

Letterletter

*An inconsistent collection of tentative theories
that do not claim any other authority
than that of common sense.*

GERRIT NOORDZIJ

THIS ICONOCLASTIC COLLECTION
of essays on typography, writing and life is the work of master calligrapher, type designer, and teacher of lettering and design, Gerrit Noordzij. It forms an important contribution to the literature of type. Noordzij is also a type historian and theorist of lettering. His students constitute the Dutch School, which is now a dominant force in European type design.

Letterletter was originally a series of 15 issues of a journal published sporadically and distributed to a select few. As Robert Bringhurst notes in his introduction, the middle two pages of the first four-page issue of *Letterletter* held "more information on the structure and nature of letterforms than most professional typographers then working had ever seen in their lives."

Letterletter described itself as a journal of typographic metaphysics. It was also "a journal of typographic anatomy, typographic optics, and typographic geometry." Brilliantly written, often unexpected, and always fascinating, these letters open up new perspectives on the "science of art and the art of science."

Letterletter will be an invaluable design tool and a pleasure to read and reread for all those who care about the written word.

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INTRODUCTION

BY ROBERT BRINGHURST

HUMANS, LIKE COUNTLESS other creatures, are born with a need to speak to one another and be spoken to in turn. We do this with the voice if we are able, but if ears or voice should fail us, we do it with the hands—and the languages we learn, to qualify as humans, marry us to those who understand us and to those we understand.

Writing is speech that can reach through space and time and marry us to people we will never meet or see: a powerful, beautiful, dangerous thing. And it is surprisingly recent technology. Humans have been talking to each other, feeding one another ideas, stories, songs, for several hundred thousand years. It was a scant five thousand years ago that we really started using the preservative of writing. The peculiar proposition that *everyone* should learn to read and write is so recent its age can be measured in centuries.

Being humans, and therefore inveterate messers around, inventors, and lovers of complication, we now have a preservative for the preservative. Typography is cooked, dehydrated writing, which is cooked, dehydrated speech. Language twice preserved, it seems, can go prodigious distances. But language is like other kinds of nourishment: if the quality isn't there to begin with, no one can put it in later. There is nothing to typeset and print unless there was first something to write, and nothing to write unless there was something to say.

Gerrit Noordzij is an expert on typography, but unlike most typographers, he is also an expert on writing. Writing, that is, in the literal sense. He is, in my opinion, one of three or four people in the history of Europe who have truly had something to say about the shaping and forming of letters. (In Asia the subject has had more attention.)

Noordzij was born in the Dutch port of Rotterdam in 1931. After the war, he trained as a bookbinder. Later he spent three decades – from 1960 to 1990 – teaching writing, lettering and type design at the Koninklijke Academie van Beeldende Kunsten (Royal Academy of Fine Arts) in The Hague. His propensity for asking unfamiliar and at times uncomfortable questions, coupled with his irreverence and enthusiasm, made him a powerful teacher. His former students include a good many of the better young type designers now at work in the Netherlands and elsewhere in the world – and with very few exceptions, they revere him.

The ideas that Noordzij pursued in his studio and classroom made their way into several publications. One was a slim book written in English under the title *The Stroke of the Pen: Fundamental Aspects of Western Writing* (1982). Another, somewhat thicker and written in Dutch, was *De streek: Theorie van het schrift* (1985). A third took the form of a bulletin known as *Letterletter*. This again was written mostly in English. Altogether there were fifteen numbered issues published over twelve years, from 1984 to 1996. For a time the little journal was vaguely

semiannual. Twelve issues were published in a space of six years, but when Noordzij retired from teaching, the schedule changed. In the next six years, only three more *Letterletters* appeared.

Nicolette Gray, Max Caflisch, Fernand Baudin and others contributed in a small way to the journal, but most issues were wholly written by Noordzij. The illustrations were drawn by him, and the first four issues were reproduced directly from his own handwritten copy. Later issues were set in types that he had designed.

It had no real publication schedule, was not sold in any store, and despite claims to the contrary, it was never available by ordinary subscription. Issues were sent to members of the Association Typographique Internationale and from time to time were given to students and friends. To the best of my knowledge, no library in North America (and not more than two or three in Europe) holds a set of the originals. But to its small initial audience, the importance of *Letterletter* was clear. Issue number one was a single sheet, folded to give four text pages. Page 1 and some of page 4 were devoted to logistical and administrative details and the definition of terms. In the

middle two pages there was more information on the structure and nature of letterforms than most professional typographers then working had ever seen in their lives. Republication in book form was in order, so that Noordzij's typographic intelligence could reach a larger audience and another generation of designers.

The individual issues carried many different subtitles. One of my favorites was written by hand at the head of issue 6. It said "The journal of typographic metaphysics." But *Letterletter* was also the journal of typographic anatomy, typographic optics, and typographic geometry. Like many a Renaissance conversation, it was concerned in equal parts with the science of art and the art of science, and always with the simplest, most durable of questions: What exists, and why? Writing a bulletin rather

than a book gave the author freedom to try out ideas and provoke conversations and arguments, which he did with great delight in his singular Dutch English. Converting the journal into a book has necessarily involved some editing, but I think the original flavor has been happily maintained. In issue 7, Noordzij confessed his aim: he wanted what he wrote to be "almost as unbelievable as the truth." And in issue 8, he admitted what good readers already knew: "*Letterletter* is not to be believed; it is only to be taken seriously."

Of course I sometimes disagree with him strongly myself. I trust that you will too. But I regard it as a privilege (and find it an excellent spiritual exercise) to argue with a teacher who pounces on his subject with such passion, such intelligence, such glee.

—Robert Bringhurst

THE RULES OF THE GAME

DO YOU BELIEVE *Letterletter*? I do not and I hope you don't either. There is sufficient nonsense in *Letterletter* which could help you to be a critical reader. However, I do not write my nonsense intentionally, I just write down my inventions. They seem extremely clever to me when new and it is only afterwards that I have to admit their untenability. *Letterletter* is not to be believed, it is only to be taken seriously.

The serious issue is the description of writing. Typography, inscriptions and handwriting are obviously different. Their difference is almost as obvious as that between sound, light, magnetism and electricity, which for practical reasons are still described in different chapters of classical physics. It would, however, neither be practical nor reasonable to allow such descriptions to diverge from the nomenclature of physics, that describes these phenomena in terms of a general theory of energy.

The idea of a general description of writing, of *gram-*

mography as I want to call it, does not require extraordinary genius in a time when the traditional barriers of steel punches, brass matrices and leaden types which separated type production from handwriting and lettering have been superseded by a new technology. Any shape can immediately be used as type once its outlines have been expressed in coordinates.

Despite its attraction the condition of general validity cannot be accepted easily because it would sweep away the well-established authority of a vast literature of classical texts. What I have to offer in turn is nothing but a rather inconsistent collection of tentative inventions which do not claim any other authority than that of common sense. *Letterletter* is intended as a lethal attack on anything that has been said or written about the subject of writing so far, because only such attacks could force the establishment to get moving again. If it does not move, it is dead.

It might be disappointing that a theory of writing seems to depend on an analysis of shapes which requires some experience in the technique of handwriting. We have been promised that handwriting and geometry would no longer be needed in these wonderful modern times of CRT-screens and computers. The screen, however, only responds to crisp geometric instructions which now moreover turn out to be closely related to manual skill. This is the message of *Letterletter* and no alternative has been offered so far.

Learned literature is distinguished by its dignity and authority. I try to avoid these characteristics because the combination of dignified authority and my intolerance might be as tricky as the combination of alcohol and other drugs. Such a combination could paralyze any opposition and change the theory to a myth. As scientific progress cannot be expected from agreement but only from conflicting opinions I do not claim your agreement or your respect; your critical opposition, however, is indispensable.

Letterletter

THE ART OF QUIBBLING

A 'STUDY OF WRITING' is the title of a famous book by Gelb* who does not offer in it a study of writing but a history of orthography. Graphology is likewise not a study of writing but a branch of pseudo-scientific soothsaying.

My study of writing has nothing to do with linguistics and my *Graphology* (in German: *Schriftwissenschaft*) expels chiromantic divination. Graphology is to be understood as the study of writing for its own sake. It includes typography which is to be understood as writing with prefabricated characters.

Graphology has a position in other fields of interest. Such studies may be satisfied by looking at a single aspect of writing, but this isolation should not excuse distorted views on writing.

* I. J. Gelb, *A Study of Writing. A discussion of the general principles governing the use and evolution of writing, second edition, 1962*

I give some examples of isolation in different disciplines. Paleography isolates ancient writing in books. Epigraphy isolates ancient writing on walls. Diplomacy isolates ancient writing in letters. Pedagogy isolates infant writing. Psychology isolates the perception of writing or motor functions in writing. Esthetics isolates the appreciation of writing. Printing history isolates typographic writing. Mathematics isolates the topology of writing. Cultural anthropology isolates conventions of writing.

There are no objections against isolation as such, but I insist on continuous reshaping of the isolated conceptions in confrontation with general graphology.

The following is mainly devoted to an attempt to generalize typographic phenomena: typography from a graphologic point of view.

A letter is two shapes of different brightness (e.g. black and white). The writer knows of the complicated

relationship between both shapes. It required the simplified view of an outsider to invent typography. And it still requires the experience of a writer to appreciate the brainwave of this inventor: He reduced the background shapes to rectangles whatever the shape of the strokes might be. (The idea was fostered by the style of *textura* which had already modeled all letters into rectangular shapes.)



Letter-rectangles of equal body-size could be composed to lines. They could be spaced but the rigid rectangles of metal or wood could not overlap. Since the introduction of photocomposition they can, as the rectangles have become imaginary now.

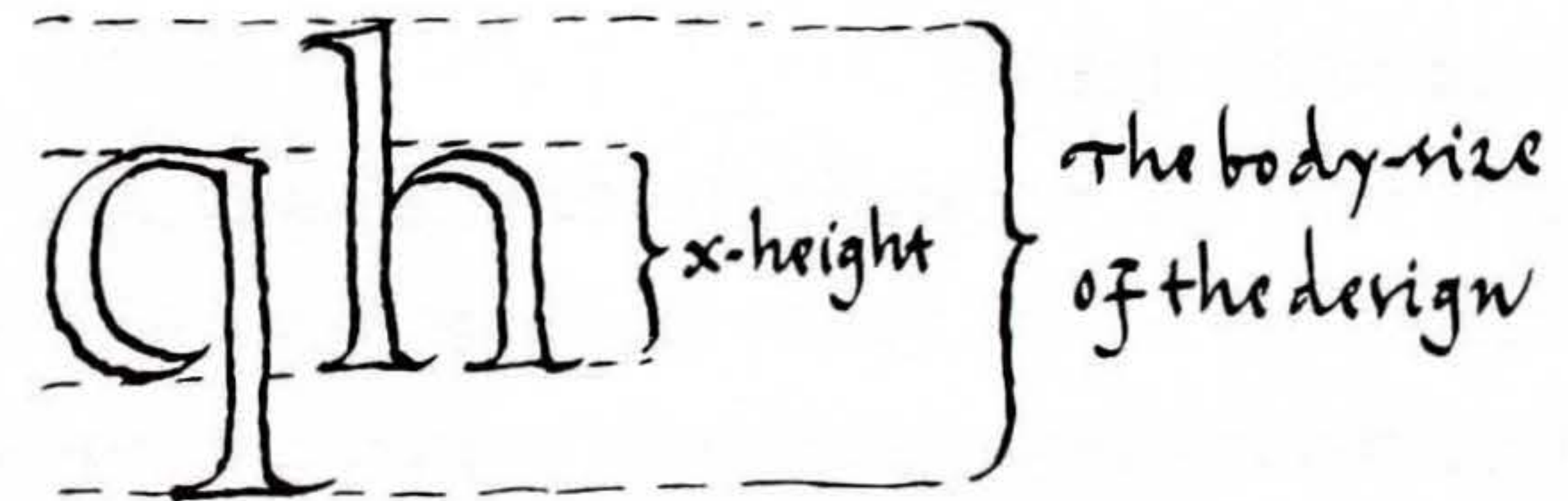
It is not wise to make the words more crowded than the original fitting of a typeface suggests but it has also been foolish to set letters wider apart. What has changed? Nothing.

Typefounders and compositors might point at the

solids that disappeared, but to the designer the rectangle has always been imaginary. It is now only more consequently so.

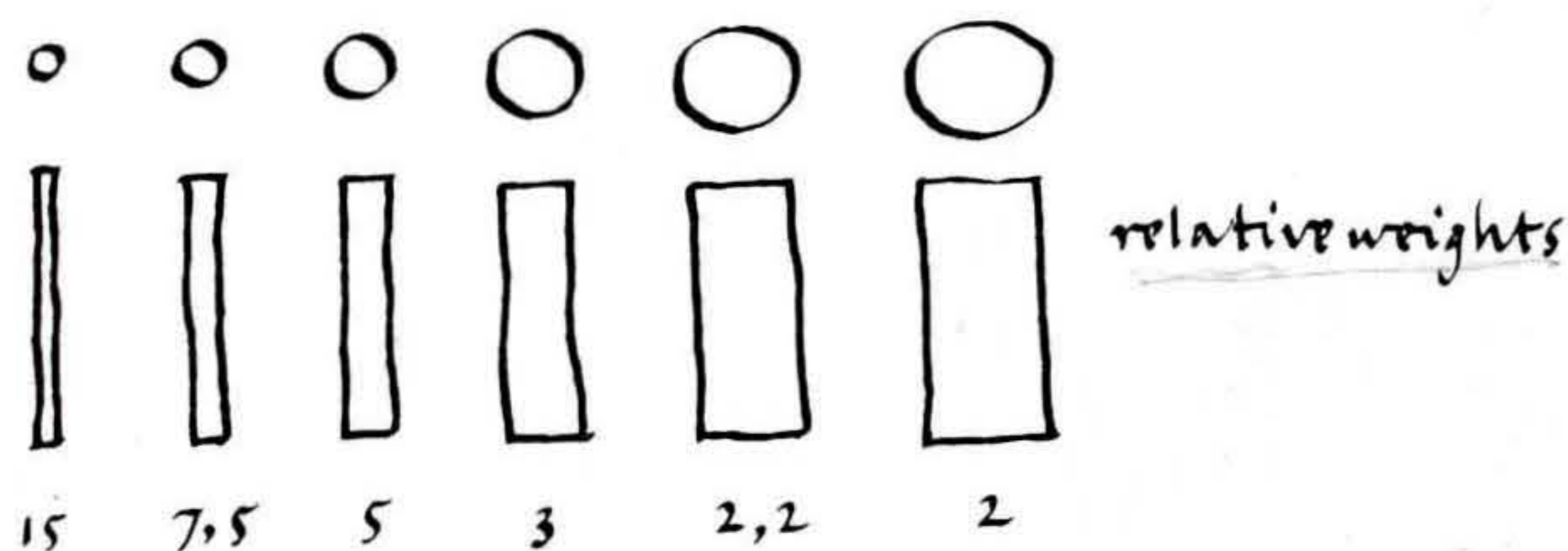


The first fundamental innovation since the invention of typography is David Kindersley's approach of the background shape by which it is liberated from its rectangular restrictions. To say it precisely: David Kindersley has invented the first system that simulates the calligrapher's perception.



Together with the rectangle, its body size has now become imaginary. The technology of casting implied a body size of the type that was bigger than the body size of

the design. This was a consequence of the necessary bevel. There was no typographic reason; the typographer required leading anyhow. There is no bevel anymore. The confusion of an imaginary bevel is the last thing we need. I propose to introduce the measuring of type design to typography: The body of type is the body of the drawing. The ratio of the x-height to the body is another characteristic of the design which would also be extremely useful for typographers. The standard information may be completed with the relative height of capitals, small caps and numerals.

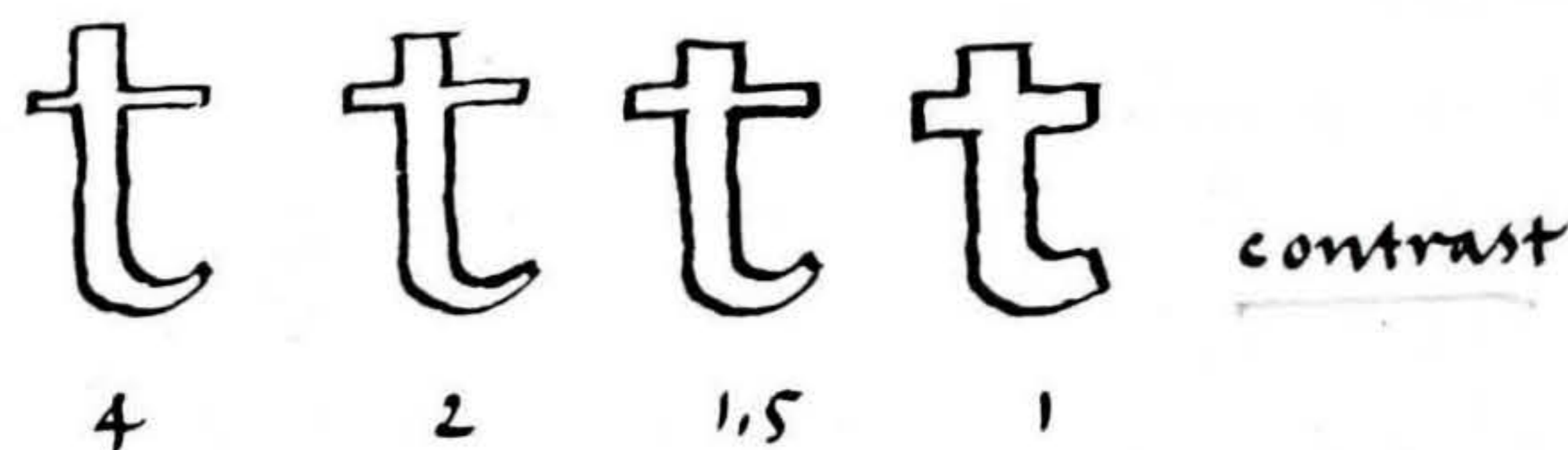


Despite confusion the practice of referring to body sizes with numbers is essentially sound. (The quarrel about the ISO directives [prescribing the millimeter as the unit of body size] is not. They are beyond the mark as

'sizes' are a question of proportions and not of any measuring unit. A nice subject for the future?)

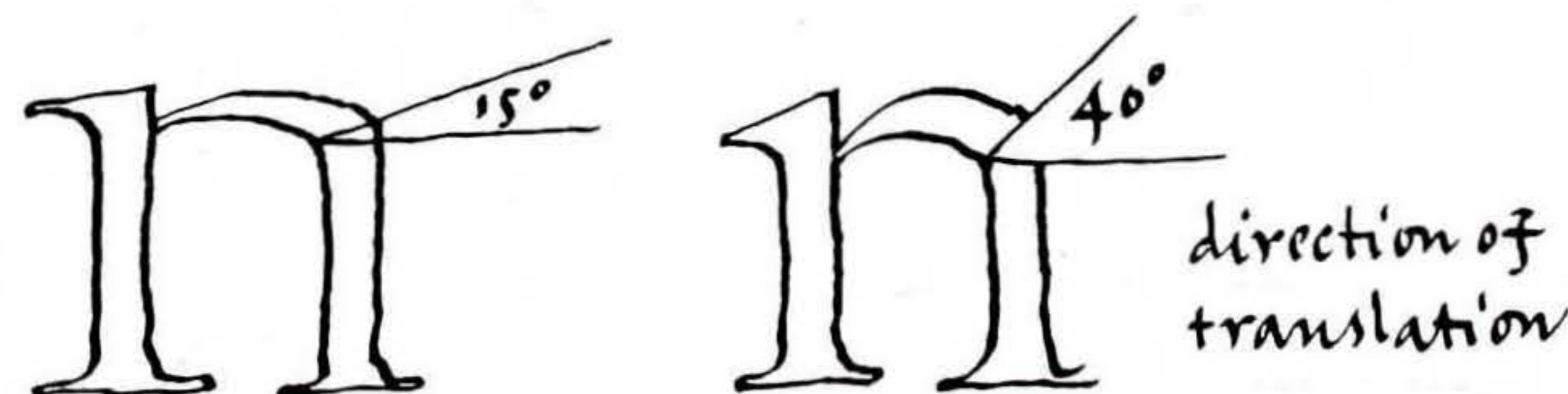
Against this, light, normal, semi bold, extra bold and ultra bold are arbitrary indications without meaning. I cannot know what I will get by specifying 'bold.'

I propose to refer to weight by the relative weight: The ratio of stem width to x-height.



The ratio of the horizontal stroke to stem-width (contrast) could help us to explode so-called classifications of type. It would also affect our conception of type families.

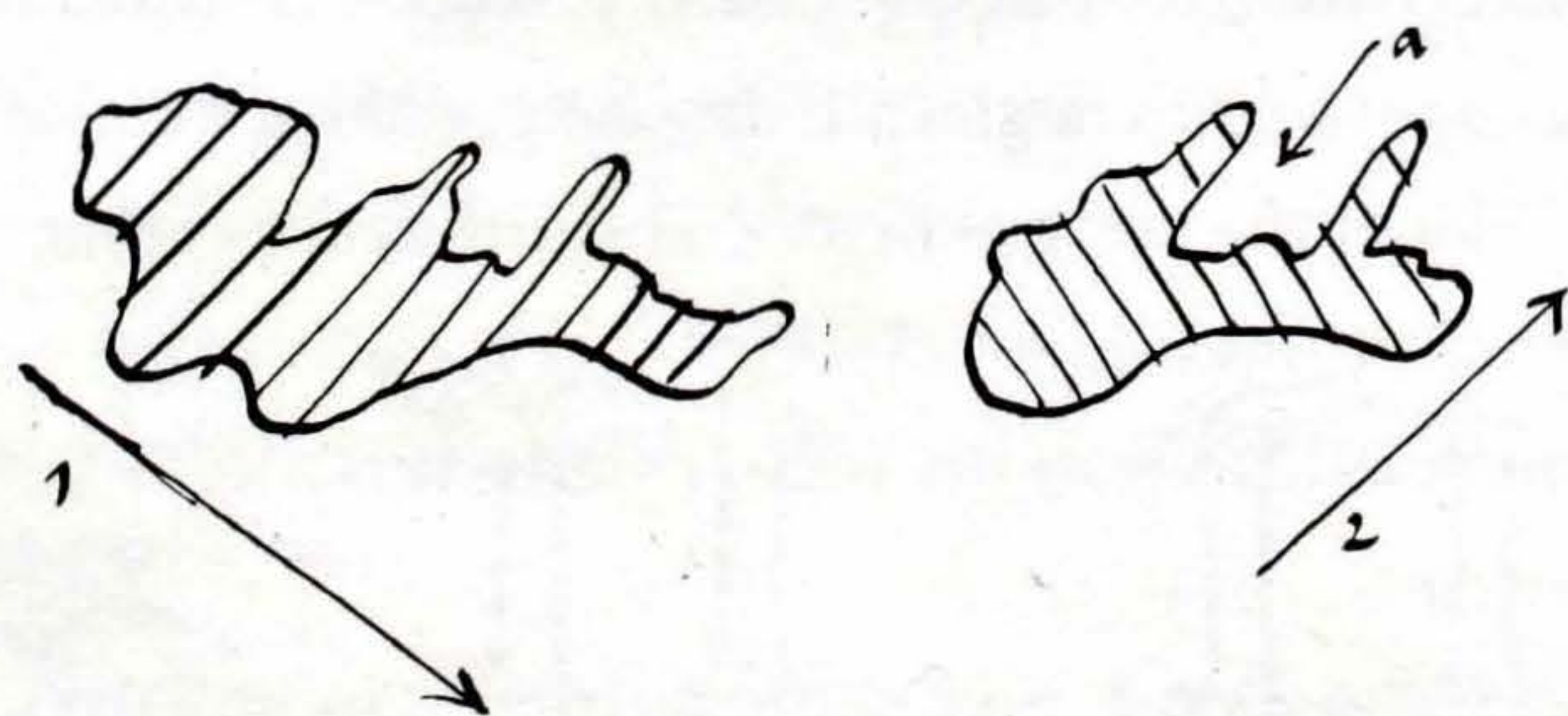
The classic stroke is essentially a vector. Its direction can be expressed in degrees. Contrast could be integrated



in this description by a second vector which expresses in calligraphic terms the thickness of the nib. These additions make the system of description nearly complete. It is equally suited for typography and for paleography. There is no essential difference between typography and handwriting.



Civilization is a game; it has to be played in freedom according to strict rules. Writing is more than just an example of civilization. Western civilization is probably the convention of western writing; what else could it be? Anyhow, writing is a game with paradoxical conditions. I do not know how far I can go in persuading students to freedom without transforming freedom into imitation or even compulsion. But I know that the freedom of the

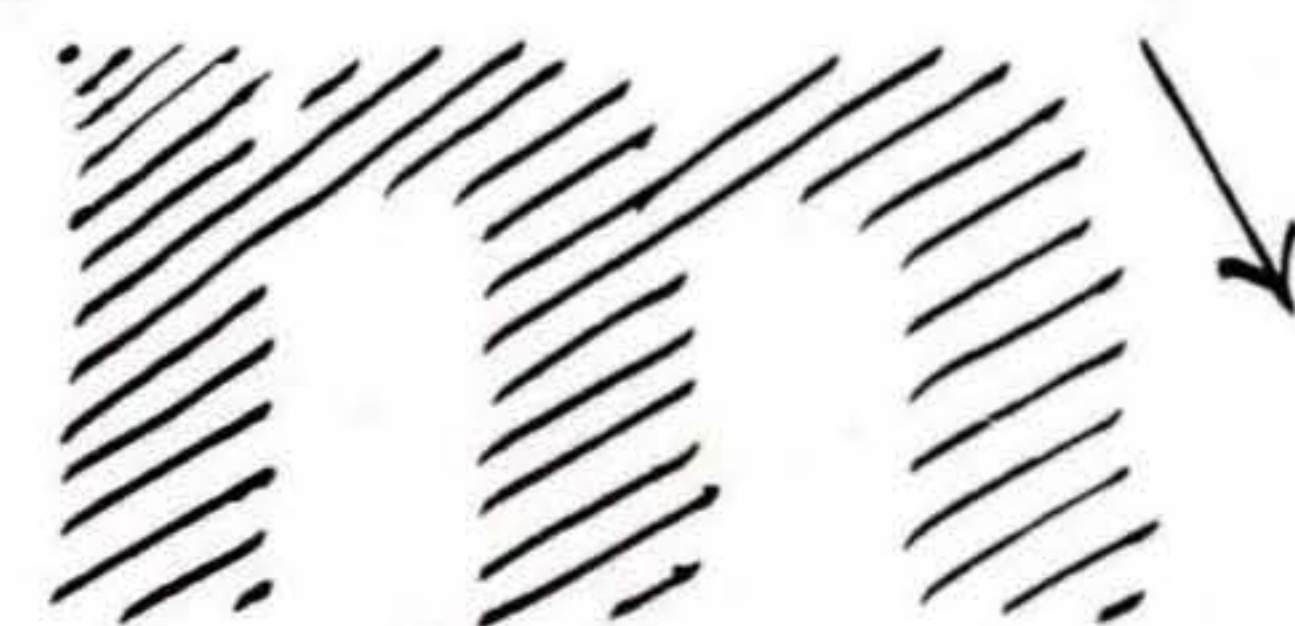


game requires a clear demarcation of the field. This was the main objective of my book *The Stroke of the Pen*. It should help my students to neutralize my tricks. Now we are often asked to tell our tricks to the computer. This requires a new class of demarcations.

