Gerrit Noordzij

The stroke
theory of writing

The stroke

Nisi Dominus

Vanum est vobis
ante lucem surgere
surgere postquam
sederitis qui mandu-
catis panem doloris
cum dederit dilectis
suis somnum, *Psalm 127:2*

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translated by Peter Enneson

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In this foreword I want to point out the difference between *The stroke* and my book *The stroke of the pen. The stroke of the pen* was published by the Royal Academy of Art in The Hague on the occasion of the 300th anniversary of the Academy in 1982. The book was typeset and printed by the Royal Printer Van de Garde in Zaltbommel.

The stroke of the pen distinguishes an interrupted and a running construction in writing, by downstrokes and up-strokes. Both constructions can be subdivided according to stroke contrast: translation or expansion. So there are four possibilities for every script.

Contrast is a scale on which pure translation and pure expansion are the theoretical extremities. For my teaching at the Academy I have no need of a division of the scale; it seems to be enough to indicate the tendency of the contrast. I have also made use of this in the investigation of old manuscripts. Indeed, for me there is not much difference between teaching and research: in teaching I turn to my future colleagues and in the investigation of manuscripts I meet colleagues from the past. A division of the scale into units might disturb the schematic character of the schema and summon the bogy of letter classification.

In the discussion about computer programs for font creation the need arose to be able to describe tightly each stage of every stroke. This description can be expressed in terms of the size and orientation of the counterpoint. The nature of the contrast is fixed by how these values play out. In this description of the stroke the subjective distinction between downstroke and upstroke is rendered superfluous.

At the start of 1985 I established the periodical *Letterletter*. In this publication of the Association Typographique Internationale (ATypI), my intention was gradually to develop a new formulation of my theory. Then came the Van de Garde proposal to make a Dutch edition of *The stroke of the pen* on the occasion of their 125th anniversary. I seized on this invitation as an occasion to work out a rounded summary of the latest version of my theory. So here then is *The stroke*.

et vidit deus
lucem quod esset
bona et divisit lu-
cem ad tenebras

G E N E S I S   1 : 4

My contribution to the course of graphic design at the Royal Academy of Art in The Hague was founded on calligraphic exercises. Calligraphy is handwriting pursued for its own sake, dedicated to the quality of the shapes. From evaluating and discussing our experiences a theory of writing emerged that allowed us to describe the properties of shapes with parametric precision, without imposing aesthetic or ideological conditions. This book is an introduction to the theory. It might make sense to indicate in a foreword what the theory is good for. It is convenient if you can criticize the consistency of a design with absolute precision by simply asking something like: did you intentionally draw the translation of the *c* at a greater slope than in your *e*? Questions like this one express the properties of a drawing in the parameters of the stroke of a pen.

The first, initial, fundamental shape is the single track of a tool. Only handwriting preserves the characteristics of the single stroke. *Handwriting* is single-stroke writing. *Lettering* is writing with built-up shapes. In lettering the shapes are more patient than in handwriting, as they accept retouching strokes that may gradually improve (or impair) the quality of shapes. Lettering is independent of the tool, but this freedom is only available at the expense of character: in writing composed of overlapping strokes the shapes of single strokes get lost, just as footprints dissolve in a trail of steps. The freedom of lettering is limited by convention. Not that drawing unconventional shapes should be difficult or forbidden, but shapes that do not conform to convention are just not writing.

From a typographic point of view, type is a special branch of writing that differs essentially from lettering. The typographer can only work with writing that is arranged in a font. Since we learned to store typefaces in computers we can imagine type as lettering reproduced in a database (the typographic 'font') that makes the shapes of the original

drawings available for composition. Lettering does not meet this typesetter's condition by itself. However, when it comes to the properties of design there is nothing that could distinguish type; it is impossible to tell typographic letters from other reproductions of lettering.

The theory furthers good practice too. The stroke is the fundamental artefact. Nothing goes further back than the shape of a single stroke. We cannot postpone a shape by drawing outlines first, because any drawing (outlines included) begins with a shape. Outlines are the bounds of shapes. If there is not yet a shape, there is no outline either. Figure 1 evokes the shape in lettering quickly with a zigzag simulating the direction and the length of translation. In figure 2 the shape is defined more precisely. The outlines should not be accentuated; the enclosed shape should absorb the outline. If outlines stand out as shapes of their own, they obstruct the view of the intended shape (figure 3).
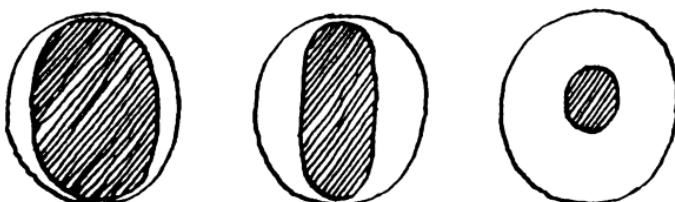
1   2   3

A letter is two shapes, one light, one dark. I call the light shape the white of the letter and the dark shape the black. The black consists of the regions of the letter that enclose the white. White and black can be replaced by any combination of a light colour and dark colour, and light and dark can switch roles, but the intriguing effects of these permutations lie outside the scope of this book. Thus I will call the strokes the black of the letter and the enclosed shapes the white of the letter, even in the case of figure 1.1, where I represent the white shape with a dark area.

1.1

The black shape cannot be altered without the enclosed white shape changing and vice versa.
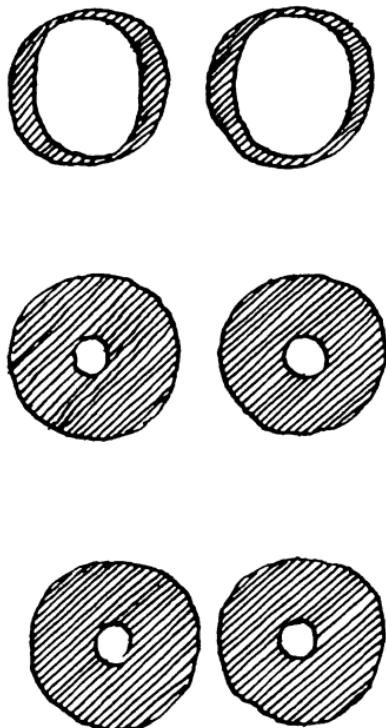
1.2

In figure 1.2 the letters from figure 1.1 appear on 'white' rectangles. In all three cases the exterior shape of the *o* has the same surface area. The surface area of this white does not change when the black shape undergoes changes, but the relation of this surface area to the surface area of the interior

shape does change. In the third rectangle the perceptual significance of the exterior shape is much greater than in the first rectangle because in the first rectangle the exterior shape is overwhelmed by the large interior shape.

In practice a free-standing letter on a small rectangle is a rarity. A word usually consists of two or more adjacent letters. Figure 1.3 is a simple schematic of this.

1.3

The white space between the letters in the second combination is identical to that in the first, but the perceptual significance of this white is so much greater that it drives the letters apart. In the third combination the bond is restored by the drastic reduction of the space between the letters. Maintaining the equilibrium in the white shapes makes all the difference. The white of the word is my only holdfast.

The relation between shape and countershape, which in writing amounts to the relation between white and black, is the foundation of perception. The interpretation of every sensation from any sense organ works on this principle. Writing is a good model for perception because, with its strict rules, it creates an artificial laboratory-like workspace that everyone has within his or her reach. The interaction between light and dark exists wherever and whenever there is something to see, but the game only becomes interesting when the opponents are well matched – I can only experience the relationship if the relationship is clear. If I enlarge the rectangle of 1.2, I diminish the effect that changing the interior shape has on the perceptual significance of the background. In figure 1.1, where the background is the page itself, I can no longer perceive this effect. The relationship is not manifest.

Manifest relationships can be divided into groups. The format of the page derives its meaning mainly from the shape and placement of the text block; the blackness and length of the line are in interaction with the white between the lines; and the forms of the letter variously affect each other within the variable contexts of the word. The word is the smallest organic unit in writing. Whatever can be said about a letter or the stroke must be said with one eye on the word. In this book I pull apart the organism, but only to be able to make the word.

Writing rests on the relative proportions of the white in the word. The various kinds of writing with their various constructions and their various strokes can be compared with each other only in terms of the white of the word – every comparison requires a vantage point that makes things comparable. The white of the word is the only thing all the various kinds of writing have in common. This universal vantage point holds for handwriting and typography alike, for ancient writing as well as modern writing, for western writing as well as the writing of other cultures, in short, it holds for writing.

In principio erat verbum

Joh.1:1

Current studies of writing do not attend to the *white* of the *word*, but to the *black* of the *letter*. Consequently considerations of writing exhaust themselves in the exploration of superficial differences. The universal vantage point that renders handwriting and typographic letters comparable is not to be found in the black of the letter. The black of a typographic letter is so different from the black of a handwritten letter that as strict comparatives they appear incommensurate. Wherever typography concerns itself only with the black shapes of the prefabricated letters printable on paper, the academic study of writing is coerced into separating the consideration of handwriting from a history of type. But even the remainders of such a separation cannot be viewed from this vantage point. Consideration of past writing – insofar as it appears in books – falls to palaeography, diplomacy investigates past writing in original sources and letters, and epigraphy studies past writing on walls. Contemporary handwriting is totally ignored. It is at the mercy of the pedagogues who, through their wilful action, place the entire civilization at risk. This may appear immoderate, but what is western civilization if not the cultural community that avails itself of western writing? Pedagogues pride themselves on the fact that they do not burden school children with an introduction to writing. In so doing they undermine western civilization at its foundation. The frightening in-

crease in illiteracy begins with the neglect of writing in the schools. This threat to civilization goes together with the differentiation of the writing disciplines. The black starting-point forces the educated to this differentiation, which has no place for contemporary handwriting, because the black strands of this handwriting have next to nothing in common with the black shapes of the handwriting that the palaeographers seek to chart. It is no exaggeration to say that the school teacher only allows bad handwriting, because he or she regards good handwriting as 'drawn' instead of 'written'. The differentiation protects the point of view. Without it the school teacher would have to test his exemplars against good writing, and this confrontation would be fatal. Now he can serenely face good handwriting, because that belongs to a different subject on the other side of the partition.

In the same manner the academic viewpoints are safeguarded. It is inadmissible to suggest that type is writing, because such speculations undermine the prejudice (a prejudice is a viewpoint that may not be placed in question). When the facts still compel us to compare type with handwriting, the facts are suppressed. The history of the 'romain du roi' is a good example of this. The 'romain du roi' was cut around 1700 according to the directives of a scientific commission. The proposal was worked out on a grid – the traditional way of transposing drawings to scale. The minutes of the commission confirm what anyone can ascertain: the designs follow in detail the handwriting of Nicholas Jarry, who worked around 1650 as calligrapher for the Cabinet du Roi. This history leaves us no other choice than to view the 'romain du roi' – the type – in terms of the handwriting of Jarry. But if this were the case the foundation beneath the sciences of writing would fall away. Scholars forestall the landslide by keeping the affair under wraps. In its place they present the 'romain du roi' as a turning point in history. The grid would then have had to have been the true starting point of the design, and the typographical letter would have become, once and for all, independent of handwriting.

