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24th May 2024

Thank you for your letter of 16th May on your Committee's inquiry into the UK and the Antarctic environment. I apologise for having to leave on urgent business at the Division but I welcome this opportunity to answer the questions the Committee raised.

- 1) The Committee has heard that the British Antarctic Territory is a key region for understanding recent and future climate change in Antarctica. What steps is the UK Government taking to support scientific research and infrastructure development in Antarctica?*

The government-funded Antarctic Infrastructure Modernisation Programme (AIMP) is enabling a world-leading capability to ensure that Britain remains at the forefront of climate, biodiversity and ocean research in the Polar Regions. The AIMP, which runs until 2031, is a long-term strategic plan to upgrade the infrastructure in the region. The British Antarctic Survey, a component of the Natural Environment Research Council (NERC), a UK Research and Innovation council, receives £48 million per year for this work under the current spending framework. Together with the commissioning of the RSS Sir David Attenborough this programme represents the largest Government investment in polar science infrastructure since the 1980s.

This investment in Antarctic modernisation includes:

- The new polar research ship *RRS Sir David Attenborough*;
- An upgrade to facilities at Rothera Research Station, King Edward Point and Bird Island in South Georgia to accommodate the RRS Sir David Attenborough;
- Modernisation of the Signy research station;
- A new science support facility, the Discovery Building, at Rothera Research Station; and
- Upgrades to aircraft facilities and capability.

Through UKRI, DSIT also funds Antarctic-focussed grants worth approximately £10 million per year.

2) The British Antarctic Survey told us that ensuring consistent funding for infrastructure and logistics in Antarctica is essential for the smooth operation of research activities. How does the Government plan to guarantee stable funding for Antarctic infrastructure and logistics, given the inherent challenges and costs associated with operating in the region?

As outlined by the Chancellor at Spring Budget 2024, the next Spending Review to set future budgets will be held after the General Election. DSIT and FCDO will work together to ensure that future Spending Review bids take account of the geopolitical importance of science in Antarctica.

3) It has been repeatedly emphasised to us that it is a necessity for Antarctic science to receive significantly larger and more ambitious funding to sustain research endeavours spanning longer periods. This contrasts distinctly with the current funding allocated for Antarctic research projects. Scientists have informed us that NERC grants typically range from £1-3.5 million (excluding logistical costs), which they argue is inadequate for ambitious, long-term scientific projects. How does the Government plan to address the need for larger-scale funding allocations with longer timescales to support major scientific initiatives and drive impactful research outcomes?

We need to ensure that we have the right mix of long-term and short-term research funding, including strategically directed and researcher-led funding to advance Antarctic science. For this reason, NERC uses a range of shorter- and longer-term funding opportunities to support the best Antarctic science.

The government has provided long-term, sustained support for Antarctic science. Since 2001, NERC has awarded more than 400 grants totalling approximately £115 million for Antarctic science through competitive schemes. The UK community of Antarctic scientists and researchers are recognised as world leaders.

In addition to competitively awarded funding, NERC funds the British Antarctic Survey to undertake both research and long-term data collections. This includes the BIOPOLE programme, a 5-year research programme led by the British Antarctic Survey to enable more ambitious, integrated approaches to study climate change impacts on nutrient supply and ecosystems in the polar regions.

Longer-term programmes include the Rothera Time Series (RaTS) of sustained observations that has been ongoing for 25 years. This programme comprises a suite of oceanographic and biochemistry measurements. These data support a wide range of research including collaborations with the Universities of East Anglia, Southampton, Edinburgh, Oxford and Bristol. Other NERC centres, including the British Geological Survey and National Oceanography Centre, are also key partners, providing ocean technology expertise and unique capabilities for sample analysis. Internationally, RaTS constitutes a key UK contribution to the US-led Palmer Long-Term Ecological Research (Pal-LTER) programme, which enables sharing of expertise and enhanced scientific output.

- 4) *Many scientists have stressed to us the key role of international collaboration in delivering scientific research in Antarctica, due to the scale of the logistical requirements of working in remote areas and extreme conditions. To better facilitate multilateral research projects in Antarctica, we have heard that there is a need for better mechanisms to minimise the risk of double jeopardy in funding – in this context this means that all international partners would have to be successfully funded for vital research to proceed. How does the Government plan to address the disparity between the internationally collaborative nature of scientific research in Antarctica and the predominantly nationally focused funding structures?*

UKRI and other funding bodies frequently work together to minimise the risk of double jeopardy and promote bilateral and multilateral collaborations. Examples include NERC working with the National Science Foundation (NSF) in the US to fund the International Thwaites Glacier Collaboration, where collaborative projects were commissioned by NSF with support from NERC. A similar process was developed for the Future of the Arctic programme with Germany and Norway, where NERC led the commissioning.

