Great Britain: The 1858–1879 1d Rose-Red Plate 77

A Discovery that Raises Questions

by Abed Habib Najjar

Foreword

Ever since the discovery of the first 1864 1d rose-red stamp showing a plate number 77, towards the end of the nineteenth century, all philatelists and scholars of the stamps of Great Britain, without exception, believed that plate 77 printed the ten recorded copies showing a plate number 77. With so few examples existing there were no grounds for philatelic study, and there was therefore no reason to doubt this fact which was, and still is, undisputed by all.

My extensive research into this subject could not find any conclusive evidence that plate 77 printed any of the stamps known today. On the contrary, my studies have proved the opposite to be true. Not only is there no evidence that plate 77 printed any of the existing stamps, but all the evidence that has been unearthed supports the fact that plate 77 never printed any stamps at all that show a plate number 77. It is therefore reasonable to assume that either all the existing stamps showing a plate number 77 are fake, and I am certain they are not, or come from other plates of that issue that were re-engraved with the number 77. This could have happened either intentionally or in error, or could even have been a clandestine printing that was released to the public.

Is this impossible to believe? Perhaps, but an open philatelic mind in this case is needed for unravelling the mystery behind this iconic stamp and the advancement of philately.

Abed H. Najjar

An 1865 Part Cover to Brussels, Franked with Three Copies of Plate 77 Stamps

With no imprimatur (or "register") sheet[1] in existence, practically no Post Office records, little published information and only ten copies recorded, one can fully understand why the appearance of a 1d Plate 77 stamp on the market would be treated with both excitement and suspicion. It is therefore understandable that the recent discovery of this exceptionally remarkable item, one that can arguably rate as one of the rarest philatelic gems existing, would be met with serious skepticism.

The item, an irregular strip of three of the 1d rose-red with check letters in all four corners (S.G. 43) Plate 77 stamps on cover to Brussels, has brought to light a groundbreaking theory on the way Plate 77 stamps were produced. It was only with this discovery that a new study into this line engraved (or "intaglio") plate, a study that has never before needed to have been considered, now has to be carried out. The single copies that previously existed were taken at face value as having originated from an original Plate 77. However, the three copies on this cover cast doubt on this assumption. This study will show why we may no longer be able to rely on the explanation that a plate that was produced with a die numbered 77 was used to print this issue.

The Cover: Description and Detail

The stamps on the cover are examples of the 1864 "letters in all four corners," with a watermark large crown, Die II, perf 14, 1d rose-red (SG43) Plate 77, an irregular block of three, with check letters RL, SK and SL, on large part envelope from Guernsey to Brussels (Figure 1). It is canceled by a "324" duplex datestamp of November 27, 1865, showing "PD" in a circle in red and, on the reverse, the French transit and the Brussels arrival cds of November 28, 1865. The cover was mailed correctly at the 3d rate, the rate required to send mail from Great Britain to Belgium at that time, and carries the following cancellations:

1. The Guernsey duplex handstamp G16b showing the pointed "4" in "324" was in use in Guernsey between 1862 and 1867. The cover, which is dated November 27, 1865, falls within these dates. All three stamps are canceled by this handstamp, which includes the "Guernsey A" cds of "NO 27 65."
2. The "PD" (Paid to Destination) in a circle mark, which was applied in red, was added to letters going beyond France, indicating payment for the English and French postage. This "PD" mark, SG type 342, was in use in Guernsey between 1866-1873. The mark on this cover precedes this date by two months.
3. ANGLETERRE par Brest transit c.d.s. ? NO 65.
4. BRUXEL(LES) arrival c.d.s of 28 NO 65.
5. The cover was mailed correctly at the 3d rate, the rate required to send mail from Great Britain to Belgium at that time.

Figure 1. The newly discovered cover with three stamps showing plate 77.

The Dilemma

Checking the four corner letters on the three stamps shows them to match exactly those of plate 73 stamps of the same position. This can only mean that either the stamps have been faked from plate 73 stamps or were produced from a re-engraved

plate 73. The corner letters of the stamps do not match those from plates 71 or 177, from which practically all fakes are known.

A Comparison of the Upper Corner Letters of Stamps SK and SL on the Cover, with those from plates 73, 71 and 177

Stamps SK and SL from cover showing plate number 77 (note: reversed letters at top)

Letter 'K' close to left-hand side of square

Small dash inside 'S' square—a constant flaw

Letter 'S' close to right-hand side of square

Stamps SK and SL plate 73 registration sheet

Stamps SK and SL plate 71 registration sheet

Letter "S" high

Letter 'L' close to left-hand side of square

Stamps SK and SL plate 177 registration sheet

Figure 2. A comparison of check letters from two stamps on the cover and plates 73, 71 and 177.

Facts confirming that the "plate 77" stamps on the cover are from plate 73:

1. All corner letters match exactly
2. The constant red flaw at the base of the upper right-hand box carrying letter 'S' on stamp SK is on all plate 73 stamps in this position and on the imprimatur sheet.
3. Not yet shown, the left-hand "7" on the right-hand panel is in a high position unique to plate 73 stamps.

The 1864 1d Red Line-engraved Issue: A Brief Outline

In 1858, Rowland Hill announced the decision to issue a perforated penny red with check letters in all four corners and a plate number on either side of the stamp printed within the design. The intention behind this idea was to stop any possibility of rejoining unused portions of other stamps and reusing them. The plate numbers on either side served both to identify the plate from which the stamps were produced and to keep a record of the work carried out on it.