This falsification is intended to rescue an untenable viewpoint, but the effect is just the opposite. It is impossible to say anything about the autonomous typographic letter without calling to mind this historiographic falsification. Falsification is a familiar phenomenon in science. Scholars revert to it when the theory on which they have spent a lifetime threatens to be swept away. Studies of the typographic letter and pedagogy readily occasion forgetting, overlooking or obscuring the actual facts because the view of writing of these disciplines is keyed to the view that the typographic letter and informal handwriting are autonomous. And this point of departure can only be maintained at the cost of the facts.
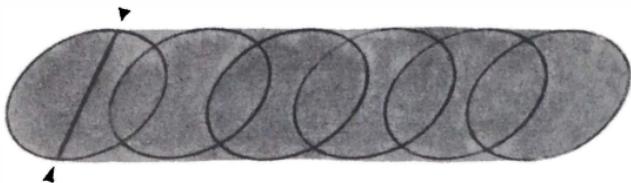
Science is the art of finding a fitting question for every answer. Theories serve to elicit questions and questions serve to undermine theories. Questions engender perplexity, which is as it should be. When my theoretical house of cards collapses, all it means is that better insight replaces my own, and I will be glad to relinquish my opinion for a better one. Science is lost when the questions that endanger a theory are warded off or ignored.

My objection against science is not that the starting-points for the differentiation of writing are untenable, for that would, in the end, appear to be the case for every theory in every vital scientific endeavour. What bothers me is the unassailability of the starting-points. This unassailability changes science into superstition. The superstitions of the scribal scholars seep into disciplines that rely – recklessly – on the very same superficial consideration of the *black* in the *letter*. I encounter it in psychology, art history, mathematics, the linguistic sciences, etc.

It is impossible for me to stick my tongue out any further. But this must be enough to get anyone who loves jousting onto their horse. In this book I put my starting-point on display, with the friendly but urgent request to hold it up against the light.

et rex aspiciebat articulos manus scribentis. Tunc regis facies Dan.5:5 commutata est,

The white shapes determine the place of the black shapes, but the white shapes are made by the black shapes. The simplest manifestation of the black shape is the stroke. A stroke is the uninterrupted trace of an implement on the writing plane. The stroke begins with the *imprint* of an implement.
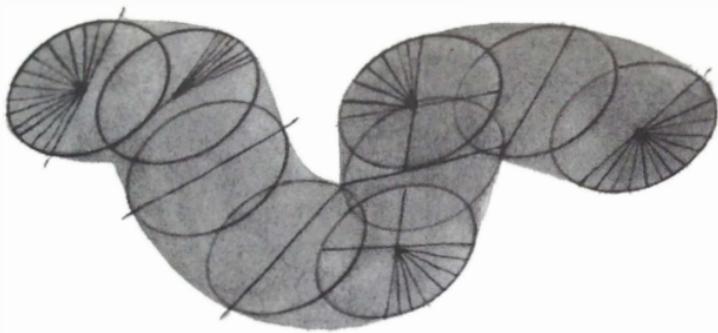

2.1

In figure 2.1 the imprint is an ellipse. This could be, for example, the imprint of an obliquely worn-down pencil point. As it moves forward, the impression produces the stroke. The extremities of this stroke are demi-ellipses. Only at the extremities is the identity of the imprint recognizable. Other than at the extremities, the contours of the stroke consist of straight lines. These lines are the track of a pair of points. Every point on the one contour has a counterpart on the other contour. This pair of points is the *counterpoint* of the stroke. The distance between the points is the *size of the counterpoint*.
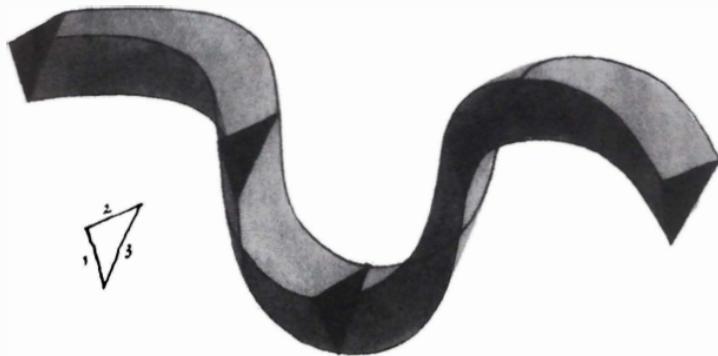
A line runs through the counterpoint, the *frontline* of the stroke. The counterpoint is a line segment on the frontline. The straight stroke of figure 2.1 is simple. In every phase of the stroke the counterpoint is the same pair of points on the perimeter of the ellipse. The frontline always runs through the same axis of the ellipse and all frontlines of the stroke are parallel.

In figure 2.2 the ellipse describes a curve and now the stroke is no longer so simple. At every turn the counterpoint falls on a different axis of the ellipse so that the size of the

2.2

counterpoint changes with every change in direction of the stroke. The frontlines change in orientation. Their points of intersection can fall on any point between the centre of the ellipse and infinity. This stroke is difficult to describe precisely. The stroke of a pencil is elusive.
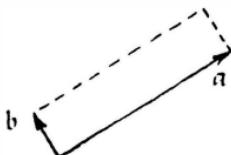
2.3

In figure 2.3 the imprint of the implement is a triangle. The stroke is generated by a combination of three vectors each having the size and orientation of one side of the triangle. The dark track is the trace of vector 1. Whenever the lines described by the vertices of the implement intersect, a different vector becomes the counterpoint of the stroke. As a schema for a tool, the triangle is the simplest of all complications.
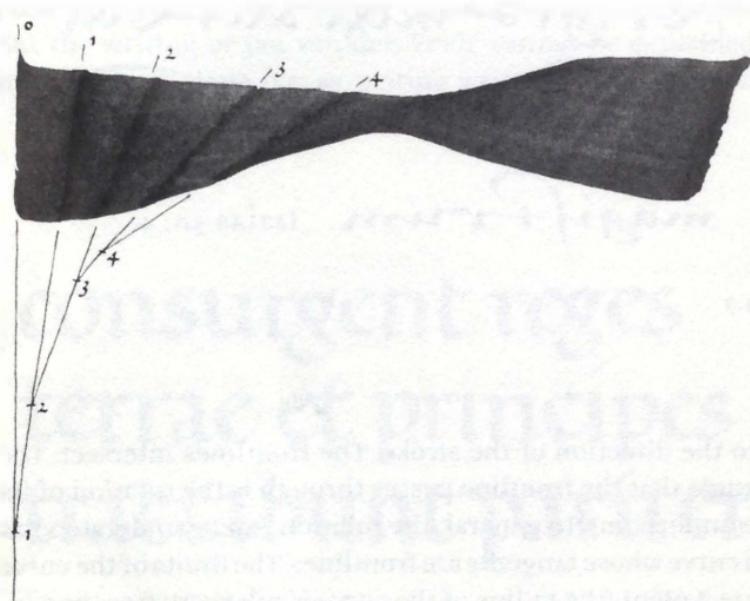
2.4

Figure 2.4 is the trace of one vector. The size of the counterpoint is the same throughout and its orientation is fixed.
It is the schema of the simplest tool conceivable, the broad-
nibbed pen. The schema holds as long as the thickness of
the pen is negligible in relation to the width of the pen. In
the writing of small letters – and for text types in general – the limits of the scheme are evident. In many typefaces the implied vector has a deliberate thickness, and the impact of this thickness is readily apparent in the shape of the
stroke. To complicate matters further, nowadays large type
is always a linear scaling of a small body. These complications take us beyond the simple principles of this introduction and make type a topic of special consideration. For the
moment I am content with representing the thickness of the
imprint of the pen as a vector perpendicular to the counterpoint, whose effect is negligible in the description of basic
principles.

2.5

22

Figure 2.5 is the schematic of a broad pen; vector *a* is the counterpoint (the width of the pen), vector *b*, perpendicular to *a*, is the thickness of the pen. When the counterpoint is a single vector, of equal magnitude in every position and fixed in orientation, the differences in the width of the stroke are the consequence of changes in the direction of the stroke. Small changes in the orientation of the counterpoint (as a result of variations in the position of the pen) and changes in the size of the counterpoint (as a result of variations in pressure) will generally present themselves in the practice of writing – such deviations play a large part in the impression a piece of writing makes and they are an important factor in the analysis of individual hands, but they can only be described as deviations from the principle illustrated in figure 2.4.

2.6

The principle can be reversed, as in figure 2.6, where the thickness of the stroke drawn in *one* direction changes because the *orientation* of the counterpoint changes relative

23

Dominus dedit mihi
linguam eruditam ut
sciam sustentare eum
qui lassus est verbo
erigit manu manu
erigit mihi aurem
ut audiam quasi
magistrum   Isaias 50:4

2.7

to the direction of the stroke. The frontlines intersect. The angle that the frontline passes through is the rotation of its counterpoint. In general, the rotation can be understood as a curve whose tangents are frontlines. The limits of the curve are a point (the radius of the curve is nil; every frontline intersects every other at this point) and a straight line (the radius of the curve is infinitely large; all frontlines are parallel to the straight line). In the latter case we no longer speak of rotation but of translation: the condition of figure 2.4.

There are phenomena that we can only see with the help

of an invention that makes such things available to us. If one says that we have to *learn* to see something, then that amounts to a reference to such an invention, or, to put it formally, to a theory. The theory creates the perceptible reality. A new theory is an invention that sets the terms by which new phenomena will be perceived. Nevertheless, not every theoretical possibility is realized in practice, because, while a theory encompasses every possibility, practice is only the ensemble of realized possibilities. To find rotation, I only have to look at the virtuoso writers who enjoyed playing tricks (because, for example, they let themselves be talked into an aesthetic bias). Dutch manneristic calligraphy (from the first half of the seventeenth century) can indeed only be adequately explained if we have learned to see rotation. To be sure, the rotations go hand in hand with a widening counterpoint (expansion), the result of variant pressure on the pen. But the writing of Jan van den Velde cannot be explained by expansion alone (i.e. as writing written with a pointed

consurgent reges
terrae et principes
tractabunt pariter
habitator caeli
ridebit, Psalm 2:2,4

pen). I wrote figure 2.7 in the Dutch standing running hand (standing running means an upright cursive). I do not pretend to be able to outdo my virtuoso predecessors – I merely want to show that their writing is written with a rotating broad-nibbed pen. When this became clear to me I remembered the description of this technique in part 3, the 'Fondementboeck', of Jan van den Velde's *Spieghel der schrijfkonste* of 1605. I knew whole phrases by heart, but their import had escaped me for years: I needed to *learn* to see.

In writing, *contrast* is the difference between thick and thin in the strokes. There are three *sorts of contrast*.

Translation: the contrast of the stroke is the result of changes in the direction of the stroke alone, because the size of the counterpoint is constant and the orientation of the counterpoint is constant (figure 2.4).

Rotation: the contrast of the stroke is the result not only of changes in the direction of the stroke, but also of changes in the orientation of the counterpoint. The size of the counterpoint is constant (figure 2.6).

Expansion: the contrast of the stroke is the result of changes in the size of the counterpoint. The orientation of the counterpoint is constant (figure 2.8).

Because a person is not capable of keeping the position of his pen and the pressure of his hand constant, a type of contrast never occurs in isolation, except in theoretical models. When I say that a hand is dominated by translation, I mean exactly that: to my eyes translation is the dominating type of contrast. This does not preclude that someone else who is searching for the peculiarities of a particular writer will not be struck by the expansion present in the very same sample. My conceptual framework can be used as a blunt hatchet or a surgical knife. Yet, axe or scalpel, the system sorts. What it can provide is apparent from the following, in which I lay the model of contrast types over cultural history.