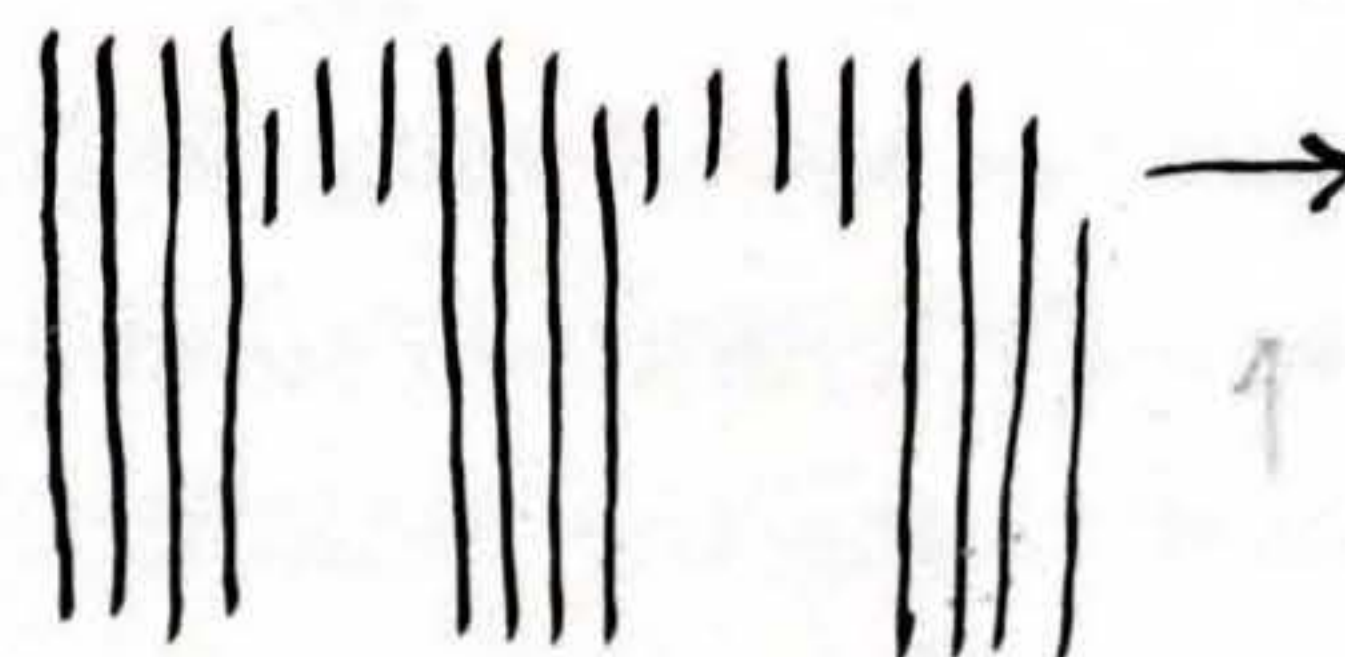
It begins with a new conception of the stroke.

A stroke is a shape that is produced by a continuous front of points. Of these similar shapes the first is a stroke. The second shape is not a stroke because the front is split by the counter. It is the direction of the front which defines a shape as a stroke.

A shape is a stroke by convention. Convention lays



a m is three strokes.

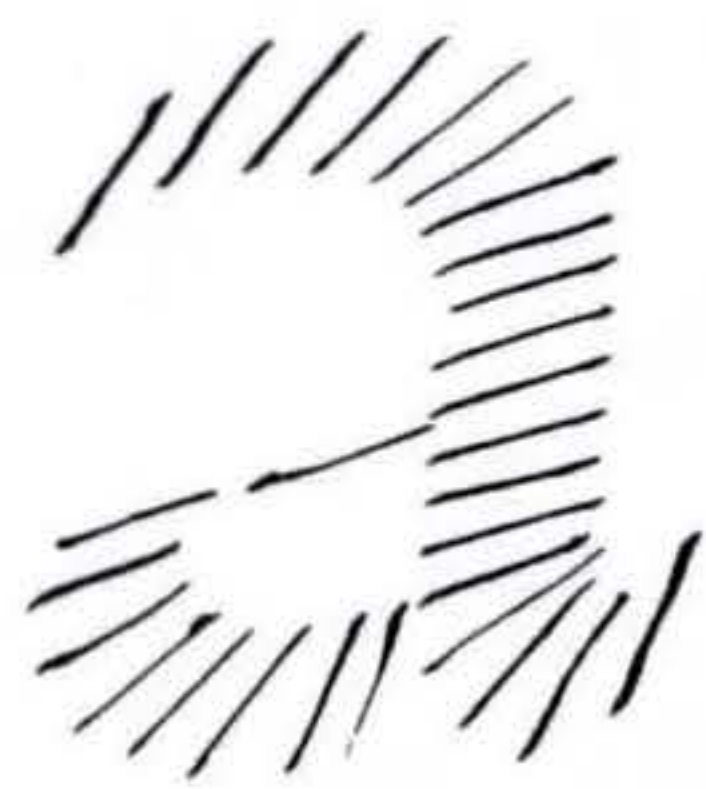


a different direction of the front could make m in one stroke but this direction is not relevant.

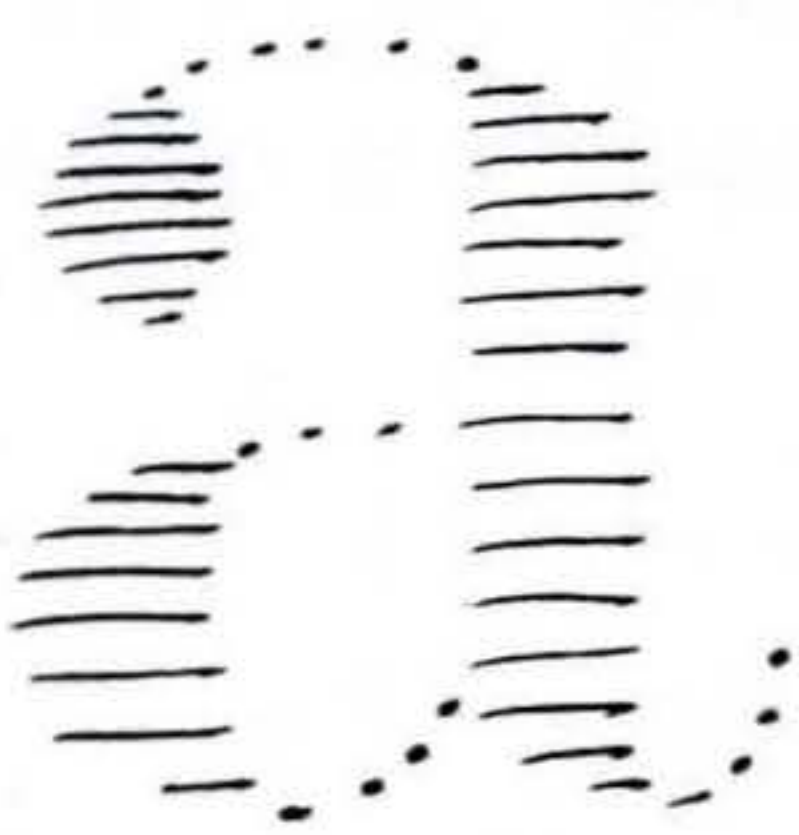
down the relevant direction of the front. I am initiated in the convention of a civilization by learning its technique of handwriting. The Chinese lexicographic system is a perfect example of this condition. The dictionary is arranged according to the number of strokes and this is not the number of 'elements.'

The front cuts the outline of the stroke in any position in two points. The front may be straight or curved (e.g. the stroke of a brush or a finger) but I consider the position of the front as a line through this counterpoint, the frontline.

Sequent frontlines are parallel (in translation) or not (in rotation) and their lengths are equal or not. This is sufficient to write history:



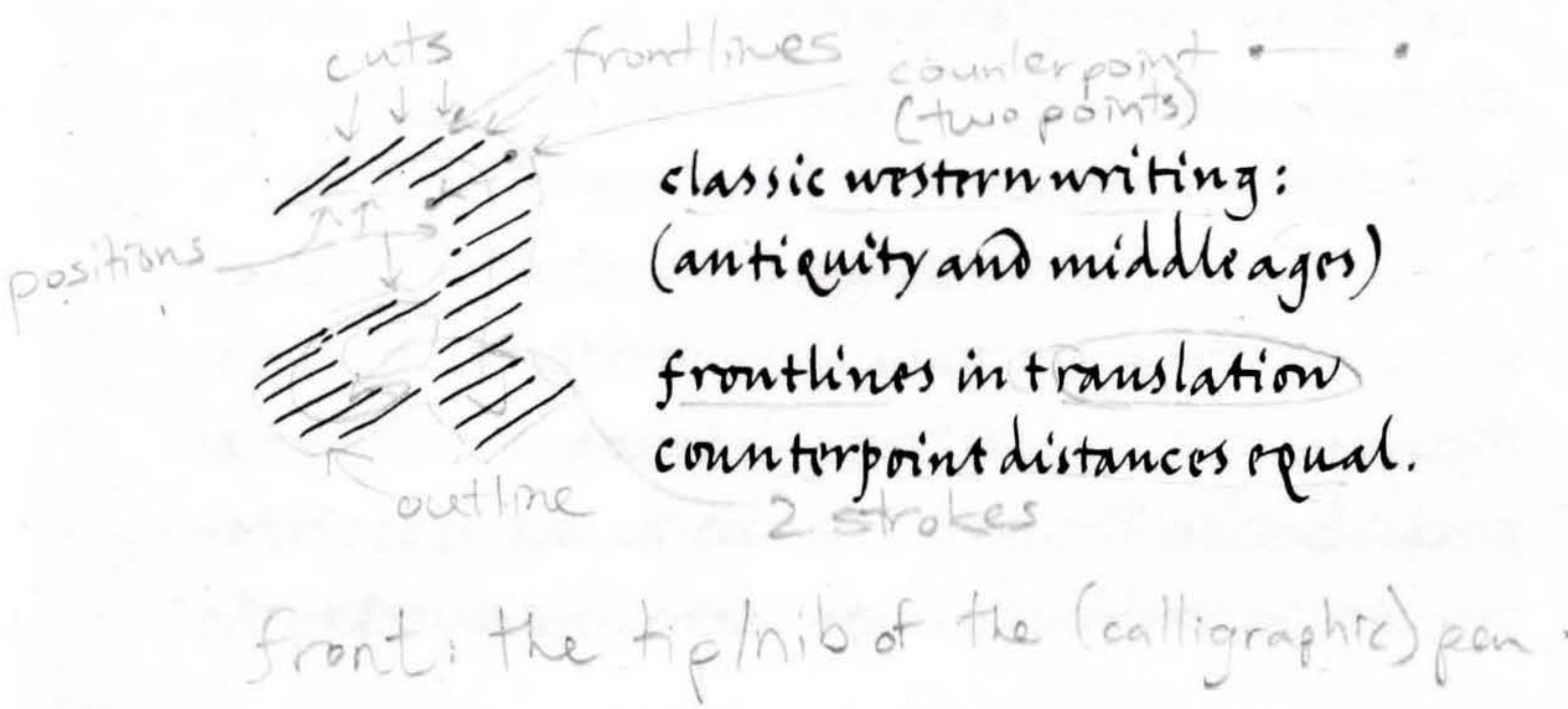
mannerist western writing:
frontlines also in rotation
counterpoint distances equal.



classicist western writing:
frontlines in translation
counterpoint distances different

Classicism is the great break in the western civilization. Its propaganda may have claimed a return to the roots of civilization, but it did so by cutting off the 3000 years old trunk. Its interest in eastern civilization is understandable. The classicistic stroke approaches the eastern stroke of the vertical brush. The difference is that the eastern frontlines show rotations.

This is a history of the main trends. It is a simplification because it neglects such facts as the expanding strokes in medieval diplomatic writing. The story could

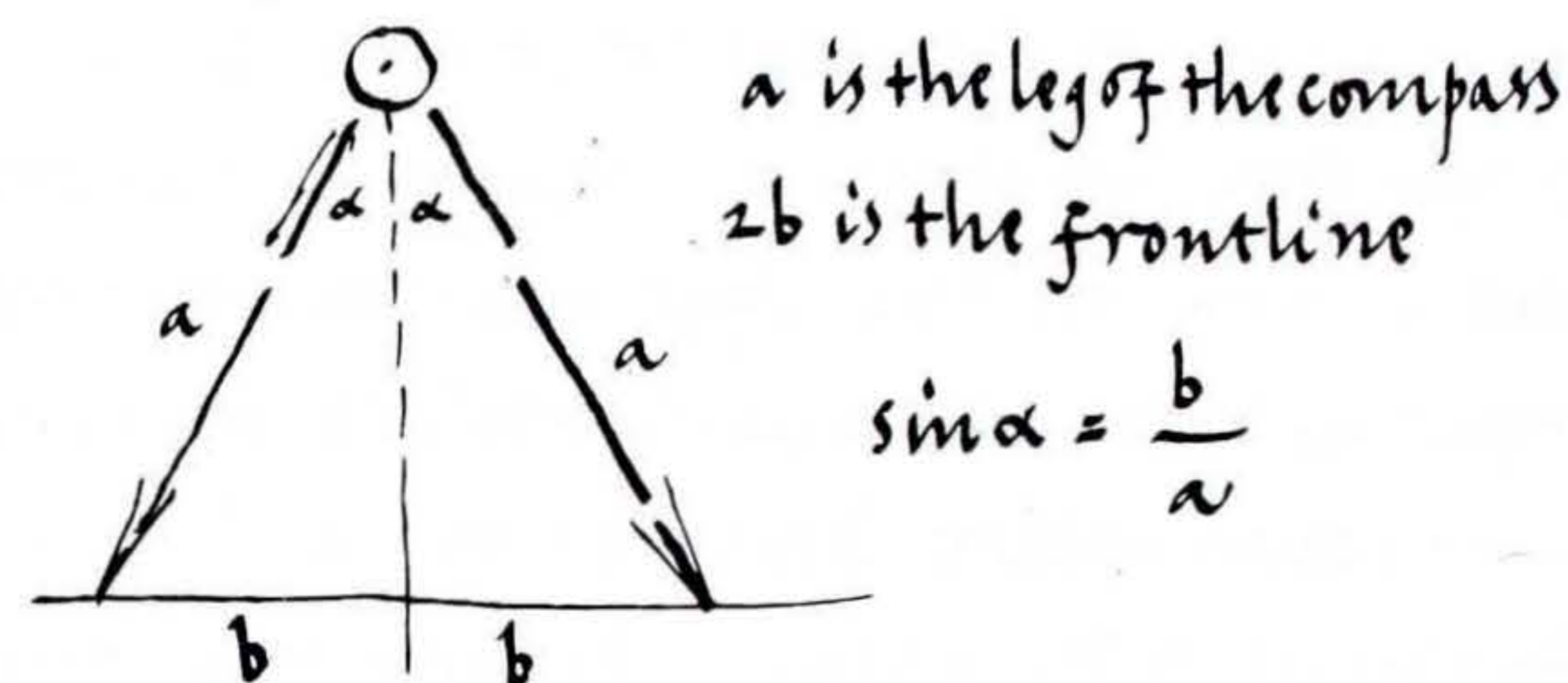


be told differently: a medieval subculture became dominant in classicism; but this would be a much more serious simplification.

This simple scheme is a reliable framework for investigations; it is not a substitute for them. The literature on mannerist calligraphy demonstrates what can happen when authors cannot write and do not understand mannerism:



The complicated rotation is clearly described by Jan van den Velde in his *Fondementboeck*, the third part of *De spiegel der Schryfkonste*, 1605. If we are not aware of the mannerist approach and if we do not know its technique and its literature we could think that the stroke has been made with a flexible pointed pen (the tool of neoclassicism). This thought is characteristic for the level of our professional literature.



I could imagine different ways to comprehend the different combinations of frontlines. Suppose, for instance, that the outlines of a stroke are drawn with the points of a compass. The center of the compass is projected on the stroke as its heartline. In any position the points of the compass are in counterpoint.

In classic writing, $2b$ is the width of the nib. In neoclassicist writing, 2α is the expansion of the nib. The contrast of the writing can be attributed to a .

Together with the rotations of the frontline between critical counterpoints and an equation for changes of α , these data could be used to guide a computer along any given heartline. This program could be used as a very expensive and time consuming imitation of a stencil for the

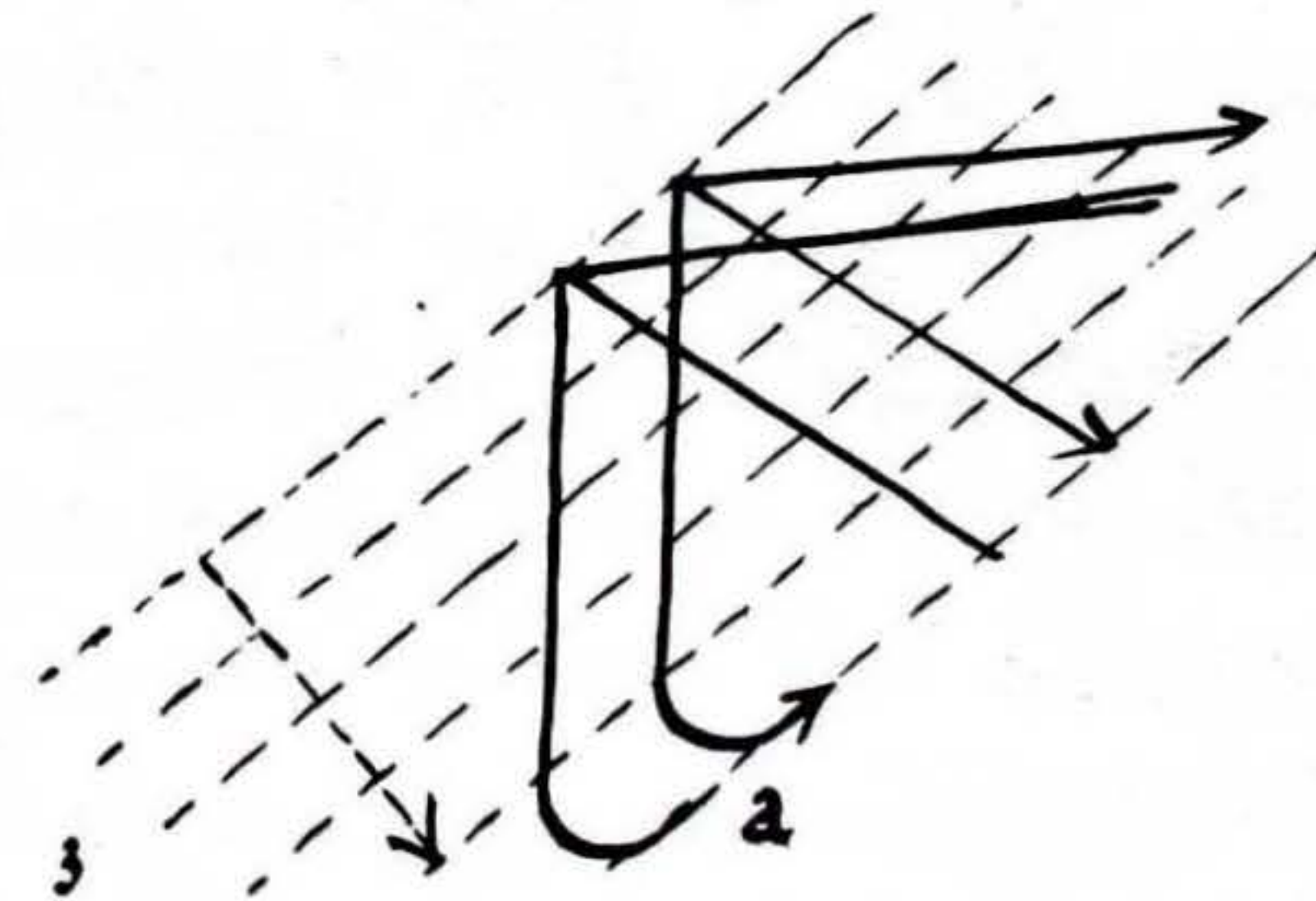
repetition of serifs, stems and curves in type design. It could also assist in preparing simple variations of a standard typeface. Whether this is worthwhile depends on the amount of work of this kind. To me the greatest profit of this analysis seems to be that it contributes to an understanding of writing. It is an attempt to describe any stroke that can be made by any tool in the human hand. It pretends validity for contemporary type design as well as for the most difficult paleographic problems, but also for any writing in the remotest future. This is a gratuitous claim. I could offer compensation for it: Western classifications of typefaces collect Greek, Chinese, Russian, Hebrew, Arabic etc. in a group which is called exotic. Instead of excommunicating my colleagues of other civilizations I invite them to criticize my suggestions from their point of view and their cultural tradition. This is a hard test, but a theory of writing which does not stand up to it has to be rejected as a mistake.

In my book *The Stroke of the Pen* I have tried to distinguish 'interrupted writing' and 'cursive writing' by the difference between upstroke and downstroke: Inter-

rupted writing shows downstrokes only (1), in cursive writing downstrokes are linked by upstrokes (2).

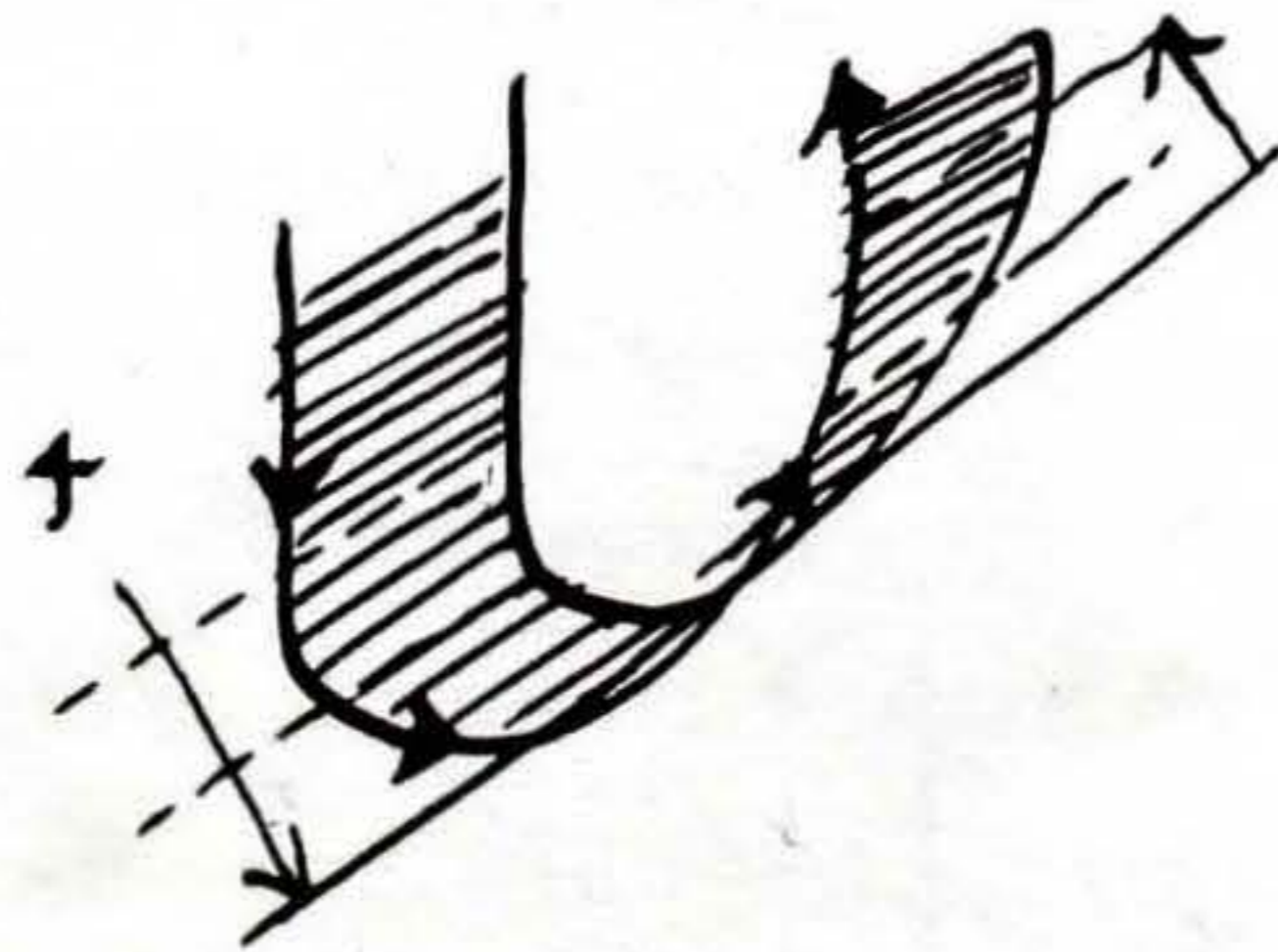


The weak point in this distinction is that the meaning of the words can be exchanged. To make sense it supposes a special position of the hand (though most people would be kind enough to consider it as a normal position). It is very difficult to explain to a computer what the human hand is. The idea of the front could make the description of the stroke independent of such a preoccupation.

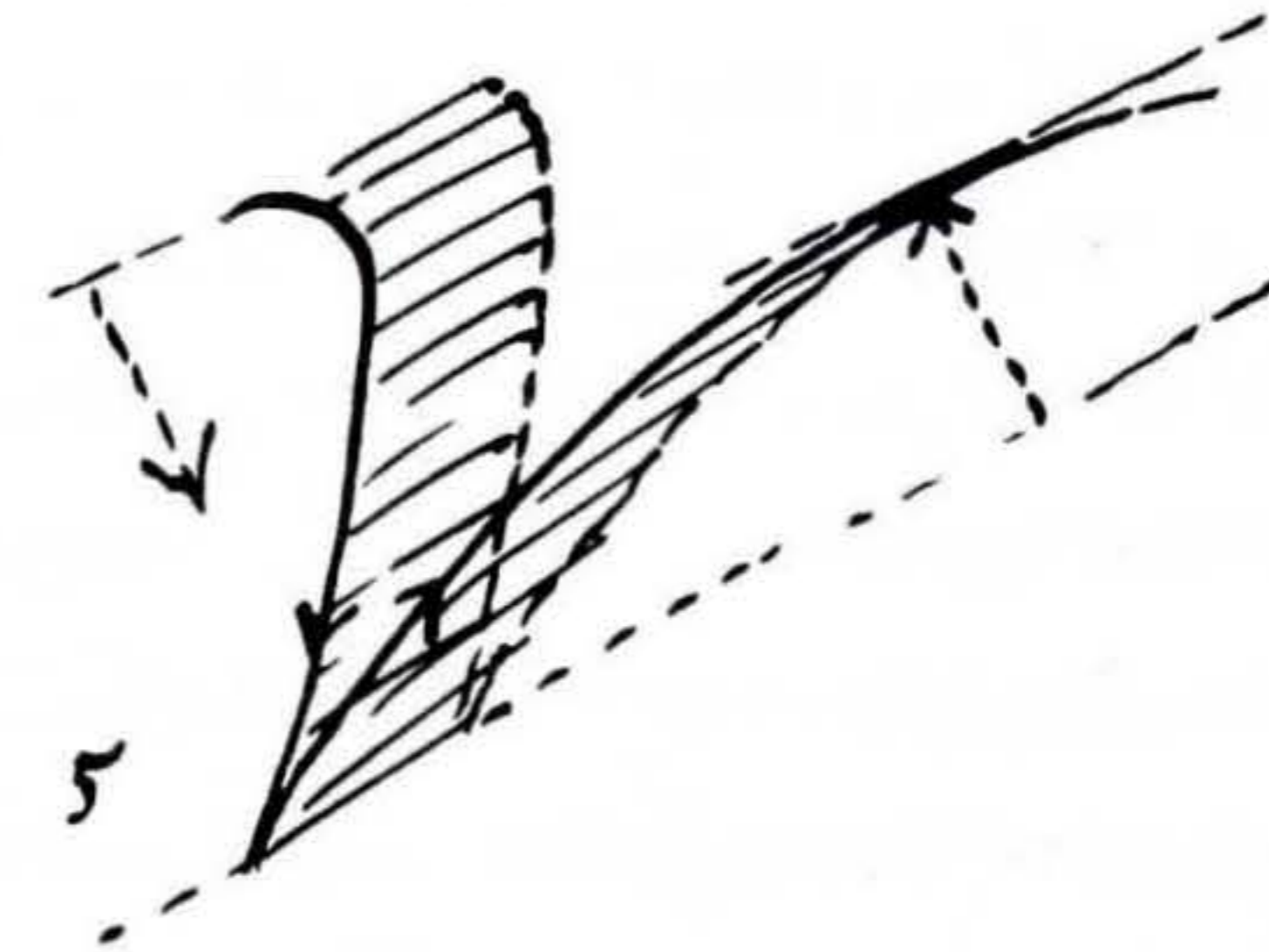


The dotted lines (3) represent subsequent positions of a frontline moving in the direction of the dotted arrow. The three strokes are in different directions with the same counterpoint, but the direction of the frontline is the same for all of them. At a, one stroke is drawn in the direction of the frontline. The stroke may be continued in this direction, but the front has stopped.

