

**A recent discovery in Trajan's Forum: some implications  
for understanding bronze inscriptional letters**

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## A recent discovery in Trajan's Forum: some implications for understanding bronze inscriptional letters

In *Typography Papers* 1 (1996), Alan May explored several methods of infilling square-cut Roman inscriptions. This article draws on the recent discovery of an inscription in the Foro Traiano whose square-cut letters are outlined by a series of grooves. It challenges Alan May's conclusion, and instead postulates the use of a method involving metal pattern letters.

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Preparations for the Grande Giubileo del 2000, Rome's celebration of the millennium, resulted not only in the cleaning and restoration of many monuments, churches, and palazzi, but also in new archeological discoveries. One such discovery, made by a team of archeologists headed by Professor Eugenio La Rocca, Sovraintendente ai Beni Culturali del Comune di Roma, coordinated by Dr Silvana Rizzo, and under the scientific direction of Dr Roberto Meneghini, was an inscription in three contiguous fragments found on 23 August 1999 in the southern portion of the Foro di Traiano where an arcaded piazza meets the northern portico of the Foro di Augusto. The fragments are part of a white lunense marble plinth or string-course that may have functioned as a parapet.<sup>1</sup>

The inscription is in the nominative:

[CAES]AR · NERVA · TRAI[ANO]

The break between the first and second fragments occurs in the middle of the N of NERVA while the break between the second and third fragments runs through the V. The first two fragments are side by side with the inscription facing up. The remaining fragment is lying on its side nearby with the inscription facing away (figures 1 and 2). The letters are square-cut and were originally filled with gilded bronze. There is still bronze (with a patch of gilding) intact for the interpoint between NERVA and TRAIANO and mortar or cement remains in the stem of the R and the bottom of the left stroke of the V in NERVA (figures 3 and 4). Tang holes are present for every letter. Stylistically they are reminiscent of those in the famous inscription at the base of Trajan's Column which is located at the northern end of the Foro Traiano.

Despite its brevity the inscription is of interest for several reasons. The first reason is the superficial similarity of these square-cut letters to the contemporaneous v-cut letters of the Trajan inscription.<sup>2</sup>

1. 'The discovery in their place of three adjacent fragments of a continuous plinth of white Luna marble as wide as the string-course, and with the central part occupied by an inscription bearing the name of Trajan in the nominative, with letters 15 cm high, originally filled with gilded bronze, seems to suggest that this piece of work was intended to be placed between the two levels on the string course itself, or on an added masonry course in the manner of a parapet. The original length of the text (my thanks for this suggestion to Elisabetta Bianchi) was about eleven metres, much less therefore than the space available on the three portico sides which seems to have amounted to fifty

metres. This suggests that the text might have been repeated several times, or that it has come down to us not only with some gaps, but also incomplete where the dedication is concerned. It is possible that in the missing part of the inscription there was some reference, which has so far escaped explanation, to the functions of this uncovered and almost inaccessible area.' (Meneghini 2001, p. 262) I would like to thank James Mosley for his help in smoothing out the rough spots in my translation.

2. Dr Roberto Meneghini has proposed that the fragmentary inscription can be dated to the final years of Trajan's life. (In an e-mail, 10 October 2002.)



Figure 1. The first two fragments of the inscription in the Foro Traiano discovered in 1999. (© 2003 Legacy of Letters Digital Photo Archive)



Figure 2. The third fragment of the 1999 Foro Traiano inscription.



Figure 3. Detail of A·TR from the 1999 Foro Traiano inscription; the interpoint is bronze infill with a patch of gold leaf in the middle.



Figure 4. Detail of RVA from the 1999 Foro Traiano inscription; note the cement or mortar in R.



Figure 5. Inscription (CIL VI 920a) currently on a wall of the courtyard of the Museo Nuovo of the Palazzo dei Conservatori celebrating Claudius' victories in Britain (43 AD). See also figures 14 and 15.

