

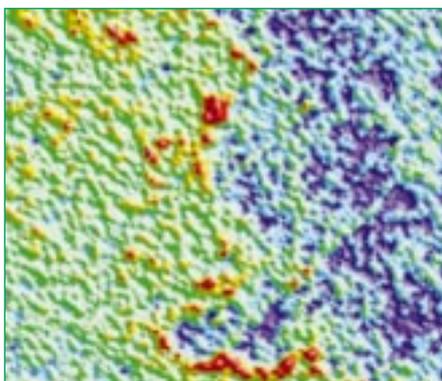
New airborne survey completed

Production flying for the collaborative BGS-World Geoscience (WGL) high resolution resource and environmental survey (Hi-RES-1) was completed on 7 September 1998. The area surveyed comprises some 14 000 km² of central England, bounded approximately by Lincoln, Liverpool, Shrewsbury and Stamford. Regular coverage at 400 m line spacing was achieved across all but a narrow strip in the north west containing the busy airports of Manchester and Liverpool. The survey allocation for this strip was used to infill three small areas of special interest where an effective line spacing of 200 m was attained. Flying height was nominally 90 m increasing, for safety reasons, to 240 m over developed areas.

The data collected were total field magnetics, multi-channel gamma-ray spectrometry and Very Low Frequency (VLF) electromagnetics. Navigation and flight path recovery were achieved using differential GPS while a video camera was used to record any cultural features along the flight path.

WGL are currently processing the data at their headquarters in Australia and we expect delivery of processed products in the near future. The data processing has not been straightforward because of cultural noise, variable flying heights, daily humidity variations and relatively low levels of gamma ray emission from the natural radionuclides. We anticipate the need for considerable further collaboration with WGL for the joint development of techniques to eliminate or suppress these effects.

The image below was derived from partially processed data and shows enhanced uranium levels associated with gently folded reefal limestone and



overlying shale in an area (about 400 km²) of the Derbyshire Dome.

When fully processed the Hi-RES-1 data sets will have a wide range of resource and environmental applications including:

- Guiding the exploration for new coal, oil and mineral deposits.
- Contributing to a better understanding of the geology of the region, including the concealed geology and deeper structure.
- Identifying areas which may be prone to high radon levels.
- Investigating possible correlations between the distribution of radionuclides and disease.

The final data sets should become available about mid-1999 and will comprise fully processed digital information and value-added products released in digital and hardcopy formats. It is anticipated that sales and licensing of this high resolution data will help to fund a further regional scale airborne survey with one of the final objectives being complete coverage of the UK.

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A worldwide family

Geological Survey Organisations around the world have formed a number of regional networks and hold regular meetings to share information and experience. For example, during 1998 BGS International organised a meeting of the Geological Surveys of the Commonwealth and also participated in meetings of the Association of Geological Surveys of the European Union (EuroGeoSurveys) and the Forum of European Geological Surveys. Further afield the BGS participates as an advisor in the annual sessions of the Intergovernmental Committee for Coastal and Offshore Geoscience Programmes in East and South East Asia (CCOP) and recently attended a meeting of 25 African Geological Surveys organised by BGR, the Federal Geological Survey of Germany. Together with its representa-

tion at meetings of the International Consortium of Geological Surveys (ICOGS) BGS is thus part of networks involving well over 70 national Geological Survey Organisations worldwide.

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BGS oriented rockdrill

Funded by a NERC BRIDGE grant and developed over the last 3 years, the BGS have designed, built and successfully tested at sea a new hard rock core sampling drill. It is for use on exposed sea bed outcrops and will work in water depths down to 4000 m. As it was funded for mid-ocean ridge exploration, it has been designed for use with lavas and basalts, although it will work on any sea bed rock. It operates from any vessel with Dynamic Positioning and uses the 17.5 mm deep tow coaxial armoured cable for deployment.

In April 1998 it underwent sea trials on the British Antarctic Survey research ship RRS James Clark Ross on the Atlantis Bank in the Indian Ocean. It recovered oriented rock cores of up to 1.1 m length from water depths down to 830 m. These cores were scribed along their entire length with a score giving their orientation on the sea bed. In all 13 cores were recovered from 17 dives, of which 2 were 1.1 m long (the maximum capacity of the rig) and 11 of which were igneous rock.

The whole machine is operated and controlled in real-time using a Windows based 'Control and Data Acquisition System', with a monochrome stills camera, displaying a picture to the surface geologist, allowing the sites to be visually inspected prior to drilling. A higher resolution copy of the initial image is available on recovery of the drill to deck.