It had the added advantage of ensuring that if two halves of any unused stamps were rejoined, the plate numbers would probably be different. In order to print the hundreds of millions of stamps required, it was deemed necessary to produce a very large number of plates in order to accommodate this task. Ultimately, plate numbers 69 to 225 were produced, even though some were not used to print stamps.

The printing of this issue fell under a new agreement between the Commissioner of Stamps and Taxes and Messers Perkins, Bacon, which was signed on December 3, 1861, for a period of ten years computed from July 5, 1861, with a six-month notice of termination. This agreement was modified in 1865, raising the printing price per thousand stamps to 4½d per 1000. A fresh contract was signed on April 12, 1867, and continued in force until the end of 1879, when the printing of the one penny postage stamps passed out of the hands of Perkins, Bacon.

The first transfer roller—with seven impressions on which the plate numbers were engraved—was produced from the master die in April 1858. The production of the finished plate was a long process, taking over ten working days. This involved the transfer roller being rocked 240 times over a polished steel plate. The plate was approximately 12 inches by 20½ inches and about 5/8 inch in thickness, on which a grid was outlined, producing a complete plate with 240 impressions. Once this process was completed, check corner letters were entered individually.

The printing of this issue did not commence until March 1, 1864, and the first stamps were issued on April 1 of that year. The imprimatur sheets were registered on March 14, 1861, for plates 71, 72, 73 and 74, on February 7, 1863, for plates 76, 78, 79, 80 and 81 and on March 1, 1864, for Plates 82 through 87.

These plates were all put to press on March 1, 1864. In total, plate numbers 69 to 225 were produced, and the majority of these plates were well used, as there was a reluctance to discard them until they were worn. Plates 69, 70, 75 and 77, and the later plate 128, were rejected mainly because the images were out of alignment for the application of correctly positioned perforations. Plate 126 was not produced as the impression on the transfer roller was defective.

The rejection of practically half the number of the nine early plates numbered 69 to 77 had to be a serious setback, bearing in mind that the four plates involved were of no use and involved a large expense of time and money in producing them. Had it been economical or possible, then why were they not replaced with another plate of the same number? It is reasonable to assume that the plate number was of no importance to the postal authorities and merely served the purpose of identifying the printing plate.

Stamps from Plate 77

For roughly a century it has been believed and documented that, as for all the other plates, plate 77 produced the few existing copies of plate 77 stamps. There was never a need to look further into how plate 77 stamps were produced. With so few copies in existence, it was taken for a fact that this stamp came from a plate 77, which was produced from a plate 77 roller.

However, new discoveries and observations, brought to light by the author, have put these beliefs into question. These involved study and observations of three stamps with strong provenance; namely the Tapling and Fletcher copies in The British Library, and the copy in The Royal Philatelic Collection. These findings suggest strongly that there is a need to have a re-examination of how stamps bearing the plate number 77 were produced.

The first discovery involves Inland Revenue document IR79/79, pages 40-41, held at the National Archives (Figure 3), which clearly states the following:

1. Plate 77 was not registered
2. Plate 77 was not put to press
3. Plate 77 no impressions were printed
4. Plate 77 was partially defaced in Feb 1862 (note that the date may have been misrecorded and is probably 1863).

A statement that appears in manuscript next to the plate 77 entry states: "incorrectly laid down for perforation."

There is no imprimatur sheet for plate 77 in The British Postal Museum and Archives.

Figure 3. The left and right halves of Inland Revenue document IR79/79, showing records of plates 70 through 80.

The Inland Revenue document IR79/79 found in the National Archives clearly states the following facts when recording the details of the printing plates 70 to 80, such as preparation, registration, defacement (both partial and full), putting to press and the number of sheets printed.

For plates 70, 75 and 77 it states the following:

Plate	Registered	Put to press	Partially defaced	No. of sheets printed
70	Not registered	Not put to press	1864 Feb15	None
75	Not registered	Not put to press	1862 Feb 4*	None
77	Not registered	Not put to press	1862 Feb 4*	None

*It is very probable that a transcription error was made in entering this date as the year this plate was partially defaced was more than likely 1863 and not 1862. Partial defacement of a plate was the process used to ensure that the plate was not put to press and that no prints could be made from it.

The second discovery involves the impression from the uninked plate 77 transfer roller (Figure 4). An albino proof from the transfer roller, which produced the 240 plate 77 stamp impressions on the plate, is available at The British Library in the Board of Inland Revenue Stamping Department Archive. It clearly shows a major feature that is not present on the existing plate 77 stamps. Notice that there are two dashes adjacent to each figure "7" on the right-hand panel as per the plate 77 roller (Figure 5). This feature must appear on all the existing plate 77 stamps if these stamps were printed from this roller and plate.

In addition, and of the utmost importance, any stamps printed from a plate created with this die must have virtually identical plate numbers.

The third observation involves three of the accepted copies of plate 77. Studying the two stamps in The British Library and the stamp in The Royal Philatelic Collection, one notices states of wear that are not expected from stamps originating from a fresh plate that has printed only a few sheets.[2]

Other major differences involve the figure "7" and the matrix around it. As can be seen in enlarged illustrations of the "77" numbers on the various stamps, the dashes from the transfer roller are not present and the numbers vary.