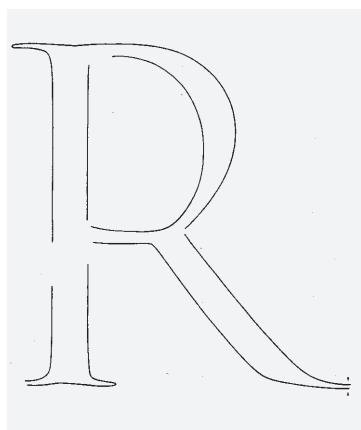


Figure 6. Tracing of R21 by Edward Catich from the Trajan Column inscription. (From Catich, 1961)

Second is the fact that these letters are lighter than other surviving examples of square-cut letters, like those in the fragmentary inscription celebrating Claudius' victories in Britain in 43 AD (figure 5) or on the Arch of Septimius Severus, 203 AD.<sup>3</sup> And third is the presence of evidence that may shed light on how bronze-infilled letters were made.

The letters of the Foro Traiano inscription range in height from 145 mm (E) to 160 mm (second A) and have stem thicknesses that vary from 20 mm (E) to 24 mm (second R). Their stem width to letter height ratio is roughly 1:7 in contrast to the 1:9 ratio that characterizes the letters of the Trajan Column inscription<sup>4</sup> (figure 6). The serifs are more heavily bracketed in the former than the latter. These differences undoubtedly reflect the contrasting methods of lettercutting of each inscription. There are other, subtler differences between the Foro Traiano capitals and those of the Trajan inscription. A has an inner serif on the right leg; the counter of R is more symmetrical and lacks a lower right 'corner'; the arms of the T are wide; and the interpoint is a triangle rather than a calligraphic stroke. Clearly the Foro Traiano letters were not made by a scriptor wielding a broad-edged brush in the manner proposed by Father Edward Catich in *The origin of the serif* (1968, 1991). And yet they are unmistakably imperial in style. Were they modelled on the letters of Trajan's Column?

It is not surprising that the letters of square-cut inscriptions tend to be noticeably bolder than those of v-cut inscriptions. The thin strokes must be heavier to accommodate the bronze infill. As a result the stroke contrast so characteristic of imperial capitals is reduced in square-cut inscriptions. For example many of the letters of the Claudian inscription at the Capitoline are nearly monoline. In contrast the letters of the Foro Traiano inscription have nearly the same 2:3 horizontal/vertical stroke ratio as that of the Trajan Column letters.<sup>5</sup> Their elegant appearance reflects the importance placed on an inscription destined for the largest and most ambitious of the Roman forums.

The surface of the plinth is smooth at the edges with a rough band in the middle framing the inscription. Richard Kindersley hypothesizes that the plinth was smoothed at the edges to make its ovolو moulding more visible from a distance. The middle section was left untouched since it was going to be filled with the inscription.<sup>6</sup> There are no visible guidelines for the inscription, but close examination of the rough surface reveals a series of four or five parallel grooves, spaced 2 mm apart, surrounding each letter and interpoint<sup>7</sup> (figures 7, 8, 9, 10). These grooves are clearly distinct from the surrounding surface. What was their purpose? They could not have had a decorative function since they are only visible at very close range. Instead they must have played a role in the formation of the inscription. That is, they were made before the letters were carved and infilled rather than after. They may be evidence for an alternative theory of how bronze infilled letters were produced to the one advocated by Alan May (1996).

3 CIL VI 920a and CIL 6.1033 respectively.

4. Measurements of Trajan inscription based on Catich (1961); measurements of Foro Traiano inscription based on rubbings made by me 19 July 2002.