- 5) *Given that the UK is spending £670 million on polar infrastructure modernisation at both poles, what mechanisms does the Government have in place to assess the effectiveness and efficiency of spending on scientific research and logistics in Antarctica?*

The Antarctic Infrastructure Modernisation Programme will transform how the British Antarctic Survey enables and supports frontier science. This long-term programme will enable a world-leading capability to ensure that Britain remains at the forefront of climate, biodiversity and ocean research in the polar regions. The infrastructures being delivered have been designed to ensure they are fit for purpose and future proof. The designs also benefit from enhanced safety and reduced carbon operating footprint.

The performance of the RRS David Attenborough, along with other NERC ships, is assessed for by the NERC Cruise Review Executive Group. The group reviews feedback from end users & operators on how the vessel, systems and equipment met their requirements. NERC runs a periodic evaluation review of BAS and all its centres, evaluating scientific output on a seven-year cycle; this aligns with the Research Excellence Framework that assesses the quality of research in UK higher education institutes.

DSIT is working with UKRI on improving how to track performance and impact of research infrastructure, as part of delivering the UK Science and Technology Framework. This will require significant research infrastructure to annually provide a set of metrics to enable the performance and impact to be consistently and centrally tracked against a set of benchmarks.

- 6) *The UK's investment in a new research ship, the RRS Sir David Attenborough, represents a substantial financial commitment. We heard during our inquiry that there has been inevitable tension caused by trying to schedule both Antarctic logistics support and marine science on the RRS Sir David Attenborough. What*

*specific roles and capabilities would the Government like to see the ship fulfil?
How can the use of the ship be maximised?*

The RRS Sir David Attenborough is one of the most advanced polar research vessels in the world and the UK's only ice-strengthened research vessel. The ship is a multidisciplinary research platform which is transforming how ship-borne science is conducted in the polar regions and provides scientists with state-of-the-art facilities to research the oceans, seafloor, ice and atmosphere. The ship can now carry several projects at one time, making it far more efficient in terms of science- person-days, and has laboratory and other facilities that allow far better quality and far more options for science than previously.

The RRS Sir David Attenborough carries out a range of vital roles:

- deploying and servicing scientific instruments;
- transporting scientists to field sites;
- providing essential provisions to the stations where scientists work; and,
- taking scientific measurements enroute to Antarctica and carrying out specific marine research projects.

7) We heard that modern technology is becoming available and is changing science in Antarctica. How does the Government plan to ensure that scientists working in Antarctica have timely and straightforward access to new technological advancements, such as autonomous vehicles, sensors, and engineering equipment, considering the evolving nature of scientific research in the region?

Embracing new technology is central to the strategy the government set out in the UK Science & Technology Framework. Within Antarctic science, we are embracing novel, low carbon, and autonomous technologies, to complement traditional approaches. Autonomous underwater and surface systems are reducing the need for ship support, reducing fuel consumption and carbon emissions, and enabling measurements in remote locations and times of year when other approaches would not be possible.

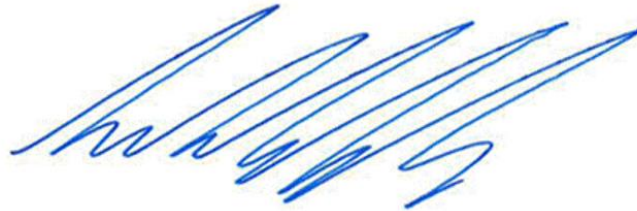
A variety of airborne remotely piloted vehicles are used to carry sensors for scientific measurements and cameras for high resolution photographs to collect data that we have never been able to access before, including data on the composition of rocks in remote, unsafe areas and accurate counts of animal populations, complementing larger-scale satellite observations.

On Antarctica networks of instruments for glaciology studies and space weather monitoring are deployed in remote locations and powered by wind and solar systems. There are also considerable current efforts in using AI and machine learning techniques both for data analysis and for efficient experimental design. AI is helping ship captains chose the most efficient routes through ice, saving time and fuel.

As Minister Rutley and I expressed at the session, I am very grateful to the Committee and your clerks for your interest in the Polar regions and for the work you have undertaken over the last couple of years. We very much look forward to your Antarctic

inquiry report in due course. I am copying this letter to Minister Rutley and Professor Jane Francis, Director of the British Antarctic Survey.

Kind regards,

A handwritten signature in blue ink, appearing to read 'Andrew Griffith', is centered on the page. The signature is fluid and cursive, with a prominent initial 'A'.

ANDREW GRIFFITH MP
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Department for Science, Innovation & Technology