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# The Shape of the Stroke

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**Abstract:**

1. Design shapes human life.
2. A civilization is a mode of design.
3. The primitive artifact (the 'DNA' of a civilization) is the single stroke of writing.
4. The stroke is a shape.
5. It is defined by a description of its two dimensions.

The present article is restricted to a description of the first dimension of the stroke (its width) in three ranges. By setting out the ranges on the axes of a cube the abstractions of the description are resulting in a concrete object. As might be expected (3) the cube is a model for cultural history; it also seems to be a specimen of parametric design.

The concluding considerations do not leave a chance to such design.

## 1 The cultural paradigm

*Western civilization is the cultural society which is communicating in Western writing.*

While showing only a photograph I could say: this is my father, and you would understand. The small piece of paper is not my father but it is giving an impression by which you would recognize him. The books my father has collected, his customs and the social circle he belongs to could probably tell you much more about my father, but unlike the small picture which identifies him their story is not exclusive.

Similarly there is much more to say about Western civilization but nothing could be more precise and concise than the simple statement of the first sentence; writing is the cultural paradigm.

Depending on my frustrations I could hide the picture of my father in a drawer or expose a framed enlargement in the living room. Thus the great civilizations are exposing their writing proudly at the first position of art and knowledge. The Western civilization is an exception in its neglect of writing which makes our culture superficial or, to put it positively, dynamic. A self-confident civilization is more stable or, if you would like, static.

A special problem arises from the suppression of our writing customs in education. It puts me in the doubtful position of telling you what your conventions are or should be. But try to imagine what we would understand of history, mathematics and language if we would have forgotten to pay some attention to these subjects since the age of eight. This is the level at which our most important convention is understood generally.

## 2 The artifact

History begins with writing but civilization begins much earlier with the first artifact, the first purposely made mark. In any *stroke* of writing this initial artifact is performed again.



Figure 1.

The form of the stroke is determined by the shape of the tool and by the movement of the hand. Complications such as the reaction of the writer to the flow of ink and the friction of the writing surface would also require consideration where it alone because it will eventually result in movement again. The friction of the writing material, for instance, could explain why in every civilization running scripts and interrupted scripts are going together. The actual shapes of writing cannot be explained; they are just as they are, but a notion of friction makes me understand why the strokes of writing are avoiding the second quadrant, the sector of the greatest friction.

The drawing (Figure 1) is hypothetical. The shade of each quadrant is an indication of the frequency of strokes that can be expected from an analysis of scripts. In interrupted writing the first and the second quadrant (the domain of the upstrokes) are empty. The upstrokes of running writing prefer the first quadrant. The orientation of the ordinates (in this picture  $30^\circ$  with the writing line) is the direction of the *counterpoint*.

## 3 The stroke

A stroke has two dimensions. The first dimension is already there before the first stroke is made: the width of the pen. The second dimension is the direction in which the pen is drawn. The outlines of the stroke are drawn by the extremes of the pen width; a couple of corresponding points. This *counterpoint* is always there in any stroke that can be made with any tool.

A stroke can be made with any tool, but only the stroke of an ideal broad pen (a broad nib without thickness) can be described in simple terms. To cut off any

further discussion about the assumed simplicity of a so-called 'monoline' stroke (the stroke of a more or less circular tool) I illustrate the stroke of the next simple tool, a triangle (Figure 2). Just try to describe its shape.

Tomorrow teachers and neuro-psychologists will resume the old story about the simplicity of mono-line writing which is nevertheless so remarkably difficult for children.

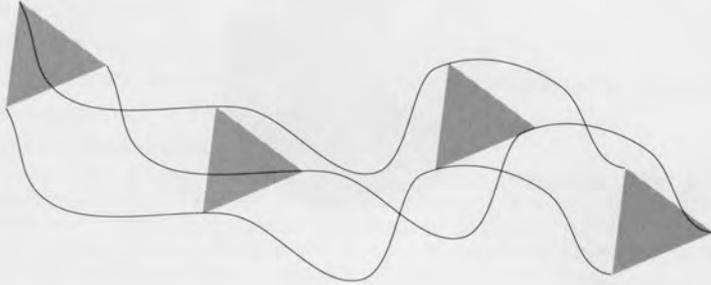


Figure 2.

#### 4 The sort of contrast

The *contrast* of writing is the flow of the width in strokes. It is sufficient to distinguish *translation*, *expansion* and *rotation*.

