One hundred years at **Eskdalemuir**

David Booth looks back at a century of magnetic, seismic and weather observations in the Scottish Borders.

Site manager Colin Pringle measures the direction of the Earth's magnetic field.

This year sees NERC's Eskdalemuir Observatory celebrating its centenary. The observatory was built in Scotland in 1904 because the extending network of electric tramways around London was disturbing magnetic measurements at Kew. The new site had to be at least ten miles from potential magnetic disturbances. The story goes that Eskdalemuir's founders pushed a sixpence (which was the right size for a ten mile radius) around a railway map until they found an appropriately clear space. Three organisations have been responsible for the observatory – the National Physical Laboratory (1908-1910), the Meteorological Office (1910-1967), and NERC (1967-present). The British Geological Survey (BGS) operates the site, and makes its facilities available to the Met Office.

We need the accurate measurements of the Earth's magnetic field made at Eskdalemuir to direct drilling in the oil industry, and as a reliable means of navigating if satellite positioning technology fails. Since 1910 Eskdalemuir has seen the declination – the local direction of the north magnetic pole – move slowly and steadily 13° eastwards. There are short-term fluctuations as well. During the last great magnetic storm (in October 2003), caused by large and sudden changes in the solar wind, the direction of the north magnetic pole recorded at Eskdalemuir fluctuated by as much as 5° in only six minutes.

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The trams and trains at Kew also affected seismic recordings there, and a variety of seismometers were installed at Eskdalemuir Observatory. Since 1964 it has been part of a global standard seismic network that was originally set up to detect and help assess distant underground nuclear tests. It also supported the then novel research into how continental plates move (plate tectonics) by providing valuable information on the Earth's structure and earthquake mechanisms. Eskdalemuir is the base station for a local network of BGS seismometers – part of the network which monitors the UK. These instruments pinpointed the magnitude 4.7 Longtown earthquake on Boxing Day 1979, and a swarm of tremors in the Dumfries area in 2001. The network also detected the air crash at Lockerbie in 1988, accurately recording the time of impact for crash investigators.

Eskdalemuir has always been at the leading edge of meteorological technology. Observations from Eskdalemuir become available on the Met office web site (www.metoffice.com) as they are made, together with a live webcam view of the sky. Eminent Eskdalemuir meteorologists include John Stagg, who advised Eisenhower on the D-Day weather, and L F Richardson, who developed theoretical principles for weather forecasting. The Met Office bases the Real Time Monitoring Centre for its network of automatic weather stations at Eskdalemuir. The observatory's reputation as one of the coldest and wettest places in the UK has meant it's often chosen to test new equipment. Meteorologists and geophysicists work on the principle that 'if it works at Eskdalemuir, it will work anywhere!'

Observatory computing room in 1920s. Note the acetylene lamps, and slate globe for epicentre determination!

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