Translation: antiquity and the middle ages
Rotation: mannerism
Expansion: romanticism

Ancient Greece does not figure in this scheme, the renaissance is absorbed into the middle ages, and romanticism encompasses the baroque and classicism. Only with further refinements do these details come to the fore, but my account of them would diverge from what cultural histories supply me with. Still, that the dominant types of contrast correlate with historical milestones is beyond doubt: let the historian explain how he or she can conceive of western civilization as being held together by anything other than western writing.

2.8
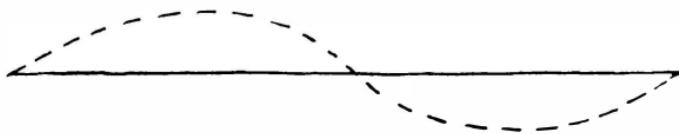
2.9

Figure 2.8 is a stroke with a swelling counterpoint; the type of contrast is expansion. The difference between figures 2.8 and 2.9 is the direction of the stroke. In figure 2.8 the stroke is straight; in figure 2.9 one contour of the stroke is straight. It is necessary to distinguish clearly between the direction of a stroke and the direction of a contour of the stroke: the *direction of the stroke* is the direction of the heartline. The *heartline* is the line described by the midpoint of the advancing counterpoint.
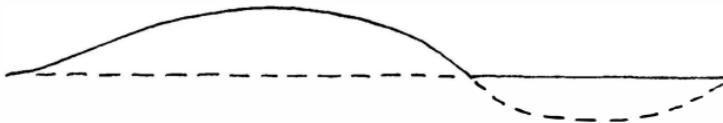
Without an unambiguous delineation of the direction of the stroke the interpretation of the stroke can go awry. For instance, figure 2.10 could be taken for a straight line with a sine curve (figure 2.11).

However, in figure 2.10, the straight segments do not fall on the same contour, and their rectilinear character is nothing more than the accidental effect of a particular expansion on a specific heartline. Figure 2.12 indicates precisely which contour is which.
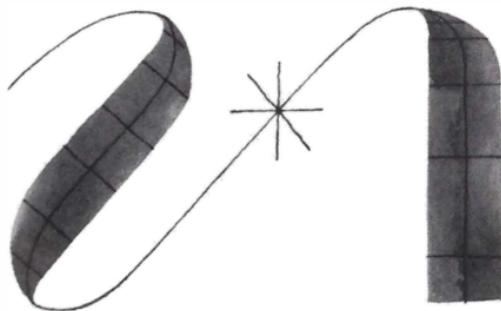
In studies of the typographic letter differences like those between the letters in figure 2.13 are grossly exaggerated.

2.13

In my analysis the three letters have virtually identical heartlines, an identical type of contrast, and the counterpoint follows the selfsame course. The differences in shape come from the different swell of the counterpoint only. One may make what one will of the importance of this quantitative difference but in one respect it remains trivial: differences will appear between all pen strokes, even within the same letter, for it is impossible to control completely the degree of expansion in the freehand stroke.
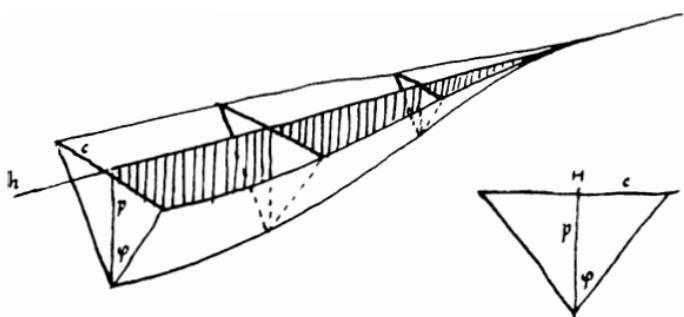
2.14

The frontline is a line through the counterpoint, the pair of points that trace the contours of the stroke. The orientations of the frontline and counterpoint coincide. In the thin segments of figure 2.14 the frontline has no orientation because there is no counterpoint. I could as easily say that the

frontline has every orientation (the star in the middle of the stroke) because the points of the counterpoint coincide: to ascertain the orientation of a line a second point is necessary. In the thin sections the counterpoint has become an inaccessible doublet whose signal I cannot pick up with the instrument of my concepts. Anything goes and nothing goes. Pure expansion is, from my vantage point, a decadent contrast sort that removes itself from systematic description because of what happens in the thin segments. The outward reaches of my inventions come into view, and with it the end of writing. What is left over I encapsulate in a geometrical formula.

$i\begin{Bmatrix} s:a \\ a:s \end{Bmatrix} \dfrac{52}{7}$ *Quam pulchri*

super montes pedes adnuntiantis et praedicantis pacem

[...] *dicentis Sion* Regnavit Deus tuus

Figure 2.15 is a spatial model of expansion.

2.15

h heartline
p the changing pressure on the pen, pictured as the depth of
   the stroke
φ the flexibility of the pen, pictured as the angle of a wedge
   running through the keel of the stroke
c counterpoint
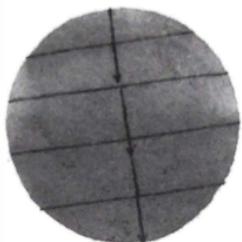
$c = p \cdot \tan \varphi$
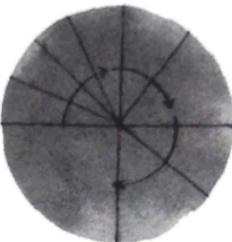
The stroke is a furrow whose depth coincides with the
pressure on the wedge that cuts the furrow. The angle of the
wedge represents the flexibility of the pen. A formula for the
counterpoint follows from the above model.

The differences between the letters of figure 2.13 can be
construed with this formula. The letters are the same in prin-
ciple: the heartline does not change. The swell of the coun-
terpoint varies with the taper φ of the wedge or the depth p
of the furrow. With a gradual enlargement of φ comes a se-
ries of changes in shape of which the letters of figure 2.13 are
merely three phases. Typographically speaking, the formu-
la underlines the fundamental similarity of Baskerville and
Bodoni.
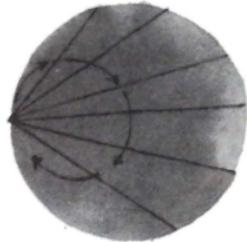
However, the problem surrounding figure 2.14 does not afford a solution on these terms either. For the thin lines, anything goes, p is zero.
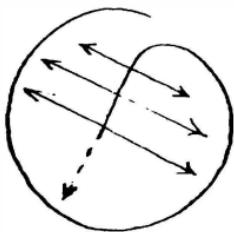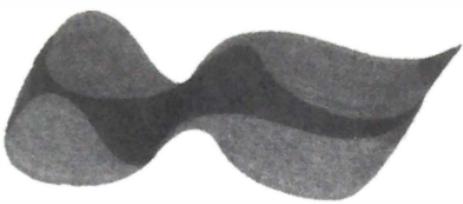
2.16   2.17   2.18

Because both the size and the orientation of the counterpoint can change, it is not possible to deduce the mode of writing from the shape of the stroke with absolute certainty. In the circular stroke of figure 2.16 the orientation of the counterpoint stays the same, while the size of the counterpoint changes. In figure 2.17 the very same shape arises from a stroke in which the orientation of the counterpoint changes and the size of the counterpoint remains the same. In the stroke shown in figure 2.18 both the size and the orientation of the counterpoint change. This theoretical model shows how the counterpoint can change without the shape of the stroke betraying the change.

2.19

In practice a round point is written with a stroke the schema of which figure 2.19 makes visible. Meanwhile, figure 2.17 illustrates the rotation of the tool in engraving and stone cutting.
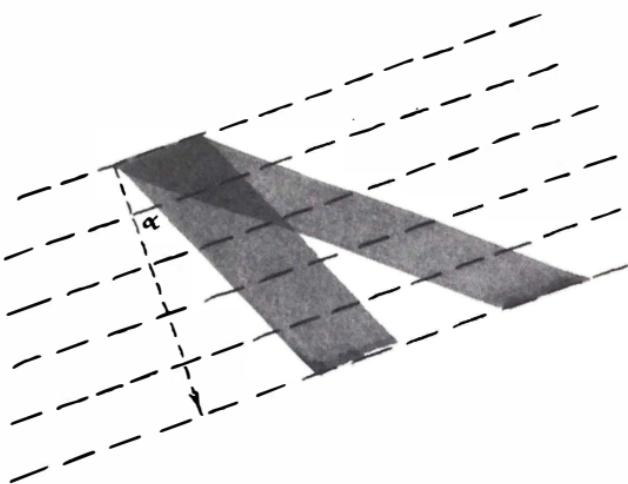
2.20

In figure 2.20 the counterpoints of two strokes reach across each other. A shape has arisen that does not allow any single conclusion to be made about the stroke. That is what the black shapes of drawn letters (and typefaces) are like. They can only be approached from the white of the word. Only in a metaphorical sense can we speak here of a stroke.

dixit Dominus ad me

Sume tibi libro
grande et scribe in
eo stilo hominis:
Velociter spolia de-
trahe cita praedare.

In figure 3.1 the directions of the strokes differ but the orientation of their counterpoints is the same. The orientation of their counterpoints is the orientation of their frontlines.
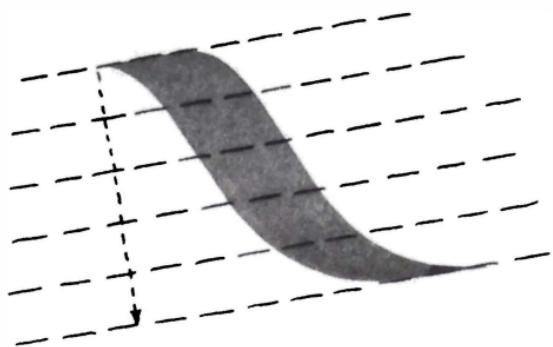
3.1
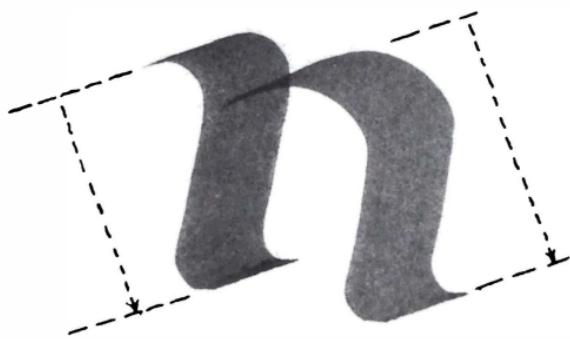
The direction of the front is perpendicular to the frontline. The direction of the stroke is consequently not the direction of the front: in figure 3.2 the direction of the stroke at its ends is perpendicular to the direction of the front. In this case the front is stationary while the stroke advances. The movement of the stroke does not necessarily coincide with the movement of the front. (The speed of the front is the speed of the stroke multiplied by the cosine of the angle between the direction of the front and the direction of the stroke. In figure 3.1 this angle is α.) At the end of the stroke the pen is lifted and positioned for the following stroke, bringing with it a new front (figure 3.3).

The stroke of figure 3.4 bends in the direction of the frontline. The front comes to a full stop. However the stroke bends further and the front is set in motion again, now in the opposite direction.

