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DIGITALIZATION OF V-CUT

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Abstract: From a range of various researches emerges the need for digitalization of cut-in letters on stone slabs. Cut-in letters are three-dimensional objects, defined by the V-cut – an engraved hollow in the shape of the letter V. At digitalization we encounter different dilemmas and questions and for a digitalization of quality it is important to face them. To what extent, if at all, is it important to consider the effect of the shadows in the cut-in letters when forming new digital letters? The V-cut is not the final shape of the engraved letter. To which extent the influence of shades will be considered in the process of digitalization depends on the style and form of the letters and, of course, on the individual contribution of the designer.

Key words: typeface design, typeface digitalization, v-cut, influence of shades

1. INTRODUCTION

The technique of engraving and the final look of the engraved letters are of great importance for the analysis and the digitalization. In this article we will present the whole process of engraving letters. Special emphasis will be given to the V-cut, the importance of shades, coloring and perception of the cut-in letters as three-dimensional or two-dimensional symbols. We will also study the possibilities of converting three-dimensional cut-in letters into two-dimensional digitalized letters.

The V-cut is an engraved hollow in the shape of the letter V. In this way sculptors used to engrave letters into stone. First they drew the letters and then, on their basis, they engraved them.

The shade in the V-cut is the consequence of the way the light falls on the cut-in letters. In this way a part of the letter becomes brighter or darker (figure 1). This gives the cut-in letters a typical look, which is impossible to reproduce with digital letters printed on paper. (Catich E. M., 1991).



Figure 1. The shades in the cut-in letters.

2. ENGRAVING AND DECORATING OF CUT-IN LETTERS

According to the theory of the development of cut-in letters, the engraving of letters is just a stage in the process of the formation of plates with inscriptions. The cut-in letters are supposed to be just a basis for coloring or gilding of the letters. In this way the engraved text is supposed to achieve an even more enhanced and three-dimensional look. According to researches, at the end most of the cut-in letters were colored. A good example is the Trajan's column, which was once completely covered in colors. In the cut-in letters we can still see the orange-red color, the standard color for coloring engraved typefaces in the roman period (Catich E. M., 1991; Nesbitt A., 1957). The habit of coloring cut-in letters slightly changed throughout centuries.

2.1 The purpose of cut-in letters

Why exactly did they engrave the letters if they colored them immediately after? The answer is simple. The purpose of engraving was a lasting preservation of the typeface on the plates with inscriptions. Engraving protected the sensitive colored letters from destructive natural phenomena, such as erosion and abrasion, which are caused by the sun, the rain and by the sand brought by the wind. Our ancestors were completely aware of the fact that the typefaces, which were simply drawn on the stone, were easily erased. The typeface on the Trajan's

column is again a good example. First it was drawn, then engraved and at the end it was colored (figure 2). The function of the frame which adorns the typeface is not just to decorate, but above all, to protect the typeface from climate effects. On the parts where the frame is damaged we can see that also the letters are damaged and therefore hardly readable (figure 3). Protections of this kind for engraved typefaces were used already by the Sumerians, the Assyrians and the Egyptians (Mosley O., 1999; Robinson A., 2000; Tschichold J., 1995).

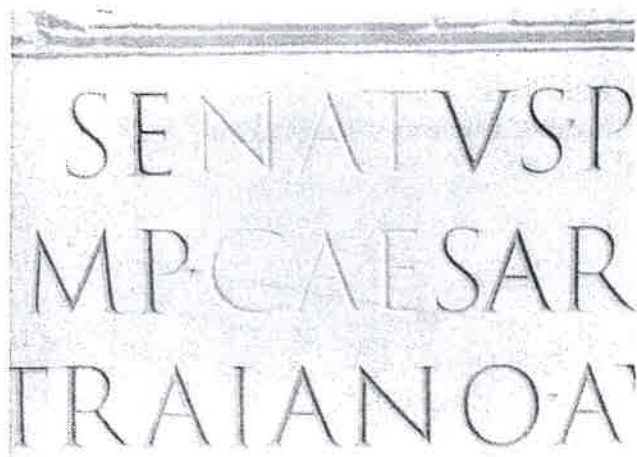


Figure 2. The effect of colored letters.



Figure 3. Inscription on the Trajan's column.

Throughout history, the engraving of letters served as the tool and the basis for the development of typefaces and literacy in general. These were the beginnings of typography.