The turning of the stroke may continue (4). The front starts moving again, but in the opposite direction. This stroke in which the front is returning is what I used to call upstroke, and in the discussion of handwriting I might stick to that expression, but in analyzing strokes I do not need it anymore.



It is sufficient to say that in this stroke the front is returning. The stroke may turn smoothly through the ultimate position of the frontline (4) or abruptly (5).



Discussions with paleographers (Martin Steinmann, Basel, and Peter Gumbert, Leiden) make me hesitant in using conventional terminology (e.g. 'cursive') because it seems to disturb understanding. These partners have suggested that I use new terms for new conceptions of old phenomena. At this moment I could accept this suggestion, but I realize that from now on the word 'cursive' has lost any meaning. I feel sorry for such a nice word to get lost in the misty atmosphere of confusing talk and ignorance. Should I also leave the nice word 'graphology' to the gossips?

WRITING AS SHAPE

WRITING IS A SYSTEM of shapes. The shapes are closely related to each other, and they are clearly distinguished from shapes which do not belong to the system. The shapes are as different as possible; they should not be mistaken for each other. This balance depends on perception. Perception might be taken for granted to a degree in education, but if it is neglected or even disturbed, education will result in illiteracy. It is even an effect of illiteracy to consider it as a semantic problem (the meaning of the shapes). Illiteracy is first of all a problem of perception. This is why Fernand Baudin wants 'to make everybody aware of the fact that any piece of writing is a good or a bad picture.'

J.P. Gumbert writes:

PALAEOGRAPHERS are a strange tribe. The subject of their life's work is script—no: for most of them it is the texts found in manuscripts, for others the manuscripts themselves, and for a minority the

script; but all of them must know, and believe they know, much about script; yet most of them know very little about writing. They would seem to stand particularly in need of Education in this matter. Yet missionary work in this field is no easier than among other outlandish tribes. The cultural distance is great; when a palaeographer and a 'writer' [I mean 'a maker of letters'—should I call him a 'letterer?'] look at the same page, they see incredibly different things. The missionary should walk carefully, admit that the values of the other culture are not to be despised, and avoid colliding with taboos. One of these is Terminology. The terminology of palaeography is a joke: most terms have several meanings, none of them precise. Yet, if a 'writer' uses an existent palaeographical term for his own purposes (however noble), the consequences are bad: 1. the palaeographer will get irritated and not listen; and/or 2. he will think

that he knows what the writer means, which is not the case; 3. the writer will think that he knows what the palaeographer means, and that is not the case either. The word 'cursive' already has too many meanings: it means script that is 'fast,' or 'careless,' or 'sloping,' or 'with loops,' or 'with linked letters'; it can't cope with its work load as it is; really, if new things are to be explained in a clear way, it is best not to chuck them into the same basket with the fuzzy old lot. But, if not contaminated from the outset with names worn beyond usability, this matter of Fronts etc. is an excellent beginning of something which may teach palaeographers to look at medieval pages in a new and useful way.

I nearly wrote just now 'in a sensible way,' but that would have been unfair; our old way was sensible

enough, witness the fact that it enables us to 'date' and 'localize' (more or less). We certainly must keep that way, which really is: to see the page as a part of history. We must learn to see it at the same time as a set of shapes and as the trace of a pen. Both views will benefit.

(By the way: we are not completely heathen; one needs only to quote Jean Mallon, Paléographie romaine, 1952, or his collected writings, De l'écriture, 1982; and he is not the only one; but there should be more.)

This correspondence reveals that we are not alone with our problems of perception and terminology. But we cannot substitute arguments by the phrase: Palaeographers say...

COMMUNICATION

AT THE HAMBURG seminar three schools demonstrated their teaching of writing. The children of a common German school had to copy movements from a model which showed shapes. We wanted to know how the resulting shapes are evaluated, but the principal of the school did not allow such theoretical questions: 'we are practical teachers, we just teach movements.'

The children of an anthroposophical school studied the letter p. They made stereotype drawings of a toad-stool because p is the letter of toad-stool and because it is a picture of a toad-stool. I did not understand this.

The children of the Japanese school wrote big black characters in gyosho. The teacher underlined his comments with red brushstrokes pointing at the tension of the strokes, at their proportions and at the balance of the characters. The teacher might have intended to make an impressive show with his young writers, but he seemed to be quite happy with our interpretation of his corrections.

The difficulty of explaining the difference between kai-sho and gyosho could be solved with the description of the strokes as moving fronts. In kai-sho the front is moving in one direction, in gyosho the front is returning. The conclusion appeared on the blackboard: western shapes with Japanese names:


kai-sho


gyosho

I would like to know whether the Japanese readers of *Letterletter* can accept this cultural link. Much more than western writers they might be familiar with the idea that the stroke is the basic element in writing instead of letters or characters.

The theory of the front of the stroke has been invented to use the computer as a shapemaking tool in the hand of

the designer. So far it could only be used as a machine for the reproduction of design by tracing the outlines of shapes. The theory does not require affirmation by computer specialists; we can simply demonstrate how it works. The proof of the theory is its cultural validity. The reactions of the Japanese school and of the professor of

palaeography are promising indications. In all our attempts we should be aware of the terminological barrier. There will be no progress as long as we think that typography is not a way of writing. Our efforts in design, technology, science, learning, industry and education depend on the answer to the simple question: what is writing?

THE INCREASE OF ILLITERACY

FERNAND BAUDIN illustrated the presentation of his project with alarming reports on increasing illiteracy. This attention to the problem of illiteracy creates a favorable climate for Fernand's campaign, but the meaning of the alarming news is not clear. The publications suggest that illiteracy is increasing in the world: The army of the USA is introducing pictographic instructions because many soldiers cannot read. Another example, a little more precise, is the conclusion that 7% of Dutch children are illiterate because they cannot look up a name in the telephone directory. But what is the world? We know nothing about illiteracy in Japan, China, India and in Arabic countries. And what is increasing? There is more publicity about illiteracy, but is there more illiteracy as well? And what is illiteracy? Who are the illiterates in the US army, are they the soldiers who cannot read the instructions or are they the soldiers who formulate them?

The Dutch telephone directory is controversial in sev-

eral respects: Editing; the alphabetical order switching from names to streets. Orthography; the sequences ei, ij, eij, ey are not arranged alphabetically. One should know that they have to be looked up under y, but there are exceptions. The typography of the directory is 'functional,' which might be another barrier for children. The 7% of the children who cannot find their way in this surprising publication could easily be mobilized against the policy of its publisher. Similar complications will have influenced the results of other investigations. Therefore: what is illiteracy?

I can produce different percentages of illiteracy depending on my definition of the problem. In the industrial countries of the world probably 10% cannot decipher words. This kind of illiteracy is deficient spelling. I estimate 30% of illiterates if the recognition of words is considered. This is deficient reading. When considering the ability of making words I could obtain 100%

of illiterates: deficient writing. These are symptoms; any of these deficiencies might be reduced to a degree to deficient perception.

The alarming publications refer to mixtures of spelling and reading deficiencies. Deficiency of writing is never considered because it includes the investigators themselves. It is this 100% of illiteracy which worries me: it encompasses our scholars, artists, scientists and other intellectuals who understand the trick of rationalizing their absurdities. They make the world believe that bad design belongs to or even contributes to the progress of civilization. They make us believe that bad handwriting is a mark of good education. They point at pedagogy which confirms all this nonsense. But pedagogy is nothing else than the systematic production of such sophisms. In the first week of 1986 I listened to a radio emission on teaching reading and writing. A professor of pedagogy at the university of Utrecht broadcast the message that a script should not be legible but writable. I appreciate the smart presentation of this humbug, but it is humbug. Pedagogy

is the art of presenting the shortcomings of education as its virtues, the most effective propaganda for illiteracy. This looks like a silly joke, but silly as it may be, the difference is that it is not a joke. The quoted maxim of the Dutch professor is representative for the greater part of pedagogic literature. As a whole pedagogy teaches education to be proud of its failures. I have a remedy for the failures but not for the pride. There is no remedy for a patient who feels perfectly well. Let us try to make him feel sick.

The improvement of the system of education is frustrated by the self-sufficiency of pedagogy. When the newspapers wrote about increasing illiteracy and speculated about its causes the pedagogic journals did not even mention this publicity. We should not believe that we could refer to it in our attempts to improve education. We should not believe that the system could be improved by small steps. The school cannot be improved but by the destruction of the system. The reason is the fatal character of education.

EDUCATION AS FATE

THE PLAYING CHILD explores space and time. Education is the part of others in this play. It is fashion to interrupt me here by pointing at the view of Soviet pedagogists who restrict education to the influence of authorities. This is, indeed, a good reason for me to reject Soviet pedagogy: In education the others are parents and teachers, but playmates and lovers as well. Education is everything that takes the child seriously in its play. The rest, pedagogic in its pretensions or not, is not education but terror.

Time and space can be distinguished but they cannot be separated without splitting the human personality. In some activities the exploration of time and space are neatly integrated, e.g. in walking, other plays accentuate one of both categories. Calculating, founded on a theory of numbers, is a play in the realm of time. Reading and writing, founded on a system of shapes (not necessarily

the alphabet and the alphabet is not necessarily the western system) is playing within the realm of space.

For the systematic introduction to reading, writing and calculating the school has been invented. The school is the systematic complement of education.

The priority of the school reflects the priority of society. We cannot demand from the school to reform society. The school systematizes cultural structures; it cannot systematize structures that do not exist. It is the fate of education to follow the trends of society from a distance.

The priority of modern society is time. Any other value is reduced to those aspects that can be calculated and expressed in chronological sequences. The rest has no value. (In this sense Marxism and capitalism confirm each other; both are alienating man from his place in space.) The school follows this trend by restricting the game to chronological components. This is taught and

this has to be learned. The spatial aspects of playing are expelled as playing. The first effect is boredom; the natural interest of children in their play is superseded by dull duty. The consequence is a disaster. The school cannot teach reading and writing according to their nature as the passive and active aspects of the same perceptual play with shapes. The spatial essence is substituted by timely sequences.

A word is a structure of white and black shapes that has to be perceived. This is easy for children because it appeals to their experiences in playing. The school will, however, maintain that this perceptual approach is too difficult for children because it is too difficult for the teachers to perceive. This is why the structure of reading and writing is disintegrated. A word is considered as a sequence of alphabetical positions. The sequence 2, 1, 7 is supposed to be understood as the word 'bag.' It is in fact the sequence b, a, g, which is not a word. Logically the sequence is identical with 7, 1, 2: g, a, b. This explains why many children cannot distinguish the word 'bag' from the word 'gab.' This logical inversion of sequences is considered a symptom of dyslexia. In obsolete neurology

dyslexia is ascribed to brain dysfunctions. This is convenient because it discharges the school from its responsibility. Dyslexia is an interesting plague afflicting more or less 30% of western children. There is a vast literature on the subject from physiological as well as from psychological points of view. The neurological basis of this literature is out of date. Dyslexia requires a new explanation. Here it is: Dyslexia is the result of western education.

Some teachers might object that they do not teach reading as memorizing sequences. They try to teach 'global' reading. If you meet such a teacher, ask him what he will do when his children read 'gab' for 'bag' and he will neatly return to the sequence.



Reading attributes meaning to words. The word is the foundation of reading and a word is not a sequence of black elements but a structure of black and white shapes. The structural word bag cannot be reversed into gab because the shape between ab does not occur in ba. Shading of the 'white' shapes is an effective method to ensure the perception of the word. It is a good protection against dyslexia and it is even a successful treatment of dyslectic damages. It relieves the child from the paralyzing sequences and uses its perceptual resources.

A traditional objection against my example says that children cannot learn different scripts simultaneously. This is not true. Children can even distinguish lunch from dinner. The distinction between scripts is much easier because the criteria can be formulated more clearly. This need not be discussed; just try and show children a gothic bastarda or an uncial. Their natural reaction is to try these shapes as well.

A pedagogic prejudice regarding typography is the remarkable custom to give the youngest children big books, composed in big body sizes of sans serif typefaces. Why? The physiology of children would require the con-

trary approach in the typography of initial readers and so does the principle of perception. Experiments result again and again in the solid fact that children need small books composed in a small body size of a typeface that is dominated by translation. (To put it less precisely, but in more familiar terms, the typeface should be classic, such as Times, and not classicist, such as Baskerville.) By meeting this demand typographers could reduce the category of so-called poor readers considerably if only pedagogy would accept sound typography.

My view on education is pessimistic. There is no practical method for any improvement. The school would say that this is not the way of teaching children. When I show the mature hands of the children in my village the school would say that they do not write childish enough. When I repair dyslexic damage, the school would say that my treatment is restricted to the effect of dyslexia (though there is nothing else to worry about). Any of us would be considered by the school as not qualified. My long experience in education on all levels makes no difference: I am a designer and designers cannot understand the metaphysics of pedagogy.

Some of my friends try to infiltrate the educational system gently. I believe that they are wasting their time if not even sacrificing their integrity. Others who are expecting improvement of teaching from the introduction of good handwriting models do not understand that the school cannot appreciate the quality of a model because a teacher never learned how to look. Otherwise the occurrence of good typefaces in schoolbooks should have had some influence. The problem of education cannot be solved as long as it is denied.

Social studies lack the clear rules of the game which are the advantage of natural science. There is no proce-

dure for reform. In this primitive jungle 'authorities' concentrate on suppressing new points of view. But outside the campus students of pedagogy have started to think again. And there are students of psychology who are discovering again the spatial character of perception. There are neurologists who understand the absolute localization of brain functions as obsolete. There are students of design who refuse to subordinate the trends of advertising and 'styling.' There are publishers of schoolbooks trying to escape from pedagogic commonplaces. These are the creative forces of a new society. For me there is no choice: I want to be on their side.

THE MENTAL CONCEPT

by Nicolette Gray

SURELY THE FIRST question which has to be decided when we consider problems of illiteracy, and of the teaching of handwriting, is the question of the meaning of the word 'letter.' Perception is an essential element in the problem, but we have to be clear *what* it is that we perceive.

Fernand [Baudin]'s project is entitled 'Printing & the hand of Man.' Gerrit [Noordzij] asks 'What is Writing?' Both these approaches assume that the concept 'letter' is contained within the activity of handwriting. I find this an arbitrary and misleading assumption. Ultimately the idea of each letter is a concept in the *mind* of man. It is by means of this *mental* concept that we are able to write and design letters and to recognize them when we read.

Editor's Note: Written in response to the essay Writing as Shape, page 11

But, as we all know, the actual form given to any one letter varies very considerably, not only according to the sort of pen used, but also according to the limitations and capacities of other ways of producing letters, whether by casting in metal or generating by computer, etc. The mental concept is not precise it is flexible, indeed protean, and yet each letter has *identity*. It has certain characteristics which are indispensable. To take lower case forms, 'g' must have a closed bowl and a descending tail, but the tail can be straight *g*, or curved *g*, and it can start at the top of the bowl (but only on the right) or from the bottom *g*. *f* must consist of a vertical ascender ending in a hook to the right and must have a central cross stroke, *f*, but the ascender can be prolonged as a *f* descender, and either or both can be looped *f* or flourished *f*. In order to define the identity of a letter we have to decide the essential characteristics. The technical devel-

opments of today make this an urgent priority. (What are the essential characteristics of the letter 'r' or 'r' or why not r?)

We have an example of the effect of muddled thinking in contemporary teaching of handwriting in British schools. Here it has been assumed that 20th century sans serif type design provides models of the proper and precise form of each letter. Children are taught both to read and to write these forms: so they make ascenders and descenders which scarcely exceed the x height of their script. Joining strokes are not part of the form learned, they may or may not be added later as extras. So very often letters are put together with no intervening spacing, cheek by jowl. The result is the transformation of a crisp and functional type design into illegible handwriting.

In order to read we need only to be able to recognize the identity of a letter from its essential characteristics. In order to write or design letters there must be added to this an understanding of the particular qualities and requirements of the medium used.

TERMINOLOGY

I went recently to a meeting of teachers organized by the Institute of Education of London University. There I was given an interesting article by an educational psychologist. Here the word 'serif' was used to mean 'joining stroke.' This single example of divergent usage of a key word demonstrates the need for cooperation.

THE DIMENSIONS OF THE MENTAL IMAGE AND ITS ORIGIN

NICOLETE GRAY is one of the most original and stimulating personalities I know. She has the rare greatness of allowing other people to develop their own attitude. Introduce her to a group of timid students and you will observe an almost immediate transformation in the party. Everybody will feel encouraged to bring forth his own view without fear. Those who know how students are will understand that this is an extraordinary achievement. Long after Nicolete has left the scene, her exciting spirit will last. Her letter about my 'misleading assumption' is a fine specimen of her frank and honest approach. There are few ideas about the nature of writing offering so many new possibilities as the idea of the mental concept. My only problem is that I cannot see any incompatibility of this idea and my theory of writing. I will demonstrate this in an attempt of integration.

A a a a a A a a

These shapes have been collected from my concept of the letter a. Of all shapes only two can be combined with a given shape n.

na na

Given the shape g only one possible a is left.

nag

In her examples of the mental concept of g Nicolete Gray considers cursive handwriting and Italian script only. Otherwise she would not exclude a start on the left top. The European cursives of the 'bastarda' family are excluded as well. Of this family the German running hand is still alive and its g is started on the left top.

NOVOJ

My steps in the selection of a suggest different levels in the mental concept of writing:

1. The concept of construction (the direction and the sequence of strokes).
2. The concept of script (the relationship of shapes in the alphabet).
3. The concept of letter (the collection of shapes representing one letter).

The concept of construction depends on knowledge of the techniques of handwriting. The concepts of script and letter depend on understanding of handwriting which however might be substituted by a more superficial knowledge (a catalogue of facts such as the classification of typefaces instead of a theory of writing).

The small concept (handwriting in some Italian cursive script) of Nicolette's examples could be sufficient in elementary teaching of handwriting. It is the minimal concept of everyman's skill. It is not sufficient for elementary teaching of reading. The mental concept of the young reader should include all current typefaces. Ty-

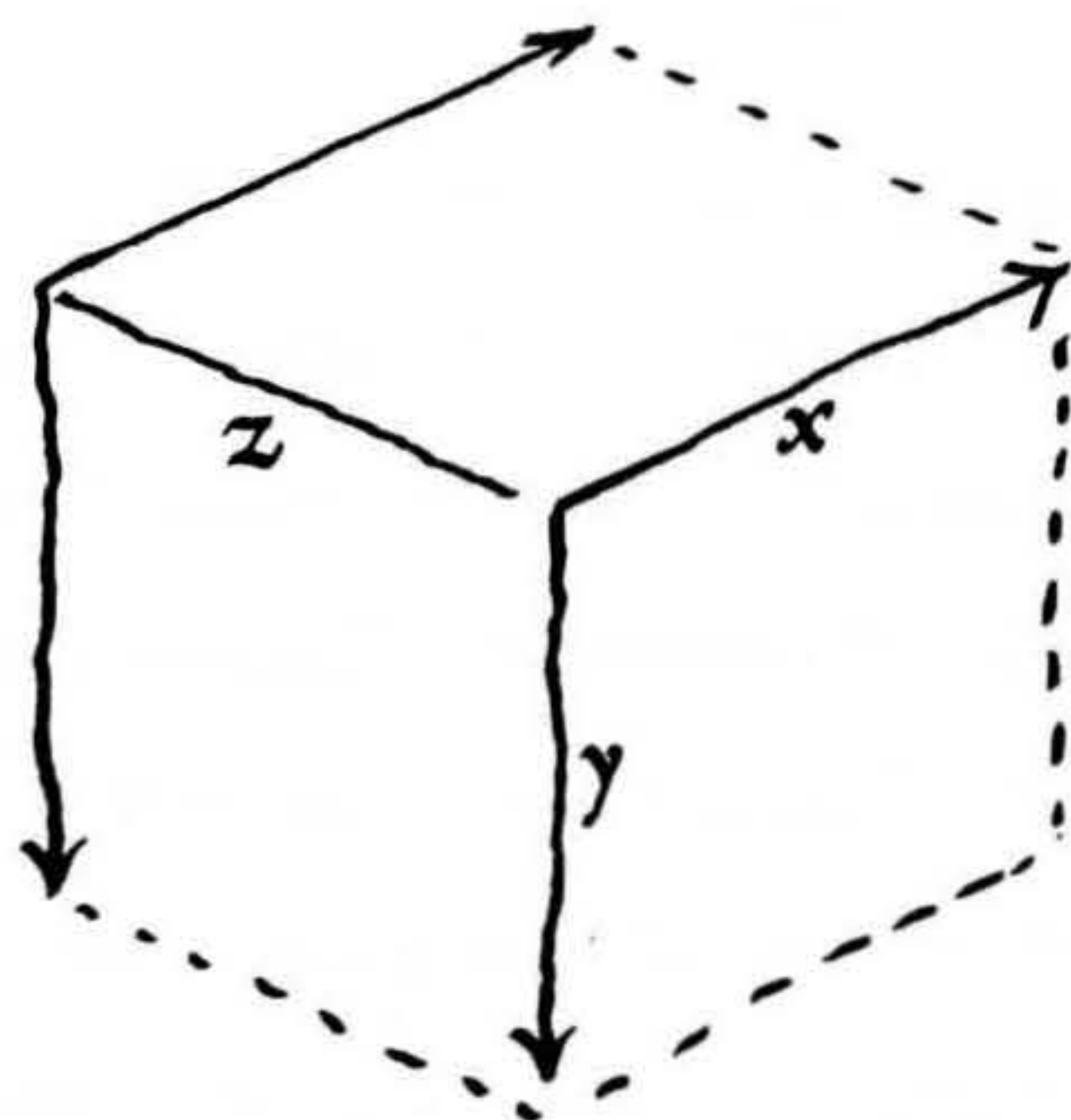
pographers, let alone type designers, need more understanding, but the difference between training specialists and teaching children is not essential.

Any teacher would say that children should learn to write a fast current hand, but I do not know a teacher who teaches his children in this sense. The school offers the children an extremely formal model and asks them to copy it as an informal hand. This is one more absurdity of our (the western) system of education. The mental concept lacks a fourth dimension.

4. The concept of articulation (the relationship of speed and articulation is more or less formal handwriting).

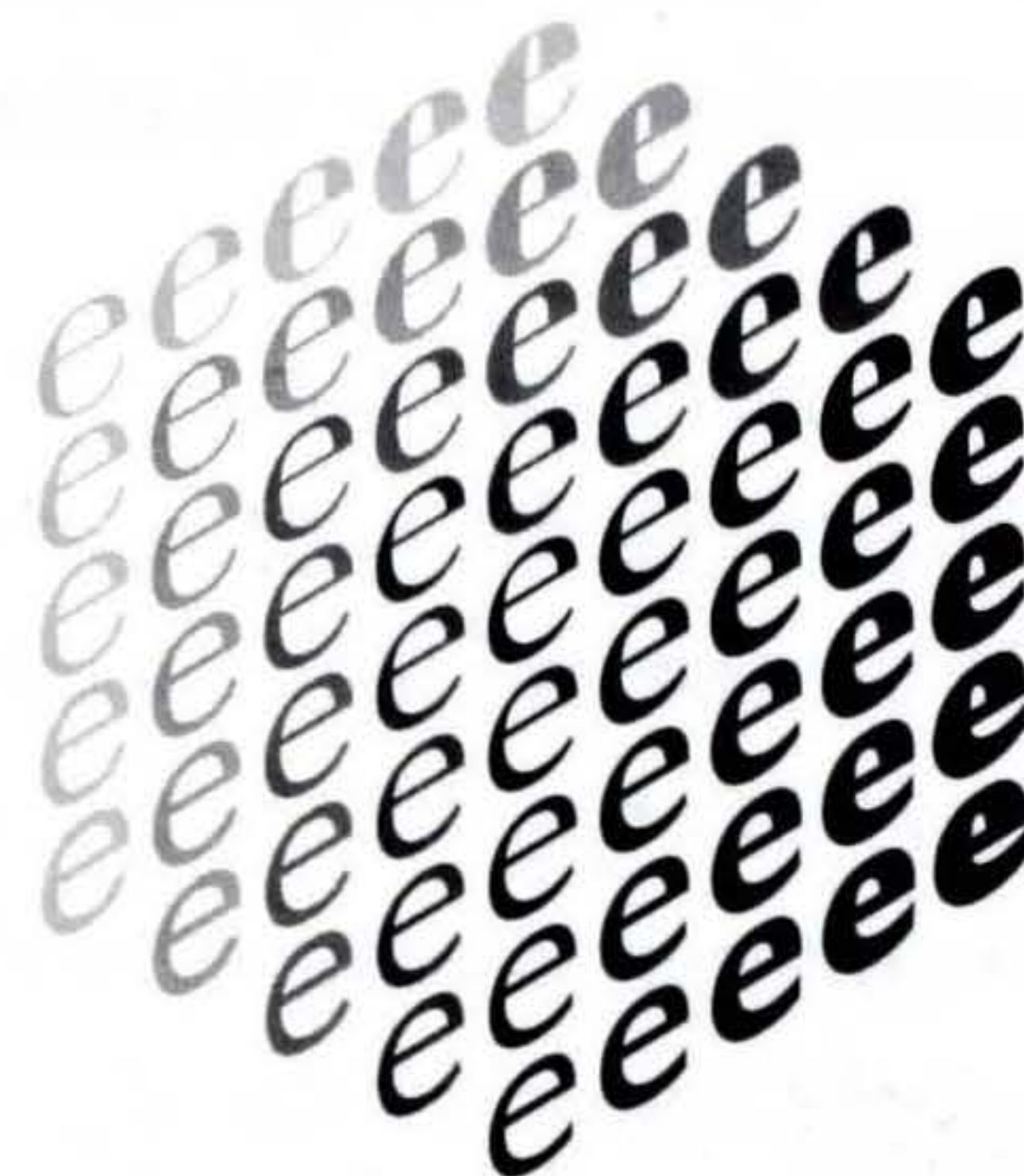
The cube of letters on the facing page represents the mental concept of contrast. Contrast would be the fifth dimension of my mental image but the cube itself is three-dimensional. This results in 7 dimensions of the mental image of writing.

The z-axis is the range of variations (in fact interpolations) in the nature of contrast. From this starting line the contrast of the letters may be increased in the direction of the x-axis and reduced in the direction of the



y-axis. The cube results from interpolating the plane x, z with the plane y, z . This is a complete model of the possible variations in contrast. Any position can be expressed in values of x, y, z .

This logical approach of the mental image of writing clashes with the position which is taken by Nicolette [Gray]. I did not try to accentuate the part of handwriting; it is just there as the first condition of writing. I can isolate a typeface with reduced contrast (commonly and extremely inadequately called 'sans serif') from the bot-



tom of my cube and use it independently, but it is not possible to understand it in this isolation. It is not an independent concept but the result of extreme reduction of contrast. To understand it I have to follow its development in the opposite direction which will bring me back to the z -axis. Any possible shape on the z -axis can be analyzed as tracks of counterpoints (See *The Art of Quibbling*, page 3). To express this in plain words: the z -axis is the range of handwriting. Along this axis 'the concept "letter" is contained within the activity of handwriting' as Nico-

lete puts it. Maybe this origin of any writing is an 'arbitrary' fact, but it is the fact in the origin of writing. Its acceptance is imperative and not 'an arbitrary and misleading assumption.'

I do not have sufficient knowledge of the beginning of writing (nobody has) to be able to point at this fact. There is, however, no alternative within the limited scope of my mind. This scope is made tangible in my cubic universe of contrast. There is only one edge conceivable as the origin, the z-axis. Any stupid computer can arrive at any shape within the cube given this axis, but even a smart designer could never derive the cube from another edge.

It might be sufficiently clear now that it is not my concept of writing that is 'contained within the activity of handwriting' but its origin. This should make a difference to Nicolete. My concept of writing is not a concept of letters either, it is rather a mental concept of collections. These collections do not consider the deviations of individual writers and designers (an important reason to say nothing about serifs). The inclusion of personal subtleties would explode the structure of the mental image, but my reason for neglecting them is much simpler: I am

considering a convention (that which all writers have in common) and what can be taught. In this objective there is nothing individual.

Not everything in my theory of writing is as tangible as the cube of contrast, though everything might be precise enough for scientific tests. There is one major problem: The theory is in contradiction with the teaching of Stanley Morison, Jan Tschichold and all other gurus of writing. It is, however, my business to explain the principles of writing and to save its phenomena. It is not my task to save worn out reputations.