35

3.2

3.3

3.4
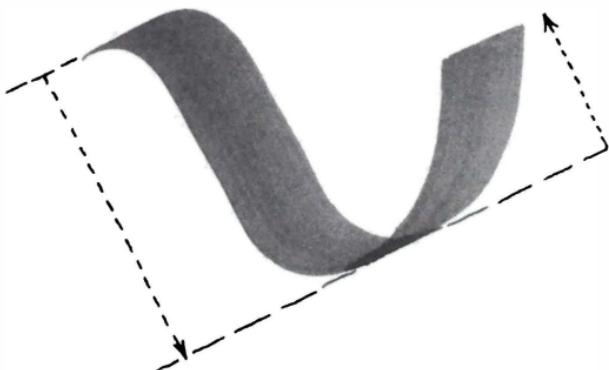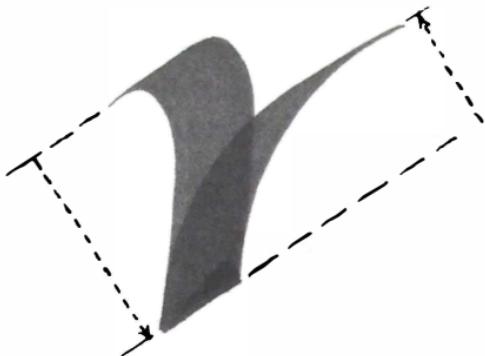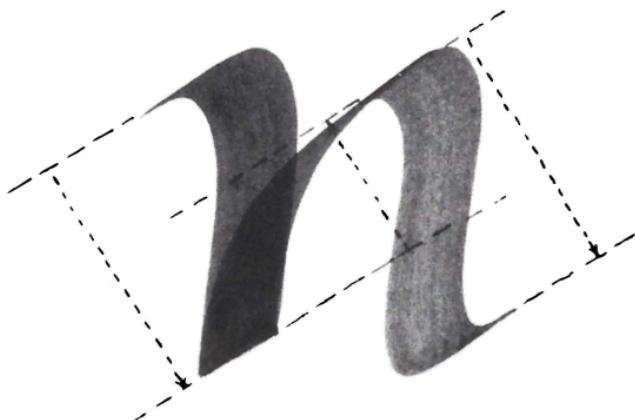
3.5

In figure 3.5 the stroke doubles back abruptly. In the letter in figure 3.6 the front moves forward and returns. As long as the stroke involves no rotation the front sweeps across an area bounded by parallel lines (translation of the frontline). When rotation is a factor, the front fans out.
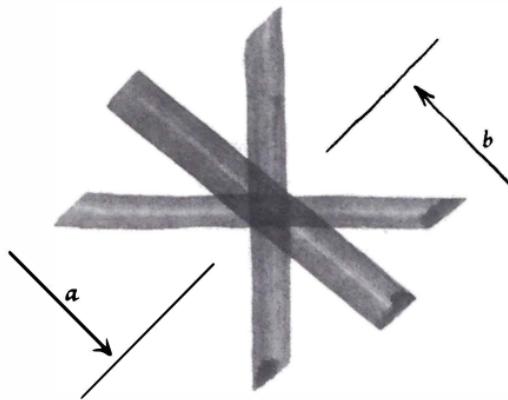
In principle, there are two possibilities: for all the strokes of a script, the front either moves in a single direction (this I call an *interrupted construction*), or there are strokes in which the front reverses its direction and turns back (this I call a *returning construction*).

3.6

In handwriting a stroke in which the writer draws the front toward his hand is called a *downstroke* and the portion of a

stroke that has the front returning is called an *upstroke*. Outside handwriting there are no downstrokes or upstrokes, but usually it is possible to make use of these terms as a manner of speaking. Interrupted construction is, then, a construction (or writing style) that consists only of downstrokes, and a returning construction has joining upstrokes between the downstrokes. In a computer program the direction of the front would however have to be identified because the computer cannot come up with a representation of a hand that makes downstrokes and upstrokes.

3.7

The frontline in figure 3.7 marks the ends of all the strokes. The strokes whose fronts move in direction *a* are the downstrokes, the strokes whose fronts move in direction *b* are the upstrokes.
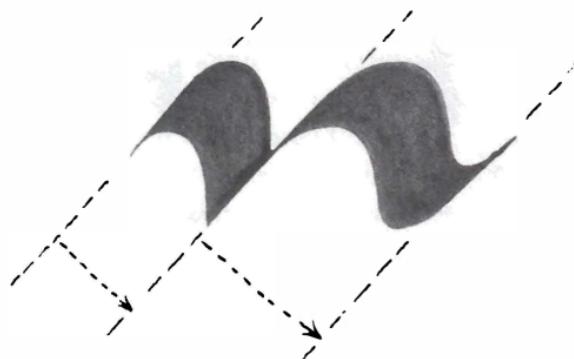
3.8   3.9

Every culture knows an interrupted construction (figure 3.8) as well as a returning construction (figure 3.9). In Japanese writing, for example, *kaisho* is the interrupted and *gyousho* the returning construction. This is due, not to a secret plot, but to irreconcilable human ideals. A returning construction can be written more quickly (with a 'running' hand) than an interrupted construction, but with an interrupted construction it is easier to maintain control. Moreover, there are combinations of material and equipment that do not accommodate the making of upstrokes. In returning construction the *articulation* of the letterform can be sacrificed to the speed of execution. Articulation and *speed* are antipodes in the development of writing. Returning construction is characteristic of informal writing, although a returning construction can also be paired with marked articulation.

3.10

With excessive speed a returning construction annihilates itself. In figure 3.10 the front has no time to turn back. The upstroke has degenerated into a sideways shift of the stroke, after which the movement of the front is resumed. This rapid writing is cultivated in the running hand of the Netherlandic mannerists. Any faster and the front does not come to a halt, and all that remains of the writing is an undulating line.

In western writing the roman is the current representative of an interrupted construction (figure 3.8). Opposite the roman stands the cursive (figure 3.9). The cursive is a descendant of the returning construction but the formal (articulated) form of the cursive is often interrupted. The returning and the interrupted cursive differ in the linking of their stems. If in returning construction a linking upstroke runs from thick to thin (figure 3.11), then the comparable link runs from thin to thick in interrupted construction (figure 3.12), and vice versa.

Returning construction is the most important force in the development of writing, but increased speed or marked articulation can be its undoing.
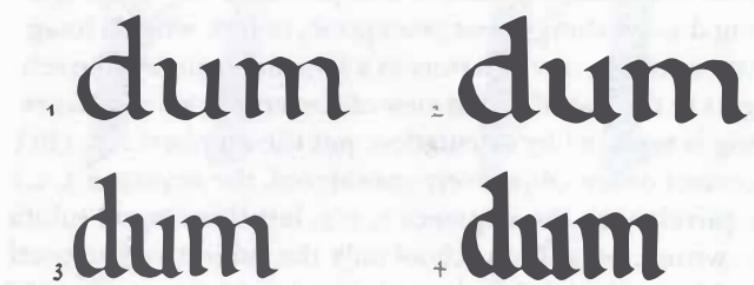
3.11   3.12

Words in language make sentences; written words make lines. On its own the written word means nothing. As long as I stay in the realm of writing, the meaning of the word is not an issue. The minute I concern myself with the meaning of the word I have to do with language. When a child learns to read, the child learns to connect written words with words in language. The problems associated with this are customarily viewed exclusively as a language problem: the child does not understand what is written. In the end it will always come down to that, but if we cannot see what is written, there will be nothing to understand. A child that cannot adequately perceive the word will never learn to read well, because school concentrates attention on comprehension. This is of little use to someone who perceives badly and schooling does nothing about perception. In fact, with its image of the word as a row of letters in a specific sequence, the school gets in the way of a clear view of the written word. Thus reading is replaced by calculation: put the numbers 1, 2, 3 in the correct order. Objectively considered, the sequence 3, 2, 1 is equivalent to the sequence 1, 2, 3, but this correct solution is wrong, because in school only the subjective perspective holds, in which left is always left and right always right. With children who know it can be otherwise, because they move around things, the school is clueless.

The word consists of forms, white and black, which constitute a rhythmic unit. If the rhythm is weak, the word is poorly formed; if the rhythm is absent, there is no word, even if the letters are scattered across the paper in the proper sequence.

In everyday spoken language rhythm means regularity in intervals of time. The intervals are not really equal in size and the same in form, but equal in value, equivalent. Rhythm in writing is not a temporal structure but a spatial matter – the intervals have length, but also breadth.

The black partitions between the white intervals may be similar, but they must be equivalent, equal in value, because otherwise they would disrupt the rhythm. When the intervals of a rhythmic ensemble are separated by mutually discrepant figures then those figures are themselves intervals of a rhythmic ensemble. The rhythmic connection of the white shapes in the word is the condition of the rhythm of the black shapes and vice versa. The black shapes of writing are determined and regulated letter by letter and the counterpoint is easily controlled. The white shapes are constituted only in the combination of letters; there is no simple measure of their size and they follow almost incidentally from the black strokes which solicit so much attention. This is why I place so much emphasis on the white shapes in the word.

4.1

Figure 4.1 surveys the significance rhythm has for practice. In 1 the letters are wider than in 3 – the enclosed white is smaller in 3 – the white between the letters must therefore also be smaller. In 2 the white that is enclosed by the strokes of each letter is also smaller than in 1 because the stroke is heavier. Hence the letters in 2 also stand closer together than in 1. If I want to make the space between letters as small as possible, then the white forms within the letters must also be as small as possible. In 4 I move in that direction with a narrow letter and a heavy stroke. Figure 4.1 aims to give harmonious word images. The word images are as they should

be, which is not a great starting point for an impressive demonstration. In figure 4.2 I have scrambled the handling of the letter combinations. This has a more striking effect. In every instance the word image falls apart. In 1 and 2 the small interletter spaces pull the letters apart (the stem of the *d* relates much more to the first stem of the *u* than to the bowl of the *d*); in 3 and 4 the large interletter spaces push the letters in upon themselves. In 1 and 2 the letters seem too broad, in 3 and 4 they seem too narrow. In 3 and 4 the word has become a row of unrelated letters; in 1 and 2 the chaos is even greater because now the letters themselves are destroyed.

4.2

The word is the condition for what we call reading. This is easy to see. We only have to imagine a newspaper or a book set entirely in capital letters. When capitals are well set, the distances between the letters are equivalent, but the great differences in the amount of white within the letters make a word image unattainable: at best capitals comprise a handsome row of letters (figure 5.1). The white shape inside the *D* is repeated in the *B*, but the shapes are much smaller in the *B* because two forms must make do with the same height as the *D*. The white between the letters cannot be simultaneously identical to the white of the *D* and to the white of the *B*. The basis for a rhythmic bond is not present in capitals. Capitals need to be spread across a space in such a way that the differences in interior shape do not disturb. This requires a great deal of room between letters and little room between lines. Text set in capitals consists not of lines and words, but of letters.