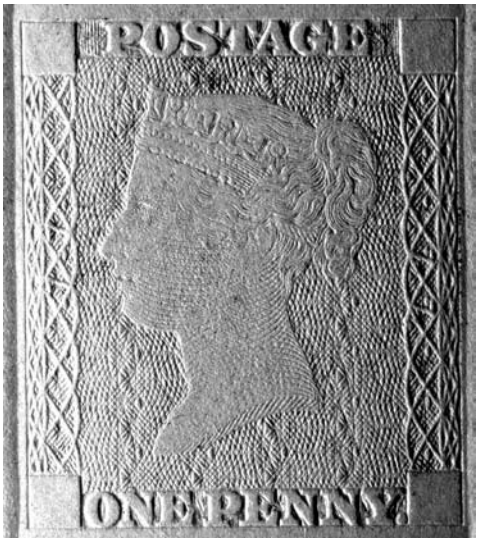


Figure 4. The albino proof from the transfer roller for plate 77, (the image has been reversed).

Figure 5. Plate number 77 from the right side of the transfer roller showing the dashes.

Figure 6. Three examples of plate 77: AB from the Royal Philatelic Collection (illustrated with the gracious permission of Her Majesty The Queen), BA from The Tapling Collection and PH from the Fletcher Collection, the latter two illustrated courtesy The British Library.

The above three facts strongly suggest that, if genuine, the three stamps on the cover showing a plate 77 number did not come from the original plate 77, but must have come from other existing plates in which the number was altered to "77," by a means yet to be examined in this article.

The Existing Copies of Stamps Showing a Plate Number 77

To date only ten copies have been recorded, five unused, of which one was presumably destroyed, and five used. These are as follows:

Unused

Stamp AB	In The Royal Philatelic Collection (examined by the author).
Stamp AC	Purchased and sold by Chas. Nissen.
Stamp BA	The "Tapling" copy in the British Library (examined by the author).
Stamp ?	In W. Hughes-Hughes collection, which passed on to Ferrary.
Stamp ?	Owned by H.J. Crocker and destroyed in 1906 with his collection.

Used

Stamp LL	Sold in 1915 for £50.
Stamp MI	Found in a box amongst a million stamps sold in 1944 for £220.
Stamp NC	Found in a collection and purchased in 1994 at Harmers of London.
Stamp PH	The Fletcher copy, found in 1920, and now in the British Library (examined by the author).
Stamp PI	On piece with 4d. Found in 1920 by a customer who purchased a box from dealers Johnson and Redhead.

The single mint copy found by Nissen and the four used copies, all of which were randomly discovered, proves that the stamp was issued to the public for postage use.

Observations of Features of Plate 77 Stamps

A study of the two stamps in The British Library and the stamp in The Royal Philatelic Collection (Figure 6) yields a few observations:

The impressions on all three stamps were not as sharp and clear as would be expected from a plate that would have printed only a handful of sheets. The impressions show some weakness and wear, in particular, around the crown jewels and the dropped dots.

The second figure "7" in the right-hand "77" varies between the stamps as far as shape and the position of the diagonal within the base of the diamond. Several are not uniform in shape. This difference should not have happened if the plate had been produced from a die with the number 77 in the side panels. Some "touching up" of transfers is possible, but not necessarily to the extent seen here.

The first "7" of the "77" in the right-hand panel has a short horizontal bar.

With the great rarity of these stamps, it is unlikely that anyone felt the need (or had the access) to examine and to compare them before. It is now quite clear that the status of all of the genuinely accepted plate 77 stamps must be examined to explain these anomalies. Their long provenance and observed characteristics preclude them from being fakes. One of the few alternative answers is that they might come from other plates that had been re-engraved.

A Comparison of the Plate 77 Roller Die Impression and the Stamps

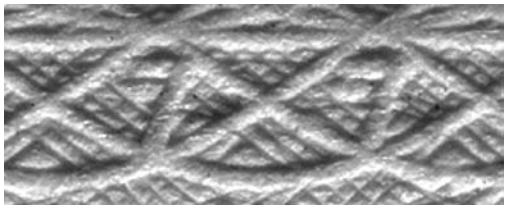
A proof from the plate 77 transfer roller is available as an uninked impression in The British Library Philatelic Collections, from which a copy was obtained, enlarged and reversed for study purposes (Figure 4). Looking at this, one will notice the row of dashes running down the right-hand side of the panel, each within the diamond and touching the plate number "7" in that square (Figure 5). This is a common feature of the master die.

Comparing this with the two stamps in The British Library and the stamp in The Royal Philatelic Collection, one immediately notices the distinct lack of these dashes. There is absolutely no reason why these dashes are not there if the stamps came from

the plate 77 roller and plate. They appear on every other stamp printed and their absence needs to be explained.

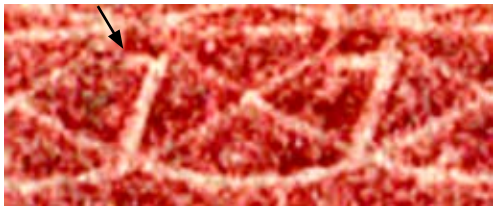
The Die and Figures 77 Compared

The shape and position of the right- and left-side figures "77" on the roller impression of the plate 77 die.



Note that the shape of the "7"s and position are different on each of the stamps.

