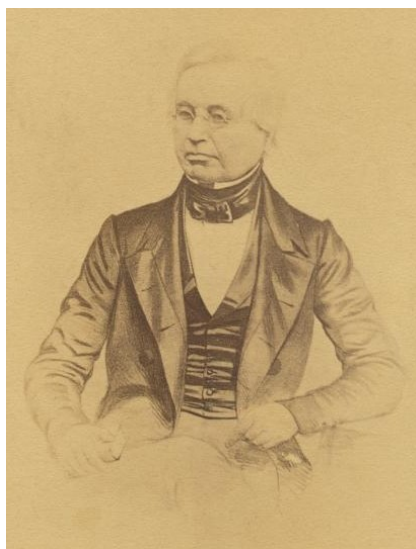


## Richard Phillips at the Museum of Economic Geology and his experimental work on the Penny Black and Penny Red postage stamps

The forerunner of the present British Geological Survey was founded on 11 July 1835 as a branch of the Ordnance Trigonometrical Survey. Its role at this time was to provide an understanding of the geology of Britain, which would be '*of great practical utility to the Agriculturalist, the Miner, and those concerned in projecting and improving the Roads, Canals, and such other public works, undertaken for the benefit and improvement of the Country.*' Its founder and first director, Henry Thomas De la Beche, also 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, under the jurisdiction of the Office of Woods and Forests. In April 1839 the eminent analytical chemist, Richard Phillips, became the museum's first curator and chemist, and in June of that year he was furnished with a laboratory for analysing rocks, minerals and soils. However, in his role as effectively the first 'government chemist', Phillips soon found himself called upon by various government departments to analyse and test a range of such unlikely materials as sweets, seaweed and soap!



Richard Phillips was Curator and Chemist at the Museum of Economic (later Practical) Geology, from 1839 until his death in 1851 (Photo: BGS archives GSM1/639/3)

### Work for Rowland Hill

Among the more interesting of these non-geological enquires were a series of experiments undertaken for Rowland Hill in connection with the introduction and subsequent modification of the world's first adhesive postage stamps. A few items of correspondence on this matter are copied into the museum entry book for the first two months of 1840, now preserved in the British Geological Survey Library at Keyworth, Nottingham. In the account that follows, this rather meagre information has been supplemented by reference to Rowland Hill's personal journal preserved at the Royal Mail Archive in London. Other published sources to which reference has been made are noted at the end of this account.

In September 1839 Rowland Hill was appointed to a senior position at the Treasury, charged with the task of overseeing the execution of his plan for Post Office Reform. This, as is well known, involved the introduction of a uniform postage rate (one penny per half ounce), and the design of stamped letter sheets, stamped envelopes, and adhesive stamps, which together were to provide three alternative methods of prepayment. By early December, Hill was able to submit definite proposals to the Board of the Treasury, which included the design of a small stamp '*to be attached to the letter ... by means of a glutinous wash at the back.*' Hill was authorised to commence preparation for the stamps on 11 December. This would seem to be the point at which Richard Phillips at the Museum of Economic Geology enters the story.

## Tests on gum

The first indication of Phillips' involvement is a general statement of analytical work carried out by the laboratory over the preceding six months up to 23 January 1840. Phillips records that *'By direction of the Right Honorable the Chancellor of the Exchequer, I have several times waited upon Mr Rowland Hill, and I have received from him two samples of substances proposed to be employed for causing the adhesion of Stamps under the new Post Office regulations; these I have examined and reported upon, and I find that I shall probably be again employed in the same service.'* No details of these early experiments have been discovered. However, on 3 December 1839 John Rawsthorne of Manchester supplied Hill with samples of manufactured gum, which included a solution made from mixing the gum with cold water, and another made with hot water. These were in all likelihood the two samples examined by Phillips. Rawsthorne was subsequently contracted to supply the gum, although its actual composition appears to have been a trade secret (it evidently consisted of potato starch).

## Creosote

On 7 February 1840 Phillips reported the results of experiments to ascertain the potential for fraudulently removing the Post Office cancellation mark. The enquiry was prompted by a Mr John Atkinson of Liverpool who wrote to the Treasury on 27 December 1839 with a detailed plan for preventing such fraud by impregnating the stamp paper with a salt of iron followed by prussiate of potash (this has the effect of making the paper sensitive to ink-erasing chemicals). This proposal followed from his success in removing a cancellation mark by the application of creosote, a solvent then only recently discovered. Following some experiments of his own, Phillips recommended instead that the red cancelling ink normally favoured by the Post Office should be replaced with printer's common black ink. This was to present a difficulty however, because on 18 March it was agreed that the One Penny adhesive stamp should be printed in black, making unsuitable the use of black ink for the purpose of 'obliteration'.