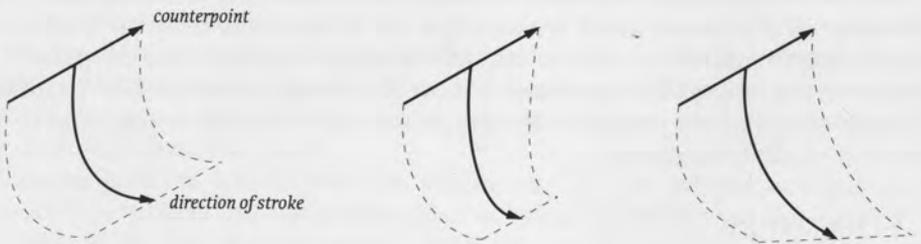


Figure 3.

**Translation:** the length and the direction of the counterpoint are constant.

Translation is the main characteristic of Arabic, Indian, Hebrew and Western writing, the descendants of the West Semitic civilization. Its tool is the stiff

broad pen which dominates the effect of the pressure of the hand on the shape of the stroke.

**Expansion:** the length of the counterpoint is variable. In expansion the hand dominates the tool, in Western writing a flexible pointed pen. Expansion has always been with us in informal writing. (One reason why copperplate engraving could not have had its assumed influence on expansion.) In the 18th century this subculture became official fashion together with chinoiserie. In the Chinese branch of civilization the priority of the hand is expressed in the stroke of the soft brush.

**Rotation:** the direction of the counterpoint is variable. In mannerist calligraphy it became an essential trick. In the history of art rotation is not known (though it has been described precisely by mannerist authors); it is usually mistaken for expansion. Mannerism itself is often confused with Renaissance or Baroque.

The 3 sorts of contrast are illustrated in their effect on the shape of a simple stroke (Figure 3). In most writing rotation is a secondary effect. The exception is mannerist calligraphy (roughly 16th century calligraphy) and notably the examples of the Flemish and Dutch writing masters. Mannerism is an exception as summits usually are but they cannot be neglected for that without flattening our scope. The mannerist mood is over but its creations are still impressive. Among them our solar system, the Dutch republic, the reformation, the music of Goudimel, Monteverdi and Dowland, the works of Shakespeare, the Society of Jesus and the conquest of America.



Figure 4.

Broken up in straight segments the stroke of the broad pen is a set of lozenges (Figure 4). The stroke of a flexible pen is a set of trapezia. These are the elementary characteristics of pen strokes. They are learnt in writing and analyzed in drawings. Type design is a synthetic application of the analysis. The evaluation of type design

will always return to single pen strokes. The mental distance from my lodestar, handwriting, is scored by the abstract parameters of contrast. As every kind of contrast my sorts of contrast can be increased and reduced simultaneously.

## 5 The cube

The abstractions compressed in the previous paragraphs have been distilled from handwriting. The remaining space is occupied with the application of this craftsman's epistemology to design.



Figure 5.

The ranges of sort of contrast, increase of contrast and reduction of contrast can be set out on the dimensions of a cube (Figure 5). My description of the cube is a mixture of technology, design, cultural history, and psychology with a flavor of cultural anthropology; a square kind of fortune-telling.

## 6 Increase of contrast

Everybody has his own Middle Ages. Mine begin in the first quarter of the 7th century when an Irish scribe invented the word. The word is the first condition of reading in the modern sense of the word. What was reading in Antiquity would now be considered as spelling. The new invention spread quickly over Northern Europe preparing the soil for the cultural adventure of Charlemagne.

The invention was simple as great inventions sometimes are: words could be distinguished by a break in the rhythmic unity of the line. In further development the word was treated as a rhythmic unity of its own. The new unit of writing could

be strengthened by reducing the white shapes between the letters which demanded a corresponding reduction of the white shapes within the letters. During the Middle Ages the size of the letters in respect to the width of the pen was gradually reduced. I have never found something like a mediaeval mood which fostered this process. It is more sensible to understand *Middle Ages* as the name of this process. In my view the Middle Ages are the period of increasing contrast. Its picture is the first line on the front of the cube (Figure 6).



Figure 6.

Old fashioned typography had a good reason for returning to the starting point. (In the books other reasons are given which I do not understand.) A character had to be arranged on a rectangular body. A decent solution for any combination of letters demanded ample space between the letters and this was in favour of the open writing of the early Middle Ages. Typography followed the developments in handwriting along the left top edge of the cube, downwards in the picture (Figure 7).