During the past fifteen years Nicolete Gray has been my most faithful opponent. This essay is another demonstration of how much I owe to her criticism, but I still fail to understand her. Even such a simple question (the left back edge of the cube) as the interdependence of Baskerville and Helvetica could never be settled in my discussion with our enigmatic first lady.

Could our fundamental difference be a difference in 'cosmology'? Then we would only be actors in the everlasting play of the discussion between the romantic and the mannerist.

THE NATURE OF WRITING

WRITING IS GRAPHIC DESIGN. As any graphic design it has a graphic and a symbolic quality. The graphic qualities such as form, rhythm, color, shade and composition are aspects of visual perception. The symbolic qualities are submitted to orthographic rules. Orthography determines the connection between the conventions of writing and language. Orthography is not language. The Japanese language, for instance, disposes an orthography which links the language with Chinese writing and of another one linking Japanese language with western writing.

The basis of western writing is a derivation of the Semitic alphabet but its vigor depends on a more modern feature, the word, which was developed in medieval handwriting. This graphic word is a rhythmic structure of 'white' and 'black' shapes. This structure is made with a sequence of letters in a rhythmic juxtaposition. A sequence of letters which is too tight or too loose does not

a

Is this a word? According to Dutch or German orthography it is not, but it is within the scope of Italian, French or English orthography.

notaword

This is one graphic word containing two or three orthographic words.

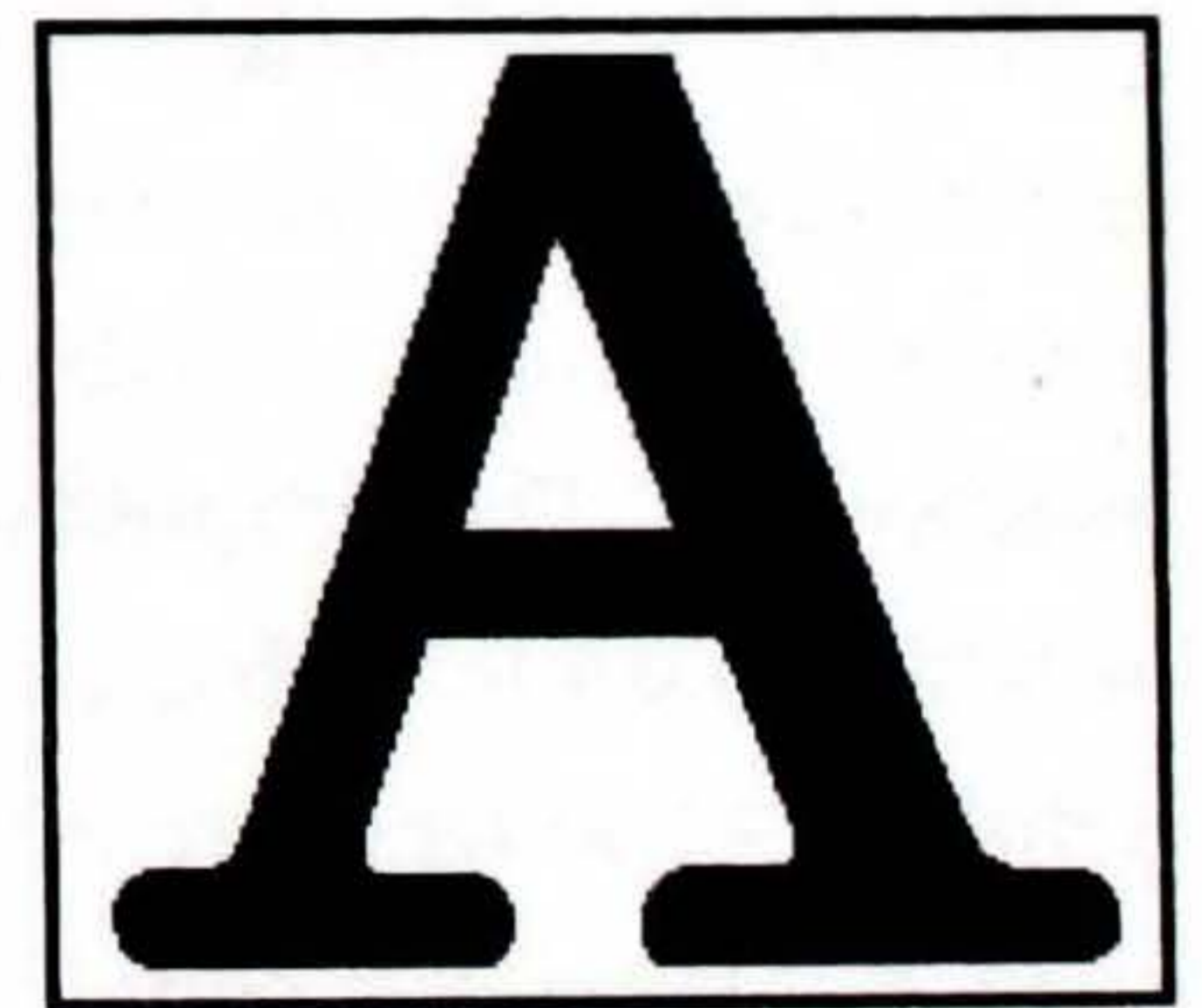
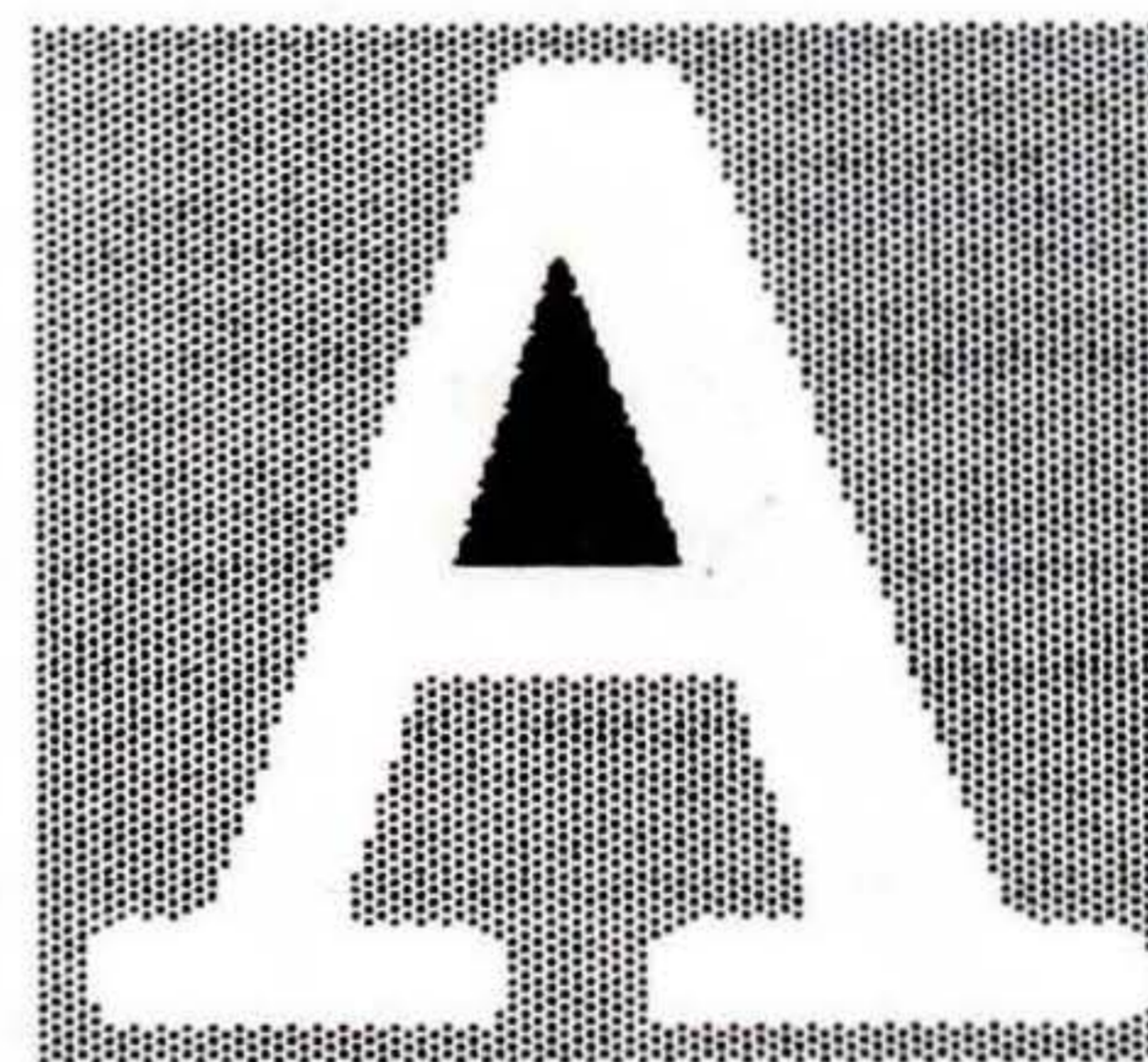
Not a word

In this writing each graphic word is a symbol of an English word.

make a word. It depends on our knowledge of the orthography of a language whether we can recognize a graphic word as the symbol of a linguistic word.

The letter does not have an unambiguous symbolic meaning. As I have shown, a letter can be the symbol of a word but it could symbolize a number as well. Everybody seems to believe that letters represent sounds. This belief assumes that orthographies are phonetic, but I do not know such an orthography. The current English orthography is far less phonetic than Dutch orthography, but also in Dutch, phonetics is not more than an underlying principle. In many cases phonetics is submitted to grammatical and etymological considerations. A consistent phonetic orthography would be inconsistent from a morphologic point of view. The diminutive of *hand* (hand), for instance, is written as *handje* (small hand) which is not phonetic. A phonetic spelling of *handje* might be something like *hañdje* but this would not be an improvement of Dutch orthography. In this example the letter *n* is not the symbol of a sound but an indication of morphologic relationship. Whether a letter is a symbol of a sound depends entirely on orthographic rules. It is the

same rules which define the symbols. Take for instance the letter *u*. German orthography assigns a sound to this letter which is written *oe* in Dutch and *w* in Welsh. The Dutch version assigns the sound to a combination of letters. Other examples of such combinations are *th*, *ng*, and the German triplet *sch*. As the number of possible combinations is far greater than the most extensive collection of phonemes the alphabet could meet the phonetic needs of any orthography. This is the common practice in our application of numerals; only ten of them are sufficient to symbolize any number. We cannot but conclude that there does not exist something like *the* meaning of letters. A discussion about meaning is not a discussion of writing but of orthography. When writing is my subject a letter is



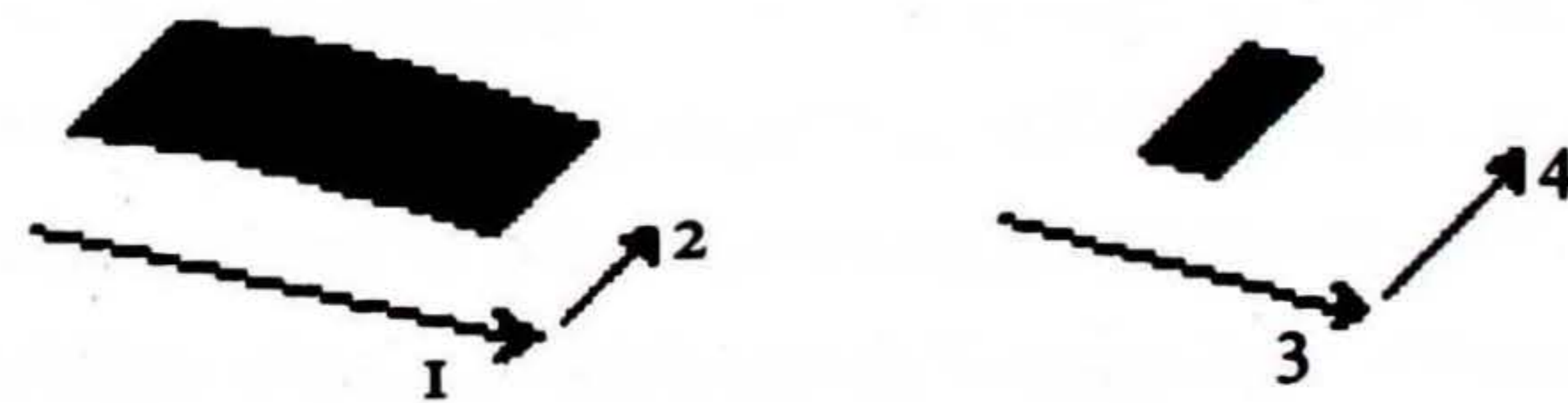
not a sound, a number or a morphologic identifier but only a complex of shapes. My concern, writing, is the making and the perception of these shapes. First of all we have to realize that a shape can only be perceived in its interaction with a background. A black shape on a black background cannot be perceived; it cannot be a letter.

A letter is two shapes, a 'black' shape and a 'white' one. 'White' and 'black' can be any other pair of shades or colors and they can take turns as well. The *form* of the letter is the quality of the interaction of both shapes. The solid shape in the background of the first picture (page 28) is a *counter* in the terminology of the punch cutter. A counter is a part of the shape which might be called countershape. In the second picture the countershape is white. The black background of this white counter is the lettershape. In punch cutting the lettershape is left open by the strokes of the graver, in handwriting the countershape is left open by the strokes of the tool.

Punch cutting is not a very usual method of making letters. It is only one method in the field which is called lettering. In lettering the letterform is made with overlapping strokes. In handwriting the letterform is made with

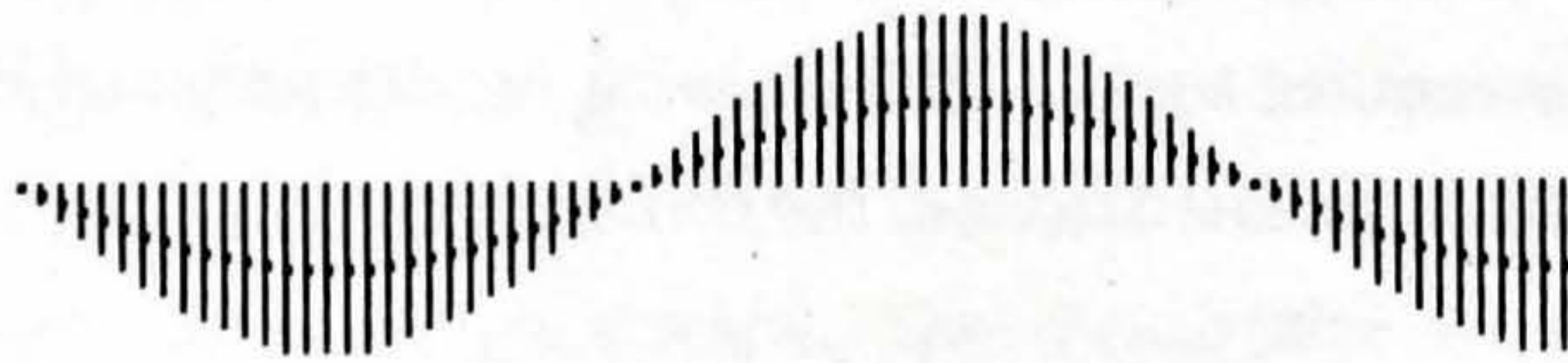
single strokes. A stroke is, of course, a shape, otherwise it could not be perceived. A stroke has a direction.

The direction of a stroke cannot be recognized in its shape. It might seem to be obvious that the first stroke in the picture has been made with a movement of a broad pen in direction 1 but it is less obvious that 3 and not 4 is the direction of the second stroke. Nevertheless the simple translation of both strokes makes their interpretation rather easy. (*Translation* is the conventional geometric expression for the characteristics of a vector.) In the next picture (page 30), the shape of the stroke is much more complicated. A geometric description of its *expansion* might require a three-dimensional model such as I have described in *The Stroke of the Pen*.



In expansion the direction of a stroke is not parallel to its outlines; it follows a path as indicated by the dotted line.

This and other complications of the stroke have their origin in the nature of the tool and in the movements of the hand. This justifies the role of tools and movements in any discussion of handwriting and it would justify some reflection of these subjects as well. The stroke contains more than a track of a movement and the movement contains more than the strokes: the writing movement is three dimensional and only a part of it is registered in the two-dimensional stroke. In handwriting, strokes can be interrupted, the movement cannot. When the movement is interrupted handwriting stops.



Such aspects of the stroke do not appear in lettering where the overlapping strokes cannot show their peculiarities. The influence of the tool can be neglected in lettering. The influence that has been attributed by some authors to the chisel and the graver cannot be demonstrated in the letterforms of inscriptions and engravings.

In these cases the strokes might be found back in the structure of the letterforms but the impression of a typeface that has been cast from the stroke of a punch in a matrix reveals absolutely nothing of the strokes of the graver. These overlapping strokes created the white shape of the letterform which is just white on a white background.

Generally typefaces have their origin in lettering. In that case they are different from handwriting with its single strokes. This difference, however, is not essential. After all it would be possible to reproduce handwritten letterforms in type. The essential difference between handwriting and typography is that in handwriting the words and the letters are made simultaneously whereas typographic letters are made in advance. Typography is writing with prefabricated letters; of the white shape of the typographic word the counters have been made in advance whereas the counterspace of letter combinations is composed on the keyboard. A good typographer will be able to compose rhythmic word images with good typefaces but in this respect handwriting is fundamentally superior to typography. For the rhythm of the words

handwriting is the standard of typography. The study of handwriting (study is not looking at handwriting but making and analyzing handwriting) is the main entrance to typographic design.

On the other hand type design allows a higher degree of articulation than handwriting because type design is infinitely slower than the slowest handwriting. Handwriting is made at some speed (otherwise nothing would appear on the paper) and with some articulation (otherwise the product could not be recognized as writing). Formal writing accentuates articulation at the cost of speed and informal writing sacrifices articulation to speed but formal and informal writing cannot be distinguished clearly as different things. Writing always moves between articulation and speed as the extremes of a continuous scale. A piece of handwriting can only be considered as formal in comparison with a less formal document; the same piece will appear as informal when it is compared with extreme articulation (with a typeface, for instance). There is no escape from this continuous scale between speed and articulation. We might try to consider formal writing as controlled handwriting against auto-

matic handwriting in informal writing but this would make little difference; what else could be under my control but automatic articulation, or what else would there be to automatize but controlled speed?

The phenomena in this introduction could give an indication for the criteria of writing. The first question is whether a specimen of writing has to be considered from a symbolic point of view (can it be read?) or from a graphic point of view (is it beautiful?). The symbolic point of view always includes the graphic criteria: good reading depends on a strong rhythm which is a graphic quality. The graphic point of view allows more freedom; it will insist on the rhythmic quality which is a first condition of all design but it does not care about symbolic conventions. These criteria are once more the extremes of a continuous scale: the symbolic tolerance of a poster or a decorative specimen of lettering is far greater than the symbolic margins of book design, and in this field a book for continuous reading is more critical than a reference book etc. but again there is no escape from the rules of the game without also leaving the playground.

In response to the question what writing is, take a

designers' point of view: Any instance of writing is an unstable equilibrium between a complex of forces. I do not care for past, present or future instabilities. Rather than the instances of writing (scripts, styles, trends, manuscripts, typefaces etc.) it is the forces of writing (translation, expansion, rotation, articulation, speed, friction,

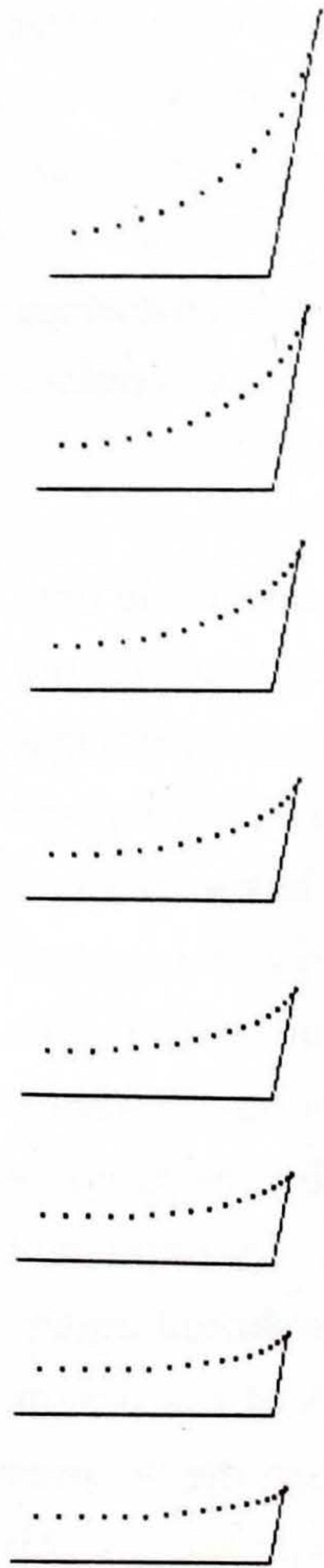
etc.) which are essential for any introduction to writing. The main problem with the terminology of writing is that it has been devised by people who did not have the faintest notion of the essential forces of writing. When we want to consider these essentials we have to invent our own terminology.

ROTATION OF THE FRONT

THE ANALYSIS OF the stroke in the first two essays of this collection seems to be abstract theoretical stuff of little practical value. A discussion of theory, however, is always a discussion of practice because practice is always governed by theory. The theory may be obscure or confused but if there is a point of view or a method, then there is a theory and if there is not a point of view or a method there is no practice either. The current practice in the production of typefaces considers letters as outlines. This is far removed from design. Writing is shape. Shape is an absolute condition for the sheer perception of writing. Unless an outline is a shape as well it cannot be perceived though we are not aware of the second dimension of outlines. Here already we loose our control of the outline which makes control of the enclosed shape also an illusion. Type design depends on an approach that allows complete control of the lettershape itself. The designer relies on the interaction of black and white shapes

only. We can imagine a line separating black and white shapes but such a line will always be invisible. Otherwise we should be able to say whether this line is black or white, which we cannot.

In the manufacturing of typefaces the invisible outline is used to define the shapes of the design. All existing methods of digitizing type are founded on this principle of definition. In his new book *Digitale Speicherung von Schriften*, URW Verlag, Hamburg, Peter Karow gives an extensive survey of these methods. Karow makes clear that digitizing starts when the design is finished. His subject is not computer aided design (CAD) but computer aided manufacturing (CAM). The book is indispensable for manufacturers of typefaces, but it is very important for designers as well because the designer should understand the conditions of the production of his design. Moreover, production begins already when the designer starts with the finished drawings of his typeface. For this



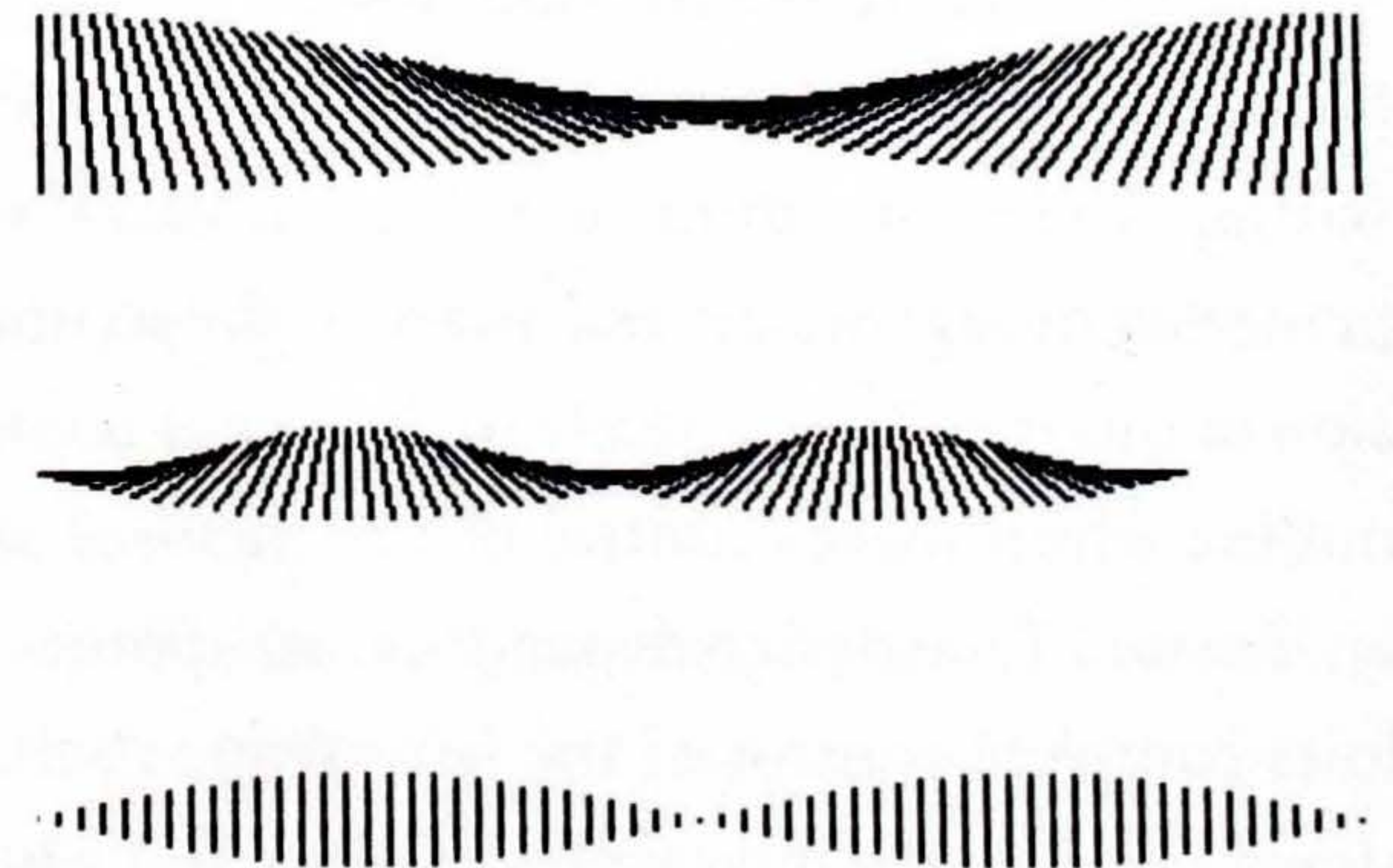
time-consuming part of his work he could take much profit of the CAM methods explained so clearly by Peter Karow. The only weak point of this excellent book is the faint suggestion that the quality of a shape could be something like the smoothness of its outline. This is not a mistake from a designer's point of view only: in all fields of knowledge it is impossible to compare the first dimension (lines) with the second dimension (shapes). It is a very common mistake, even among designers, to mix up dimensions. It would not be fair to blame Peter Karow for a suggestion that is not in fact important for his subject.

It is much more important for my subject. The parameters resulting from my description of the stroke as a front of a progressing counterpoint will be of little help for CAM methods aiming at the reproduction of existing designs. My parameters support computer aided instruction which eventually might yield something like CAD. The actual advantage of the

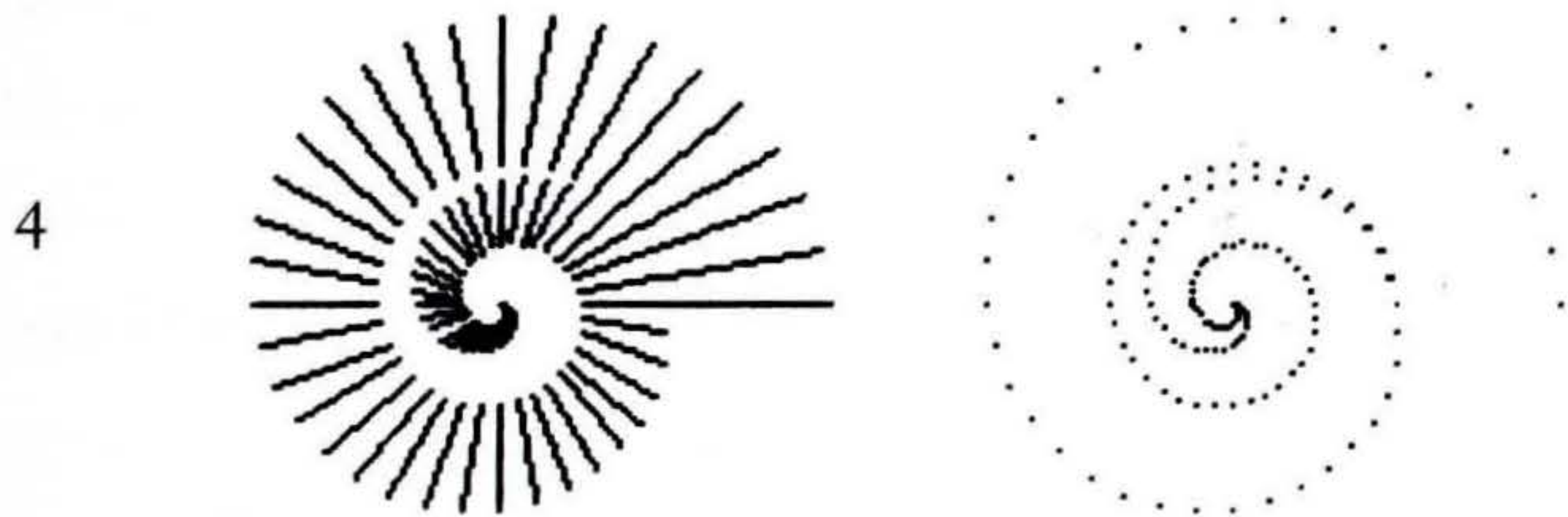
computer is that it allows me to increase the counterpoint and the angle of its direction continuously.