5.1

5.2

In the minuscule this is different (figure 5.2). The interior shapes of the *m* consist of a repetition of the interior shapes of, among others, the *h*, however these shapes are not stacked

above each other, but beside each other, so they can be equivalent. Hence the minuscule is capable of a rhythmic bond. Yet this is not enough. Imagine a newspaper or a book consisting entirely of lines where the rhythmic ties are not disturbed by word spaces. This would also make reading virtually impossible. Hence the invention of reading consists in the interruption of the rhythmic integrity of the line. A minor disturbance of the rhythm appears to be enough for words to be distinguished as rhythmic units. Something this simple is an invention because it is only simple in retrospect. It is hardly obvious that disturbing the rhythm will enhance the accessibility of a script (the minuscule) that owes its very shape to the rhythmic flow of the line. After the semitic invention of the alphabet, the invention of the word is the single most important invention that I know. The word – and with it, reading – is what has made western civilization possible. I want to take stock of this turning point in the story of civilization, but I cannot find reference to it in the history books, nor in the palaeographic corpus. Even in cultural-historical literature the concept of the word does not make an appearance. I had to seek out the invention of the word on my own from reproductions of old manuscripts. If I can rely upon the dating of the manuscripts and on the identifications of their origins, then the word appears to have been invented in Ireland in the first half of the seventh century.

In the sixth century, systematic separation of words does not occur. Interruptions that look like word separations appear to mark the end of a sentence or phrase. In the ninth century word separation is the rule. In the eighth century the word image appears only in scriptoria established in the wake of the Irish-Anglo-Saxon mission. Before that it is limited to books written in Ireland and England, and the oldest manuscripts that systematically exhibit word images are all Irish. They are dated at the beginning of the seventh century.

This is the complete report of my investigation into the origins of the word. My conclusion is hardly more than a supposition. I have little understanding of manuscripts; I have

simply relied on the captions of the reproductions I have compared. Research into the invention of the word has yet to begin. I have made up my Irish inventor, but he is indeed real enough for me to ask him how he came upon his idea. He seems to want to say that the separation of sentences with a slight disturbance of the rhythm has inspired him; maybe errors, of the kind every writer makes in transcribing a text, also played a role. I would want to ask my self-made colleague yet another question, but this time he does not answer: in the seventh century the christianizing of Europe begins in Ireland. Sometimes the missionaries pick up the sword, but they have an effective new weapon at their disposal: the word. In the seventh century the islamification of North Africa begins in Arabia. These missionaries swing the sabre much more visibly, but a careful reading of the Sunna suggests that true religion has another mighty weapon: the word. Since early times Arabic writing has exhibited an inclination to ligatures, that is, letters with common strokes, such as also appear in western writing (figure 5.3).

5.3

Ligatures simplify the pattern of strokes and most of the time that works to benefit the word image. However, in the seventh century the ligature becomes the rule in Arabic writing: with a few exceptions, a word is a ligature. The Arabic principle that binds the letters of the word to each other with black strokes is the opposite of the western word, which is founded on the cohesion of white forms, but this correspondence remains: in the seventh century an expansive culture avails itself of a new way of writing in which words

are separated. The question of whether Arabs and Irish knew each other has been raised before – ornamentation in Irish plastic art was the occasion. I get the impression that the question is mentioned in art historical literature only as a curious example of wild speculation. My question could be subject to the same fate. I do not mention it here to give it a certain status, but to accentuate the importance I attach to the invention of the word.

In general the sciences have the inclination to bypass whatever appears open to plain view: the strange and difficult to access evidently has more attraction. In the end there is only one remaining blank space on the map: the place we occupy. The Arabic ligature does have the attention of western science, but the fundaments of western writing have been left untouched. It does not matter to me how the answer to my question will come out. What does matter is that this answer can only be given by somebody who has first taken western writing into account.

It is possible that I have given the impression that the invention of the word is a hiatus in the otherwise complete history of writing. I should correct that: the history of writing does not exist. There is something that goes by that name, but it is not what it claims to be. Consider the following.

At first writing is logographic – each token (for instance A) stands for a word. Thereafter writing becomes syllabic – each token (for instance A) stands for a syllable. Finally writing is phonetic – each token (for instance A) stands for a sound. The A is not at issue in this history. It is not writing that changes, but the meaning that is attached to the token. Had the token changed, the change would not be of interest to the so-called history of writing. This so-called history of writing is not a history of writing but a schematization of the evolution of spelling. The schema is crude; whether a spelling can be considered phonetic depends on the rules established for a specific language. Present-day Malaysian spelling is much more phonetic than English spelling. Add to that, that the schema

is heavily biased toward the writer. A Malaysian can imagine that he is writing phonetically, but he does not read phonetically, because all of western civilization reads by recognizing one or more words as tokens of lexical words in one glance, so that the reader uses western writing logographically, and that is possible only if the writer makes rhythmic words. Spelling is keyed to writing, but spelling is not writing and a history of spelling is something other than a history of writing. How it looks, I do not know, because the history of writing is yet to be written.

The invention of the word stands at the beginning of a development that without hesitation we call mediaeval. So there is something to be said for considering the invention of the word as the beginning of the middle ages. In this sense the middle ages extend from around 600 to around 1500. I could also consider the introduction of the minuscule as the beginning of the middle ages, but then I do not know what I should count as already and as not yet belonging to the middle ages, because, unlike the word image, the minuscule did not appear out of the blue. The mediaeval quality of the minuscule – its rhythm – is already present in the half-uncial and this name alone suggests that this script is not easy to delimit. The minuscule stands squarely within the Roman development of writing. If this piece of antiquity must already be counted as part of mediaeval writing, then why not the uncial also? A cultural-historical schema is only a schema, but if a schema is to be useful, then, besides being crude, it must also be clear. I would want to put this forward in support of my proposal to have the middle ages begin at the moment that the civilization of antiquity is brought back strengthened by the Irish. The semitic heritage receives a new impulse that gives civilization a new character: western civilization. The middle ages begin with the invention of the word and the middle ages come to a close with the invention of typography. My schema has three turning points:

1. The alphabet
   (semitic writing)
2. The word
   (western writing)
3. Typography

Typography is here understood as: writing with prefabricated letters.

The middle ages are our prejudice. If we think of them as a dark time in which the heritage of a classical civilization is blanketed by a stupidity and superstition which our clarity of vision has at long last banished, then all we can do is look back affectionately to the primitive splendour of mediaeval writing. Were I, however, invested with the sense that, with so much less time in their lives than we (not extended, that is, by artificial light), these individuals mastered their techniques at a level that we view as unattainable, then my middle ages would be other than the 'dark middle ages' of the text books. In my middle ages the most important moments of western civilization – the invention of reading and the invention of typography – come into their own. And for me the western style of reading differs so sharply from the spelling of the ancients that I see the mediaeval invention of the word as, if not the invention of western civilization, then at least its beginning. My confidence is buttressed by my respect for my mediaeval colleague. The richness of mediaeval writing is not made less complex by my schema, but now I can at least indicate the path it takes: the middle ages are the period during which the development of writing is turned toward the consolidation of the word. When western civilization becomes receptive to humanistic propaganda, which wants to return to the loose word image of the early middle ages, then the middle ages have passed.

Every change (sudden or gradual) that gives greater accent to the rhythmic bond of the white forms in the word counts as consolidation of the word. This amounts to a reduction of the white. In the case of the text letter (whose late form is called textura or textualis) this process follows the principle shown in figure 4.1. The following examples show this reduction without recourse to the actual mediaeval forms themselves.

Figure 6.1: using light strokes on broad letters makes for large interior shapes. For a rhythmic balance large shapes between letters are required. The word image is ethereal.

qualibus literis

In figure 6.2 the stroke is heavier. Less white remains in the letter. Balance is achieved by a reduction of the interletter shapes. The word image becomes more compact.

qualibus literis

6.2

In figure 6.3 the letters are even closer together. With letters of the same height as in the previous figures, the interior forms can be accommodated to the reduced interletter shapes only by a narrowing of the letters.

qualibus literis

6.3

More can be said about the middle ages, but this does not add to or detract from this principle. The mediaeval writers place their letters ever closer together. To keep the rhythm intact they make the interior shapes of the letter ever smaller. Consequently the text letters become ever narrower. These are the principles that elucidate the evolution of mediaeval writing. The motive for these changes is an open question. I take for granted that the mediaeval writer was aware of the importance of the word image. Whatever could strengthen the word image he viewed as something that could raise the quality of his work. For anyone who has a notion of the importance of reading and writing, I would think this is a sufficient explanation. My mediaeval colleague was happy to be able to read and write, however, he laid the foundation for

visio Isaiae filii Amos quam
vidit super Iudam et Hieru-
salem in diebus Oziae Iotham
Ahaz Ezechiae regum Iuda.
  audite caeli et auribus percipe
terrae quoniam Dominus locu-
tus est:

filios enutrivi et exaltavi ipsi
autem spreverunt me.
  cognovit bos possessorum suum
et asinus praesepe domini sui Isra-
hel non cognovit populus meus
non intellexit. Isaias 1:1-3

52

a society that dreamed of a blessed future where all people are illiterate. With his invention of typography the mediaeval scribe has relieved us of the need to write well and that has alienated us from the word. And in the end his chasing after a perfect rhythm lapsed into uniformity, because the narrowing of letters led to interior shapes that were not only equivalent, they became identical and the humanists could justifiably call this barbaric – gothic.
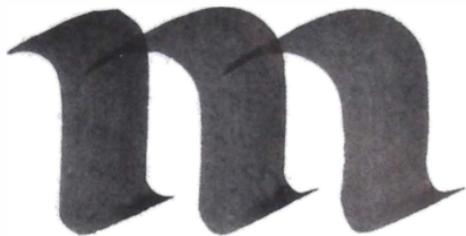
6.4

Late mediaeval text letters were without exception written in an interrupted construction, but the minuscule was originally a running script (a script written in a returning construction) (figure 6.4). The upstrokes are visible in the trian-
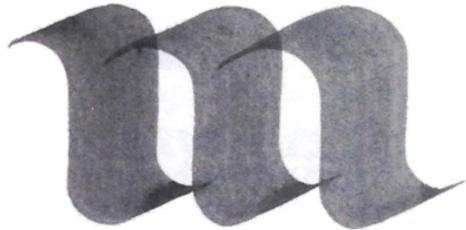

6.5

gles that I have darkened in the example. In figure 6.5 I have darkened the very same triangles, but here the pieces of upstroke are swallowed up by the broader stroke. The difference between the returning construction of 6.5 and the interrupted construction of 6.6 is not visible in the shape of

6.6

the letter. When the interrupted construction is adopted the letter can acquire feet accentuating the ends of the strokes, but the feet are details from which no hasty conclusions can be drawn (figure 6.6). This is the prototype of textura. If this
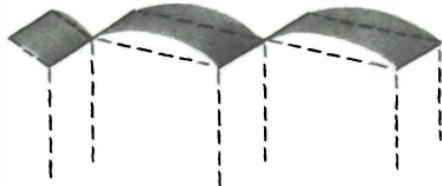

6.7

letter were to be made narrower, the difference between the curves and the feet would become too small (figure 6.7). The letter is no longer recognizable as an *m*. This can be remedied with a backstroke in the feet (figure 6.8). This is the endpoint of the blackening of the textura. The point of departure for this development is the preservation of the arches in
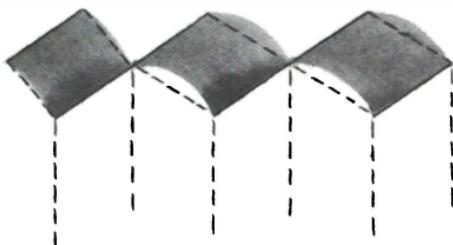
6.8
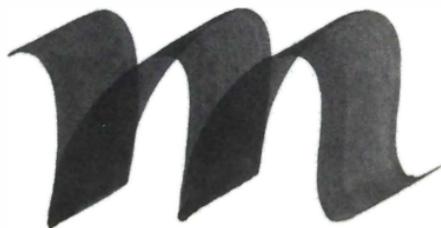
6.9

the letters. The arch can be conceived of as a bowed parallel-
ogram (figure 6.9). Given a larger counterpoint and a smaller
span the parallelogram approaches a lozenge (figure 6.10).
There is less room for the bowing of the arch to come to
rights. Consequently the arch is flattened.

