Peninsula. There is a risk that you could have an overconcentration of catch. It is frustrating, because CCAMLR would normally take a precautionary approach. At the moment, the krill fleet combined is not getting towards that number. The actual amount of krill that is taken is a bit lower. Norway takes 70% of the catch, certainly around South Georgia. Norway is taking a much more forward-leaning approach to this.

Most of the operators who engage in krill fishing are members of the Association of Responsible Krill Operators. They made a statement that they would stick to having buffer zones, so they would not catch the krill directly against the penguin colony. It was a very poor outcome from a CCAMLR perspective. From a conservation perspective, it is worrying. It is not an immediate catastrophe, but it could be.

We need very quickly to get back to the negotiations. We hope that China and Russia will come with a more forward-leaning approach, because I suspect some of the environmental groups will be starting to question whether or not krill is a sustainable catch. If it is not, then it will not get Marine Stewardship Council accreditation, and it will be difficult to sell it into market. There are pressures to try to resolve this. I hope that we will be able to resolve it in the near future.

Stephen Doughty: I should point out that we have taken over the chairship of CCAMLR now. We have nominated Robbie Bulloch as Chair of the Commission, and he is the incoming FCDO Director of the Overseas Territories and Polar from April. He is going to try to work in that role with all the parties to try to find consensus on the conservation measures in particular.

Q469 **Chris Hinchliff:** Given that you have just talked to us there about a situation in which consensus has not been possible, in which you have not been able to find an agreement, and the risks that that is raising, what specific actions can or is the FCDO taking to try to move beyond that and create a way around some of these geopolitical challenges?

Stephen Doughty: We are always willing to try to find ways through on these crucial matters and that is particularly in our approach with China. The Foreign Secretary set out very clearly about where we need to co-operate with China on issues relating to climate, conservation and other matters. Obviously, it is quite a different circumstance in relation to Russia and, unfortunately, we see this behaviour in multiple international fora.

I would say there are examples where even where there are significant difficulties and differences—I will just point to the recent south Atlantic co-operation agreement, where we were able to agree with Argentina about data sharing on fisheries science, in particular in the south Atlantic.

That obviously interacts in terms of the ecosystems, where previously that was not happening. Having met fishery scientists in the Falklands a couple of years ago, I saw how important that would have been to their work. They were operating a little bit in the dark. Even when you have difficulties and challenges in a relationship, there are ways of finding ways forward, and we always seek to try to do that.

Q470 **Chris Hinchliff:** You are confident that progress is still possible?

Stephen Doughty: I am not confident. I will say progress is possible, but it very much depends on the circumstances. Russia's disregard for the international rules-based order and system at the moment is apparent for all to see. That is manifesting in multiple locations, not just in its barbarous war in Ukraine but in its behaviour in a whole series of institutions, including, of course, at the United Nations Security Council.

Q471 **Alison Taylor:** Following on, Minister, from the geopolitical situation and the Antarctic Treaty System, can I ask you how the UK will be working to ensure that the Antarctic Treaty System continues to protect the continent's unique environment, as well as maintaining its status as a region dedicated to peace and scientific research?

Stephen Doughty: I said a little bit before about our objectives for the treaty system overall in relation to the environment and some of the protocols and ways that that works.

I will say a little bit about another area that is hugely relevant, which is mineral extraction. It is obviously a concern for many people, quite rightly. The environmental protocol includes a prohibition on commercial mineral extraction, which does not expire. It can be amended by a three-quarters majority rather than consensus. The minerals prohibition could only be amended, for example, if there was already in place a binding legal regime on extraction, which would itself require consensus and ratification by all the parties.

We know there is often some speculation around this, but we do not believe currently that there is any clear evidence that any party is going as far as to directly get the evidence for a commercial mineral deposit. Whether it is in the fisheries conservation, whether it is on minerals, whether it is on the co-operation on the science, there are a whole series of ways in which we will continue to use the treaty and its bodies. It is great to have Jane and Robbie coming in as well and representing us in many of those forums and fighting the corner for the Antarctica that we all want to see, which is one that is sustainable, secure, safe and treasured for all humanity.

Q472 **Alison Taylor:** The previous committee heard concerns about Russia's activities in Antarctica. What is the Government's assessment of the activities of the Russian ship Akademik Karpinskiy? Has the Government had assurances that these activities are focused on scientific research? Is there evidence that there are any other objectives such as resource

prospecting?

Stephen Doughty: You may be referring to the media speculation I was responding to earlier. Rather than commenting on an individual vessel, I would say there is no clear evidence the Russians are undertaking any more than geophysical mapping of the ocean floor around Antarctica. Mapping would provide potential location of hydrocarbons and other minerals, but if you were to verify those, you have to undertake further activity, seismic surveys, drilling and so on, and we have not seen any evidence of that. The reality that it is an extremely environmentally challenging place for commercial mining or hydrocarbon exploitation, so exploitation would probably be vastly more expensive than anywhere else in the world. All the treaty parties gave those commitments in Helsinki in 2023 on this, but like everything, we keep these things closely under review is what I would say.

Q473 **Chair:** On the question of Russia, what assessment have we made about what its view is on climate change? Are there reasons to believe that it may get some beneficial consequences from it, as obviously a lot of Russia is extremely cold and not particularly productive? Have we made any assessment as to whether it is as committed to this fight as much of the rest of the west is?