2.2 Shades and their role in cut-in letters

We researched mostly the importance and the perception of shades in cut-in letters and we came across some interesting revelations. It is difficult to distinguish between engraving letters and sculpturing. We need the same tools and material (stone) for both and we also use the same techniques for their realization. One of the most known engravers (and also typographers) of the 20th

century, Eric Grill, was at the same time also a very successful sculptor. Today, the engraving of letters is supposed to be an unresearched (mysterious) branch of art. Only a few people research the history of this field. Most of the typographers and calligraphers are not familiar with or do not know anything about this way of reproducing letters. Engraved letters have a special characteristic which separates them from ordinary letters on paper. They are three-dimensional. Even though the V-cut is the basis of cut-in letters, it is not sufficient for the final look of the letters. Once they engraved the letters, they colored, gilded or filled them with copper. Most of the people wrongly believe that the V-cut is the final product of creating engraved letters. The problem arises when, in the course of time, the color peels off and what is left is just the V-cut. Most of the old slabs with engraved typefaces are colorless, which is a consequence of erosion and of the non-renovation of the letters. Originally, the letters on the slabs were colored. For those very reasons a false assumption about the V-cut to be the final shape of the letters dominates among typographers and calligraphers. (Catich E. M., 1991; Johnston E., 1994).

Actually, the V-cut has also the function of giving the letter a shape with the help of the shades and illuminated parts (figure 1). The deficiency of this is that these letters change shape at different lightings (at different times of the day). The appearance of the engraved letters is the best at noon, when the sun is in its highest position and gives the letters a uniform illumination.

The engraving of letters is a process consisting of many phases. The first phase is drawing of letters with a flat brush, the second is engraving the shape of the drawn letters, and the last is coloring, gilding or filling the engraved letters with metal. If we wanted to produce the original image of the previously drawn letters with shades, we would have to engrave thicker lines (strokes) than the drawn ones. Only in this way, shadowing half of the V-cut, could we produce the weight of the original letters. They were not able to do it because the final products were colored letters and they would have looked too heavy. Uncolored engraved letters are problematic. Because of their three-dimensionality and the effect of the shadows they appear much lighter than the letters which were previously drawn. If at the end they did not color the engraved letters, it was necessary to make the previously drawn letters thicker. On figure 4 we can see the difference between a drawn, calligraphic and engraved letter (Catich, E. M., 1991, Johnston, E., 1994).

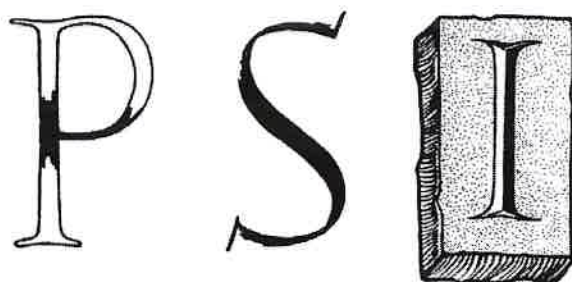


Figure 4. Different types of letters: drawn, calligraphically written, engraved.

Light is very important when it comes to the perception of engraved letters, but not all slabs with engraved writings are positioned in optimally illuminated spaces. It may become difficult to read the typefaces in weakly illuminated spaces. If we have a direct light, the contrast of the edges will completely disappear and the readability will become even worse. Early morning and evening hours are also inadequate; the consequence is again a weak readability and illegibility of the text. Because of all the reasons mentioned, we should not rely just on the V-cut when it comes to engraved letters. The V-cut is too much dependent on the momentary illumination in the surroundings.

Usually, the illuminated part of the letter has the same or a lighter color than the basis. The darker or the shaded part occupies half of the cut and carries the image of the letter. Therefore, we should increase the effect of the shades if we wanted to achieve the original look of the letters and an ordinary legibility of the text. The typographers, who created their own typefaces according to the engraved letters, shaped the letters so that they looked heavier than the engraved ones. If they copied just the effect of the shades, the letters would be too light. Those engravers who rely just on the effect of the shades engrave the letters with deeper V-cuts. In this way they achieve stronger shades and a heavier look of the letters. Today, they use a more acute angle for cutting (16 degrees and more). They increase the weight of the thin parts of the letters, so that they could achieve an adequate weight of the thin strokes. Today the letters are just engraved, not colored anymore.

In their origins, engraved letters were not founded just on shades. The letters on the Trajan's column can be taken as a reliable example. If we considered in the process of digitalization just the visual effect of the shades, the letters would be too light and incomplete (figure 5). The V-cut of the letters on Trajan's column is very shallow, especially in thin lines (figure 6).



Figure 5. Shades in the engraved letters on Trajan's column.