6.10

The alternative, given this point of departure, is the pres-
ervation of the upstroke (as in a running construction). As
long as the upstroke curves out far enough, it will remain
visible, in spite of the larger counterpoint (figure 6.11). But
now there is no room for the arch. The alternative to the tex-
tura is a different principle of form. This form-type is called
cursive.
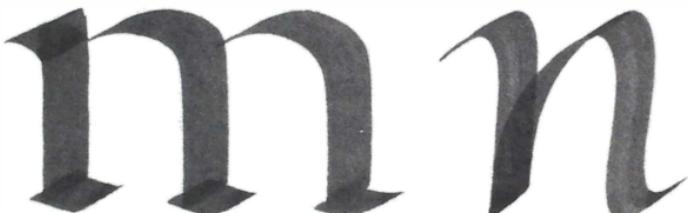
6.11

mín mín

ne dicas, quid putas causae est
quod priora tempora meliora
fuere quam nunc sunt/ stulta
est enim huius cemodi interrogatio.
Ecclesiastes 7:10

An eighth-century manuscript lacking discrete word images might be put on the table, with the question 'where was it written?' Even without seeing the manuscript, I am almost certain the answer would have to be: in Italy. The later the manuscript, the greater the chance that the answer is correct. Earlier in the eighth century it might have been the case that the manuscript would have originated from another corner of Europe, not yet pervaded by Irish-Anglo-Saxon civilization. Italy lagged behind, as it did throughout the middle ages. The consolidation of the word never made its way to the other side of the Alps. The Italians did however adopt the forms that the consolidation gave rise to, but not the heavy stroke from which the forms derived. The humanistic cursive is a cursive with a small counterpoint (figure 6.13) and the roman has all the characteristics of the textura

6.12   6.13

but for the heavy stroke (figure 6.12). After 400 years we have become accustomed to roman type, but we might yet do well to marvel at the fact that the reversal in the textura foot has

6.14

been so emphatically adopted, and for no other reason than the prestige of mediaeval western civilization. In figure 6.14 I show the roman against its gothic model, the textura.

6.15   6.16

The early mediaeval minuscule shown in figure 6.15 has a modest angle (< 30°) between the counterpoint and the direction of the line. In figure 6.16 the same form is written with a greater angle (± 45°). This places the shape of the minuscule in the neighbourhood of the forms of the humanistic cursive. It is not until later in the middle ages that cursive writing is cultivated, but the phenomenon is already clearly visible in the manuscripts of the eighth century, for example in the *Book of Armagh*.

These sorts of complications occur almost everywhere. The consolidation of the word image involves ever-narrower letters and an ever-heavier stroke. This is the general principle, but for every writer a different letter width feels normal and every pen has a different width. Those who are impatient to know all the ins and outs of the affair may be driven to despair in the face of these additional restrictions, but for palaeography they are of the essence. They constitute the most important evidence when it is a matter of determining how many writers have worked on a given book or when it is a matter of tracing the comings and goings of a peripatetic writer.

Of even greater interest are instances where the deviations follow a clear pattern. Reversibility of translation is an irrefutable principle.

The stroke of western writing is in principle point-symmetrical: strokes can be rotated 180° without anything changing in the position of the writer in relation to the stroke. In other words, I can just as well make every stroke upside-down. With some letters even the entire construction is capable of being written in reverse: *o*, *s*, *l*, *d*, *p*, *u*, *n*, *b*, *q*, *z*. Even when these letters are written upside down or when they are turned fully around, they stay letters. The only thing that changes is their meaning. The meaning of *p* or *d* and the meaning of *u* or *n* does not depend on the form of the letter but only on my position vis à vis the form (figure 6.17).

6.17

Line-symmetry, where figures are each other's mirror images, makes its appearance in western writing with expansion. Here the meaning of a letter can also change when I look at the letter from its backside. A *d* now is not only a rotated *p* but also a reflected *b*. I am sure of the meaning of the form only to the extent that I am certain of my position. This certainty is lacking in small children. Teaching of reading based on recognition of meanings of letters bypasses the child. It disrupts the development of cerebral functioning. Teaching reading too must have as its starting point the white of the word. But this simple proposition presupposes a turnabout in pedagogy, in the study of writing, and in cultural history. Not only that, designers of schoolbooks must be re-educated as well.

In figure 3.11 and figure 3.12 of chapter 3, a returning and an interrupted construction are shown side by side. In consistent construction the interrupted cursive of figure 6.19 is the alternative to the returning construction of figure 6.18.

     6.19

Technically a *u* is an *n* in which the direction of the stroke of the one is the inverse of the direction of the stroke of the other. By rotating the letter through 180° the direction of the stroke can remain unchanged. For the reader this difference is laden with symbolism. How this symbolism operates I do not know. The difference is not entirely rational. It might not even have arisen if we could only clearly remember that there was a time when we could 'read' our picture books upside down without problems. But, rational or not, the feeling of a difference does exist. It has even forced its way into the professional literature, which advances the 'discovery' that we actually read the tops of the lines (or the bottoms – I've forgotten) and that letter designers consequently need to pay special attention to the tops of their letters (or the bottoms). Here the not entirely rational difference begins to border on the nonsensical. That no one has as yet protested points to the force of the irrational distinction between above and below. Embracing the distinction creates new alternatives for writing the cursives shown in figures 6.18 and 6.19.

6.20   6.21

In figure 6.20 a returning construction occurs only when the upstroke curves clockwise. In figure 6.21 upstrokes that run counterclockwise are the only kind of upstrokes that are written. The differences between these four writing styles spring into view the moment we are conscious of their construction. Yet these differences occur in manuscripts that were clearly intended to look the same, for instance in books on which several writers worked. At times I have thought that the old writers were not conscious of construction. But I find the same unconscious differences in the work of students who are equipped to analyse fully the construction of a piece of writing. Inconsistent construction is a peculiarity of the individual writer, not of the script. This is of importance for palaeography. But it relativizes my robust story about the principles leading to the difference between roman and cursive. The fixed pattern in this slippery material is the consistency of the inconsistencies. I have yet to see a manuscript in which the constructions of figures 6.18, 6.19, 6.20, and 6.21 are used interchangeably by the selfsame scribe, and I think that such a manuscript does not exist. At most I can imagine that a manuscript is started with the best of intentions in regard to a specific principle and that the writer falls into his own pattern when he has gained momentum.

The richness of form in late-mediaeval writing is in large part due to a construction that has not yet been dealt with, the bastarda. I hesitate to call the bastarda a writing style. If I do call it a writing style, I need to add that the various phases of its development have been used concurrently long enough to present themselves as different writing styles. They even have different names, such as French bastarda, 'lettre bourguignonne', Netherlandic bastarda, and fraktur, but these names themselves reveal that it is a matter of regional variations of a common principle. Fraktur is German and the Burgundian bastarda is Flemish, or at least Southern Netherlandic. In the scholarly literature, because of the traditional separation of printing history and the history of

Ecce ego facia nova
et nunc orientur
utique cognoscetis
ea / ponam in deser-
tio via et in invio
flumina ISAIAS 43:19

handwriting, any attempt at an all-embracing description of the bastarda is absent. The fraktur is left to hang in the air. In search of the principle I lay aside the taboo.

In their cursives French manuscripts from the beginning of the fourteenth century exhibit an aberrant *r* or an aberrant *a* or both. Figure 6.23 shows these deviations next to a proper cursive construction (figure 6.22). From the onset cursive scripts with these divergent letters were called bastarda.

6.22   6.23

The constructions (figures 6.24 and 6.25) show a typical backstroke at the transition between upstroke and downstroke. The heartline makes a triangle. The backstroke in the returning construction (or the imitation of it in interrupted construction) is the defining characteristic of what I here call bastarda. The backstroke pulls apart upstroke and downstroke. They can be bent back toward each other, but there always remains something of a heavying of the stroke that wrenches slightly at the rhythm of the black forms. The theoreticians of the bastarda Jan van den Velde and Johann Neudörffer afford these thickenings an emphatic presence in their virtuoso examples: the thickenings belong.

6.24   6.25

The backstroke is a complication for the writer. So there must have been something that justified the effort, especially early on, because later the writer could take comfort in the certainty that this is how it belonged and that everyone did it like this. In figure 6.22 I have written the cursive in such a way that the bastarda represents an improvement. The web of space under the *r* cuts a hole into the word that is stopped by the backstroke. Add to this, perhaps, that the top of the cursive *a* has the letter begin with an upstroke, which is not favourable technically. In the bastarda the *a* begins like an *o* that is completed with a downstroke incorporating a bridge. But maybe I am seeing too much in this, and the backstroke of the *a* is a borrowing from the *r*. I say this because the *r* resembles an *a*, a resemblance which holds only if the difference between above and below has no meaning. And of that I am, given figures 6.20 and 6.21, not so certain.

arum   arum
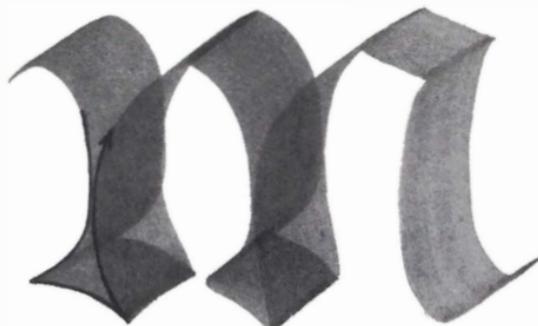
6.26   6.27

The Burgundian bastarda is a subsequent phase in which every letter with an upstroke has a backstroke (figure 6.26). Clearly this has to do with aesthetics. The bastarda is beginning to look like the textura (figure 6.27). Despite the fact that a form that is native to a returning construction (the cursive) is written with lifts – or interrupted – to make the cursive 'more beautiful', it looks as if the bastarda is an attempt to approach the articulation of an interrupted hand (the textura) with a returning construction. This holds even more for the stretched bastarda presumably put into circulation by Jaquemaart Pilavaine, who worked in Bergen around 1450 (figure 6.28).

In the calligraphy books of the seventeenth century this tall letter is called the Netherlandic bastarda, but also fraktur, because there is no difference between this Netherlandic hand and the German fraktur. The German fraktur appears

64

for the first time in a Latin prayer book that Maximilian had printed in Augsburg. He delivered a model for the type along with it. The model has not been recovered, but this emperor was the Duke of Burgundy, and the Count of Flanders. When he gave the commission, he was in Brugge, the centre of Burgundian manuscript production. Consequently it is not surprising that, apart from ascenders, the new German typographic letter was identical to the Burgundian hand. The German script comes from Belgium.

6.28

In many cases it is difficult to decide whether a script is still an ordinary cursive or a bastarda, especially if the form appears in an interrupted construction. Maybe the roof of the *a* is a workable criterion. If the cursive (figure 6.29) has a roof, it is an upstroke, written from right to left. In the bastarda (figure 6.30) the roof is a downstroke, written from left to right.