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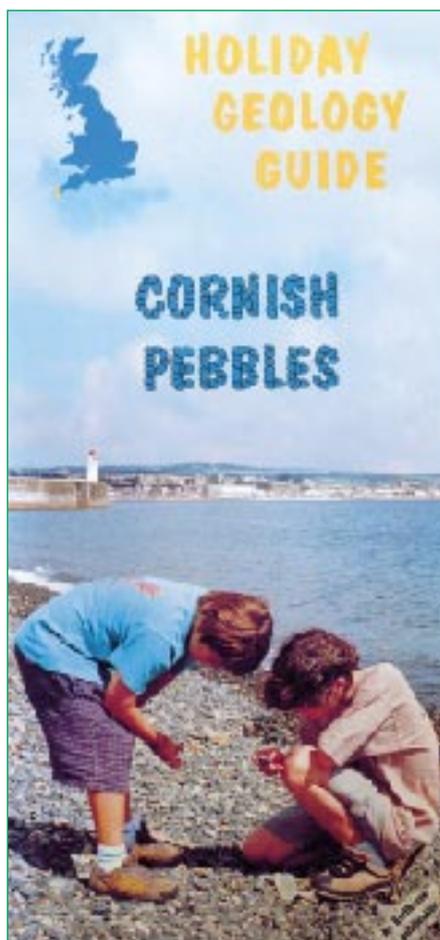
Geosciences and radioactive waste disposal

The UK Centre for Economic and Environmental Development is organising a national consensus conference on radioactive waste management in May 1999. Selection of a site for deep geological disposal of radioactive waste, should Government reaffirm such a policy, depends on the geological subsurface characteristics of the site, as well as a number of other factors. In their evidence to the House of Lords Select Committee on Science and Technology inquiry into the management of nuclear waste, the Geological Society and the British Geological Survey offered to use their good offices to explore the degree to which there may be technical consensus within the profession. To these ends the BGS and the Geological Society jointly hosted a meeting on 10 and 11 February 1999 open to all members of the geoscientific community to determine the extent of agreement over several generic geoscience issues including:

- What are the geoscientific characteristics of sites suitable for the deep disposal of long-lived radioactive wastes?
- What geoscience data are available to support initial site selection?
- What aspects of geoscience knowledge should be enhanced?
- What are the geoscientific issues relating to management strategies other than deep disposal?

Isotope laboratory award

The BGS, and in particular the NERC Isotope Geosciences Laboratory (NIGL) have been awarded a 2.5 year £89k grant to investigate the metal speciation and bioavailability of heavy metals in contaminated soils of Wolverhampton and Nottingham, with collaborators from Imperial College and Nottingham University. Professor Parrish of NIGL will lead the BGS effort and the project will focus in detail on using lead isotopic measurements, as well as copper isotopes, to attempt to trace the metals back to original contaminant sources. The project will use the new Plasma 54 multicollector mass spectrometer at NIGL, co-funded by NERC, BGS, BAS, and University of Leicester.



Help for harassed parents

The new BGS Holiday Geology Guide on *Cornish Pebbles* will enable parents to relax at the seaside as their offspring match their pebbles with those in the guide before turning to the other side to discover how they were created during the turbulent geological history of Cornwall. For visitors to the seaside resorts of Yorkshire, the BGS also presents a holiday guide entitled *Scarborough and Whitby — the Jurassic coast*. This utilises a colourful, computer-drawn, 3D, panoramic map of the cliffs and coast to guide the holiday-maker to the secrets in each rock stratum.

Two more Fossil Focus guides have been produced. The highlight of *Plants* is a watercolour by the wildlife artist Richard Bell which juxtaposes four scenes from Britain's land history. *Echinoids*, the subject of the other publication, are the ancestors of the present sea urchins. The guide gives the layperson, collector and student the

essential information for this fossil group along with another Richard Bell watercolour.

All BGS publications are available from :

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Palaeoclimate forum

The Natural Environment Research Council has identified global change as one of the five main issues on which its research should be focused in the next 5 to 10 years. Isotopic techniques are likely to play an important role in gaining knowledge of natural climate variation over a range of timescales. NERC's Isotope Geosciences Laboratory (NIGL) is a central facility for providing isotopic scientific support to the UK's environmental research community. As part of its mission to anticipate and respond to the needs of this community, NIGL is convening a one day forum for the discussion of isotopes in palaeoclimate research. The forum, to be hosted by Leicester University will be held on Wednesday 28th April 1999, and comprise 6 keynote presentations.

- An overview of Palaeoclimate Research – Professor Neil Roberts (Plymouth University)
- Isotopes in the marine environment – Professor Nick Shackleton (Cambridge University)
- Isotopes in the lacustrine environment – Professor Allayne Street-Perrott (University of Wales Swansea)
- Isotopes in speleothems – Dr. Frank McDermott (University College Dublin)
- Isotopes in Polar ice cores – Dr. David Peel (British Antarctic Survey)
- Isotopes in dendroclimatology – Professor Mark Pollard (Bradford University)

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