5. Proportions are 7:11 versus 13:20 for the E (upper arm) and 8:12 versus 16:23 for T.

6. E-mail 17 October 2002 from Kindersley, who viewed the fragmentary inscription with me on 20 September 2002.

7. The existence of the grooves was pointed out to me by Elisabetta Bianchi, assistant to Dr Meneghini, during my first visit to see the inscription on 19 July 2002. I do not know if

other square-cut inscriptions have similar grooves, but those in the Roman Forum as well as on the Arches of Titus, Septimius Severus and Constantine have been so subjected to weathering and restoration that any grooves originally present are no longer visible.



Figure 7. Detail of R A from the 1999 Foro Traiano inscription; note the alignment and the series of grooves outlining both letters.

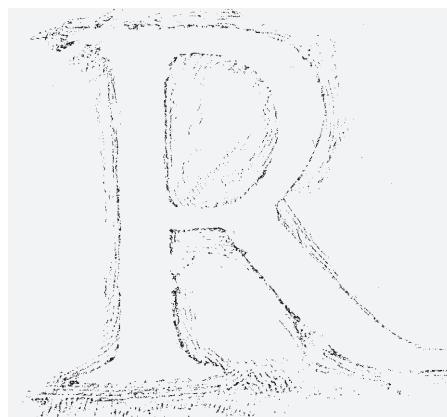


Figure 8. Rubbing of R2; note the series of grooved lines.

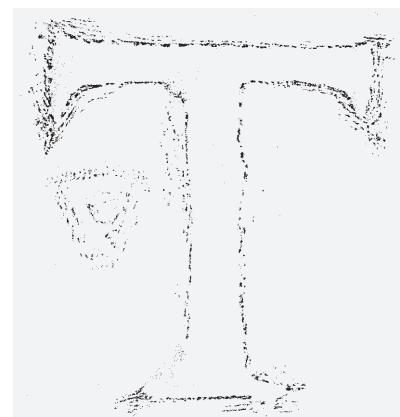
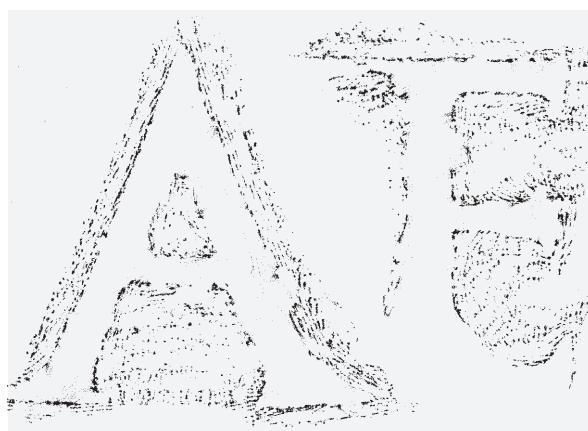


Figure 9. Rubbing of interpoint and T; note the series of grooved lines.

Figure 10. Rubbings of A1 and E; the lower left corner of the E is missing; note the series of grooved lines surrounding A1.



May, after testing out several possible methods, concluded that the most plausible one was as follows:

Take separate casts of each of the letter cavities and the surrounding stone surface using either clay, softened wax, or plaster ... Make female impressions in sand, clay, or plaster of those parts of the casts that are below the original stone surface. These new 'moulds' are effectively duplicates of the original letter cavities. Cast bronze infills from these duplicate cavities. (May 1996, p.126)

This method assumes that the letters were first written on the surface according to the Catich manner and then carved in stone. Kindersley, a lettercutter with several decades of experience, is sceptical. 'Instinctively I feel the process of cutting the letters first, making a positive, then a negative for casting from is far too complicated and fraught with difficulties,' he writes. 'For example, the carved letters have straight vertical sides making it very difficult to remove a negative mould from the marble.' But the real sticking point for him is the problem of shrinkage of the bronze after casting.<sup>8</sup> May, who used lead instead of bronze for his experiments, suggested that cold-working of the cast letters after insertion into the cavities might have solved this problem, though Kindersley remains unconvinced. (May's solution requires that the letters be made of an alloy of bronze, tin, and lead to provide the proper malleability for cold-working).<sup>9</sup>