The first picture shows the mannerist trick of rotating the pen (*The Art of Quibbling*) in a theoretical model. The next pictures illustrate the problem of the professional palaeographic literature: because our scholars neglect the movement of the front they cannot distinguish the mannerist stroke of a broad nib (fig. 2) from the classicist stroke of a pointed nib (fig. 3). For a historian this is rather serious.

When the frontlines are not parallel as in pure



translation, they must intersect somewhere. This point of intersection is the center of rotation. In actual handwriting this center of the stroke is generally far away from the counterpoint. In the stroke of my computer I can elongate the counterpoint to include the center of rotation. This abstract theoretical movement could result in such a familiar picture as that of fig. 4.



The spirals could make us aware of some fundamental laws of perception. As designers of type and of typography but also as manufacturers of type we are making our living from perception. The laws of perception are the first condition of our position, so let us have a look at them. The second spiral suggests a line. There is not a line but just a collection of small shapes. It is the arrangement of these dots which persuades us to see them as dotted lines. The dots have been drawn with exactly the same

parameters as the shape of lines. The distance of the dots increases along the outline of the shape. Nevertheless they describe the shape everywhere with the same definition. Peter Karow's problem, how to find equivalent positions for his marker points, has here been solved before it could arise. This might turn out to be the essential difference between CAD and CAM.

The pattern of dots digitizes exactly the same spiral as the sequence of counterpoint lines, and for a blind machine there is no difference between their definition. For the evaluation of the definition, however, there could be no greater difference. The pattern of lines evokes the impression of shapes, a white shape and a black one. These shapes are meaningful for design whereas the dotted lines are not. This explains why it is almost impossible to evaluate the quality of a typeface in outline drawings. The spiral forces me to realize the interaction of the white and the black shape: they can only increase at the cost of each other. A good designer is always aware of his defining white shapes with his black strokes. Many bold type fonts lack this balance. Times bold is an example of such non-design.

THE SEVEN-TIMES TABLE

DEVISING A HISTORICAL framework is easy. You only have to omit those historical facts that would not fit in it. It will be necessary to leave out the vast majority of facts anyhow, so why not help history a little? History is the art of impressing people by putting carefully selected facts into an order that seems to make sense. The sense depends on our actual situation. The history as told by Burckhardt is still good reading as civilized literature but its historical meaning depended on the optimistic feeling of the sixties of the nineteenth century which is not our feeling. Accordingly the history of typefaces as told by Stanley Morison belongs to a period when typefaces were still there and when there were no designers. (Apart from the work of a few nonconformists such as W.A. Dwiggins and Jan van Krimpen, type design was a matter of facelift.) Now we know that we will never again be certain what a typeface is and we do have many designers who do not need other people's first principles.

This requires a new framework for devising history. I like this one.

Fourteenth century B.C. (Eighteenth dynasty of Egypt): Invention of the broad pen and invention of the alphabet.

Seventh century B.C.: Explosion of the Semitic civilization; the alphabet penetrates India and the Mediterranean.

The century of Christ: Roman writing comes of age (invention of the minuscule).

Seventh century A.D. (Ireland): Beginning of the Western civilization with the invention of the word. The Irish civilization spreads over Europe until it clashes with the Arabs at Poitiers.

(Arabia): Beginning of the Islamic civilization with the invention of the word. This civilization spreads over North Africa and penetrates Europe until it clashes with the Western civilization at Poitiers.

Fifteenth century: Explosion of the Western civilization. (The printed book. End of the classic attitude. 'Modern' times begin.)

Twentieth century: End of the classicist attitude. (This timetable could be a sign of it at least.)

This table offers satisfaction to all kinds of prejudices. A faithful Marxist might fill it with such social changes as would have been considered important by the master himself and anthroposophists might use it to confirm the learning of Rudolf Steiner who was very fond of seven year intervals; he might have liked intervals of seven centuries as well. To help the latter a little I call the framework *The seven-times table*. I did not intentionally make seven entries. There is one important entry missing (which would really bring the number of entries to seven):

Xth century: Invention of the Chinese brush. I would be grateful for the proper number to replace my *x*.

The statements of the table are intended to raise questions. Some questions would give no problems. If one would ask 'Where are the Greek in this table?' I could reply 'nowhere.' Other questions could be more tricky.

There is a striking parallel between the missionary expansion of the Islamic civilization and that of the Irish civilization, it even looks like a conjunction. Both movements introduce the same new element in alphabetic writing, the word. The difference is that the Western word links the letters with white space and that the Arabic word links the letters with black shapes, but even this difference is in a way not a difference. Now the question might arise: When did Arabs and Irish exchange their great idea? This question is dangerous, because it is used in the established literature to show that speculations about the common aspects of Irish and Arabic ornament can go as far as assuming cultural contacts between both civilizations. We are supposed to understand at once how ridiculous such an assumption must be. It is very ridiculous indeed, but is it less ridiculous to accept that Arabs and Irish invented exactly the same marvelous trick independently, while moreover the splendid results were decorated with the same kind of abstract ornament? Or should I be satisfied with the belief that such things are bestowed automatically to faithful believers? I am a great believer myself, but sometimes my doubts are shining through.

Once the Greeks are neatly put aside, I can forget the worn story of boustrophedonal writing and consider a more important question: Why did Semitic writing change its direction when it came into foreign hands? (It is not only the Western offspring of Semitic writing that goes from left to right but the Indian as well.)

The two great original civilizations, the Semitic and the Chinese, are both writing from right to left. If it should be the natural way (if there is any natural at all in the cultural achievement of writing) to write from right to left, the part of stone cutting should be considered. A right-handed craftsman draws a tool in his right hand from left to right, but he pushes it from right to left. So the natural direction of a stroke made by drawing a pen, a brush or another tool with the right hand is from left to right. A right-handed stonecutter, however, holds his tool in the left hand, pushing it from right to left with the blow of the hammer in his right hand. If the first stage in the development of writing had been a stage of stone cutting it would be quite evident why both original civilizations started by writing from right to left. But if you would hes-

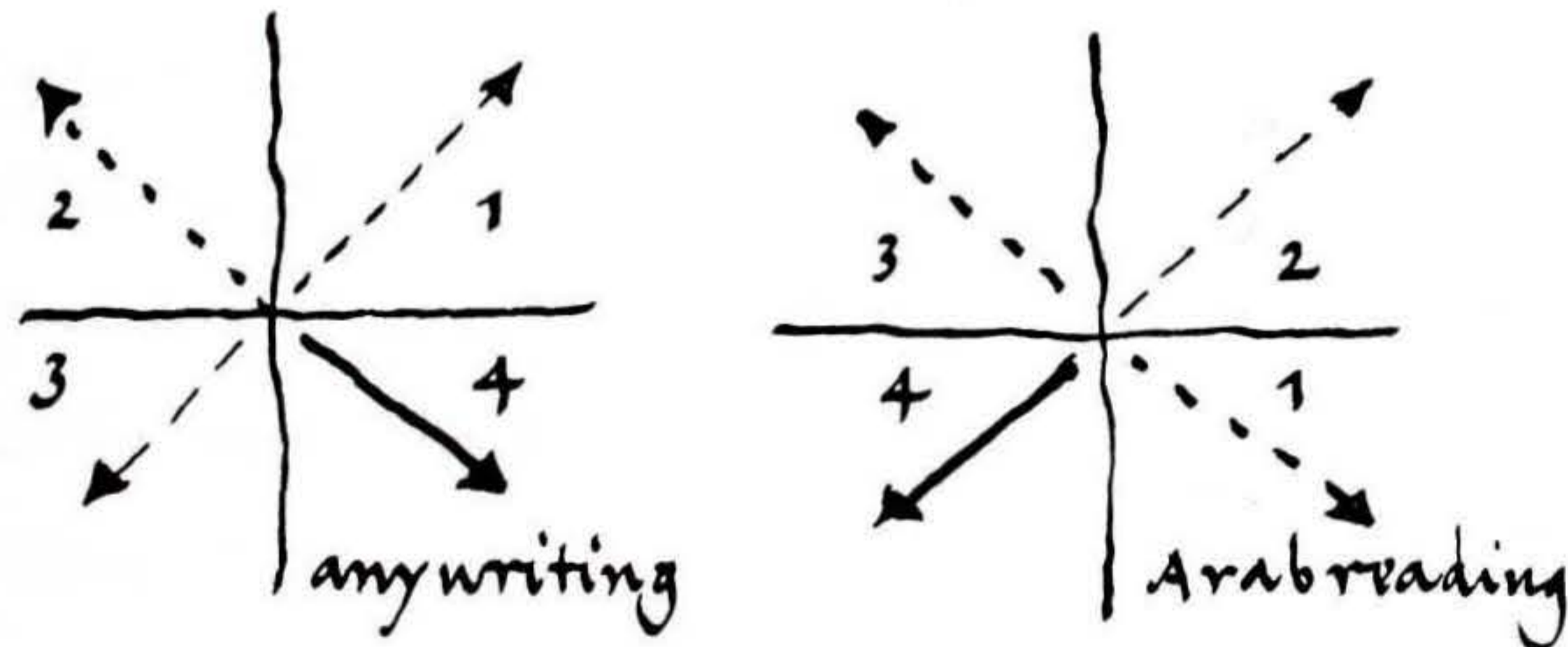
itate to accept that all writing started as stone cutting you have me on your side. Why should a complicated technique of working stone with 2 tools in 2 hands precede the simple technique of 2 fingers writing in the dust?

Between hammer-driven cutting and drawn strokes there is the technique of engraving. A right-handed engraver pushes his tool from right to left, but the direction of an engraving is difficult to analyze. Engravers turn the plate in any direction to make all strokes, even the sharpest curve, as straight strokes running from right to left. Engraving is the most sophisticated technique I know, and supposing any influence of engraving on any writing would violate common sense. This is a rather strong argument for throwing away the literature on writing. And if you would nevertheless annoy me by referring to conclusions from these piles of compiled nonsense I shall do my best to tear you into pieces.

This is one example of the meaning of my historical framework. As such it is not better or worse than any other time table, nor does it supply better answers, but from a craftsman's point of view it evokes far better ques-

tions. Wrapped in questions about the origin of civilization is the question about my control of my hands. It is in fact the question about your and my personal civilization.

Because I dislike to separate theology, craftsmanship, literature and technology from other aspects of metaphysics (which should not be misunderstood as the holistic chimera) I consider civilization as the attitude which is reflected by all we feel, believe, think and do. In this view it is convenient to summarize a complicated story about man as the center of his reading and writing in a set of Cartesian axes.



We are used to write in the fourth quadrant: from left to right and from top to bottom. Until the seventh century B.C. any writing seemed to be restricted to the third quadrant: from right to left and from top to bottom. There is, however, a complication which can be revealed by analyzing the sequence of strokes in ancient writing on clay tablets. The dissertation by Gerrit van der Kooij, *Early Northwest Semitic Script Traditions*, Leiden 1986, discusses many examples of ancient Semitic writing showing that the strokes of each letter were made from left to right and from top to bottom. This means that there is no difference between our way of writing a letter and the ancient way. In this respect nothing has changed since 3000 years. The difference is only in the mutual position of the letters. We put the second letter at the right side of the first one whereas our Semitic ancestors would have put it on the left side. I am inclined to consider this difference as superficial.

Ever seen Arabs writing? They swing their writing pad, turning the Cartesian system ninety degrees, and then they draw their strokes from left to right and from

top to bottom. To read the result they swing the Cartesian system back in its original position so that the result appears to be in the third quadrant. In fact the sequence and the direction of the strokes in Arabic writing are essentially the same as in Western writing. The different direction is not in writing but in reading.

Reading, what is that? In the modern sense of the word reading depends on the perception of word images. What was reading in antiquity is now spelling: collecting letters and combining them to words. In spelling, the letters are perceived and the words are thought. In reading the words are perceived immediately. Elementary teaching of reading would be an introduction to *perceptual unities* of word images. Our educational system only teaches *logical sequences* of letters which is spelling but is advertised as reading. By ignoring this categorical difference between spelling and reading the schools of the Western civilization are destructive for the logic of children. They make children stupid or dyslexic. Nevertheless many children learn reading, but they do this in the same way as they learned walking, talking and (to a de-

gree) how to behave. They are learning in spite of the school.

There is no direction in the perception of a word, therefore I should have written *spelling* (which is dynamic) rather than *reading* (which is static) as the last word of the paragraph at the beginning of this page. Typographers do know what reading is, but nobody seems to know when modern reading was invented. From comparing pictures of manuscripts I conclude that our way of reading was invented in Ireland in the first quarter of the seventh century and that the Arabic way of reading was invented in the same period. This is the end of antiquity, the beginning of the Middle Ages and the start of Western civilization. Even if this invention could not be considered as the most important historical event after the invention of the broad pen and the soft brush, it would still deserve a place in my timetable. Since a history of writing that neglects the invention of the word is not relevant, you have another good reason to throw away your library. If you have plenty of space, you could keep your books for the pictures. Though they have been selected

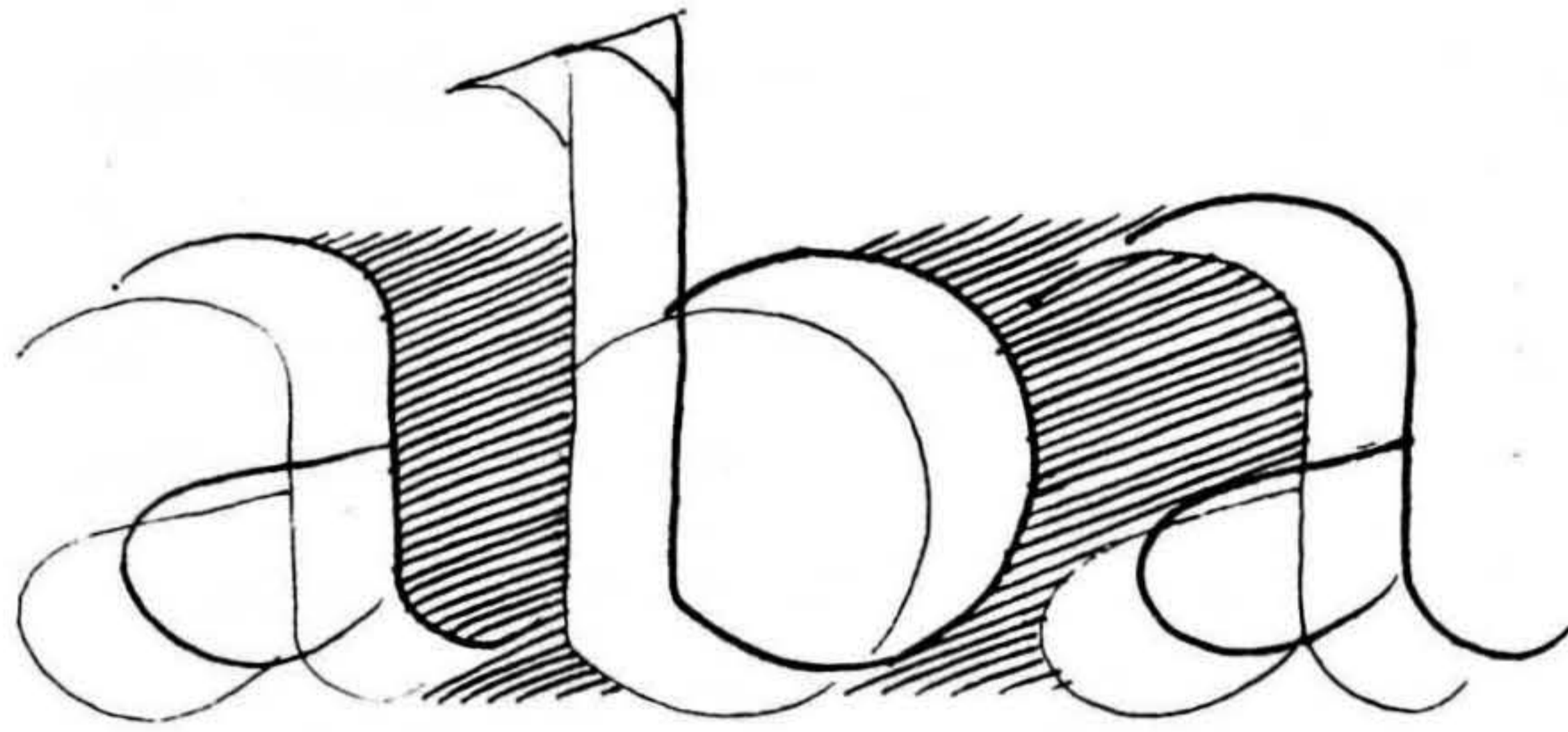
from an irrelevant point of view, they might contain useful material for a new approach.

The seven-times table is my cradle of questions. It is just a trick to urge you to reconsider everything you

thought to think of writing, civilization, history and your own position. This position of yours is adrift. If you need a compass, try my table.

THE PUZZLE

THIS ESSAY IS A start towards publishing suitable computer programs to support education in letter-forms.



1

Figure 1 resembles an illustration in *Education as Fate* (page 17). Writing a word and shading the counterspaces of the letters is the best way to understand what a word is. The exercise is training of perception as the condition of reading. It seems difficult to talk with young children about the balance of the counterspaces, but the exercise makes it easy. When a child uses different colors you can

ask him whether there is as much blue in his drawing as red and green.

The exercise turned out to be effective in the treatment of word blindness as well.

This is a simple method without any disadvantages, but there is one serious problem. The method assumes some knowledge of handwriting, which is completely beyond the scope of the school.

I made some attempts to design a puzzle of counterspaces. Letters should only result from the juxtaposition of counterspaces. It is, however, difficult to design manageable pieces of such different and complicated counterspaces as those of figure 2 and 3.



I had to drop the idea until the arrival of the computer, but then it was easy to solve this problem. The related parts could be connected and pulled over the screen as a combination.

I started with 3 letters from which 2 different words can be composed (figure 4 and 5).

4 gab
5 bag

In the approach of the school both words are the same elements in the same sequence. Everything depends on

our ability to see the inversion of this sequence. Because inversions never have a meaning for young children, education always fails when it is founded on their differences.

For typographers it is essential to see the different elements of both words. It is as essential for children.

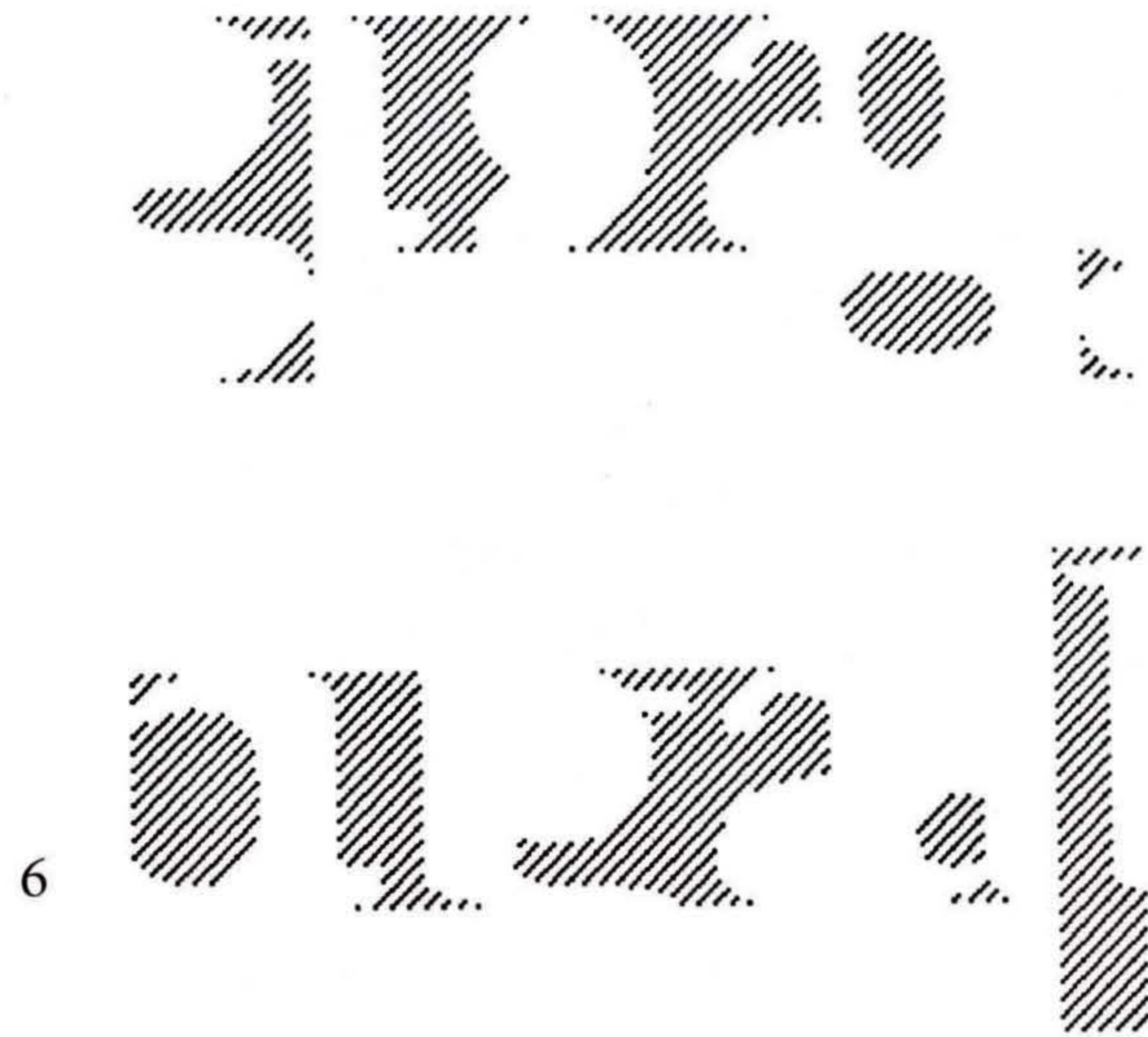


Figure 6 is a collection of the elements. The puzzle starts with this collection in the top of the screen.



The elements can be selected and dragged to a guiding line in the bottom of the screen. Figure 7 shows 6 shapes on their way to the new position.



In figure 8 the composition is nearly completed and only now can something like a sequence of letters be distinguished – but it would be extremely stupid to emphasize or even to mention this sequence in front of a child.

That is all.

The puzzle offers even illiterate teachers the instrument to approach reading at a high level of design. One could use the puzzle to introduce a much more important task. Children will now understand what a word is. They could make another word by cutting out its countershapes and pasting them in a well balanced composition. Criticism can be left to the children by stimulating them to help each other. The task might be varied with different scripts (but no capitals, of course) and different techniques such as drawing and painting and, perhaps, actual writing of the elements of letters in double strokes.

I observed children of different ages and abilities in the execution of the puzzle. All of them found the puzzle difficult but fascinating. Though they did not always arrive at the perfect result of figure 8, they still understood the meaning of the puzzle. This could be concluded from successive drawing and writing exercises. I also observed puzzling grownups. Choosing the shapes seemed to be more difficult for them than for the children.

The puzzle is new. I cannot say much more about its effects. The test case will be a common classroom with a

common teacher who would have to leave his children alone in solving the problem.

This proposal is the great opportunity for my distinguished opponents to explain the essential difference between professional design and simple handwriting. I cannot see such a difference. It would be sufficient to make clear that my puzzle has nothing to do with the conditions of elementary teaching or with the foundations of design.

I am convinced that it is impossible to give such a demonstration. I conclude with a confession which could explain this conviction. I imported the attention to countershapes into elementary teaching from my course in type design at the Academy in The Hague. Even the idea of devising a puzzle has its origin at the Academy. To check the understanding of my students I asked them to design a device which could be used to demonstrate the interaction of white and black shapes in the word image.

And it was word-blind students who urged me to use exercises with countershapes to solve their reading problems. Their impressive achievements are the final justification of this approach.

This article is an introduction to the puzzle. It does not cover all aspects of dyslexia. For a discussion of this subject I could refer to the issues of March and September 1987 of the *Scientific American* or still better, to *Education as Fate* (page 17).

Most publications on 'reading sickness' insist that we should say *dyslexia* instead of *word blindness* because the handicap does not imply impaired vision. I decided to return to the English word which is sufficiently different from the English word *blindness*. If the authors in question do have any authority at all, they do not seem to be entitled to devise priggish 'improvements' of common English.

UPSETTING THE TABLE

A dialogue between Nicolete Gray and Gerrit Noordzij

GERRIT NOORDZIJ has written a very provocative account of the history of writing with most of which I disagree. I thought of commenting on points of disagreement, but find that it is clearer if I offer an alternative history.

Writing was first developed in Egypt and in the Fertile Crescent. Our tradition is related to the latter and to the cuneiform script of the Sumerians; this was partly phonetic, partly ideographic. It was finally reduced from about two thousand to forty-one signs in Achaemenid Persia. Even so the script was still not purely alphabetic.

The alphabet was probably invented in Palestine. It was adopted by the Phoenicians, but without signs for vowels, and received a final version from the Greeks, around the ninth or tenth century B.C. All western alphabets derive from Greek. Arabic and Hebrew belong to a different family.

Roman capitals derive from Etruscan and early Greek writing, around the seventh century B.C.; though they did not achieve their final, mature form, from which roman type design derives, till around the first century A.D.

The minuscule, that is the four-line book-hand known as half-uncial (though more related to cursive), appears in the fourth century, i.e. in the late antique, but still Roman, period.

Thereafter follows the long period of successive barbarian invasions, the setting up of the separate kingdoms of the Ostrogoths, Franks, Visigoths, Lombards, Anglo-Saxons, and the conversion of these peoples to Christianity. Ireland was never part of the Roman Empire. Its conversion was begun by the Romano-British St. Patrick (died in 461). In the sixth century the Irish set out to reconvert Europe. They founded monasteries at Iona, Luxeuil, St. Gallen, Bobbio, Echternach, but they were

not alone; Anglo-Saxon Benedictines, Willibrord, Boniface and others went to Frisia and Germany. Others such as Wilfred went to Rome and from Rome came St. Augustine. The Roman tradition was never broken.

Gerrit refers to the tradition of 'the word.' I understand this to imply the use of a broad pen creating a reverse as well as a positive shape. A broad pen was used for uncial and 'rustic' late antique book hands and at first words were not separated, but books were read aloud, so the separateness of words must have been recognized.

Different varieties of script were evolved in the different kingdoms. Of these the Anglo-Irish, or Insular, was the most formed and beautiful. It was used as one of the bases for the Carolingian minuscule, sponsored by Charlemagne, to be used throughout his Empire.

The Irish were important missionaries but the battle of Poitiers (732) was won by the Frank, Charles Martel, grandfather of Charlemagne. The battle marked the final checking of Arab advance into Europe. The creation of the Holy Roman Empire (800) marks the restoration of European initiative. The Carolingian minuscule is the basis of lower case type design. So by the time of the Arab

explosion writing had been used in Europe for many centuries.