AB left-hand panel: note "7" touching left

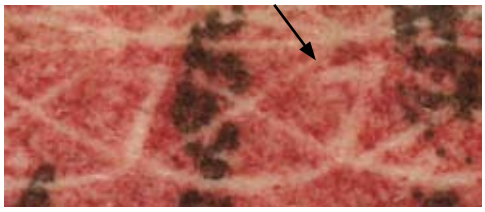


AB right-hand panel: note short first "7"

BA left-hand panel: note "7" touching right

BA right-hand panel: note short first "7"

PH left-hand panel: note "7" touching center



PH right-hand panel: note dropped top of "7"

Figure 7. A comparison of the numbers 77 on the three stamps.

Notes on the above images:
1. Note the distinct absence of the dashes against each "7" on the right-hand panel. These dashes must appear on stamps from plate 77.
2. Note the broken top of the first "7" of "77" on the right-hand panel.
3. Note the distinctly worn impression of the figure "7" on all the stamps.
4. Note the varying shapes of the two strokes making up the figure "7."
5. Note the position where the figure "7" touches the intersection of the curved filigree lines.

The variable nature of these impressions is not compatible with what would be expected of stamps created with the same transfer roller. Each of the "7"s in the same position should be identical, but it is clear that they are not.

W.R.D Wiggins, in his book *The Postage Stamps of Great Britain Part Two, The Perforated Line Engraved Issues*, makes the following statement as to the position of the figure "7."

> In plate 77 the left-hand 7 is placed immediately above the intersection and the right-hand 7 slightly to the left of the intersection.

Close study of both right- and left-hand figure "7," as can be seen in the comparisons, shows that he may have used the Fletcher copy "PH" for his observation, which is the only one that shows those characteristics for the second digits. If Wiggins had based his comments on a single stamp, assuming that the roller had been used to create the plate with the numbers as part of the die, he would have missed the variance between the different stamps.

Note also that the curved lines of the filigree near the top of each "7" are weakened or broken to varying degrees, in contrast to the transfer roller. This would suggest that retouching or other work took place on the plate in this area.

The Challenge of Changing a "3" to a "7"

The check letters of the stamps on the cover in Figure 1 show that they came from plate 73, but the plate numbers at the sides of the stamps show "77." If the three stamps on the cover were altered to change the "3" into a "7" on five of the six positions, with the sixth too scuffed to matter, an artful faker may have chosen one of two primary ways: replacing the second "7" with numbers cut from a different set of stamps, or painting over the "3" and substituting a "7" for it.

Given the nature of the area involved, it is difficult to imagine why someone would choose plate 73 for the "raw material," rather than one such as 72, which has fewer strokes to convert (see Figure 8 for the comparison of a "7" and a "3"). Similarly, choosing a cover that has three stamps, one badly scuffed, offers more work than would be the case with a single stamp in fine condition on a local cover.

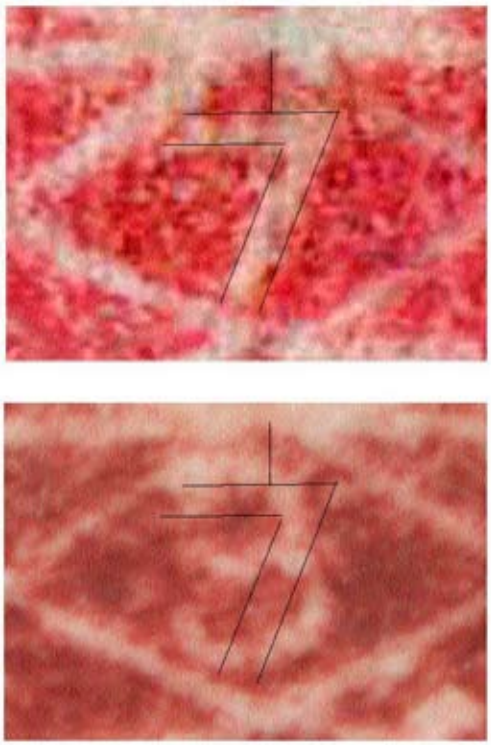


Figure 8. The diamond of a "73" plate with a "7" as an overlay, showing the area that would need to be altered.

Some forgers have been known to practice their "art" on inexpensive items, just to perfect their technique. This cover, however, carries the correct rate, correct datestamps, transit and arrival markings and PD mark, all of which tally exactly and are of the correct time period for a plate 77 usage. This implies that, if faked, the stamps would already have been on the cover and the effort made more difficult in that the cancellations fall over some of the "7"s.

To further complicate the logic, why would someone go to all the trouble to make such an item and then leave it to be discovered over a century later in an old-time collection on the continent, where knowledge of such rarefied items as the existence of Great Britain plate 77 stamps is less likely.

Expert Opinions

Expert opinion was sought for the cover bearing the three plate 77 stamps and the results were as follows. It is interesting to note that the two opinions differ greatly.

Expert Opinion "A"

The cover with the three plate 77 stamps was submitted for expert opinion and received a certificate in 2006 stating they "... are not from plate 77 but have been faked in each case using a stamp from plate 73." A letter in response to one requesting clarification of the opinion stated that "The corner letters on the stamps on your cover exactly matched those of plate 73. Further there is a slight indentation on all these stamps where the '3's' would have been and on examination these have been replaced by '7's', probably from some defective copies of other plate 71 - 79."

The letter and certificate intimate that the "3"s on the stamps have been replaced by "7"s from other plate 70's stamps. "Replacement" would suggest a "cut and paste" process. Examination shows that there are no traces of the "indentations" mentioned in their letter, so it is unclear what they may have seen to make that observation.

The experts, despite being provided with strong suggestions and evidence that all plate 77 stamps have come from re-engraved plates, continued to insist that the stamps on the cover are not from plate 77 and, as such, are fakes.