Stephen Doughty: Ultimately, I do not have a particular insight into what is going on inside the Kremlin and its policies on climate change. Obviously, Russia remains a major hydrocarbon energy producer and, equally obviously, a lot of the money raised from that is going to fund its war in Ukraine. That is why we have been taking very substantial actions, for example, on the shadow fleet, to stop Russian shadow activities going on in energy exploitation.

It should be pointed out that those are not just because of the money and where it is flowing and what that is supporting, but also because of the environmental consequences of some of those shadow fleet vessels that are operating around the world and the risks that come from those. There are a whole series of measures that we are taking, but I do not have a clear insight into Russian views on climate change.

Q474 **Chair:** We heard from Mr Gray in the first panel that he feels, given the evidence that we have heard, that the profile of Antarctica is lower than it should be in the public mind and in our political discourse. Obviously, I am expecting global coverage of this Committee, but it is always possible we will not get it. Do you think that we are taking this seriously enough as a society?

Stephen Doughty: On that point I completely agree. I think the Antarctic and the Arctic need to have far more attention in our minds, not only for the devastating potential shifts and loss of habitat biodiversity, the sea level rise risks, the wider feedback loop risks within the global environment and climate and the oceans itself and, of course, our

atmosphere. Those should deeply worry us and the Arctic and the Antarctic are at the heart of those stories.

I see them both also as areas where there is increased geopolitical competition, and therefore we need to be protecting our interests and those of allies and those who believe in a multilateral rules-based order. The Antarctic Treaty has always been a very clear example of that and what it has achieved. We would stand strongly against any attempts to weaken or undermine that system and its protections.

I do hope that more attention is paid. It is one of the reasons why I have taken such an interest in this since becoming a Minister, why I am convening the group of Ministers across Government to look at these issues and the wide range of interests that we have, how those are joined up, and how we can better co-operate with other allies and partners.

I was speaking with Lord Coaker from the Ministry of Defence, who I think was in Chile just a little while ago speaking with partners there in relation to Antarctic science and security issues in the south Atlantic. I think I was the first Minister in 10 years to attend the Arctic Circle Assembly just a few months ago and to meet with key partners there. There were others very much on display there in terms of their presence, and it is crucial that the United Kingdom is part of those discussions, not only because of our incredible history, our expertise, and our scientists. Patrick was speaking about the high profile we have in the scientific research. It is crucial that we maintain that, but also because of those wider equities and interests that we have in both regions.

Q475 **Chair:** Given what we have heard about how much deterioration there has been in the last two years—and we appreciate and welcome this cross-departmental working and all that you have just referred to—are we doing enough? Preserving the existing treaty is preserving a path to failure, that is what we are hearing. What we need is active improvements in the situation rather than simply to not make the existing protections worse. Do you think we, as in the global society and the UK Government, are doing enough?

Stephen Doughty: I probably would not agree with the characterisation of the treaty in that respect. We are committed to it. We are committed to making it a success. We also deal with a very complex and contested world at the moment, and we could fire off criticisms at all sorts of other multilateral agreements and bodies, but they are the agreements that we have. This Government are categorically committed to the multilateral system, rules-based order, international law, and to working with our partners to protect that system and the values and principles that it represents.

This is a writ large commitment for this Government. It is why we put so much focus and investment into it. It is why we take the positions that we do and the investment that we do in the systems. Can there be additional things done on top? Absolutely, there are always additional

measures that we can take. Some of those we can do unilaterally; some of those we can do with partners and allies. We will continue to explore opportunities to achieve those goals, particularly in Antarctica in relation to its peacefulness, its protection, and its place as a treasure for humanity.

Q476 **Chair:** To be clear, I was not saying that the treaty itself was a failure. I am saying we are hearing that with the consequences to the Antarctic and then beyond that to the world, we are on a path to failure and we need improvement. That is the point I was trying to make.

Stephen Doughty: Absolutely, Chair. We are well aware of the risks and the threats and that is why we are taking many of the actions that we are, whether that is the investment in the science, the investment in our facilities and resources, the investment in the diplomacy around this. It is one of the reasons why I have been trying to build links with some of our partners internationally.

I spent a lot of time with my Norwegian counterpart, Maria Varteressian, and we have been up in Tromsø recently and speaking about the work on Svalbard, also speaking about the Antarctic and our co-operation there. It is very clear that we have to be working with like-minded partners such as Norway and others to ensure that we see progress in all these areas.

Q477 **Chair:** Minister Vallance, from your perspective as a scientific adviser to Government, coming out of the Budget and hearing the evidence that we see here, what will you be saying in those cross-departmental discussions about what the UK Government should actually be doing in excess of what we have already done, if you like?

Lord Vallance of Balham: Just to make sure the record is clear, I am not the scientific adviser to the Government anymore. I am the science Minister, which is different. There is a very competent scientific adviser named Angela McLean. I will make the case, as I would always do, that where there is opportunity for science funding that will make a difference, we should prioritise it because it is important. This is important and, of course, there are other areas as well, but this has been a long-standing strength of the UK.

I will give you an example. I was visiting the University of Bern on Monday and looking at some of its work on ice core sampling, where you can go back to 800,000 years of CO_2 content. They are now trying to go down to 1.5 million years. They will know at the end of this week whether they have ice from 1.5 million. Some of the analysis of that is going to be undertaken in the British Antarctic Survey in Cambridge. This is a global scientific effort that requires teams in every country. We need to make sure our team is as strong as it can be.

Chair: Well, thank you very much to the three of you. Excellent evidence. We very much appreciate your time and your contributions today.

HOUSE OF COMMONS