Arabic is written from right to left, like most Eastern scripts. Owing to the importance of the Koran for which it was used, which might not be translated or altered in any detail, it developed into sophisticated and beautiful forms very quickly. There are three forms of each letter, initial, medial and final. The word would thus become a unit; except that six letters have no medial form. The earliest of the many styles of Arabic writing is Kufic, formal and static, often used for the decoration and sanctification of buildings, carved in relief, painted on ceramic, ornamented; so capable of making reverse as well as positive shapes. Other styles are more fluid.

At first Greek also was written from right to left, then 'boustrophedon' (as the ox ploughs) was tried, reversing the direction of letters such as E, L, P which look in one direction. After about 500 B.C. the Greeks decided to write from left to right. Latin script—but not Etruscan—also adopted this direction. I have not come across any explanation.

X: The traditional date for the use of the brush for

calligraphy in China is the Ch'in Dynasty, third century B.C. (Qin).

Gerrit Noordzij responds:

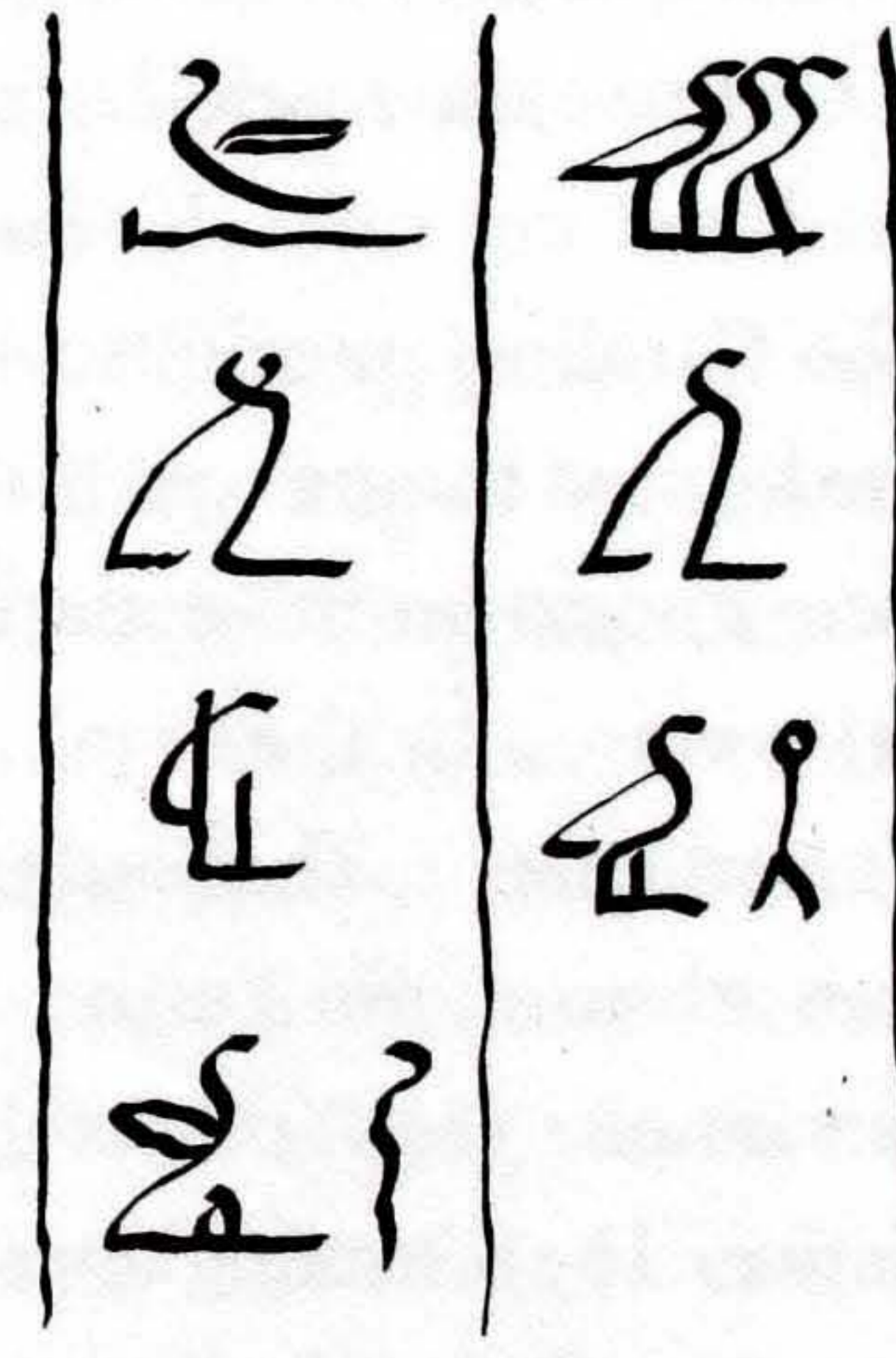
Nicolette starts with a summary of what is generally believed to be the history of the development of writing. Perhaps the history is wrong, but it is definitely not the history of writing. If it could survive criticism at all it would be at best a history of spelling. It says that at first writing was logographic, a sign (for instance A) represented a word. Then it became syllabic, a sign (for instance A) represented a syllable. Finally it became phonetic, a sign (for instance A) representing a lot of sounds. Whatever might have changed in this development, it was not the writing. The same sign (for instance A) could serve in all cases.

Though not told very respectfully, this is the concern of such books as *A Study of Writing* by I. J. Gelb. Because our present orthographic systems are not phonetic and because these systems require a logographic arrangement, I cannot believe a word of it. It is in contradiction

with the facts of every day. However, this history is not my business.

A history of writing is a history of shapes and not a history of meaning.

The history of our (Semitic, Western and Indian) writing is the story of shapes composed of strokes with a broad nib. These shapes cannot owe anything to the reversed pyramids sunk into the clay of Sumerian cuneiform writing. The tool and the stroke of our writing have



their origin in the 18th dynasty of ancient Egypt. A broad nib is all I need to write this collection of hieroglyphic birds.

I do not know if this divergence between Nicolete and me is a matter of disagreement. It seems to be rather a difference in point of view. For Gelb there is no difference between a system of writing and a system of spelling (as he says explicitly) and Nicolete seems to be able to live in peace with such tremendous nonsense. I cannot.

With her critical remarks Nicolete reduces my table to more reasonable proportions, but I can still serve my cup of coffee on it. Probably I have not been sufficiently clear about the invention of the word. In the article 'Support for the table' there are more details.

The Irish civilization (christened in *The Table* as the Western civilization) clashed with the Arab civilization at Poitiers. Nicolete wants to make it clear that it was Frankish warriors rather than Irish monks who fought the battle, but this is not a point for disagreement. I did not suggest something else.

The history of Western writing is the history of the

broad pen, but this history has not yet been written. Obviously there are a few breaks in the history of the broad pen. The broad pen is clearly an Egyptian invention. It came into use in the same period when the Semitic alphabet was invented. The Greeks did not adopt the broad pen, which is an indication that the alphabet reached the Greeks before the broad pen was introduced in Semitic writing around the tenth century B.C. (Van der Kooij). Semitic calligraphers waited 3 or 4 centuries before adapting the Egyptian innovation. This is difficult to understand for me.

The Romans might have learned to use the broad pen after invading the Levant. The Greeks seem to have learned nothing after the fifth century B.C.

The Greeks are standing aside in the history of Western writing because they did not learn to use the broad pen. They are, however, of some interest from a pathologic point of view.

The Greeks made mistakes because they were not sure of the difference between left and right. It is rather exaggerated to call this infantile mistake 'boustrophe-donal'

(I do not know if an ox would ever make this mistake; a fly would not).

A mathematician gave me the Harvard Lectures on Symmetry by Hermann Weil. From his analysis of Greek geometry Weil comes to the same conclusion as I do in my analysis of Greek writing and as William M. Ivins in his *Art & Geometry*.

The Greeks did not know which stem of P was the longer one and they solved this problem by changing P into π with stems of equal length. Now it was always right, even when it was wrong. In a more reverent story

this little but dangerous trick might be advertised as THE CREATION OF SYMMETRY, but I call it pathological because it reminds me of the learning disabilities of children. This aspect of Greek civilization could be considered as collective word-blindness.

In the *Timaeos* (Plato), the old Egyptian priest says to Solon: The Greeks will always remain children.

In the end of the Semitic novel *Iona*, God and the prophet are discussing the astonishing fact that there are such people as Greeks and children 'not knowing how to distinguish left and right.'

MOVING THE FRONT

(THE THEORY IN PRACTICE)

SHAPE 1 HAS A constant counterpoint and the front-line does not change its direction. At first sight it would be much simpler to say that this shape resembles the stroke of a broad pen. This could not be said of shape 2.



I can, however describe this shape as the track of an increasing counterpoint on a rotating frontline and this description can be compared with the first description of shape 1.

The theory of the front enables students of type design to relate their work to the stroke of the pen without

being confined to its technical limitations. This is why the theory was invented. It arose from the evaluation of practical work.

Gradually the theory revealed its power in the related fields of archaeology and mathematics. Here I would like to show its possibilities in design.



The moving counterpoint is conveniently presented by zigzag shading which evokes the shape very quickly. Different levels of articulation are reached with different densities of shading. The effectiveness and the speed of this method can persuade students to abandon drawing

outlines, and only then design can start. The speed also encourages them to make the alternatives they would otherwise only talk about.



So we got used to a practice of discussing design by quickly shading the subjects of the discussion.

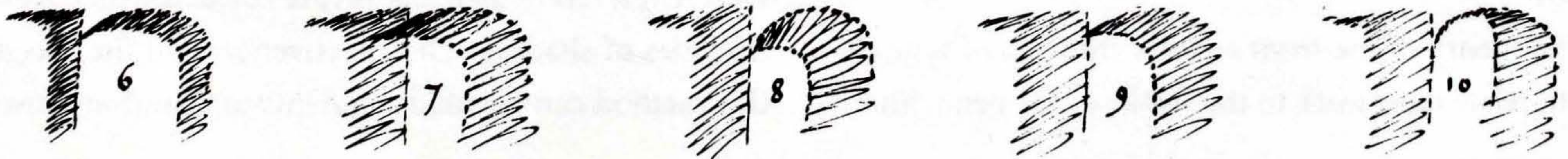
The next set of shapes is an example of such a process of evaluation. The contrast of 6 could be described as rather straightforward translating the direction of the stroke. A matching bold cannot be treated so simply. In 7 the increased counterpoint covers the beginning of the

second stroke. This could be avoided by contracting the curve, but this would result in a kind of 'black letter' and not in a matching bold.

Eight is a complex of adaptations. The curve is sharper, the frontline starts as a rotation and the counterpoint is increasing. Without rotating the front so much, a greater counter could be obtained (9). The balance of the countershapes is better preserved in 10, but now the contrast of the expanding counterpoint is far removed from the starting point 6, which is almost the other extreme in the range.

Observations of this kind might be organized in a comparison of the 'bold handwriting' of the Middle Ages and the bold type design of the 19th century, but for now I leave this subject.

Different densities of shading have been used in the illustration for this *Letterletter*. In the illustrations for a



schoolbook on geography (11) the designer (Christoph Noordzij) has applied shading to attune his lettering to the freehand drawing of the diagrams. For this purpose the shading had to be rather dense.

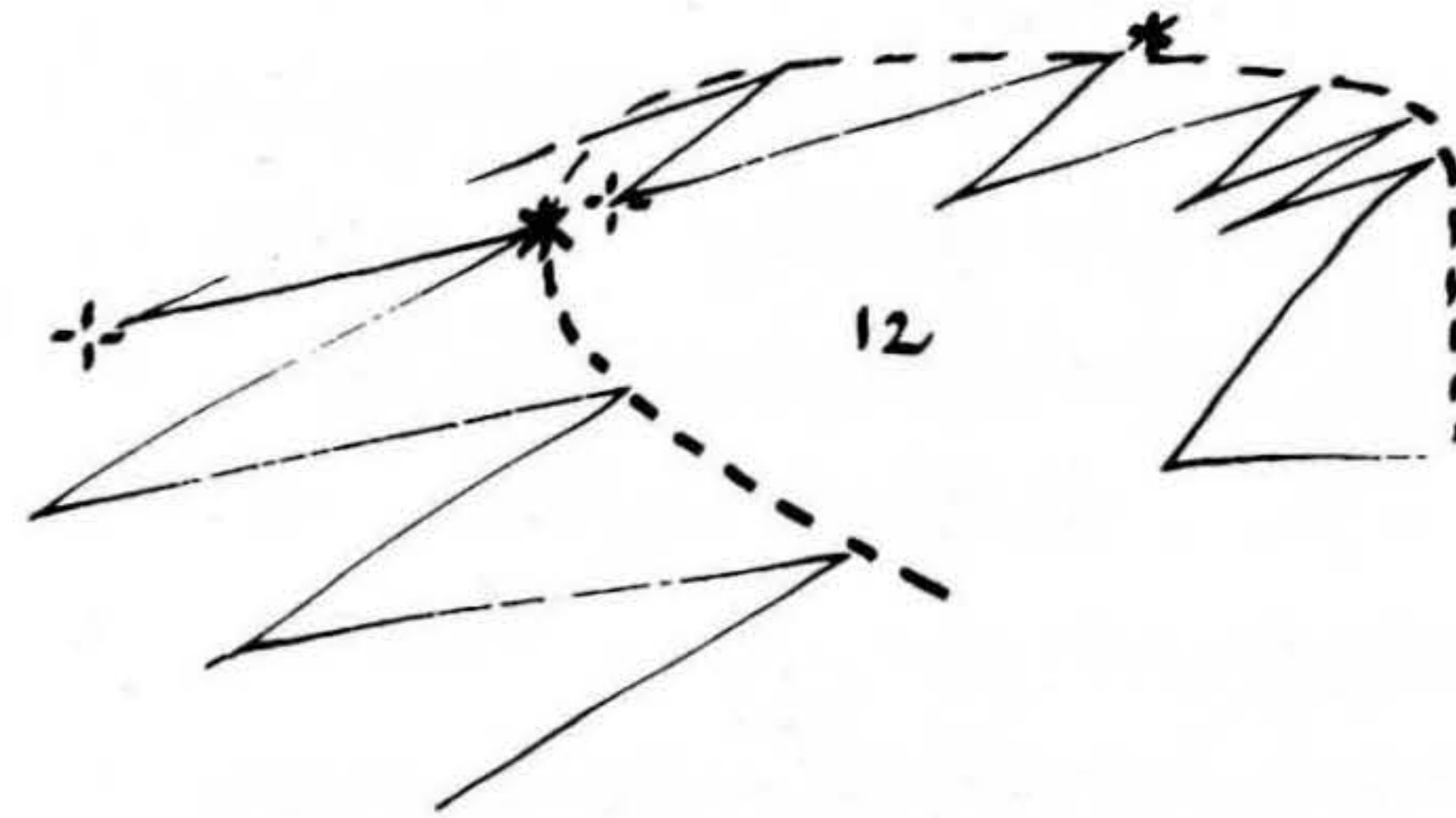
Keileem in Nederland



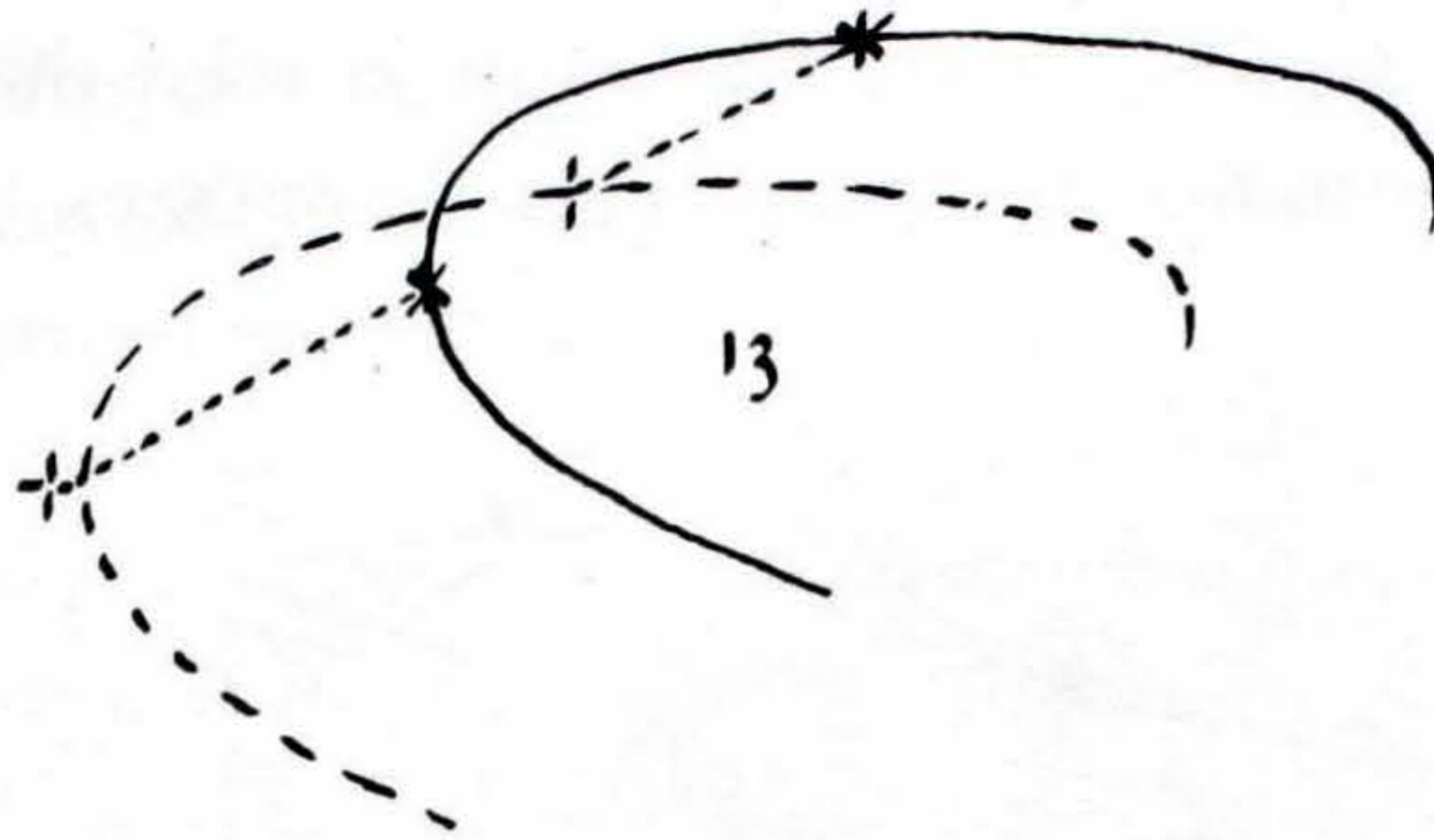
- Keileem, dicht onder het maaiveld
- Keileem tot 20 m - NAP
- Keileem op meer dan 20 m - NAP

11

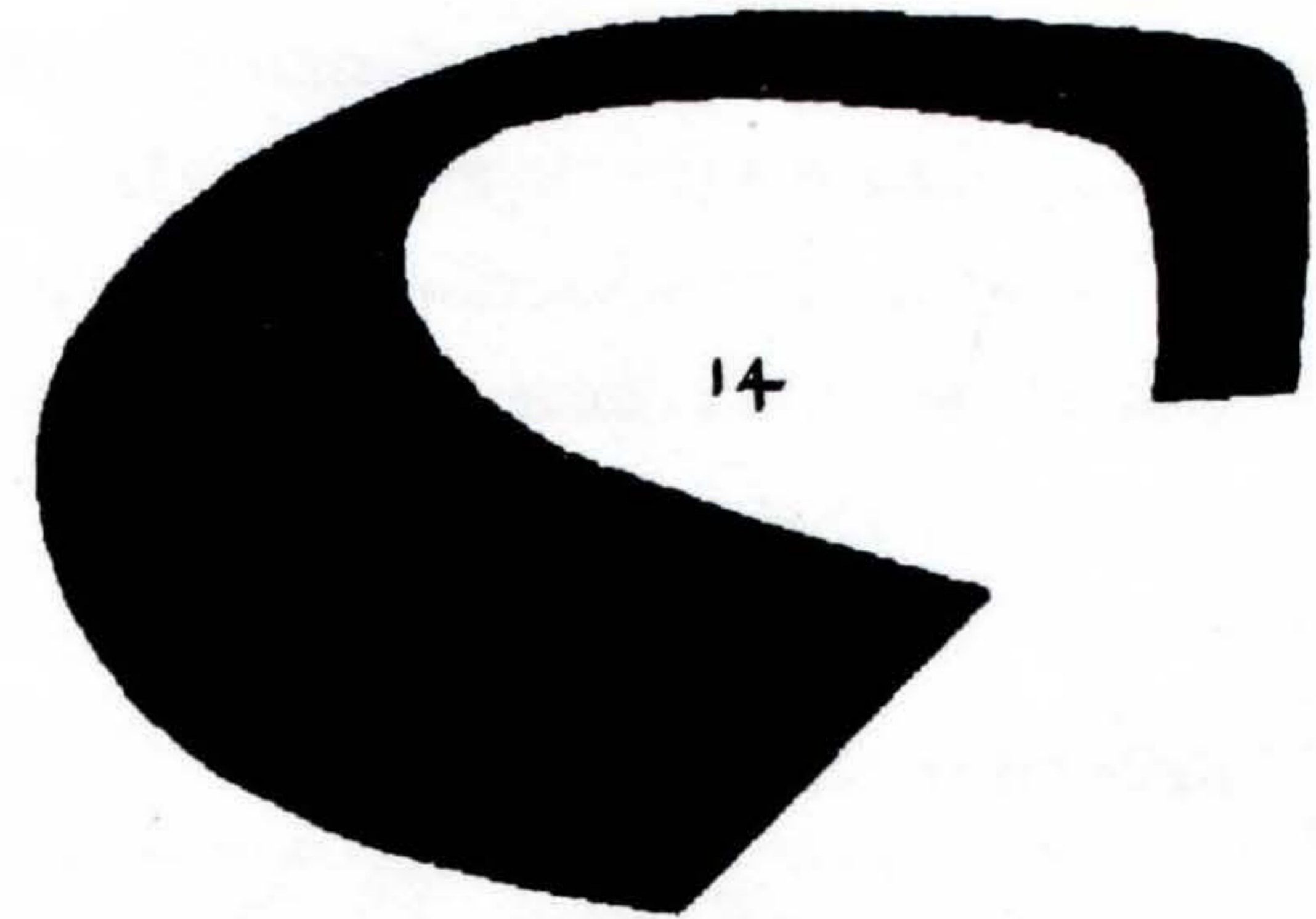
At this density the shading results in solid shapes which might be finished by smoothing the outlines.



The shading of 12 is probably too loose for human perception. Without the additional points of the dotted line the shaded shape would be difficult to recognize. The theory of the front describes the shape as a set of translations of the dotted line. The translations are intersecting. Two of them have been drawn in 13 with 2 different positions of the counterpoint.

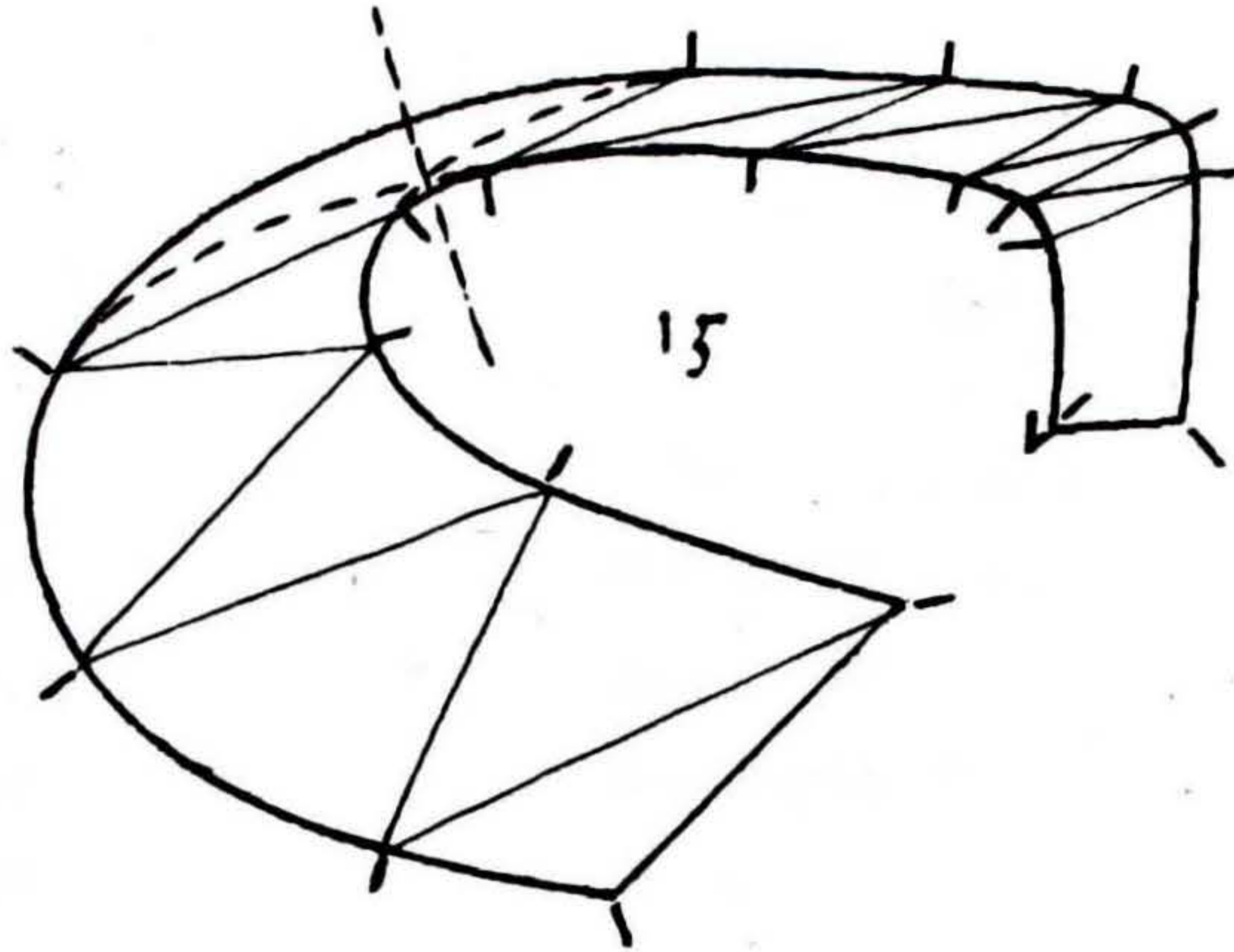


Perceptivity can be boosted by the mathematical formulas of a computer program. I digitized a shape such as 12 for Mac Ikarus, using the turning points of the zigzag as marking points. Mac Ikarus does not understand the craftsman's logic of 13. Instead of following the translations I had to switch to the other extreme by linking * with †. This resulted in an extremely wide span between the marking points of the outer outline.



Fourteen shows the shape as it was calculated by Mac Ikarus (in the coarse resolution of the Macintosh screen).

Fifteen is the corresponding outline-drawing with the actual marking points.



To this drawing I have added a reconstruction of my shading.

The theory of the front was invented as a model of the relationship between type design and handwriting, as a framework for evaluating studies in type design.

A theory should have a wider scope. It has to offer a reasonable explanation of any phenomenon in its field. In this case the effect of the theory is favored by the mathematical structure of Mac Ikarus, but it seems to work, anyhow. The most important question in digitizing—where should the marking points be placed?—receives a simple answer in this experiment: the marking points are controlled by the theory of the front.

Up to now digitizing belongs to the final stage of production. The experiment applied it in the first stage of design. This could return the definition of the shape into the hands of the designer.

SUPPORT FOR THE TABLE

Epistemological afterthoughts

IN 'THE SEVEN-TIMES TABLE' the invention of the word is the end of antiquity and the beginning of the Middle Ages. To others antiquity might come to an end when Aetius had to accept 'barbarians' as his allies to defend Europe against the invasion of the Huns. It is only my feeling which takes the invention of the word to be a more important turning point in history.

My preference for this event is connected with my personal position. In my own attempt to understand the changes in medieval writing and to understand reading disabilities I depend on my conception of the word. Without this conception I would be as helpless as the historians in their approach to the development of writing and as pedagogy in its approach to word blindness. My framework is my way to explain civilization.