Expert Opinion "B"

The cover with the three plate 77 stamps was submitted to a different expert group and received a certificate indicating that the stamps were fakes, in November 2007, stating specifically "... The stamps are not from plate no 77, rather the second digit of each stamp has been altered to resemble a 7."

Requesting further details from the second expert group, the following wording sent to them was agreed by them as to the way the fake was made.

"Using a 10 power magnifying glass you have noticed readily apparent repairs/alterations to all the right hand figures in order to make them resemble a figure '7.' The five small localized areas of 1.5mm in diameter containing this figure are covered by a yellowish rose-red colour as opposed to the lake red colour of the stamp. This is presumably due to the skilful application of a pigment/paint/colour/dye or similar in order to complete the faking process. This accounts for the colour difference between these five small areas and the colour of the stamps."

The correspondence and certificate intimate that the right-hand figure on the stamps was tampered with and altered to resemble a "7," and that a foreign coating of some form was applied, often referred to as being "painted in."

Forensic Testing

The conflicting opinions are both logical responses, given the common belief that the plate 77 stamps came from a plate uniformly created with a transfer roller die with that number, and that stamps that plated positively to a different plate (73) must have been altered. With such a strong argument against any other possible answer, it is easy to understand that the usual manipulation of such stamps had to be the explanation for the "altered" numbers. Even the difference between the two opinions is reasonable to expect, since either "alteration" could have been likely and not worth the extra effort to prove or disprove.

In this case, however, certain tests are possible that would eliminate both of the "usual" manipulations as an answer to the question of how stamps from plate 73 could have received "77"s for plate numbers. There is no doubt that forensic testing

and philately have not always seen eye to eye. The criteria to be tested have not always been a matter enabling definitive results to be obtained through forensic testing.

As far as forensic science and philately are concerned, doubt can be generated from data obtained forensically to support the dating of stamps, ink or paper, or for authenticating color, cancellations or other features. However, in this case forensic science is used to establish whether tampering and faking has taken place, specifically cut-and-paste or the painting-in with different pigments. One will agree that police, government and other bodies worldwide today rely on forensic science for this, and today's forensic science is perfectly capable of being definitive.

The cover was sent to four forensic organizations for study. It must be stressed, however, that the most comprehensive work was requested from The Forensic Document Laboratory and The Reading Scientific Services (RSSL). An earlier examination carried out by The Forensic Institute and The Forensic Science Service was somewhat superficial and did not use the necessary equipment for a rigorous test. As a result, that examination did not yield the comprehensive results required. Subjective conclusions were made on some of the findings, which left some questions unanswered. The requirement for high technology testing was vital in order to give concrete results that would leave little room for doubt or questionable conclusions. The high-tech forensic research carried out by the RSSL did make the picture much clearer and answered some of the uncertainties.

Ultimately, the stamps were examined by light microscopy and scanning electron microscopy (SEM). They were analyzed using X-ray microanalysis and X-ray microfluorescence (associated with elemental mapping) in order to determine any differences in the elemental composition of the ink used on the stamps and the underlying paper. These methods were performed according to established routines used in the RSSL laboratory.

Reading Scientific Services Limited (RSSL), February 1, 2008

The examination was carried out by an RSSL senior scientist, Mr. Tom Ray, and a full report was produced. Herewith is a summary of the report of the findings which has been cleared for accuracy by forensic scientists.

1. The right-hand diamond showing the figure "7" showed trace elements of lead, chromium, barium and titanium. These showed up to occupy the shape of the diamond and no traces of these elements were found outside this diamond area. Aluminium and mercury were present in significantly lower levels than in the surrounding print. The distribution of the elements in question showed a clear correlation with the diamond lace pattern. (See Figure 9)

2. SEM examination (in the "back-scattered electron" mode) of the scuffed region on the LS/SL stamp demonstrated that, even though invisible to the naked eye, remnants of the printed pattern (i.e. where the plate number would have been) were still visible using this technique. Furthermore, X-ray microanalysis demonstrated that the diamond where the second "7" would originally have been contained a trace of lead, this was not detected outside of this region. This analysis is consistent with the results obtained from the other "visible" second "7" regions on the stamps. "This damage did not appear to have been a recent event; the underlying fibre colouration appeared 'aged' and consistent with other worn areas on the stamp."

3. Further analysis of the second "7" diamond regions in the SEM using the topographic imaging mode (a technique used to show the surface topography of a sample) showed that, in each case, no obvious indentations or fibre disturbance was apparent. For comparison purposes, ink was removed to form a "7" in the diamond lace pattern of a reference Penny Red stamp: indentations were clearly evident as a result of this process. Based on the observations performed during this examination, it was consid-

ered unlikely that the second "7" diamond regions had been tampered with in terms of fibre manipulation (e.g. by scraping, cutting or adding fibres). The conclusion was worded as such. "No evidence was found of fibre disruption (e.g. through deliberate tamper by scraping, cutting or the addition of fibres) during topographical examination of the second '7 diamond' regions." (see Figure 10)

4. X-ray microanalysis of typical regions within the diamond showed correlation with the data obtained by XRF: the analysis showed that aluminium and mercury were present in lower levels than the surrounding print and that additional trace levels of barium, titanium, chromium and lead were present. With the exception of these elements, the main constituents of the ink composition were present in similar levels within and outside of the second "7" diamond region (zinc in particular). Based on the elements detected, analysis of reference plate 73 and 78 Penny Reds indicated that the ink used for these plate numbers was similar to each other but different from that of the stamps in question, the main difference being the absence of zinc, a reduced level of aluminium and an elevated level of calcium in the 73 and 78 plate.