6.29   6.30

videte qualibus literis scripsi vobis mea manu

Gal.6:11

Deposuit potentes de sede et exaltavit humiles esurientes implevit bonus et divites dimisit inanes

Lucas 1 : 52, 53

What distinguishes a Burgundian nobleman from a humanist? In *The waning of the middle ages* Johan Huizinga answers: 'Charles the Bold still read his classics in translation.' Presumably this answer says more about the difference between a nobleman and a scholar than about the suggested difference between the middle ages and the renaissance. Huizinga himself cannot identify clearly the difference between Burgundian and Italian authors. The differences in accent he points to are substantially more modest than the differences in national character that exist, or so we are led to believe, on either side of the Alps. At the end of the fifteenth century something is in the air, but it does not materialize. Huizinga wishes to illustrate the lucid simplicity of the renaissance, but finds, precisely in the imitation of the Italians, only 'extreme swollenness' and an even more mannered bombast than in his flamboyant middle ages. Huizinga waits for the springtime of the renaissance after his waning, but he waits too long. When his middle ages have passed the renaissance is finished as well. The new phenomena that bewilder him are not the incomprehensible signs of a sluggishly approaching renaissance, but typical expressions of mannerism. Huizinga knew what he could not let himself believe: the middle ages are the renaissance. One ought not to believe such a thing, but Huizinga has no option but to affirm that the ideal of the French culture of chivalry is the ideal of the renaissance. And when he has described his quintessential mediaeval figure, Charles the Bold, his conclusion comes as a confession: 'This self-conscious savoir-vivre is actually, in spite of the stiff and naive forms, completely renaissance. It is [...] the most characteristic property of Burckhart's renaissance man.' Yet, on the last page of the book, after all of this is gone for good, Huizinga is still waiting for the fresh full wind that will purify the air. It is good that he stops there, because, when mannerism has run its course, all that remains is a bourgeois self-sufficiency of which only the name is fresh, the enlightenment.

The apostles of the enlightenment had uncovered the true shape of antiquity lost from sight in the 'dark ages'. Across this mediaeval side-path they laid a new road to the sources of civilization. Figure 7.1 shows (left to right) the classical, a mediaeval and the classicistic form of the capital *D*. The classicistic *D* appears to have rediscovered the purity of the classical form, which had got lost in mediaeval tomfoolery. Figure 7.2 is a schematic of the strokes with which the letters of figure 7.1 are made. Now a new picture emerges: in mediaeval culture the classical principle is preserved unscathed, and it is classicism that has departed from the classical foundation in order to orient itself toward a chimera, a utopia of its own making, put forward as the true antiquity. This makes sense to anyone who does not look closely. Official culture, distancing itself from authentic culture, is based upon this trick of the eye. This masquerade of wanting desperately to clothe oneself in a culture other than our own is, taken by itself, an innocent hobby, but the extent of it makes the sport dangerous: talent is tracked down and transplanted into a pseudoculture, to the point where the chasm between society and so-called 'cultural life' has become the mightiest institution of western civilization.

7.1

7.2

It all begins with the stately splendour of the swelling counterpoint. The frontline is still sufficiently clear in the expanded portion of the stroke, but the contrast relies on its contraposition with a thin stroke in which the frontline spins about on an imploded counterpoint. When even contrast is renounced as superfluous ornament, writing is altogether without orientation. Now the barbarians can have their say with their plans to improve the alphabet so it will be easier for children, computers and other illiterates. Whatever they say is completely true in advance because the criterion is annihilated: a line can be drawn in any direction through a point, just as an echo chamber confirms any piece of nonsense.

7.3

Expansion is only possible in the portion of the stroke that lies on a path at right angles to the axis of the pen. The thickenings are all parallel as long as the orientation of the pen is fixed. In every other area, the stroke is thin. Where the stroke is thin, the distinction between upstroke and downstroke loses its meaning. The difference between roman and cursive rests only on an interpretation of the tradition (figure 7.3). The stroke of the broad-nibbed pen is the only norm for the pointed flexible pen. This applies even more for the ballpoint pen.

The traditional difference that the forms of some letters display in roman and cursive is also taken over in expansion (figure 7.4). The roman requires changes in the orientation of the pen. In the cursive they can be avoided by an adaptation

7.4

7.5

7.6

7.7

of the letterform (figure 7.5). It is completely meaningless to perpetuate such opportunistic solutions in writing that has no swelling strokes. The curlicues in the z are only there on account of contrast. When there is no contrast, there is no need of curlicues (figure 7.6).

A straight oblique stroke ought to be closed off horizontally. The stroke is a parallelogram. In principle, the stroke begins and ends with a filament whose curve has been resolved into a nick (figure 7.7).

The technique of the pointed flexible pen is difficult, because irregularities in the contrast and the direction of the strokes are almost unavoidable, while such irregularities are very obtrusive because of the strict orientation of such strokes. The most important reason to do writing exercises in expansion comes from typography. After John Baskerville applied expansion in his letters for printing, midway through the eighteenth century, it remained the one and only point of departure for the contrast of letters for printing until into the twentieth century. William Morris and his kindred spirits are an exception. Even the nineteenth-century sanserifs that are currently modern are derived, by contrast reduction, from expansion.

To conclude this chapter, a note about mannerism. I cannot point as self-evidently to mannerism as I can to antiquity or the middle ages, because not all works of cultural history give mannerism a place of its own. In fact, I have never yet come across mention of mannerism in histories of writing. What I understand by it is mostly regarded as the decline of the renaissance. But I cannot make do without mannerism, because in my theory it embodies the great turning point of western civilization. So I will indicate briefly what I understand by mannerism.

Around 1500 the classical world picture suffers a disturbance on all fronts: astronomical (Copernicus), geographical (Columbus), political (the Turks), and theological (Luther). All the existing cultural forces react to this shattering with

29 { mane nobiscum quoniam advesperascit et inclinata est iam dies.
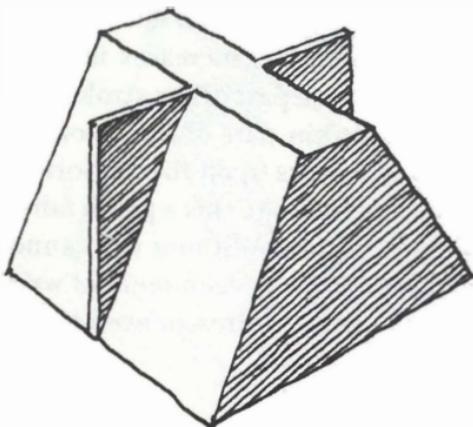
32 { *nonne cor nostrum ardens erat in nobis dum loqueretur in via et aperiret nobis scripturas.*

attempts to create a new world picture. This can be called artificial, and with reason, but there is no reason to condescendingly depreciate this cultural reorientation as 'rhetoric'. A small sample of mannerist creations should suffice to dispense such a prejudice: Saint Peter's, the Wilhelmus, modern astronomy, analytical geometry, mechanics, the music of the English virginalists, the poetry of William Shakespeare and John Donne, every important calligraphic 'writing book', every important copper gravure, the Statenbijbel, *In praise of folly*, and the Dutch state.

Mannerism does not allow itself to be slipped in between renaissance and baroque as a transition period. My haphazard collection of examples stands against the background of the middle ages. What is common to all mannerist expressions resists a splitting up of their backdrop. In relation to mannerism, the renaissance is just a regional mediaeval phenomenon – the Tuscan counterpart of the Burgundian gothic.

Mannerism is considered anti-classical. The creation of a new heaven and a new earth is indeed something different from the classical certainty that everything has its proper place. From a mannerist perspective the middle ages are just as classical as antiquity.

cecídit cecídit Babylon
illa magna quae a vino irae fornicationis sua potionavit omnes gentes   Apocalypsis 14:8
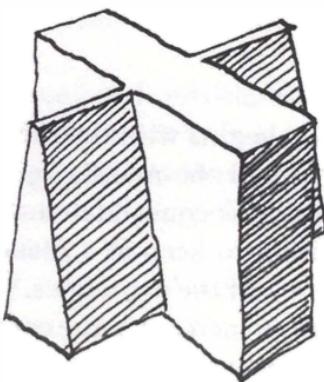
8.1

Western civilization begins with the invention of the word image. I have presented the middle ages as the period in which the word image is consolidated. This simplification puts me in a position to keep at a distance nuances that might hinder the view of the main lines. What does fall into view comes down to an increase in the contrast of the stroke. I can take this synopsis even further, for now our perspective is no longer limited to that of mediaeval translation. Increases in contrast can just as well happen in nineteenth-century western typography as in Bengalese calligraphy – of which I am, incidentally, ignorant.

Figure 8.1 is a model of such an increase in contrast. The top of the block is a cross with a given contrast. Proceeding towards the bottom the thicker stroke becomes thicker, so that every horizontal cross-section shows a greater contrast than the top. An end of increases in contrast is reached when the thin stroke no longer has a meaning: at the bottom of the block the cross has turned into a rectangle.

In figure 8.2 the thin stroke becomes thicker towards the bottom. The effect is a decrease in contrast. The endpoint of this decrease is reached when the strokes are equally thick.
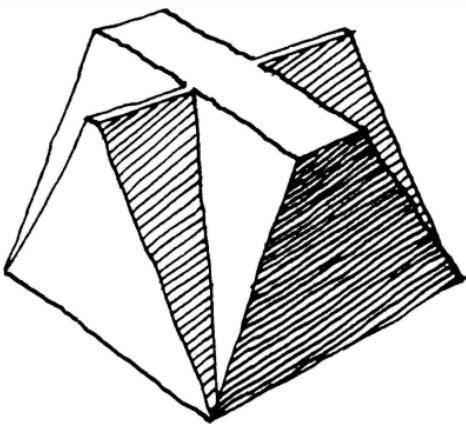
From this perspective an increase in contrast and a decrease in contrast are not simply each others' opposites, they exist at right angles to each other. Both operations involve a thickening of the stroke: increases in contrast involve a thickening of the thick part of the stroke, while with decreases in contrast the thin part of the stroke becomes thicker. This way of seeing rests upon the a priori that writing has contrast. The alternative to this a priori falls outside of my powers of representation. Without it, I cannot imagine a single explanation for the development of writing, for the cohesiveness of the great cultures, or even the total failure of education.

8.2

If my model for the increases and decreases in contrast makes sense, then it is strange that we so easily capture, in a single overarching scheme, various degrees of increase in contrast (as the middle ages or as the various gradations of type) but not the various degrees of diminution. For the average person and even for the average typographer the cross sections of the block in figure 8.1 belong together, but not those of figure 8.2. The bottom of figure 8.2 is the domain of

the sanserif, and for almost everyone, that is a world unto itself. Figure 8.2 however compels one to conclude that the sanserif does not exist as an autonomous category.
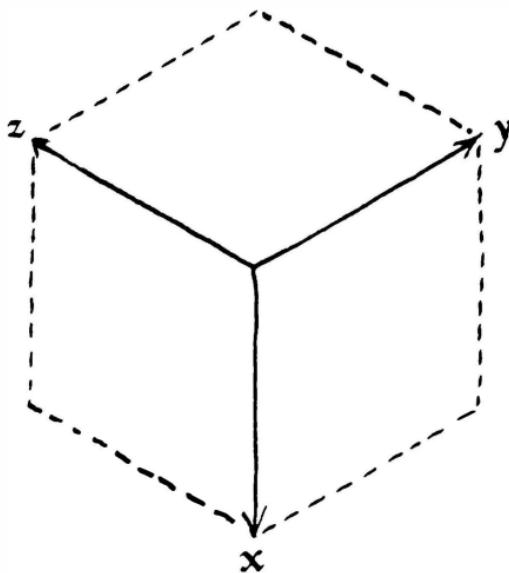
8.3

In the block of figure 8.3 the thinner stroke as well as the thicker stroke becomes thicker. The decrease in contrast catches up with the increase in contrast, but when they coincide, the white has disappeared.