Figure 7.

The expansion in early classicist writing was light and so were the corresponding

typefaces. In the first decades of the nineteenth century typefounders wanted letters with thicker strokes. You could devise any explanation for this desire you like. The official history of typography (the one that is copied by all authors) has found this explanation in 19th century business. This scholarship might become interesting when it will eventually explain why 16th, 17th and 18th century business do not require such consideration. Meanwhile I explain 19th century type design with *Ivanhoe*. In his novel Sir Walter Scott has spelled out the romantic feel of his time for imaginary Middle Ages: splendid, heroic, simple and safely gone by. As quickly as the contemporary novelists the typefounders hurried within a few decades through a development of many centuries. The first line on the back side of the cube is my picture of this development (Figure 8).



Figure 8.

The proven mediaeval procedure did not work suitably in romantic type. The heavy strokes of 15th century book hands made excellent pages, whereas the new typefaces resulted in scattered lines that could be used for a single headline at best. The letters of the cube show where the idea got lost. In expansion, stress is restricted to vertical downstrokes. The other parts of the letter are thin and it was the pride of the typefounders that they could make them very thin. The balance of mediaeval writing remained out of reach for its bloodless revival.

## 7 Reduction of contrast

The thin parts were the problem and now the type designers made a remarkable step. By thickening the thin parts of the letter they increased its blackness by reducing the contrast and with this decision type design deliberately moved away from handwriting for the first time in its history. We are descending on the back side of the cube (Figure 9).

Soon the whole backside of the cube was filled in with reductions of contrast. Modern type designers have never recognized the difference between increased



Figure 9.



Figure 10.

and reduced contrast; typefaces are just *light*, *bold* or something between and civilization was reduced to fake.

At the turn of the century the cube turned to its front side again when new inspiration was found in the revival of translation but printers kept insisting on 'matching' bold typefaces. Their version of the cube is filled with interpolations of the eclectic plagiarism which recently has arrived at some status as 'post modernism'.

Before putting the cube aside, turn it upside down. Modern typography, our own contribution to civilization, is the sediment of the cube (Figure 11).



Figure 11.

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At a close view I have read the fate of our civilization from the single letter that makes the cube. From a decent distance the front and the back might be imagined as the two modes of human civilization, West and East.

## 8 What else?

The cube might suggest perspectives for computer aided design. But by accepting the conditions of my cube the user would make himself a prisoner of my design. In this sense *computer aided design* is a contradiction.

The cube is bound to the design of its extremes. I could increase flexibility by devising ranges for the shapes at the extremes of the axes. This could go on ad infinitum but in this immense universe I would meet nobody but myself. I cannot detach the conception from my point of view. And even in the limited space of Western erudition my point of view is only one of an infinite number of possibilities. Moreover my point of view is constantly moving. I would have to adapt my decisions continuously to the development of my a priori.

The importance of these apparent futilities could be illustrated by comparing the present article with *A programme for teaching letterforms*, my contribution to Fernand Baudin & John Dreyfus (ed), *Dossier A-Z 73, Association Typographique Internationale, Copenhagen 1973*. The drawings on page 85 are showing increased and reduced contrast on translation and expansion. The data for the cube are already there, but they would yield a completely different cube representing my state of mind of 18 years ago.

I am inclined to a sceptic conclusion: computer aided design could at best result in a mechanism for the production of templates restricted to the idea of yesterday. Computer software fixes the user on obsolete methods which is precisely the contrary of design. However, it gives you the nice feeling of having designed something without understanding anything.

This kind of problem could be solved partially by allowing the user of an application full access to his own templates and to modifications of the parameters. In fact this would not be a solution because it supposes understanding again.

The meaning of the described parameters is their vigor in the discussion of design. Their power in education cannot be overestimated. The limitations of the present article imposed the restriction to a discussion of contrast. *Construction* is another dimension of writing. It would extend the subject from a description of the single stroke to sequences of strokes. Also the interaction of *articulation* and *speed* would require consideration. Increased articulation slows down writing and represents the social trend to formalized establishment. This process always provokes the informal reactions which want to be formalized again in a new establishment. Here again the paradigm of writing offers a suitable model for social processes, the development of science included for *civilization is design*.

Attempts to catch writing itself in parametric terms have failed so far.