First official geological survey in the British Isles

from Gordon L. Davies

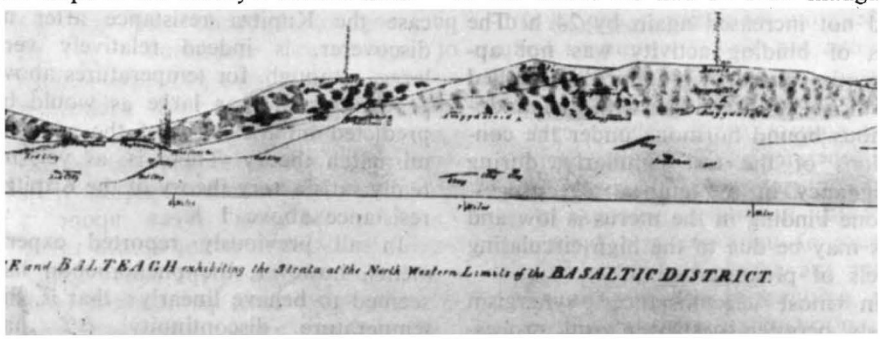
In March 1832 Henry Thomas De La Beche approached the Master General and Board of Ordnance offering to plot geological lines upon the ordnance maps of south-western England, and the outcome was the establishment in 1835 of the Geological Survey of Great Britain as a branch of the Ordnance Survey. A fact which is much less well known is that as early as 1824 Lieutenant-Colonel Thomas Frederick Colby (1784–1852), the Superintendent of the Ordnance Survey, had himself inaugurated an Ordnance Geological Survey of Ireland, and although it proved abortive, it was a pioneering venture that deserves to be remembered in this the year of its hundred and fiftieth anniversary.

Colby was keenly interested in geology (he had been a member of the Geological Society of London since 1814) and he resolved to bring Irish geology within his purview when in 1824 he was directed to extend the Ordnance Survey's operations into Ireland. The Irish rocks were to receive this particular attention because the survey was under instruction to publish maps of Ireland on the lavish scale of 6 inches to the mile instead of the 1-inch scale that was standard in Britain. Colby hoped that as his men worked their way across Ireland they would also be able to collect geological information as a byproduct of their normal topographical duties. Indeed, writing in February 1826 he looked forward to the completion in Ireland of "the most minute and accurate Geological Survey ever published".

Initially Colby's plan was that the surveyors would collect geological samples, mark the collection sites on maps, and then despatch both samples and maps to the survey's Dublin headquarters where a geologist would identify the specimens and then interpolate geological lines on the maps. This seems to have been the procedure used when the survey began operations in counties Antrim and Londonderry in 1825, but the inadequacy of such random methods soon became apparent. In November 1826, therefore, Captain John Watson Pringle (who lived about 1793–1861), a Waterloo veteran and a former pupil of Friedrich Mohs at the Freiberg School of Mines, was appointed to reshape the survey's geological activities. Under his direction the field parties were themselves instructed in the construction of geological maps and sections, and for their guidance he prepared a pamphlet entitled *Geological and Mineralogical Observations* fifty copies of which were lithographed at the Tower of London in March 1827. From the surveyors Pringle expected a geological map of each parish accompanied by two geological sections drawn from north to south and east to west, and he estimated that using his methods the geological survey of Ireland would be completed by 1834 at the trifling cost of £5,500.

But Pringle's methods were never accorded a fair trial because Colby's superiors decided that geology was interfering with the survey's more legitimate topographical duties and in September 1828 Colby was directed to cease all geological investigations forthwith. He did manage to revive the Irish Survey's geological activities in January 1830 when Captain Joseph Ellison Portlock (1794–1864) took over the duties formerly discharged by Pringle, and the fruit of this resurrected geological survey was Portlock's classical map and memoir of the geology of Co. Londonderry and adjacent areas published in 1843. By then, however, the Geological Survey of Ireland was merely a poor cousin of the vigorous body that De La Beche had created in England, but this should not be allowed to obscure the significance of Colby's achievment back in the 1820s. He had in 1824 inaugurated the earliest official geological survey to operate within the United Kingdom and that only 3 years after the Corps Royal des Mines had planned in France the earliest of all national geological surveys. The French surveyors, however, did not start work in the field until 1825, the very same year as Colby's men 'broke ground' in Northern Ireland.

Sadly, Colby's abortive geological survey of 1824 never published any of its work, but a few geological maps and sections produced under Pringle's direction have recently come to light in the Dublin offices of the Irish Ordnance and Geological surveys. Some of these items have found a place in the exhibition being staged in Trinity College Dublin to mark the anniversary of the foundation of the Ordnance Survey of Ireland. The exhibition opens on June 7 and will run for 2 months.



Part of a geological panorama running north to south for 11 miles across the Co. Londonderry parishes of Drumachose and Balteagh. The original possesses a horizontal scale of 6 inches to 1 mile and a vertical scale of about 1 inch to 430 feet. The panorama which shows the Tertiary plateau basalts (blotched) resting upon Cretaceous chalk and Triassic sandstone, is the work of two of Pringle's officers, Lieutenants Lancey and Fenwick, and it is dated November 28, 1827. The topographical detail and geological inscriptions have been lithographed and geological colours then added by hand, and the panorama was evidently used as a specimen designed to show survey parties the type of work expected of them.

Infrared superhet for detecting pollutants

from our Chemical Physics Correspondent

Anybody who, since the 1930s, has built his own radio receiver is aware of the advantages of superheterodyne detection. Not merely can the main amplifier be chosen for a convenient frequency, but more importantly the signal strength is proportional to the product of the electric field strengths of the weak incoming signal and the powerful local oscillator in contrast to the less favourable square of the signal field for direct detection.

Hitherto these advantages have been denied to those who need to detect weak infrared signals, because of the lack of suitable local oscillators whose stability must be good compared with the band width of the amplifier. Stable infrared lasers have altered this position so that the whole problem of the detection of weak infrared emission is being considered. These comments are prompted by an article by Menzies and Shumate (*Science*, **184**, 570; 1974) who use the superhet principle for the detection of small amounts of pollutant gases. But as these authors point out, a wider range of applications is possible including the gathering of meterological information by sensing the atmospheric emission at selected frequencies. And it may not be long before such detection systems are used in conjunction with astronomical telescopes. Furthermore, when tunable infrared lasers are more readily available the scheme can be used in conjunction with frequency scanning.

The heart of the instrument is the mixer detector, in the present case a copper-doped germanium photoconductor. This receives the signal,