

Scientific stamp of approval

NERC is forty this year, but parts of the organisation, such as the British Geological Survey (BGS), have a much longer history. BGS's forerunner, a branch of the Ordnance Trigonometrical Survey, was founded on 11 July 1835. Its founder and first director, Henry Thomas De la Beche, immediately set about creating a Museum of Economic Geology that would contain 'specimens illustrative of the application of geology to the useful purposes of life'. The museum was established at a house (later two adjoining houses) at Craig's Court, Whitehall. In April 1839 the eminent analytical chemist, Richard Phillips, was appointed curator, and in July of that year he was furnished with a laboratory where he could analyse rocks, minerals and soils. However, in his role as possibly the first government chemist, Phillips was soon called upon to analyse various unlikely substances such as sweets, seaweed and soap!

One of the more interesting requests, first recorded in the museum entry book under January 1840, concerned analyses for Rowland Hill (inventor of the adhesive postage stamp) of 'two substances proposed to be employed for causing the adhesion of stamps under new Post Office regulations'. Phillips experimented to see whether creosote, a recently discovered solvent, could be used to fraudulently remove the Post Office cancellation mark (then called the oblitative stamp). He recommended that the normal red cancelling ink be replaced with ordinary black printing ink. But this presented a difficulty, because the one penny stamp was itself to be printed in black.

The world's first adhesive postage stamp, the Penny Black, was issued to the public on 1 May 1840 (the Twopenny Blue followed on 8 May). Problems soon arose however. Rowland Hill recorded in his diary for 21 May that '...all sorts of tricks are being played by the public, who are exercising their ingenuity in devising contrivances for removing the oblitative stamp, by chemical agents and other means. ... I am making every effort with the aid of Phillips the chemist, and others, to prevent these frauds.' The Post Office, which had been hostile to Hill's reforms, at first continued to use its

David Bate explains how scientific expertise helped design the earliest postage stamps.



own red ink, but after further tests by Phillips, tried specially prepared black printing ink.

Hill also recommended that the one penny stamp should be printed in red. Phillips tested suitable red (and blue) printing inks in late 1840, and confirmed they were easily spoilt by any fraudulent attempt to remove the cancelling ink. The new Penny Red was issued to the public on 10 February 1841, and a new Twopenny Blue appeared in the following month.

'...all sorts of tricks are being played by the public...'

The laboratory's role in introducing adhesive postage stamps was one of accident rather than design. But scientific skills and technical capabilities are often useful in surprising situations, and this is as true now as it was in 1840. These days, BGS's state-of-the-art geological laboratories employ an impressive array

of analytical techniques with wide-ranging applications. For example, analysing oxygen and strontium isotopes in human teeth has helped trace human remains from archaeological sites (you may have seen some of this work in the TV series *Meet the Ancestors*, *Blood of the Vikings*, and *Secrets of the Dead*), and chemical analysis of trace elements in foods and human tissue has helped in epidemiological studies – not activities traditionally associated with a geological survey organisation!