This is an open-ended closing. While the three blocks might well be a conceptual artifice that can strengthen my grasp of changes in contrast, they do not provide the inexorable closure of a theory. For the theory, I expect more from the three-dimensional coordinate system in figure 8.4.
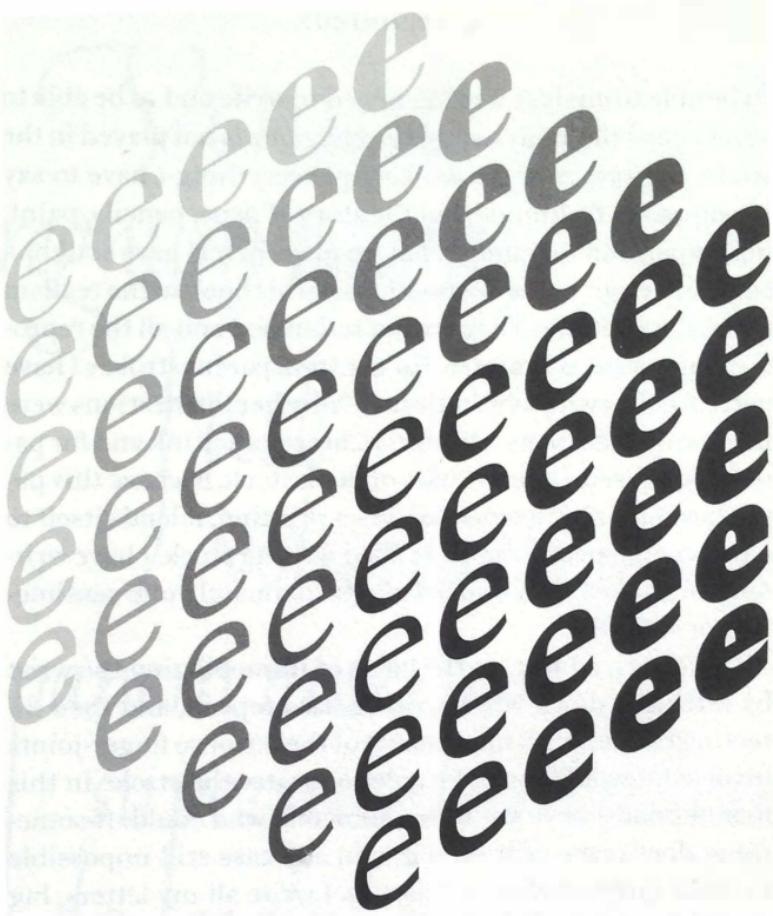
For handwriting the equation $x = y = 0$ holds. The z-axis runs from translation to expansion. For cultural history this means, from classical to classicistic, and, for cultural anthropology, this means from western (semitic) to eastern (Chinese). On the x-axis increasing contrast is set out and on the y-axis contrast reduction. Interpolation of the various points on the three axes produces an array of points that, taken together, form a cube.

8.4

Figure 8.5 shows the cube that, by way of example, is constituted by interpolations of the letter e. The 125 letters can each be denominated with an x, y, and z coordinate. In this case the x, y, and z stand for a number between 1 and 5, but in principle, each axis comprises an infinite number of positions. (Of the 125 letters, 64 are invisible in figure 8.5.)

The cube clarifies my open-ended closing. This book is a reconnaissance along the z-axis, with a few excursions in the direction of the x-axis. What transpires at the end of the y-axis can only be indicated in vague terms.

8.5

To be able to analyse writing I need to write and to be able to write I need the analysis. This circle-game is not played in the study, but rather in the workshop. Everything I have to say presupposes technique, but the story of pens, pencils, paint, ink, paper, and parchment has no place here. I have sought a counterweight to the abstractions of this book in the realism of the illustrations. They are not retouched and all the reproductions are at actual size. For the transparent strokes I have used brushes with synthetic hair. All other illustrations were made with steel pens. The ink is Chinese stick ink and for paper I have used various kinds of book stock. Because this paper has the sizing needed for offset printing, it lends itself to handwriting better than so-called writing stock. I have written the strokes with a speed of approximately one centimetre per second.

In western education the habit of immobilizing the wrist by setting it down while writing has crept in, and then directing the pen with movements of the ten or so finger-joints involved. I would never be able to master the stroke in this manner and I have yet to see someone who could. If something does come of it then it is in any case still impossible to make large strokes in this way. I write all my letters, big or small, in the same way. The fingers are virtually at rest relative to the wrist, the angle between the shaft of the pen and the writing surface is constant and the whole arm is in motion. This motion is barely visible when writing a small hand, but I can clearly make out the movement of the muscles of the upper arm if I place a finger on my arm under the shoulder-joint. The text of Matthew 6:10–11, for example, is written in its entirety using this pattern of movement, the long stems as well as the small letters.

I have scattered Latin biblical passages through the book as free-standing examples of various kinds of writing with various types of contrast and constructions. Because they have no direct connection with the text, they fall outside the

Veniat
regnum tuum
fiat
voluntas tua
panem nostrum
supersubstantialem
da nobis hodie

Mattheus 6:10/11

chapter-related numbering of the actual illustrations. The passages are taken from the mediaeval Vulgate (the Stuttgart critical edition), but I have identified the locations according to the Dutch Calvinist tradition. I have made use of the Vulgate because I think that western writing came into its own in this book. The rhythmic word-image exercised great influence on the letters involved. The letters that appear together most frequently thus also fit together the best. The frequency of letters is however determined by rules of spelling. In the middle ages no other text is written as often as that of the Vulgate, which allows me to assume that the frequency of the letters and letter combinations of this work constitute the ideal milieu for our mediaeval styles of writing. Letters that are scarce in the Vulgate (such as the y) or letters that are completely absent (such as the j) perhaps do damage to the word image. If this is so, then we should reject any change in spelling that attenuates the discrepancy between frequency of letters and the letter frequency of the Vulgate. In Dutch spelling the frequency of the j is, according to this standard, too high. That this is the case, is supported by the well-known phenomenon that any typeface looks better in Latin than in any other language. In this typographic example the black of the letters remains the same, but the quality varies. Typographic quality is dependent on the white of the word, and that is the point of departure of this theory of writing.

posuit os
meum
quasi
gladium
acutum

ISAIAS 49:2

This translation of Gerrit Noordzij's *De streek: theorie van het schrift* is based on its 1991 printing. The original text goes back to 1985, the year after Noordzij's occasional Association Typographique Internationale publication *Letterletter* was launched.

An earlier version of chapter 2 (The stroke) and chapter 3 (The orientation of the front) of this translation appeared previously on a listserv set up in 2003 to facilitate discussion of Noordzij's *Letterletter*, following the edition of that work made in 2000 by the Canadian publisher Hartley & Marks. Close readers will notice that the text of the online version of chapter 2 differs markedly from the present translation in several places. This is because, before we prepared the present edition, Gerrit and I experimented with the notion of updating the text. However, this proved unwieldy, and the present version of the chapters in question sticks closely to the original text, unless basic issues of English-language clarity made rewording important.

So, for example, the formulation of the first two sentences in the online version of chapter 2 was dropped in favour of something more reflective of the Dutch original. This in spite of the fact that, for instance, the online version of the second sentence, '[T]he *primitive* of the black shape is the stroke', might be considered to state Gerrit Noordzij's conceptual a priori in a nutshell, while this translation's '[t]he *simplest manifestation* of the black shape is the stroke' is more in keeping with the plain-language approach of the Dutch text.

One terminological choice deserves special mention. In chapter 3 the author contrasts an 'onderbroken' construction with a 'kerende' construction. The verb 'onderbreken' means 'to interrupt' or 'to break off', as in a journey. I translate 'onderbroken' as 'interrupted', but I like the journey imagery of breaking-off prior to continuation.

The Dutch word 'keren' is 'to turn'. I turn my head, I turn

up a card, I turn inward, I turn away from evil. In Gerrit Noordzij's scheme, a 'kerende' construction is one in which the stroke turns abruptly ('keert abrupt om': turns abruptly around), one in which the front reverses itself ('omkeert': turns over, turns back, reverses itself). To strengthen the image of turning back, reversing its movement, turning back abruptly, and to frustrate the image of following a curvilinear path, which just 'turning' can have, or of flipping over, which 'turning around' can have, I translate 'kerende' as 'returning'. This usage corresponds with Gerrit Noordzij's use of 'returning' in *Letterletter* 2 (Hartley & Marks edition, p. 10).

And finally, the full passage from Van den Velde's *Spieghel der schrijfkonste*, to which Gerrit refers on page 26, reads as follows.

Van ghelijcken ghebruyc ic ooc een zoodanighe Penne ommyne trecken te halen, maer neme daer toe een schacht die vvat stijfachtich is, makende haren bec vvat langher, ende de splitte oft spalte van ghelijcken, om dat den inct des te langhzamer en van passe volghen zoude: Ende om te verhoeden dat dezelve niet en kritsele oft en sprinckele (ghelijc zulex in myne Schriften niet veel ghesienen vvort) zoo voere ic dezelve teghens den rugge opvvaerts een vveynich overkant, ghelijc een Schip dat zoetkens laveert, omdat se des te zoeter over tpampier svveven zoude, vvant die recht oft steyl teghens den rugghe opvvaerts te vvillen voeren zalmen qualijc konnen beletten dat se niet en kritsele, ende dat de trecken ghe heel onzuyver vallen, der vvelcker glatticheyt ende reynicheyt, ic voor eene groote konste ende vvetenschap houde, als zijnde eene vande kloecste ende byzonderste grepen die een meesterlijc Schrijver tot vermaertheyt brengen mach.

Peter Enneson

The stroke is the most concise and powerful statement of Gerrit Noordzij's theory of writing. First published in Dutch in 1985, it appears here for the first time in English. The book puts forward a genuine theory of all writing, done with any kind of generating tool. Noordzij starts with fundamentals – the space within and between letters – and proceeds in stages towards a full account of how the strokes of writing can be formed, and an analysis of the qualities of letters. Along the way, there are reflections on history and culture, and remarks on method. Noordzij's theory serves to repair the split that grew up, with the invention of printing, between written and typographic letters. He shows us the underlying 'written' quality of all letters, with whatever technology they have been formed. Just by virtue of its strong theory, *The stroke* has practical consequences that transcend any simple 'how to do it' approach.

'I cannot remember ever finding – and in such a small space – so many essential insights into the workings of the pen and into the writing process. No-one will be able to neglect Noordzij's book in any future discussion of the subject.'
Jost Hochuli, *Typografische Monatsblätter*

Gerrit Noordzij

is one of the eminent Dutch graphic designers and (in all senses) writers. He has also been a path-breaking teacher at the Royal Academy of Art in The Hague, where from 1970 to 1990 he directed the course in letter design. Among the students from his classes are some of the most distinguished Dutch type and graphic designers. As a writer of essays and books, his works include the bulletin *Letterletter* (reissued in book form in 2000) and *De handen van de zeven zusters* (2000).

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