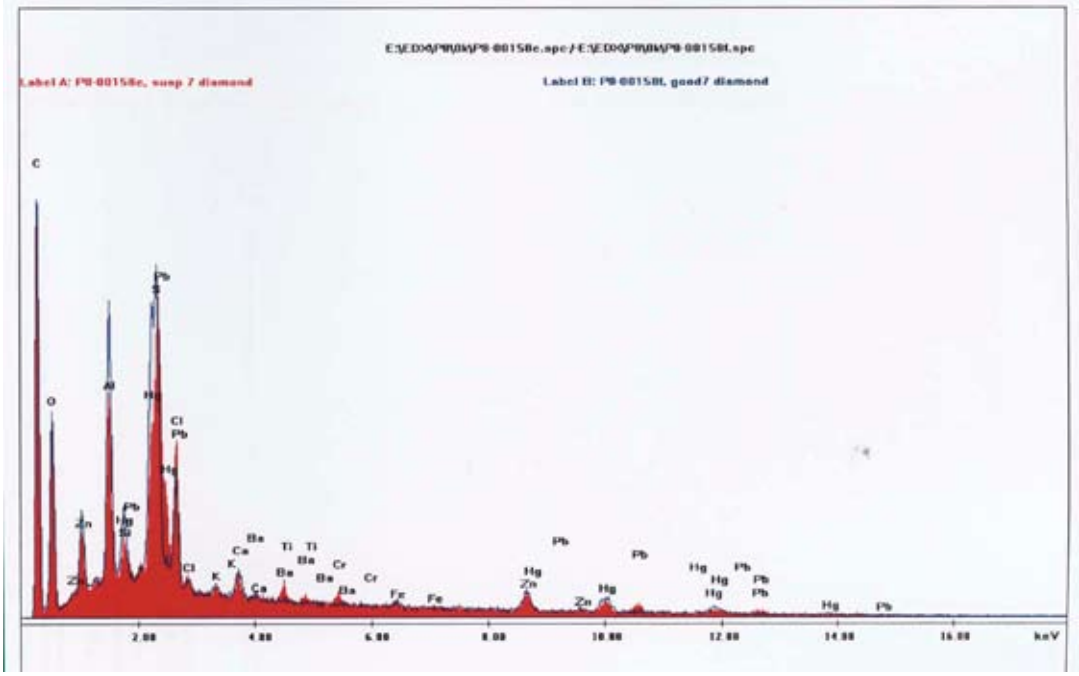


Figure 9. The elements found in the left and right "7" numbers of a "77" pair on the cover.

Figure 9 shows the X-ray microfluorescence spectra, red for the right-hand "7" and blue for the left-hand "7." Notice the great similarity between the two and, in particular, the main peaks of zinc and calcium suggesting that the printing ink base used was made up of calcium carbonate (calcite) and zinc oxide (china white, zinc white), both of which were common ink bases at the time. Being pure white in color, a suitable dye, in this case probably cochineal or carmine-red, would be used to give the appropriate shade of the rose-red required. The report noted trace elements of lead, barium, titanium and chromium, which could have some significance and will be treated later in this article. In essence, however, the two pigments are identical.

The "Painted-In" Option

Notwithstanding the presence of the trace elements, in order for a forger to acquire an ink that would give a similar spectrum to the one in the left-hand diamond, one would need analytical instruments, such as those used in the testing of these

stamps, in order to establish what elements exist. These instruments have been on the market for only around 20 years.

One must then establish the elemental content both qualitatively and quantitatively. Suitable "pure" compounds must be found that would contain these elements only, which have to be mixed into a correct medium, an oil, and constituted into an ink, of course allowing for the correct dye to give the exact shade.

Although theoretically possible today, this exercise would be of the utmost difficulty, and it would be highly unlikely to give the required result. As to carrying this out years ago, it is more likely that this would be an impossible task. Furthermore, the forger's main aim would be to match the color, the thought of an elemental chemical analysis being carried out would probably not even have entered his consideration at all, even if he were to know it to be possible.

The Cut-and-Paste Option

If the right-hand "7"s were to have been inserted from donor stamps with plate numbers containing the number "7," the paper of the stamps on cover would have to show a cutting of the fiber. Besides an exceptionally skilled cutting process in such a small area, the resultant positions should not show any evidence of tampering, and the cancellations that were on some of them would have to be enhanced convincingly. Needless to say, this is a very demanding task for the one trying to fake the stamps.

On the other hand, it is rather easy to dismiss this argument by using the scanning electron microscope (SEM) in topographic imaging mode. The two scans in Figure 10 show the second "7" in the left- and right-side diamonds, respectively, of stamp RL. The paper fibers show continuity, and a careful look will show the diamond shape, which completely fills each image, noticeable particularly at the right. Scans of the other two stamps show similar lack of any manipulation, with the scuffed area on SL showing the fibers as being long and more "exposed," as might be expected.