Kindersley and I, intrigued by the grooves of the *Foro Traiano* fragment, have postulated another method, one that avoids the shrinkage issue entirely. It assumes that the bronze letters are cast in sand moulds, with tangs intact, before the inscription is carved. A piece of timber whose thickness matches the length of the tangs is laid on the plinth and aligned with the bottom of the text. The bronze letters are then assembled along the length of the timber and the position of their tangs marked. Sockets for the tangs are cut and the letters are inserted into the stone so that they are flush to the surface. Next, outlines of the letters – the series of parallel grooves – are traced onto the stone and the letters removed. Using the outlines as a guide the inscription is cut vertically into the stone. Finally, the original cast bronze letters – along with some cement as a bonding agent – are inserted into the cavities.<sup>10</sup>

Not only does this theory account for the grooves but it also explains the lack of guidelines, the bulbous serifs and the misalignment of the letters. In outlining the letters multiple grooves are used to ensure that the outline is visible against the rough surface of the stone. The existence of a single outline for the ARN in CAESAR · NERVA – the serifs of the right leg of the A and the stem of the R are joined as is the leg of the R and the left serif of the N – supports the notion that the entire inscription was assembled at once rather than letter by letter (figures 1, 11, 12). The use of a piece of timber as a guide to arranging the letters would obviate the need for scratched guidelines of the kind often found on v-cut inscriptions. The misalignment of the letters – most noticeably the slight rightward tilt of the first A in TRAIANO and the E in NERVA – suggests that they shifted before being outlined (figure 7). (Once the bronze letters were inserted into the tang holes the timber would have been removed and thus there would have been no guide to insure perfect alignment). The bulbous serifs – as well as

8. In an e-mail, 18 November 2002, from Kindersley; he also stressed the problem of shrinkage in an e-mail of 17 October 2002.

9. May: 'If their bronze letters were cold-worked after casting, the bronze they used must have been a compromise alloy.' He suggests the addition of tin and lead (May 1996, p. 128).

10. In an e-mail of 18 November 2002 Kindersley solves the riddle of how to deal with the tangs, a problem that had me stumped when I first proposed this process to Richard: 'To answer the latter, the process would be to cast the letters off site in a foundry from sand moulds with the tangs intact. The tangs would be approximately 30 mm long. A piece of timber 30 mm thick would be attached to the marble aligning with the bottom line of the text. The letters with their projecting tangs would be set up in the timber and the tang position marked up onto the marble. Next the tang recesses would be sunk into the marble and the letters would then be placed flush in the sockets, the exact position refined and the outline traced back on to the marble for recessing to receive the casting.'

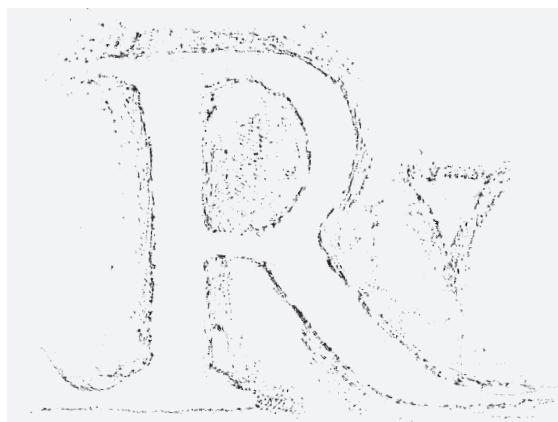


Figure 11. Rubbing of R1 and interpoint from the 1999 Foro Traiano inscription; note the join with the preceding A.