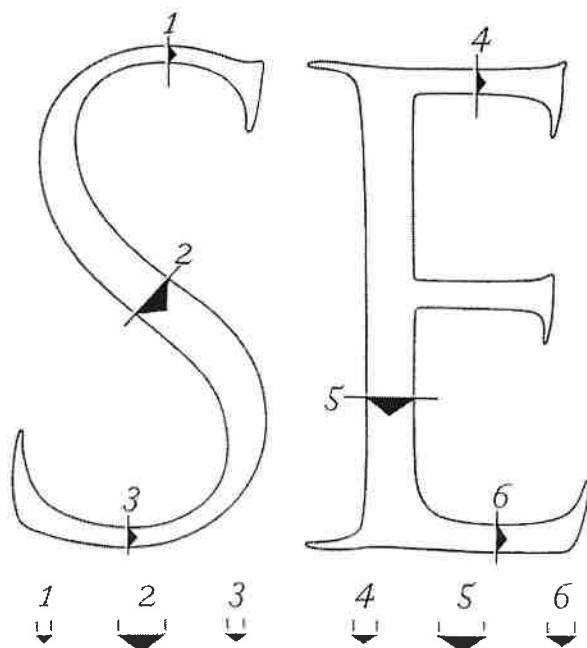


Figure 6. Different depths of the V-cut in different parts of the letters.

The depth of the V-cut changes in thicker and thin lines. We can take the letter O as an example (figure 7). The cut of the letter O is a three-dimensional space and not simply a two-dimensional circle. This way of engraving letters is contrary to the theory which presents the shades as the image-maker of the letter.

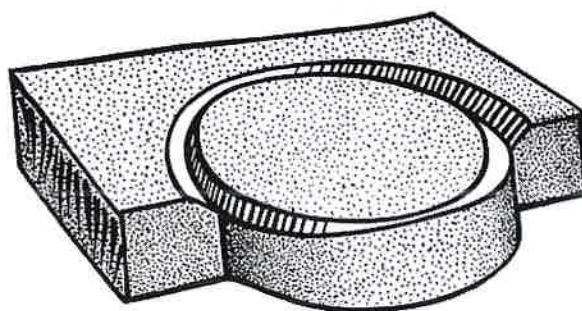


Figure 7. Changing of the V-cut in the letter O.

It would also be unreasonable to rely on the function of shades and to create such careless junctions and final lines as we can see in figure 5. In this way, the shades could not assure a quality readability of the text. If we wanted to place stress on the shades, we would make an equally long V-cut throughout the whole letter. The then sculptors engraved the typefaces with the purpose of making them readable as the letters on paper are read from the front side. As already said, at the end they used to color them or fill them with copper. The function of this kind of letters was the same as the function of letters on paper. Maybe it was for the same reason that they did not give much emphasis on the effect of the shades (Catich E. M., 1991; Johnston E., 1994).

3. DIGITALIZATION OF THE V-CUT

As we already showed in the previous chapter with the Trajan typeface, the role of shades in the digitalization of the V-cut is almost insignificant. How much the designer is going to consider the shades depends just on the style or the shape of the letters that he wants to achieve.

In the digitalization of our typeface we did not consider the shades. For the width of the basic and thin strokes we used the complete width of the V-cut. We also shaped the serifs as the V-cut tells us to. That is why they are explicit, round or cut at the end. On figure 8 we can see three engraved letters A and their digital version. On figures 9, 10 and 11 we can observe in a similar way the uppercase letters S, D and X. As we can see, the digitalized letters are much stronger than the engraved ones. In engraved (uncolored) letters the shade is unfortunately the only factor that determines the width of the lines. Anyway, in the digitalization we took into consideration the whole width of the V-cut because during the research we realized that originally the shade in the V-cut did not have a fundamental meaning.



Figure 8. Comparison of the engraved letters A and their digitalized version.



Figure 9. Comparison of the engraved letters S and their digitalized versions.



Figure 10. Comparison of the engraved letters D and their digitalized versions.



Figure 11. Comparison of the engraved letters X and their digitalized versions.

4. CONCLUSION

In the article, we showed with clear examples what the process of engraving was like. We mostly exposed the problem of the perception of shades, their effect on the shape of the letters and on the digitalization of the V-cut. We discovered that the V-cut is just an intermediate stage in the formation of engraved letters, as the letters were in the end always colored or gilded. It is true that shades give the letters a unique three-dimensional effect, but we must be aware of the fact that, during the day, this effect changes constantly with the changing of the position of the sun. This is why we can not rely on the shades and can not consider them to be the main image-maker of the letter or of its basic and thin strokes. They did not exist and were not even considered in the process of engraving. They were not noticed until a piece of metal fell out of the letter or until the color peeled off or faded. From this follows that in the digitalization of the V-cut we can rely mostly on the whole width of the V-cut.

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