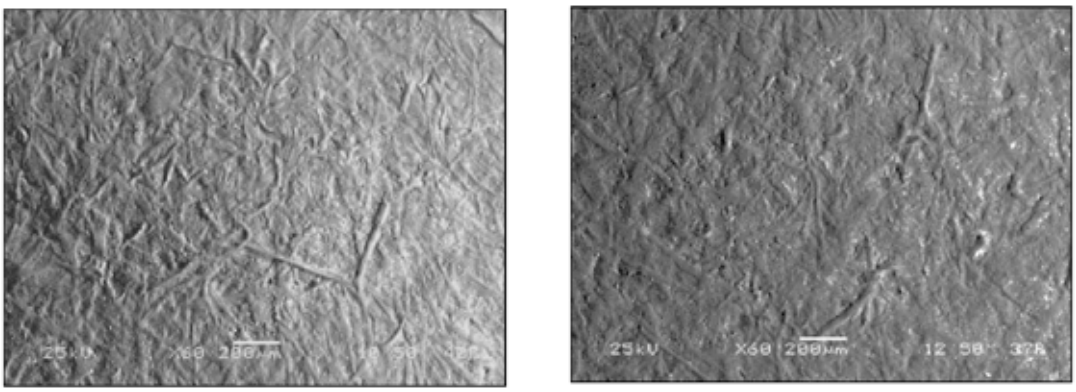


Figure 10. Scanning electron microscope images in topographic mode of the left and right side diamonds that contained the second "7" of the "77" on stamp RL.

A Brief Summary of Findings on Plate 77

As demonstrated above:

1. Records show that no impressions were taken from plate 77.

2. Accepted copies of plate 77 stamps do not match the plate 77 transfer roller and show differences among themselves in the "77"s, particularly at the right.

3. The three stamps on cover that show plate 77 have check letters that are from plate 73.

4. High powered inspection shows that the numbers have neither been painted-in nor replaced with "7"s from other stamps.

A New Concept

How can stamps exist from a plate that, according to official records, was never registered or put on the press to produce stamps? Why do those few that do exist fail to match the die that was used to make the plate and vary among themselves? Could the answer lie in a simple cover that was mailed to Brussels in 1865?

Consider the findings of the X-ray microfluorescence analysis. The elements, lead chromium, barium and titanium were found in trace quantities to take the shape of each of the right-hand diamonds containing the second figure "7" in each "77" pair. It is extremely unlikely (see other evidence) that these trace elements formed a part of an offending ink, particularly since they are also found in the scuffed area that shows no attempt to create a "7."

On the other hand, the very specific shape suggests that they could have come from an alloy plug that might have been used to alter the number on the plate. Furthermore, the burin used to engrave the number on such a plug may very well have left some of these trace elements within the diamond plug. The fact that trace elements found are not from the ink is again supported by the finding that the same trace elements were present in the area of the scuffed diamond that would have held the second "7," which was observed using the SEM. The figure, although invisible to the naked eye in the scuffed area, showed these very trace elements within the diamond area using x-ray microanalysis.

Most importantly no instance of these trace elements was found in the area outside this set of diamonds. This suggests a theory that the plate was altered very precisely in the area of the diamond. Such trace elements could not be placed so exactly within an area that is not visible to the naked eye or to light microscopy by something as relatively coarse as ink used for painting-in a number. In any case, offending inks matching this colour exactly cannot be made from trace elements.

Topographical analysis shows no disturbance of the fibres at all. Since, in this case, a figure "3" would have to have been changed into a "7" five times, it is expected that tampering of some form must be seen if it were a fake (see Figure 10).

Apart from the trace elements discussed above, the ink profiles matched exactly. This is compelling evidence that no foreign ink was introduced. Analysis on two random penny reds (from a 73 and a 78 plate) indicated that, in each case, a similar ink had been used. This ink did not contain zinc.

In the case of the questioned 77 stamps, zinc was present throughout (including the "second 7 diamond" region). This would indicate that no ink had actually been removed from the second 7 diamond, as the zinc was present at a similar level in this region to the zinc outside of this region. In order for a forgery to have been made, the forger would need to know that zinc was a major component of this particular stamp (i.e. he would need access to sophisticated analytical equipment such as an SEM with EDX detector).

The Importance of Zinc

Zinc in practically equal amounts was detected by both X-ray microanalysis and X-ray microfluorescence (associated with elemental mapping) in both the area carrying the right-hand figure "7" and the rest of the stamp. This finding is of great importance in authenticating the three stamps, as it makes the probability of using a foreign ink or pigment containing zinc extremely remote, in fact practically impossible for the following two reasons:

First: in order to acquire and chemically match the vital pigment needed to fake these stamps, one would need to know that zinc was a major element in the ink used to print these stamps. This is an impossibility, bearing in mind that the sophisticated equipment needed to discover this fact is very recent. Furthermore, introducing zinc into a suitable pigment in order to produce a similar spectrum of the elements present on the stamp would be a task of the utmost difficulty.

Second: stamps from plate 73 and 78 were similarly examined by the RSSL, and no traces of zinc were found. Furthermore, a recent research paper on the analysis of inks used to print the early line engraved 1d red issue ("Fourier transform infrared spectroscopy applied to ink characterization of one-penny postage stamps printed 1841–1880," Núria Ferrer, and Anna Vila, Serveis Cientificotècnics, University of Barcelona), gives no reference to finding any zinc at all on any of the stamps examined of all the issues. It follows therefore that a printing ink using zinc was used for a very limited period and was obviously an exception rather than the rule, as in this case.

Is Re-engraving the Key?

The variation in the plate numbers of the accepted copies of plate 77 shows that the transfer roller did not play a part in the creation of the stamps. Similarly, the three stamps on the cover in question also vary, which would normally cause any expert to suspect manipulation. Shown below are the areas of the three stamps with the left and right sets of "77" marks, which obviously vary from one stamp to the next.