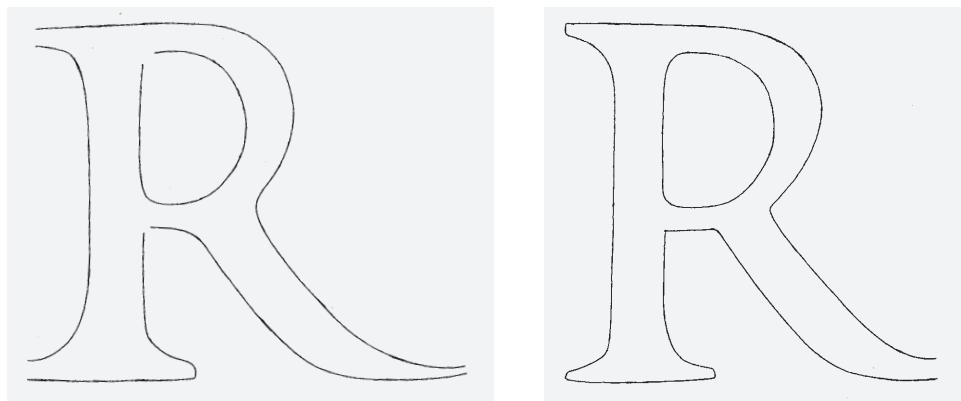


Figure 12. Outlines of R1 and R2 traced from rubbings to show the disparity between the two letters.



Figure 13. Repeat of figure 7, showing detail from the 1999 Foro Traiano inscription; see the alignment of R A and the series of grooves outlining both letters.

11. In an e-mail of 18 November 2002 from Kindersley: 'Interestingly all the serifs show a swelling (distortion) which could be due to the effect of shrinkage of the metal while cooling after casting.'

the soft junctures of strokes – reflect the fact that the letters were cast before they were carved.<sup>11</sup> Close inspection of the Claudian inscription reveals many of the same layout quirks as in the *Foro Traiano* fragment: inconsistent spacing, letters joined at the serif (e.g. EN and AT in SENATVS), tilted letters, and uneven alignment (figures 14, 15).

This method is essentially the same as that proposed by Susini in *The Roman stonecutter* (May's method C) in which letters cast from prepared patterns are used as models to cut the letters in the stone. Pointing out that the letters and tang hole positions of square-cut inscriptions are not identical for similar characters, May dismissed this theory. But his objection was based on the assumption that 'If such

Figure 14. Detail of the upper portion of the Claudian inscription at the Museo Nuovo of the Palazzo dei Conservatori. Note the raised C in line 1, the raised O in line 3 and the alignment of IM in line 4.

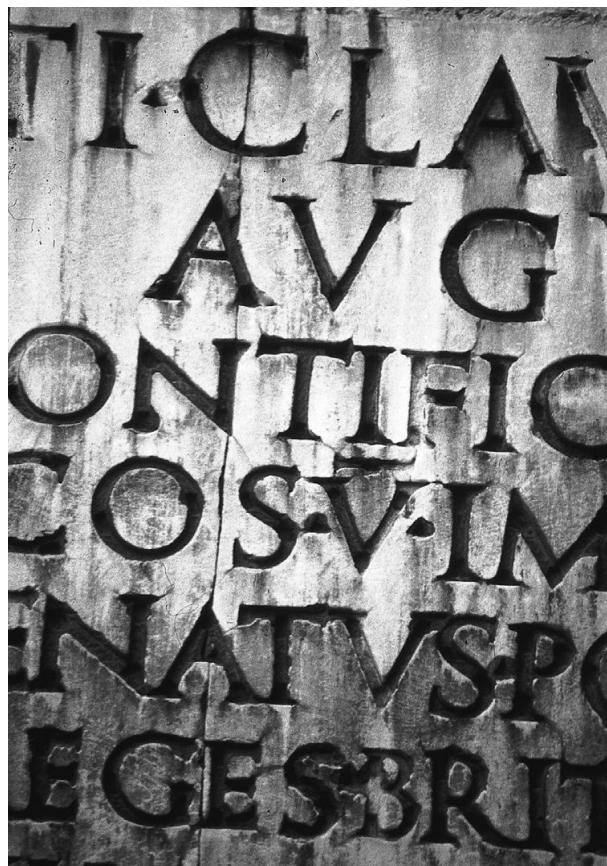


Figure 15. Detail of the lower portion of the Claudian inscription; note the alignment of IM on the bottom line, the dropped Q in the third line (as well as the differing sizes of the letters below its tail), the alignment of LA and IA and the dropped C in the second line, and the alignment and relative sizes of B and R in the top line.



