Giant Waves in the Atmosphere over the Mountains of the Andes, Antarctica & Southern Islands

By Prof Nicholas Mitchell

Professor Mitchell surprised and delighted the society's audience with his lecture on giant atmospheric waves. We were expecting a meteorological education but learned that the number of whales in the Southern Ocean depends on the flux of meteorites into the Earth's atmosphere.

His tale started with our need to improve weather forecasts in the UK, which now require complex "global circulation" computer models. We know that these are missing out something important because they predict that Antarctica should be much colder than it actually is. Professor Mitchell's research group is trying to work out why.

The key lies in connections. The prevailing westerly winds of the southern latitudes set off giant vertical undulations downwind of the Andes and the mountains of South Georgia and Antarctica. These, it now turns out, lift energy and momentum into the higher levels of the atmosphere feeding a global stratospheric circulation pattern that ultimately influences weather tracks across the UK.

So, Prof Mitchell's group aims to understand the influence of the giant waves on the high-level circulation by means that include tracking meteor trails with radars on South Georgia and at the British Antarctic Survey Rothera research station. It was good to hear that even though his team also exploit sophisticated satellite monitoring of the atmosphere, it is still necessary to put research student boots on the ground releasing meteorological balloons from South Georgia and building elephant-seal-proof radar aerials. Old-fashioned field observations are still vital! As an aside, the work reveals that meteoritic dust settling from outer space gets swept down over the Southern Ocean, thus supplying enough additional iron nutrients to stimulate additional plankton growth and hence supporting higher whale populations.

Like all the best lectures, this was a well-told scientific story with surprising twists that convinced the audience that the group's research is important. A number of society members were also envious of the speaker's chances to go to some of the remotest and most beautiful places on Earth.

Michael McEllin