Preferences need no proof. We cannot but accept or reject them. This makes discussion difficult. At most we

may expect better mutual understanding from such a discussion, but we will never arrive at a conclusion about the correct history. There is no such thing as correct history. Everybody might invent his own history. We must not, however, invent historical facts. The said Aetius really allied with the Franks to stop the Huns. And the word must have been invented in Ireland at the beginning of the seventh century. These facts must not be violated in decent history and they have to be documented convincingly.

The weak point is that the invention of the word has only little evidence in my table. One might ask if it is a fact at all. I only deduced its occurrence from pictures in books on palaeography and these pictures were selected for a different purpose. It would be beyond my knowledge of old manuscripts to make a new selection which does not depend on palaeographic anthologies.

The essay *The Seven-times Table* on the invention of the word inspired Martin Steinmann (University Library, Basel) to send me the text of a paper by M. B. Parkes, 'The contribution of Insular scribes of the seventh and eighth centuries to the "grammar of legibility,"' published in *Grafia e interpunzione del Latino nel Medio-evo*, Seminario internazionale Roma, 27–29 settembre 1984, a cura di Alfonso Maierù, Roma 1987 (Lessico intellettuale Europeo 41). Steinmann remarked: 'sometimes scholars and designers are thinking the same thoughts.' How close thoughts can meet could be demonstrated in Parkes' wording: 'When Irish scribes copied Latin texts they soon abandoned the *scriptio continua* which they had found in their exemplars. Instead they adopted as the basis for their scribal practices the morphological criteria which they had encountered in the analysis of the grammarians: they set out the parts of speech by introducing spaces between the words. This process is well advanced in the datable manuscripts produced at the end of the seventh century, such as the Bangor Antiphonary (Milan, Ambrosiana, MS C.5. inf.: *CLA*, 311; copied c 680–91), and the beginning of the eighth century, such as the Iona

manuscript of Adomnan's *Vita Columbae* (Schaffhausen, Stadtbibl. MS Gen. 1; *CLA*, 998; copied before 713).'

Thoughts are keeping more distance in: 'What characterizes the word-separation of Anglo-Saxon scribes is its delicacy: the space between words is minimal but adequate. They seem to have been conscious of the risk of impropriety when introducing a practice which was alien to the tradition of *scriptio continua* in the exemplars they were seeking to reproduce. This delicacy testifies to the sense of decorum which Anglo-Saxon scribes brought to the production of books.'

Of course not. The delicacy shows that these scribes were designers, understanding the balance of shapes. It is, however, with much relief that I find my declaration of the invention of the word confirmed explicitly in an independent paper. Parkes produces examples from the end of the seventh century and the beginning of the eighth century, whereas I claimed the invention of the word for the beginning of the seventh century, but this is not a contradiction, as according to Parkes the new way of writing was already 'well advanced' at the end of the seventh century.

The difference between the seven-times table and Parkes is not in the recording of the historical fact but in its appreciation. My turning point is merely a 'contribution to the grammar of legibility' in the scope of the scholar.

THESE LINES IN SCRIPTIO CONTINUA SHOW THAT
THEIRISH SCRIBES INVENTED LEGIBILITY AS SUCH
HAS SCRIPTIO CONTINUA IS COMPLETELY ILLEGIBLE
IN OUR SENSE OF THE WORD

Parkes suggests that the Irish scribes 'sought to achieve new standards of calligraphy' and that they derived such standards from the works of ancient grammarians. Here his thoughts are taking a different direction. Seeking new standards of calligraphy never produces historical facts but at most journalism. Perhaps someone might have sought, but I do not know of any instance where such seeking resulted in standards. New standards come when we do not care for them because we are concentrated on the work under our hands. *The good craftsman seeks out the commonplace and tries to master it,*

knowing that originality comes of necessity and not of searching (Edward Johnston, *Writing and Illuminating and Lettering*). I found my turning point when my work imposed a state of mind disclosing a translucent panorama of the Middle Ages. And it was only afterwards that I could realize that something important had happened when the dominating force in the development of medieval writing appeared to me as the obsession to consolidate the image of the word. This has nothing to do with language or linguistic grammar and only very little with orthography, but everything with visual perception. It was a new principle of design which made medieval scribes look at old things with new eyes.

Obviously the same historical fact can be discovered along different roads. Parkes does not understand anything of design because he is preoccupied with linguistics. Nevertheless, he arrives at the same point. Why should my identification with my old colleagues be a better method? This is difficult to decide; the decision is even impossible if the issue is isolated.

Isolation of subjects always makes understanding

difficult. Try, for instance, to isolate any of the following statements:

1. The alphabet cannot be improved.
2. Serifs are redundant.
3. The tool of Western writing is the broad nib.

When isolated none of these statements can be refuted or confirmed. However, when considered together it is rather easy to see that the first and the third statements are true and that the second statement is false. Isolation, such as the isolation of typography from other writing, is always demagogic in its effect (even when it is not intentionally demagogic).

I do not understand what Parkes says about grammar and how this could ever bridge the gap between antiquity and Western civilization, whereas my connection (design) explains everything. It explains how 2 constructions, the interrupted construction ('roman') and the turning front ('cursive'), originated from the same ambivalent Roman minuscule. It explains why the contrast of medieval handwriting increased continuously. It explains why the interrupted textura became ever narrower

whereas the cursive hands became wider. And it explains why finally typography turned to the old-fashioned writing ('littera antiqua') of the Italian mannerists. All these phenomena have been 'explained' previously as the impact of religion, humanism, economy, social changes and other 'spirits of the time' which explain nothing because they could explain anything. I demand of an explanation of design that it explains design. This is my only justification of disturbing my students with history. My history has to bring the forces of design into their control.

The 'delicacy' which is attributed by Parkes to Anglo-Saxon handwriting, because its word spaces were minimal, is merely a characteristic of any Western writing unless it is bad. (Scholars are accustomed to bad handwriting and to poorly justified typewriters.) Probably Parkes does not understand much more of design than I do of linguistics. This difference in attitude, method and purpose reinforces the discovery we are sharing: the word was invented by Irish scribes in the beginning of the seventh century.

Besides making medieval design understandable, this

turning point in the history of Western civilization could help us to improve the teaching of reading. *The Puzzle* (page 42) is rooted in my view of history.

Of course, you could be satisfied with the present state

of education and you might really believe that the textura was narrow because the cathedrals of later centuries were quite high. Then you would have no need for reasonable history as a substitute for cherished myths.

UNDERSTANDING TYPE DESIGN

SUPPOSE YOU ARE A teacher of typography. Because of the round number of his anniversary Giambattista Bodoni will be a topic of the trade magazines in 1990. How would you explain his meaning to designers who are translating their drawings into the vectors and bitmaps of digital type? You could take it easy by pointing at the presumed independence of Bodoni. And because our electronic dungeon allows still more freedom we would only have to learn from Bodoni how to win the game by violating its rules. This approach would be as easy as any other destruction, but it will not be your approach for you were supposed to be a teacher; it would be your duty to make type design understood.

It has been suggested that a principle of type design could be found in the technique of punch cutting. A study of the craft of punch cutting could contribute to the understanding of type design. Of course, such an in-

verse relationship between design and a way of executing design has never been demonstrated, but let us try.

Students of the department of graphic design of the Royal Academy of The Hague visited the Museum Plantin Moretus at Antwerp. The staff of the museum had been so kind to make some special arrangements for their visitors. On a desk in the library a small box labeled ST 22 was waiting for us. What at first sight looked like a collection of hand-wrought nails turned out to be the punches of the joli roman (± 6.5 point Didot) by Hendrik van den Keere. Our binocular microscope revealed the qualities of its design. Due to the tradition of the Academy, all students had some experiences in type design of their own. They knew the complications of designing small letters on a large scale. Now they learned that designing at actual size must have had its complications as well. How could Van den Keere cut punches with

a tool of the same steel, and how could he control the result at this small size?

Students know how dangerous it is to ask such questions; they might lead you to new questions which could easily disturb your ambitions for the future. Therefore a teacher can be satisfied when such questions are nevertheless arising. I had now a handle for an introduction to punch cutting. We could see the strokes of the graver being beveled away from the shank of the punch or carefully leveled out in its counters. In the shapes of the typeface no trace of the tool is left.

Yet we did not really learn what punch cutting is. I could demonstrate that a stroke with a graver in rolled copper removes ten times as much of the material as the same stroke in annealed steel, but one demonstration does not make the spectator into an expert in copperplate engraving and steel engraving. I would not say that my

students understand punch cutting. They might, however, understand that the influence of punch cutting on type design cannot be indicated, because there is not such an influence.

Punch cutting might not be very important for the history of type design, but during 500 years it has been a practical condition for type-production. This justifies to a degree the stress on punch cutting that is made by the authors of our classics on the history of typography, though not much information is to be expected from a paragraph on engraving written by an author who does not even know how to temper or to hone a graver.

Probably the classical story did not have the purpose to make punch cutting understood. The intention might have been to make us believe that typography must be independent of the stroke of the pen, and this propaganda has been very effective.

UPDIKE & SCHOLARSHIP

IN HIS ADMIRABLY written book, *The Printed Book in America*, Joseph Blumenthal praises the works of Daniel Berkeley Updike: 'Of great importance to his craft, his written works in the history and scholarship of printing are primary sources for its understanding and appreciation,' and, more specially about *Printing Types*: 'Updike's scholarship is thorough and perceptive, his style is urbane and witty.'

This is generous, very generous, and I try to believe that it is honest as well, but I do not recognize anything of it in my reading of *Printing Types*. The judgement of Updike is amazing and perhaps, if you would happen to enjoy a very special sense of humor, even amusing, but everywhere it demonstrates painfully the absence of the most elementary understanding of type design and its history.

I appreciate *Printing Types* as an invaluable compilation of facts, dates and pictures which has been unsur-

passed in the fifty years after its publication. If it were revised, most of the information could be brought up to date without essential changes, and this is remarkable enough. *Printing Types* is an excellent directory, but as a work of scholarship it is ridiculous.

It is necessary to say this if I want to be trustworthy for students of typography and type design. I have to assure my young colleagues that it is not their fault when they do not understand anything of this 'source of understanding.' *Printing Types* does not offer the slightest contribution to the understanding of typography but rash prejudice at most.

I come to this now because I wanted to consult *Printing Types* about Bodoni. For the facts *Printing Types* might still be reliable, but Updike's interpretation of the facts is definitely nonsense. This would not be a serious problem if there were an alternative, but I do not know of its existence. I am afraid that there is no source for under-

standing the history of type design and typography. Perhaps even this would not be a very serious problem if everybody were aware of this situation. The serious problem is not that we do not understand anything, but that we appreciate our accumulated misunderstanding as knowledge or even scholarship.

This edifying consideration resulted in an attempt to invent a scientific framework for history (the *Exercise*, page 72).

As to Updike's style it is not my principal objective to criticize it, but I find it at more instances clumsy and ponderous than 'urbane and witty.'

Some positions, such as the traditional reputation of Updike and Morison and probably Tschichold and Mardersteig, cannot be discussed. Turning to the psychologist in the teacher of design, I would like to know why this 'is not done.' He is not quite sure. Any social circle has its unassailable authorities. Other members of the tribe may get lost or may even be sacrificed deliberately only to preserve the sacrosanct position of the leader. In a primitive society this behavior might be necessary for the

survival of the tribe. However, to explain it as sheer atavism might be a simplification in an individualistic society such as ours. There is at least also some logic in the civilized tradition of celebrating the dead prophets and killing the living ones. The latter do not as patiently accept our adjustments of their message as the dead. Moreover, in our overestimation of youth the young generation is a threat to any established position. It would be the ideal solution for this problem if young people could be educated in respect for our position while keeping them busy with attempts to understand the understandable. This method could prevent our personal dismissal for a while. But the combination of tribal and individualistic reactions is not healthy for a modern society. For science and scholarship it is a disaster. It is worrisome that scientists and scholars are so readily inclined to condemn an open attitude as something that 'is not done.'

Even this more complicated explanation of cultural repression might be a simplification because a few exceptions, such as *Letterletter*, are often accepted.

THE FRANKLIN LETTER

Benjamin Franklin wrote the following letter to Bodoni, dated Philadelphia, October 14, 1787:

I have had the very great pleasure of receiving and perusing your excellent *Essai des caractères de l'imprimerie*. It is one of the most beautiful that art has hitherto produced. I should be glad to see a specimen of your other founts besides this italic and roman of the Letter to the Marquis de Cubières; and to be informed of the price of each kind.

I do not presume to criticize your italic capitals; they are generally perfect: I would only beg leave to say, that to me the form of the *T* in the word *LETTRE* of the title page seems preferable to that of the *T* in the word *Typographie* in the next page, as the downward stroke of *T, P, R, F, B, D, H, K, L, I* and some others, which in writing we begin at the top, naturally swells as the pen descends; and it is only in the *A* and the *M* and *N* that those strokes are fine, because the pen begins them at the bottom.

THE FRANKLIN LETTER IN HISTORY

I owe the quoted text of the letter to D. B. Updike, *Printing Types: Their History, Forms and Use*, Vol. 2, Cambridge, Harvard University Press, 1922. Updike uses the letter to prove the international fame of Bodoni. If this should be important there is only little support in the letter for this fact. With the biography of Franklin in mind I would not read the text as a letter of the famous scientist or the famous statesman but as a letter of an old man who had taken up again his old profession of printer as a hobby. In this letter the old American printer expresses his critical appreciation of the work of the Italian type designer.

In my view Updike missed the point. This is not extraordinary, for in the same view Updike always missed the point. It would be easy to compile a voluminous anthology of the curious comments with which Updike

decorated his impressive collection of facts. Here is as an example of how Updike explains the style of Bodoni:

‘But while it was in his first period that he produced his most beautiful books, he himself did not think so. It may be said that this is self-evident, because he soon changed his style for one which he must have considered an improvement. But it was not Bodoni, but the spirit of the art around him, that made his later types more and more rigid, their heavy lines thicker, and their light lines thinner and more wiry. Wonderfully perfect as these types were in detail, they contributed to a style of printing that made these later books as official as a coronation, and as cold as the neighboring Alps.’

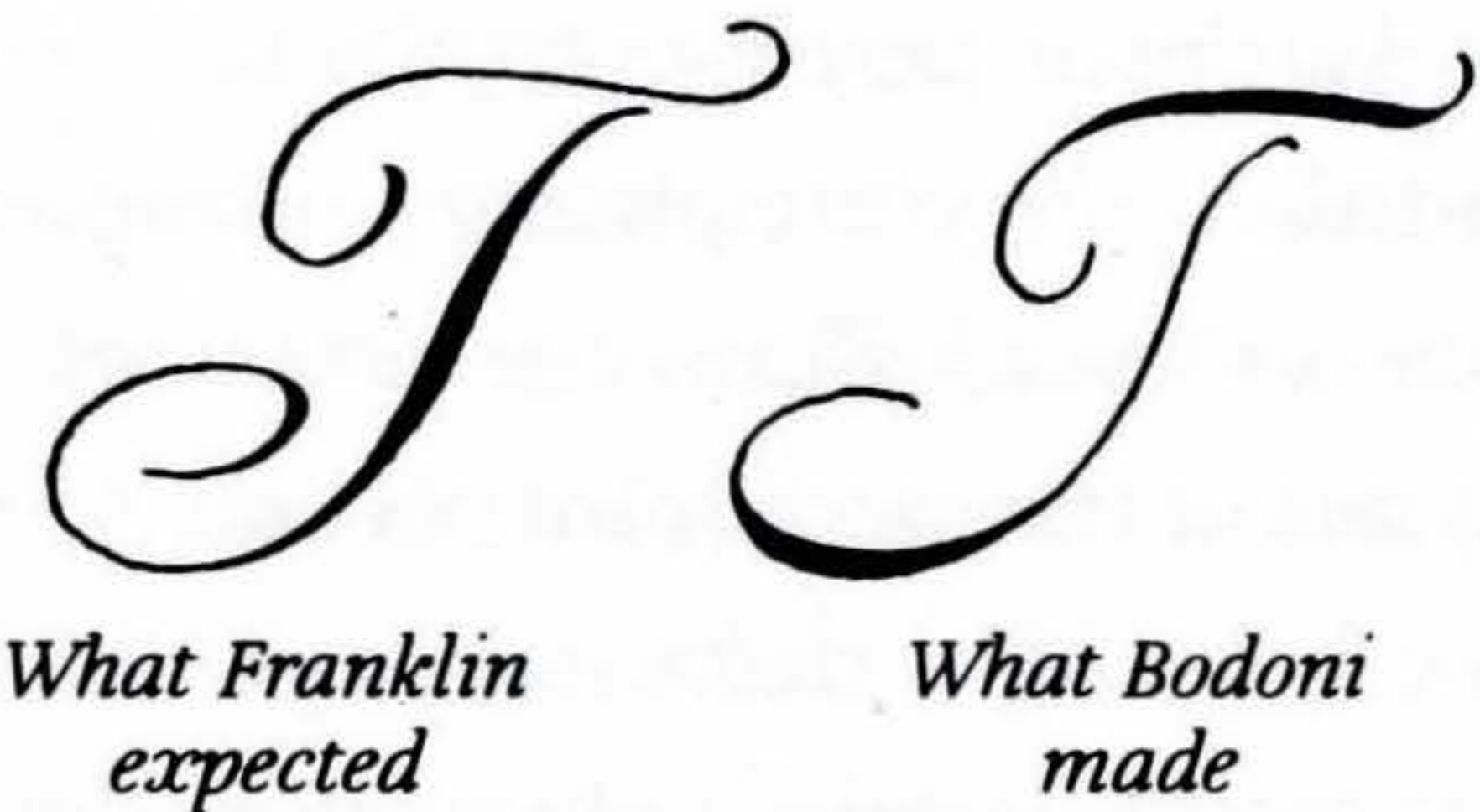
Is it not amusing? Even in *Letterletter* one would not likely find its equal. I return to the letter to read it again, this time in my own way.

READING THE FRANKLIN LETTER

Franklin finds that Bodoni exchanged the accents that handwriting would ‘naturally’ give to the letters.

The first conclusion to be drawn is simply this: For

Franklin it is a matter of fact that type design can be discussed in categories of handwriting. If this idea had been extravagant, Franklin, in his polite style, no doubt would have apologized for his unusual argument.



Franklin was a man of the world. He knew the old world as well as the new one, and in both hemispheres he had lived and worked at all social and cultural levels. If his argument had not been familiar in the world of his time, he would, again, have introduced his odd notion. This results in a second conclusion: In the time of Bodoni handwriting was the standard of type design of the Western world.

Franklin worried about Bodoni’s deviation from the

standard as he, Franklin, understood it. No doubt, his view on handwriting was sufficient for the scientist, the politician and the mediocre typographer he was. It did not meet, however, the subtle understanding of the accomplished printer and type designer Bodoni.

In his typefaces Bodoni took profit of the two different positions of the pen that could be applied in majuscules. This is why Franklin could point at two different forms of *T*.

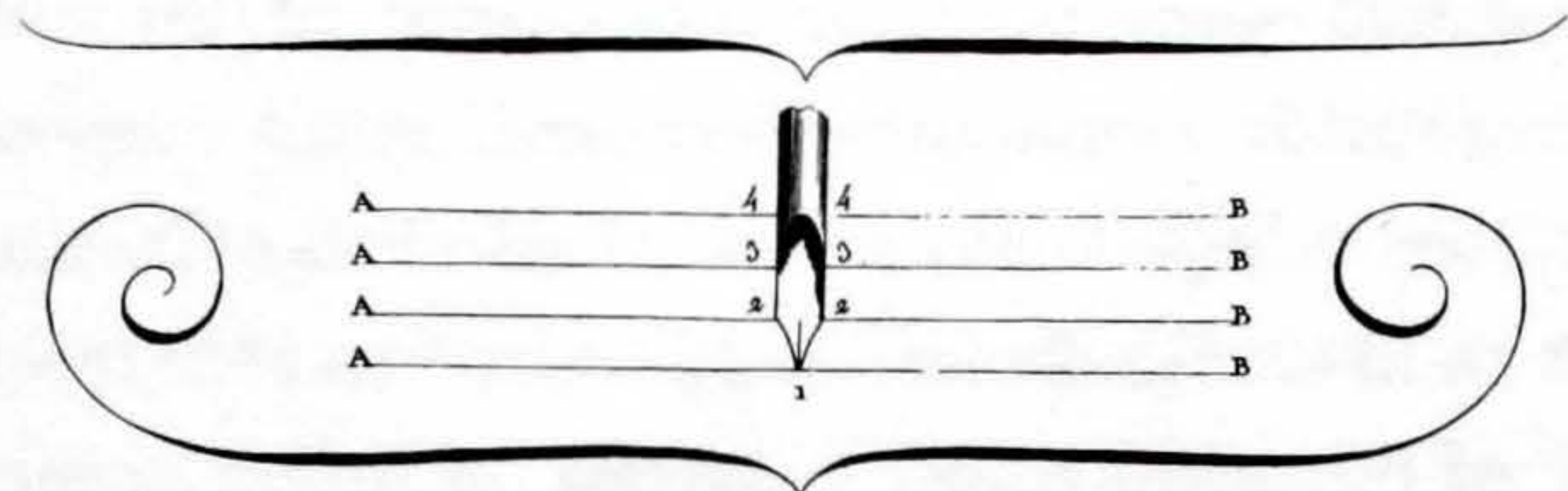
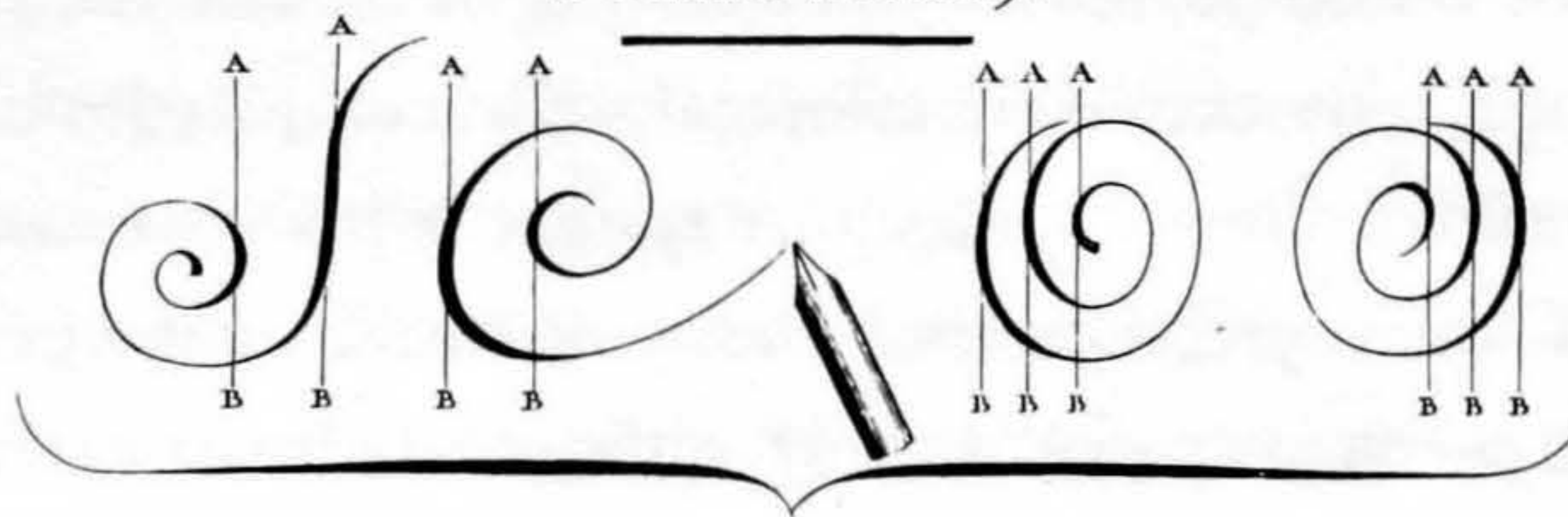
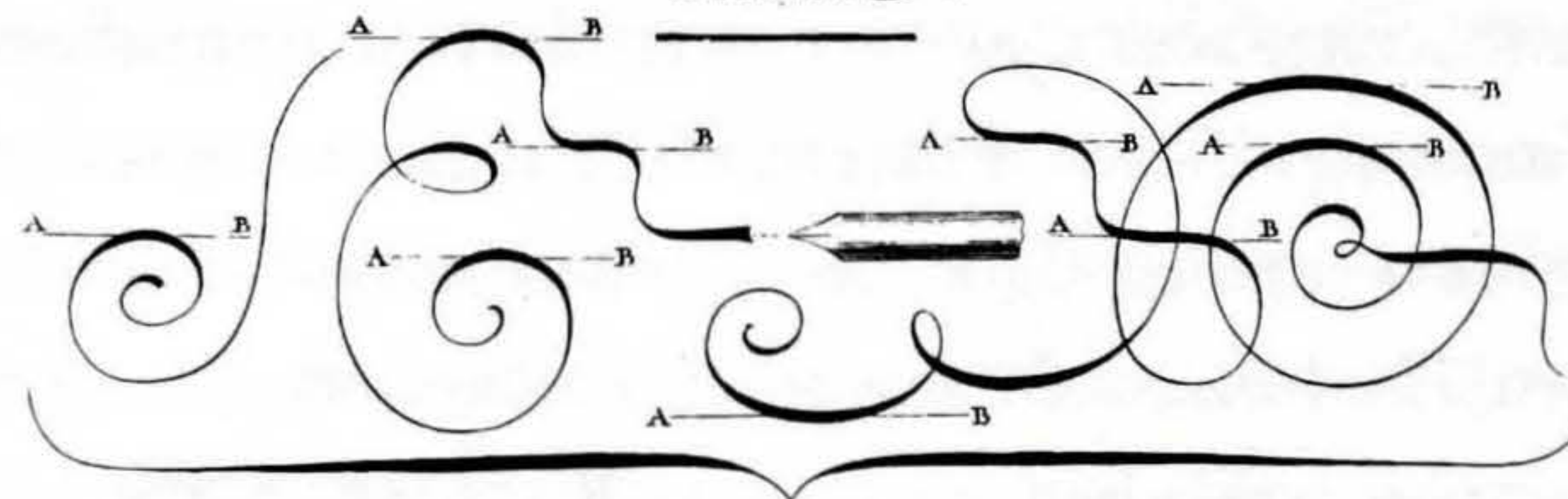
Third conclusion: The letter does not show that Bodoni cared less for the standard of writing than Franklin did, but that Franklin did not know the finer points of the standard. Obviously he also did not know the typefaces by Fleischmann and Rosart which have the same arrangement of contrast in *T* which he criticized in his letter to Bodoni.

THE STANDARD OF TYPE DESIGN

As a matter of fact the typefaces by John Baskerville, Richard Austin, Bodoni and their contemporaries are reflecting the standard of handwriting of their time.

It should not be too difficult to reconstruct the text-hand of the time from these derivatives. A full range of the different shapes of the different body-sizes of Baskerville's or Bodoni's roman could in one respect reveal more of this hand than a collection of formal manuscripts would do, for the manuscripts, as formal as they might be, are extremely informal when compared with type which allows the designer to specify his view with much more precision than the swift stroke of the pen could carry.

As I can see, the manuscripts do not differ essentially from the typefaces that have been derived from them. The most significant difference is that the manuscripts are always earlier than the typefaces. Had Franklin known *The Universal Penman*, the collection of English calligraphy published by George Bickham in 1743, he would have recognized it as the background of Baskerville and Bodoni. And in the excellent treatise by Paillason, *L'art de l'écriture*, in the *Encyclopédie*, he could even have found the question in his letter to Bodoni answered explicitly.

*Primitive Position.**Seconde.**Troisième.*

Obviously Franklin did not know these works or, if he did, he certainly did not peruse these fundamental works, but perhaps Bodoni did. Bickham and Paillason might have made him exchange the example of Fournier for that of Baskerville.

THE WORK OF BODONI

'Wonderfully perfect as these types were in detail' is how Updike chooses to characterize the typefaces of Bodoni, but Updike does not reveal what he finds so perfect in them, and I cannot see it. I like their vigor and their carefree irregularity, but I would not call them perfect because of their deliberate 'imperfections.' Similar parts, such as the stems of the letters, are different in thickness, direction and shape. The dull perfection of the Bodoni revivals on our composing machines is absent in Bodoni's typefaces. Instead, they revel in the freedom of good penmanship. Bodoni enlarged the irregularities of the small sizes almost proportionally in the big sizes. He could have easily avoided this. We have to conclude that Bodoni made his typefaces deliberately as irregular as

good handwriting or at least that he liked them as irregular as they are.