a method had been used, we would expect to find that each of the occurrences of any letter of a particular size in an inscription would be identical, as it would not have been necessary to have more than one pattern for each character' (May 1996, p.126). This assumption may be logical, but not necessarily true. The three As, three Rs and two interpoints of the Foro Traiano inscription are all different, but that does not mean that they were not cast before being carved. Their bulbous serifs and curved stroke junctures are more typical of casting than of carving. Perhaps, despite the inefficiency, the Romans cast each letter of an inscription as needed.

Although circumstantial, the most telling evidence in favour of the notion that the metal letters were made first is the poor spacing of square-cut inscriptions. The letters, unlike those of v-cut inscriptions, tend to be positioned as closely together as possible, suggesting that they were physically assembled before being carved. This conclusion is reinforced by examples of letters that are misaligned and crooked (e.g. the MA in MAX of a square-cut inscription currently in the depository of the Foro Traiano, figures 16, 17) as well as some that may be upside down (e.g. several of the letters S in the inscription on the Arch of Septimius Severus). The overall impression of a square-cut inscription is of a group of disparate letters thrown together rather than of a rhythmic and harmonious whole.

This variation of the Susini method is based not only on the circumstantial evidence of the letters comprising the Foro Traiano inscription but also, in Kindersley's words, 'on how we would tackle this problem today'. It has several advantages over May's preferred method. First of all it is simpler. Second, it avoids the problem of shrinkage in casting bronze letters. Third, it guarantees that the bronze letters will fit the carved cavities without any additional recourse to cold-working or other strategies. And lastly, it can be used to prepare inscriptions horizontally on the ground or vertically *in situ*. Of course, as May said, no method can be considered definitive – including this one – until we have more information on the surviving bronze letters themselves.

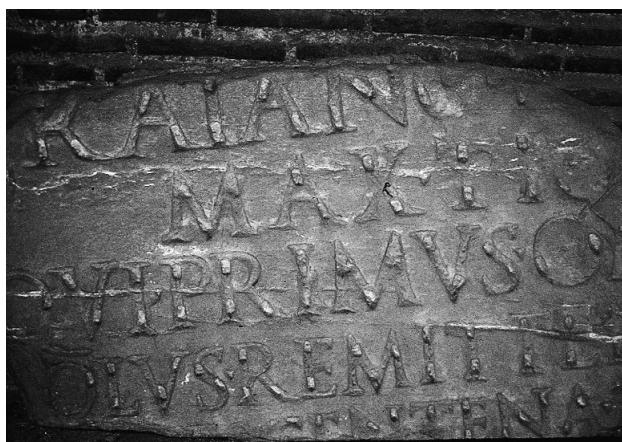


Figure 16. Inscription, discovered in the 1930s, in the depository of the Foro Traiano (underneath the Via Fori dei Imperiali). Note the tilted A and T on the second line.



Figure 17. Detail of the inscription shown in figure 1, showing parts of lines 1 and 2. Note the mis-aligned MA. (© 2003 Legacy of Letters Digital Photo Archive).

My thanks to Dr Roberto Meneghini and Elisabetta Bianchi for access to the inscription and additional assistance with the background of its discovery; to Garrett Boge for additional photographs and for making a full-scale rubbing of the inscription; and to Richard Kindersley for his valuable insights into the technical aspects of lettercarving.

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