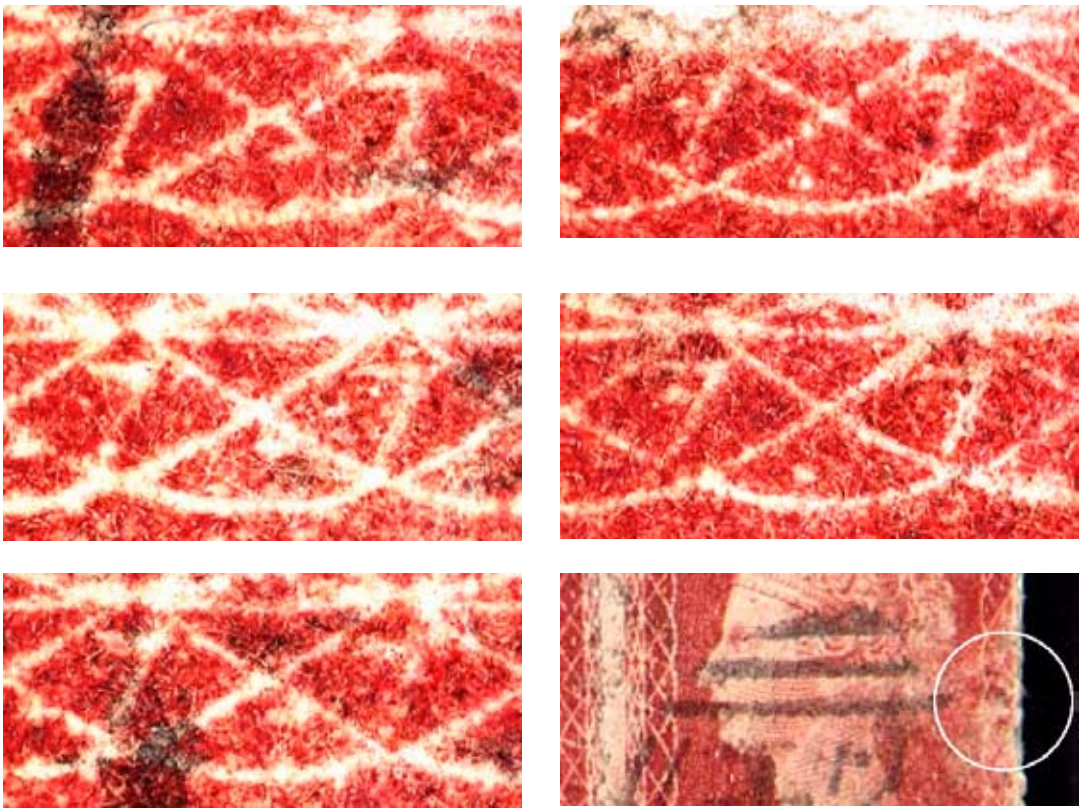


Figure 11. The areas of the stamps from the cover, showing the variation in the "77" numbers. The halves are left and right of each, from top to bottom, of RL, SK and SL, with the scuffed area showing at the right of SL.

Keeping in mind that the original number in the right position of each of these stamps was a "3," it should be obvious that more had to be done than a simple repainting of the diamond. That, plus the uniformity of the elemental composition of the ink dismisses that argument. The integrity of the fibers in the diamond at the right of each pair shows that the paper has not been disturbed or replaced.

Exhaustive tests show that these stamps have not been manipulated. The findings by each of the expert groups, to whom the cover was shown, are excusable in that they would expect stamps from a plate to have uniform characteristics, and these do not. But neither do the "genuine" examples. In each of the two cases, it is quite likely that the extremely remote chance of finding another rare plate 77, let alone three on cover, would make them very wary.

Examination by each would also see that the second "7" was not uniform, leading to the "obvious" answer that the items had been manipulated. One chose to suggest, probably on the basis of some observed anomaly, that genuine "7"s had been patched in from other genuine stamps. The other saw the variation in the second "7"s and perceived a difference in color, leading to the idea of those numbers having been painted-in. Neither would see the need to resort to using advanced technical equipment to conduct a study.

It is the variation in the engraved plate numbers that makes these stamps stand out, while at the same time making them seem suspect. Although at least one solution exists that would explain the observed anomalies, there is no way to prove that such action actually happened.

An answer, with supporting ideas, will appear in the next issue.

Illustration Credits

The Royal Philatelic Collection copy "AB": Shown with gracious permission of Her Majesty The Queen, to whom copyright belongs.
The Tapling "BA": The Tapling Collection, Great Britain section, page 28, The British Libarary.
The Fletcher "PH": The Fletcher Collection, volume 81, page 1, The British Library.
Impression from transfer roller: The Board of Inland Revenue Stamping Department [the Stamp Office] Archive, List 4, volume 12, The British Library.

Endnotes

1. The term registration sheet has been used in preference to "imprimatur," as the former is the correct term, as used in the Board of Inland Revenue Stamping Department Archive (the Stamp Office Archive). The term imprimatur is a philatelically manufactured word for registration. The term "Somerset House" means The Stamp Office (of the Inland Revenue, now HM Revenue and Customs), the department responsible for overseeing the production of postage stamps printed by Perkins, Bacon.
2. Note that the check letters in the bottom corners are the ones that indicate the stamp's position on the plate.

(To be concluded)