## Red cancellation

On the same date (18 March) the printing firm of Perkins, Bacon & Petch, to whom the task of producing the adhesive stamps had been entrusted, wrote to Phillips enclosing twelve impressions made with an improved red cancelling ink which they believed could not be removed without damaging the paper. The results of Phillip's tests are not known, but the firm wrote to Hill on 18 April sending him *'two small pots of red ink similar to that from which you tried specimens.'* On 24 April Hill wrote to Colonel William Maberly, the Secretary of the Post Office, calling his attention to the power of creosote to wash out the red cancellation mark, and forwarding to him a specimen of red ink supplied by Perkins & Co. *'which is free from this objection.'* On the following day the Post office issued a printed circular to all postmasters and sub-postmasters with directions for preparing a red stamping composition. Maberly had earlier described Hill's plans for postal reform as *'preposterous'* and *'utterly unsupported by the facts'*, and as might be expected, he was uncooperative and obstructive in the face of any recommendation made by Hill. For this reason it is unclear whether the ink supplied by Perkins & Co. formed the basis of the new stamping composition.

## Tricks by the public

The world's first adhesive postage stamp, the Penny Black, was issued to the public on 1 May 1840, while the Twopenny Blue followed on 8 May. Problems soon arose however. Rowland Hill recorded in his journal 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 & other means'*. But he added that *'I am making every effort with the aid of Phillips the chemist & others to prevent these frauds.'* The Post Office continued however to employ the same red ink for the purpose of cancellation, and not until mid August did it concede in writing to the Treasury that there was a problem with fraud.

## Rainbow trials

Already by the beginning of June Hill was considering the use of a different colour for the One Penny stamp. J. B. Bacon, of Perkins & Co., wrote to Phillips on 4 June: *'I have now the pleasure of enclosing you some stamps in Pink [red-brown] which I think is best for colour and for printing of any we have yet produced and which will probably stand your test as well as any. I also send one in the Black ink we are now using, but wet in the solution, it is all the safer for wetting, but not so good as the Pink.'* This is a reference to the so-called Rainbow trials conducted from May to November 1840, in which impressions from a trial plate of twelve stamps made from the One Penny die were specially printed in a range of colours, including black, blues, lilac-rose, and shades of green and red. The stamps were subjected to various tests connected with obliteration, some of which were undertaken by Phillips at the museum laboratory.

## Black cancellation

During August Phillips undertook tests on various black inks intended for cancellation purposes. This followed from a Dublin chemist's success in demonstrating that common black printer's ink could be removed without injuring the stamp. Nevertheless, at the end of August black cancelling ink was tried in place of red for a trial period on letters going through the London District Post. Edward Bacon, writing in 1920, records the earliest known use of the black cancellation mark as 31 August 1840. All cancellations at this time employed the so-called Maltese cross obliterator.

## New stamps

On 17 September (in a report to the Treasury on obliteration) Hill formally recommended that the One Penny stamp be printed in 'red' and the Twopenny value in a new blue. Suitable red-brown and blue printing inks were tested by Phillips. These were designed to be fugitive and thus easily defaced by any attempt to remove the cancellation mark, which would now be applied using a modified black printing ink. The Royal Collection contains a trial sheet of twelve stamps (cut into two halves) in the red-brown colour, on the reverse side of one of these sheets is written *'Exposed by Mr. Phillips to the sun from Oct. 21 to Nov. 6.'*

The new red-brown One Penny stamp was issued to the public on 10 February 1841, and a new Twopenny Blue appeared in about the middle of the following month. Initially cancellation of the new stamps was undertaken using red ink, but in due course all postmasters were supplied with a specially prepared black composition for this purpose. Hill had recommended that Phillips be employed to inspect and approve the ingredients for making the new cancelling ink, but it is unclear whether this was complied with.



The old Penny Black with red Maltese Cross 'obliteration'



Replacement Penny Red with black Maltese Cross

## Phillips and the Museum

It has already been noted that Phillip's duties as chemist were principally meant to be directed towards the analysis and testing of geological materials. The extensive use of his time by government departments for other purposes, and the uncertain relationship between his official duties and what was termed his '*private professional business*', began to cause some concern to his employer at the museum, De la Beche, during 1840. This may explain why no further correspondence concerning the Post Office work was copied into the museum entry book after February of that year. The experiments for Rowland Hill were evidently commenced in an official capacity but may later have been undertaken on a private basis, although conducted in the museum laboratory at No. 6 Craig's Court. Unfortunately Phillips had been under the mistaken impression that there was an arrangement between himself and De la Beche in this respect. In January 1841 the museum entry book records that Phillips had received a total of £91 15s 0d '*For duties performed for the Post-office*'. But he goes on to note that '*For the professional business which I have performed for the Post-office I am undoubtedly indebted to my station as Curator of the Museum*'.

### Sources:

**Bacon, E. D.** 1920. *The line-engraved postage stamps of Great Britain printed by Perkins, Bacon & Co.* London: Chas. Nissen & Co., 2 vols

**Muir, D. N.** 1990. *Postal reform and the Penny Black: a new appreciation.* London: National Postal Museum, 242 pp.

British Geological Survey Library: *Geological Museum entry book of in-and-out letters, 1835–1842*, GSM1/1, pp 128-36, 180-2.

Royal Mail Archive: *Rowland Hill's Post Office Journal*, POST100/1,4.

David G Bate

Natural Environment Research Council: British Geological Survey, Keyworth, Nottingham

The above account was submitted for publication in *Stamp Magazine* and appeared in the issue for May 2006 (vol. 72, no. 5, pp. 64-6) under the title 'The appliance of science', but it contains editorial alterations and omissions as well as being slightly recast.