All these qualities are pulling the typefaces of Bodoni out of the reach of the drawing office where a smooth outline is mistaken as a paramount quality in the production of type. If we did not already learn this from sixteenth century type designers such as Hendrik van den Keere, Bodoni offers us a last chance. His 250th anniversary in 1990 might be a good occasion.

Updike is not a source of understanding Bodoni and there is nothing else that is much better. There is only a remark by Stanley Morison that the change in Bodoni's style was influenced by the work of Baskerville. This is true – not that I could prove this influence, but by assuming it we could come closer to the understanding of Bodoni, and in this sense we would probably come nearer to truth.

A RELEVANT HISTORY OF BODONI

Bodoni was a good craftsman. He followed the best example he could find and he believed he had found it in

the work of Fournier. I do not think that he read how Fournier justified his design by pointing at the criteria of handwriting in his *Manuel typographique*. Perhaps typographers never read.

The work of John Baskerville was a revelation for him. Bodoni had found his new master. Here it was not necessary to read anything, because it was clear at first sight that the writing master of Birmingham in his type design was just continuing handwriting with other means. Once again typography was writing with prefabricated letters and this is how Bodoni now had learned to understand typography. I do not know this because Bodoni said so (as he seemed to have done) but because I can see it.

The assumed influence of John Baskerville does not sufficiently explain the change in the attitude of Bodoni, for the range of his shapes is more extended than that of Baskerville. It is this extension which puzzled Benjamin Franklin, who knew the work of Baskerville well enough. Moreover, Bodoni was not the only type designer who followed Baskerville. All his contemporaries did. All typographic instances where Bodoni could have found his

new style were interpretations of handwriting. Only from a narrow typographic view could these adaptations of common calligraphic practice be taken as innovations.

It seems to be difficult to find out whether Bodoni followed Baskerville and other type designers in his interpretation of contemporary calligraphy or more immediately their style of design. The difficulty is that in this case type design and handwriting can hardly be distinguished.

For the journalist something is important when it is news. From this point of view Mr. Bush is more important than Franklin, Adams, Jefferson and Washington together. Cultural events are evaluated in the same way. This newspaper esthetics has superseded the appreciation of quality: to be good a work of art has to be new and it should be conspicuously so too. The famous artist of today is a fortune-teller; he has the mysterious imaginary eye foretelling what we want to see. (Of course, he is not supposed to predict the more probable effect of this stupidity.) Historians of art take much trouble to rewrite history in esthetic newspeak. They would show Giotto rather as the first painter of a renaissance than as the last

important medieval painter of Tuscany. This might be a complication for our appreciation of Bodoni. For the gossip of the day Bodoni can only be made important if we could promote him as an innovator, whereas his work can only be understood as an interpretation of his predecessors in handwriting and in type design. This is sufficient to make him uninteresting for modern eyes. It would be of little help to point at the original or even unique subtlety in this interpretation; this would only make things worse, because subtleties cannot be rendered in headline journalese. My perspective on Bodoni will not likely contribute to his fame. I can only hope that it will inspire students of writing to study his work with a new attention.

When I visited Alfred Fairbank on his eightieth birthday, I made some photographs. Fairbank arranged the pictures cleverly: he did not give me a chance to take a picture which would show him without a pen in his hands.

There is a portrait of Johann Michael Fleischmann with a mold in his hand and with all the tools of the punch cutter on his desk. The tools are telling the whole

story: this is the portrait of the great type designer. Am I exaggerating the meaning of details?

There is a portrait of Giambattista Bodoni. In his hand we do not see a mold or a graver but a quill. The simple message is that this type designer wanted to be de-

picted with the tool of the penman. Why not accept the hint?

Bodoni interpreted handwriting in his typefaces. This is his relevance for our position.

EXERCISE ON HISTORY

WHEN, AS A CHILD, I read about the English wars, I learned stories of brave Dutch enterprises, most of them incredibly victorious. Obviously my books were devised to educate the young generations of the Low Countries to patriotism, not to asking questions.

Later, reading English historians, such as Callender, about the same events which were now referred to as the Dutch wars, I learned that the impertinent Dutch fishermen were always defeated by the English navy, except when it was foggy by day or dark by night. And when a Dutch squadron sailed deep into the heart of England and demolished the fortified naval docks on the barricaded river Medway, the Dutch were desperate rather than brave or smart and they could only succeed because England was paralyzed by the Plague.

There is sufficient nonsense in my childhood reading to arouse suspicion. In spite of their victories the Dutch had to give up Nieuw Amsterdam and to accept that the

defeated enemy called it after York, a township somewhere at the other side of London.

But the serious history for adult English readers deserves some suspicion as well. Victorious England was forced to amend its own proud English law in favor of a defeated enemy (the Act of Navigation) and to accept the everlasting memory of the Dutch terror in the English language with the curious degrees of comparison: bad—worse—Dutch. Dutch disease, a lethal virus infection in elm trees, has a worthy counterpart in the Dutch name of rachitis: Engelse ziekte.

The facts about these wars are at hand in the governmental archives of both kingdoms, nevertheless they do not seem to impose rigid restrictions on adapting history to educational purposes.

Something sensible could come out of cool calculation. From the number of ships lost on both sides and the average crew on naval vessels we could conclude that the

first and the second English wars were the most cruel massacres of the time. Many thousands of young lives were sacrificed to nothing but the trivial interests of a few rivaling fish and slave merchants.

I do not know whether this view of the most glorious history of civilized Christian nations could be of much help for our approach of the issues of our own time. For this moment I am satisfied with the conclusion that history is tricky stuff.

THE SIGNIFICANCE OF HISTORICAL EVENTS

Once I believed that the history of typography could be separated from the history of writing simply because this was the history written by learned men in famous books. History seemed to be definitive to me: we cannot change the past.

The past is a set of chaotic events without any significance of their own. If we want to observe any significance in events of the past, we will have to impose this significance upon them first, and before we can do this we have to make a small collection of events, because it would be physically impossible to deal with a big collection.

Many acorns have fallen from many oaks. Their significance depends on our interests. It will be different for a biological interest or for a climatological interest, and for the history of physics all fallen acorns will probably be indifferent except the acorn that in the seventeenth century fell upon the nose of a sleeping scientist. This means that we have to make a significant selection of events before the significance we want to observe in them can be imposed upon them. But then the significance which we may choose to attribute to our observations must already be there before a first observation can be made. Any observation is guided by a dream, a brainwave, a fantasy, a revelation or however we might like to call it. In science this metaphysical intruder has to be made manageable in crisp wording. This will result in a statement of a special class; it is a hypothesis or a theory (hypothesis and theory are not different things but just different words for the same kind of statement).

History is the art of making a significant arrangement of significant events of the past. The significance a historian wants to expose is largely a matter of his desire. The origin of the questions which are moving him is hidden

in his soul. The ultimate reason to separate the collection of typographic events from other events in the realm of writing or, otherwise, to integrate the history of typography in the history of writing, is a psychological reason or a reason of the soul. From a psychological point of view we cannot say which trauma is the better one. If we would not like to make psychology too important we could say that we only observe what is significant and that any significance depends on our faith.

In my example from the naval history of England and the Netherlands, the significance of the events is connected with the historian's point of view, and this depends clearly on his commitment to his subject and to his audience. I presented this commitment as the weak point of the historian, but it is his strength too. A more distant point of view would make the events appear less distorted, but also less significant.

THE PROBLEM OF SELECTION

Against the chaotic multitude of events, the selection of relevant events might seem to be difficult. This difficulty, however, is solved by my problem even before it can

arise. When I do not yet have a problem I can live in peace with the multitude of things as they are. Then, in a dream or at another occasion of revelation or diffuse thinking (the level of thinking which is called feeling) a few things could appear in an intriguing or even a significant coherence. This ready, dreamed selection is not only the origin of a hypothesis; it already is a hypothesis, though probably a weak one. Usually the revelation looks more like a problem, which can only be solved by working. Insofar as dreams can be attributed to a psychological condition or to faith your dream is as good as mine. But as a hypothesis not every dream is as good.

THE QUALITY OF A HYPOTHESIS

In science the simplest and most beautiful hypothesis (or theory) is the best one. Fairy tales might be considered simple when they can be understood without much thinking and beautiful when their sentences are short and direct. I would always try to write simply and beautifully in this respect, but in scientific fairy tales these literary qualities are not decisive.

A scientific theory is beautiful and simple when it

does not hide its restrictions and its weak points. It will, on the contrary, expose them as clearly as possible and show precisely how it can be criticized. Insofar as it does not, it is not a theory but a myth or a dogma. Just like theories, myths are revealing of the significance of events, but they just want to be accepted as they are. Beautiful and simple as they may be in their own way, they do not claim the main virtue of a theory, which always provokes criticism.

Admittedly there is a lot of wishful thinking in this comparison of mythology and science. In fact it is not so easy to distinguish them. The current model, for instance, of an expanding universe that began with a big bang is far from beautiful or simple. It is rather a myth (though a silly one) than a theory. And even this simple observation could evoke taboo reactions such as might be expected from the fanatical believers of a myth, but which should not occur in any scientific discussion.

On the other hand myths not only demanded belief; they communicated understanding as well, in tales 'to present what knowledge there was of the fabric of the world.' The content of ancient myths often seems to be

primitive because it is distorted, due to the 'astronomical, geological, biological etc. etc. ignorance of most Assyriologists, Egyptologists, Old Testament scholars, and so on: the apparent primitivism of many myths is just the reflection of the primitive knowledge of their collectors and translators.' (I found these quotations in Paul Feyerbens's *Against Method*.)

Perhaps my distinction between myth and theory might be approved thus: The defense of an accepted theory is of mythological nature, whereas the criticism of a theory could be of a more scientific nature. This approach transfers the difference between myth and theory from the content of a hypothesis to the response. It is our reaction which is mythological or scientific rather than the hypothesis, which seems to be of metaphysical origin anyhow.

Such questions as whether the study of typography can be isolated from the study of writing or whether both studies have to be integrated, can be answered from many different attitudes between two extremes. In a mythological attitude one position has been chosen and this one will be defended. In a scientific attitude both

positions are criticized. These extremes are the poles of human attitude, both of them as intolerable as the poles of the earth. The orientation of human life might be dominated by one of these extremes, but it cannot be reduced to it; inconsistency is human fate. Even in the famous scientific discussion of quantum mechanics, the last arguments of Einstein and Bohr were mythological prejudices.

I could now try to improve my distinction once more: a scientific discussion of a theory seems to be a rational attempt to justify a religious position. With this refinement my antithesis has lost much of its clear rigidity. What can be saved of it? I would maintain that any scientific (or scholarly) comparison of theories has to be decided by their explanatory power and never by the reputation, let alone the number, of its adherents or because we are accustomed to a special theory. Nevertheless this is what will always happen. It is hard to give up a dream or a comfortable feeling because it is in contradiction with empirical observations, but nevertheless this is the first rule of the game called science.

HISTORICAL FACTS

Reality provides us with the arguments for discussing theories; a theory is refuted when a contradicting observation can be made. Scientific research is the search for such facts. A fact is real when it can always be observed again (when the proper ritual is observed: the observation of a star might require a telescope whereas the observation of Mont Blanc might require a journey).

In this narrow scientific sense of the word, historical facts are not real. All we have are recordings of events that cannot be observed anymore. When we assume the authenticity of the recordings, we can only believe the facts. Historical facts are believed or deduced interpretations of real documents. This puts history in an awkward position from a scientific point of view. In science we are challenged to invent highly improbable theories, because it is the greatest triumph when the most improbable prediction comes true. As far as I can see history is the prisoner of probability.

'You too, Brutus' has been recorded as the last word of Caesar. We do not readily believe the record because it is

not probable that Caesar would have cared very much for literary statements while choking in his blood.

It has not been recorded that Gutenberg invented typography. Nevertheless this is believed because it is probable to many of us. I do not believe that Gutenberg invented anything, but my doubts could be reduced to considerations of probability as well. I do not see an escape from probability, but history should nevertheless try to invent theories that will make everybody say: that is highly improbable. History too has to be provoking.

THE SCIENCE OF HISTORY

History does not belong to science. This does not reflect on history itself but only on the fact that historians are not used to present their views in scientific (mathematical) models. As soon, however, as I choose to introduce a scientific model into history, history becomes a science under my treatment.

The objection could be made that history cannot be treated this way because history does not deal with real facts, as physics does. This is the objection with which I

kept myself under control, but step by step I had to give it up. First I found that I could make an exception for writing (and craftsmanship generally) because the impact of a tool on material could already be rendered by a mechanical (that is mathematical) model, and this is how the treasures in our libraries have been made; enough to keep me busy for a while. Then I realized that history would be practically impossible if we would not attribute a degree of reality to the unreal historical facts. To this degree history could be subject to the methods of science.

When you allow me to assume that the manuscripts of Nicolas Jarry really were written about 1650 and that Grandjean really cut his *romain du roi* towards the end of the seventeenth century, then these presumed realities could be simulated in a model representing the typeface as a projection of the handwriting. This is a scientific conclusion based on reasoning presuming the empirical reality of recorded statements.

It is an advantage of scientific history that it demands apodictic statements, which can be refuted easily. It is not interesting whether you believe me or not. The question

is whether you can demonstrate, for instance, that the handwriting of Jarry cannot be projected in the typeface. As long as you do not, my hypothesis will stand as the best approach to truth, and this fact makes any other position untenable. Then everything that has been written or said about the design of the *romain du roi* has to be rejected except for the views of André Jammes, who studied the documents concerning the *romain du roi* (I owe a lot to my conversation with him).

A model would allow me to invert history and to consider the handwriting of Jarry as a projection of typography. Alfred Fairbank did so in the King Penguin editions of his *Book of scripts* (in later editions the error has been removed). In a mathematical model the inversion of an object and its projection is not necessarily an error; it could be a method for checking the model, but the trick should not be extended to reality. As a rule events of the

past cannot be changed in the future. What can be (and has to be) changed is not the past but history.

I have to admit that a mathematical model would prove that the same point of view allows many different interpretations of the same set of phenomena. In his famous (which could mean infamous as well) *Against Method*, Paul Feyerabend claims that 'anything goes.' This is in contradiction with the mathematical model which shows that not anything, but only an infinite number of interpretations, is possible. The difference might seem to be futile at first sight, but it is substantial: there is always an infinite number of other points of view that could be taken, and from each of these points of view nothing goes. If Feyerabend, however, had given away this refinement it would not have made him as famous as the false statement.

THE OTHER HAND

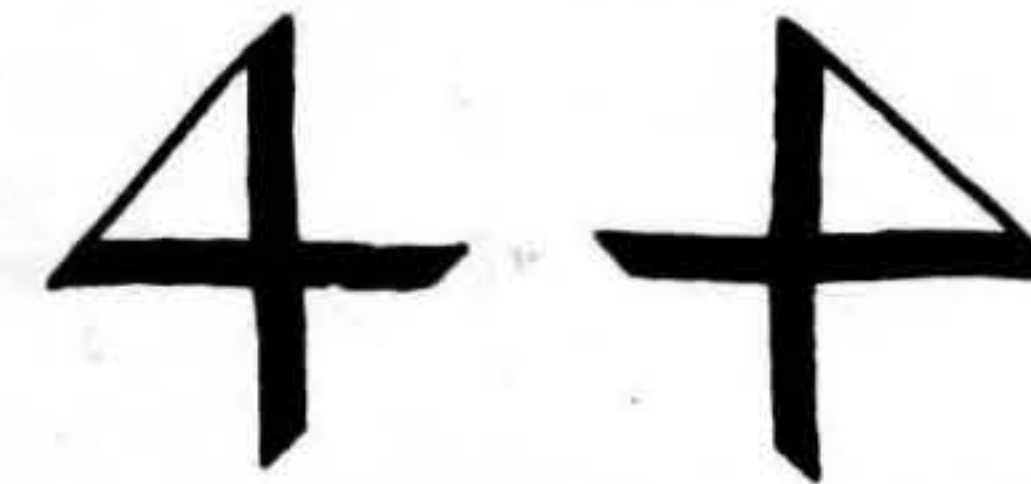
MANY LEFT-HANDED people are writing with their right hand. I encourage left-handed students to write with their left hand, because they too should work under optimal conditions.

I am used to sketching and writing the lettering for engravings downwards for the most natural control of the contrast of reversed writing. Left-handed people have the advantage that they can more easily write mirror-wise on horizontal lines. Accordingly they should write readable writing downwards.

Greece is still under the Turkish rule of its own authorities. In a conversation with a Greek physician about left-handedness, my learned partner spoke: Left-handedness does not occur in Greece for it is forbidden.

In Holland stealing bicycles is forbidden; nevertheless I would advise you to lock your bike.

The broad nib is essential for discussing left-handed writing. Only a broad nib reveals the essential difference between these two:



Ambidextrous writers are right-handed persons who imitated a left-handed mother.

A MATRIX OF WRITING

NUMBERS CAN BE written in words or in numerals. When written in numerals, numbers are ideographic. For the reader they might be rather logographic; German readers will read 92 as *zweiundneunzig* whereas French readers will read *quatre-vingt-douze*, but both

expressions are addressing the same concept as the English expression *ninety-two* and in this respect our numerical system is a perfect and universal ideographic system. Universal understanding is only blotted by the separator between units and tenths which is written sometimes

1	2	3	4	5	6	7	8	9	0	1
2	3	4	5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0	1	2	3
4	5	6	7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2	3	4	5
6	7	8	9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4	5	6	7

1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8

with a comma and sometimes with a point. This could become a real problem because in both traditions the other sign is used as the separator between thousands and hundreds. Of course, everybody could know that the Americans do not follow the Dutch, but few of us will be sure at what side the Polish, the Vietnamese, the Chileans and the Turks are standing.

When preparing this article I consulted a pile of the world's most famous manuals on typography to make sure that they have nothing to say about numerals. The most amusing information is offered by Marshal Lee. In *Bookmaking* he says about numerals: 'numbers are called figures.' This is an excellent argument to put the pile aside and to make a fresh start.

To start with I have made one arrangement of numerals accentuating the lines of writing with generous leading and another one looking like a matrix (by spacing the numerals widely). Now I have something to look at. The first impression is that the numerals in the lines are looking smaller than those in the matrix. Moreover the matrix creates the impression of greater clarity; the numerals in the matrix have the greatest 'magnitude.'

This visual impression is merely an indication that the shapes of our numerals fit more naturally into the matrix than into the lines. There could be a demagogic aspect in my choice of the typeface. The designer (as I know him) is preoccupied with the conviction that numerals are only at home in a matrix and that their performance in a line is of secondary interest. However, numerals of such typefaces as Helvetica or Univers, which obviously have been designed from a different point of view, show a similar increase of magnitude when composed in a matrix.

Perhaps the visual impression is reinforced by a mental twist. We are unconsciously expecting that a line of numerals should represent a number, and this feeling makes us look for a clear order of units, tens, hundreds, thousands and so on. This searching is considerably supported by a clear separation of the meaningful vertical lines. It would do no harm if we were to become consciously aware of this condition of numerals. The design of numeric data begins with this awareness.

As a teacher of design I had to rationalize my feelings about numerals. I know of colleagues who prefer to leave

the students alone to make their own discoveries. For me this was not a practical method. I had only four or five years for an introduction to design and this period is too short for a student to discover anything of his own (apart from the great discovery that there is a trend, but that has nothing to do with design). So I decided to teach them. Because my teaching began with handwriting, I could start with the practical remark of Edward Johnston that numerals are written with a slanted pen. Slant has the effect of horizontal stress.[†] Stress is a modulation of the writing line, which means that in any straightforward writing the stress is perpendicular to the writing line. In the vertical lines of Chinese writing the stress on horizontal elements is much greater than in the horizontal lines of Arabic or Western writing. In the case of common numerals there is no reason to assume a specially

[†] *This seems to be in contradiction with the appearance of our italics. They are written with a slanted pen and nevertheless retain the vertical stress. This effect is, however, only achieved by suppressing horizontal elements in the forms of the letter. In our italics the horizontal curves are contracted to a sharp curve. Numerals do not show such a contraction.*

sophisticated kind of writing (such as in some styles of square Hebrew writing). So we might conclude that our numerals have been conceived as a vertical system of writing. Old text books on calculating support this view. By avoiding numerals in lines of text, old typographic and manuscript books confirm my view in an opposite sense: because numerals did not match with horizontal lines, numbers in the text were always written in words or in letters (mcm lxxxviii j fits more smoothly in a line of text than 1989).

The practice of writing numerals in vertical lines resulted in a canon of shapes which demanded to be written in vertical lines. They do not work well in the wrong direction just as letters made for horizontal lines do not accept a vertical arrangement. This implies that the combination of letters and numerals in one line will always be problematic, and this incompatibility might have been the main reason for trying ranging numerals. The results are not encouraging me to join these attempts. It is more rewarding to accept the nature of writing than to aim at marvelous innovations which are violating natural conditions (which they call *laws* in science).

The first example from a financial report is more or less in line with common practice of pushing the numerals into horizontal lines:

grondstoffen	3618
lopend werk	15998
produkt	65794
handelsvoorraden	<u>1420</u>
	86830

The second arrangement evokes the vertical lines of units, tens, hundreds, etc. on which the value of the numerals depends. Because the numeric convention demands that these lines are arranged from right to left, it is only natural to reverse the order of numbers and captions as well:

3 6 1 8	grondstoffen
1 5 9 9 8	lopend werk
6 5 7 9 4	produkt
<u>1 4 2 0</u>	handelsvoorraden
8 6 8 3 0	

The value of the numerals is conveyed by the columns of the matrix. It is the column which determines whether 2 has to be understood as two, twenty or two hundred. The circle of 0 is used to indicate an empty place in the column. Originally the 0 was written as a point. This practice survives in arithmetic. The emptiness could be polished off by using o (the letter) for 0 (the number), but this little deviation from the numeric tradition does not improve clarity. It could be renounced as undue esthetics.

ANAGNORISIS

IT IS THE GREATEST problem of the literature on writing (and perhaps of cultural history generally) that it does not distinguish the history of pretensions from observable facts. There is no doubt that the humanists of the fifteenth century pretended a renaissance of antiquity and this pretension deserves an important place in history, but do not forget the quotes. However, an analysis of the pretensions would reduce the renaissance to a label of the inferiority complex of Italian scholars who could not keep pace with the scientific and cultural achievements of transalpine Europe. This made them believe really that the cursive style of writing which they adopted from northern Europe was an invention of their own.

The facts do not need belief: they can still be observed in our libraries. From the library of Trinity College, Dublin, I have reproduced a fragment, 3.5 times enlarged, of folio 33 recto of the book written in 807 by Ferdomnach for Torbach, abbot of Armagh. I have selected this frag-

ment because it does not reveal its origin at once by such typical insular shapes as e, r, s. You would expect that the uncial shape of t, which had disappeared from book hands in the twelfth century, would be an indication of its origin. Were it not for this t, one could take the writing for a mannerist hand in Arrighi's style. This demonstrates how our observations can be overruled by the mystifications of our classic literature.

macham
iacob

Many years ago Bernard Meehan, Keeper of Manuscripts of Trinity College, wrote me: 'There is no doubt that a great deal of work remains to be done on the palaeography of the early Irish manuscripts.' Yes indeed, and the work that has been done remains to be done again.

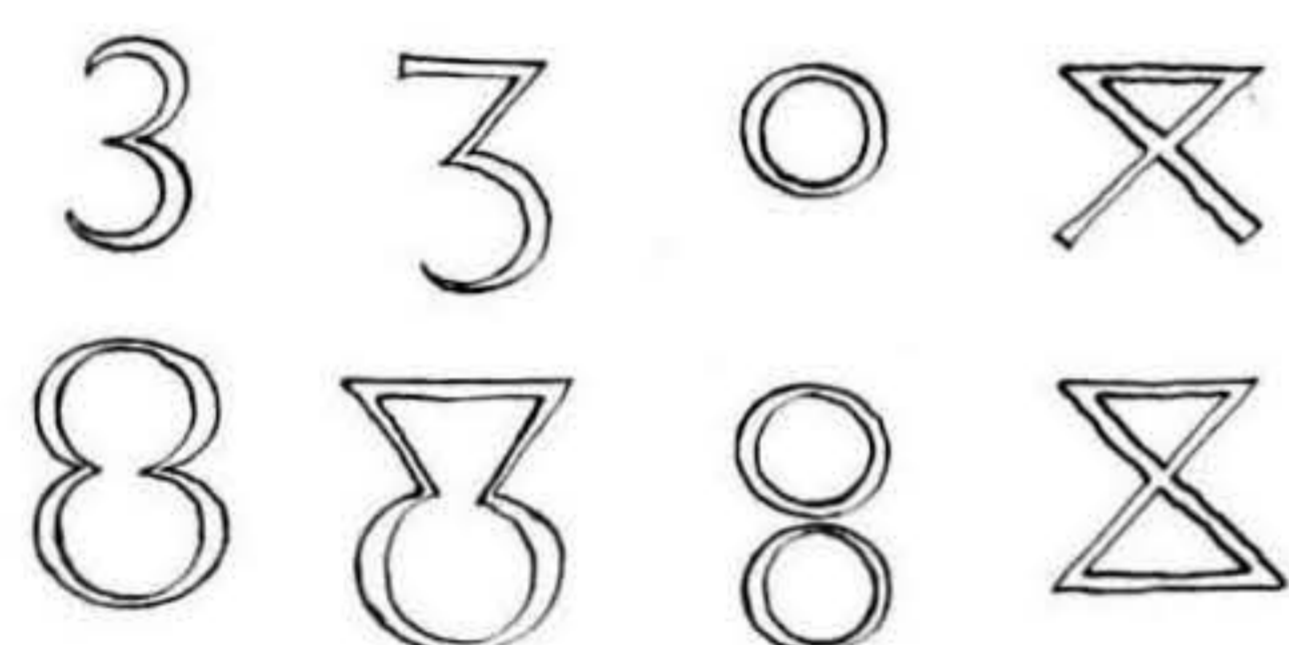
In her description of the Book of Kells, for instance, Françoise Henry concludes that the delicate decorations of interlacing strokes required a brush of a quality that can only be made of sable. In the four pages of the Book of Kells which are all I have ever seen, I did not see painted lines but pen strokes; I cannot make such sharp ledges of color with a brush because the load of color would open the tip of the brush. The thickness of the thin ridges cannot be seen in common reproductions. The study of the technique in reproduction would require stereoscopic

macro-photos at least, but the scope of any study is necessarily limited to the skills of the scholar as well: the scholar has to study craftsmanship and physics first.

To make such fine ridges as in the Book of Kells I prepare a gum tempera (or if you would not mind, a pigmented acrylic dispersion) with a high surface tension to avoid spreading of the strokes. They would still spread if the pen were dipped into the color. The essential trick is to keep the pen clean and dry on one side by applying the color to the pen with a brush. The rest is as simple and difficult as any handwriting. We will never know whether this interpretation of the observable reality is the truth about the Book of Kells. If other interpretations should ever come closer to the truth, the discussion about the cradle of Western civilization will be a technological discussion anyhow. Historians may listen.

THE NUMERALS OF SINT JAN

MEN OF LETTERS did not look at numerals. Their pride was the Liberal Arts, which they kept for themselves in esoteric writings put in an artificial language which common people did not understand. Theirs was the alphabet. Numerals were for merchants, craftsmen and scientists, the low breed speaking its mother tongue, the civilians of a barbarous northern culture.



Everything that was written about the home-made divine proportions of writing was about letters only. Even the proportions of the word were neglected because the word was a barbarous invention as well; it did not belong to the would-be heritage of the would-be civilization that had to be considered as the real civilization.

Completely ignored by the scholars, the shapes of our numerals could fluctuate freely in the hands of workmen. How they fluctuated cannot be found in books, for they are still ignored by scholars. Little has been written about the history of numerals; every amateur can still invent his own history of this subject.

Ten years ago I designed a calendar for a printer of stationery. I designed a set of numerals for the job and I added a matching alphabet. I could recommend this reverse of common practice as an exercise for type designers who want to escape from the narrow-minded humanistic code. It could give you a feeling of how the Western civilization might look without its tarnish of humanistic gossip. And if you happen to like that kind of humbug as much as I do, it might still be nice to look at it from below for a moment.

I illustrated my calendar with numerals from tombstones in the cathedral of Sint Jan in 's-Hertogenbosch,

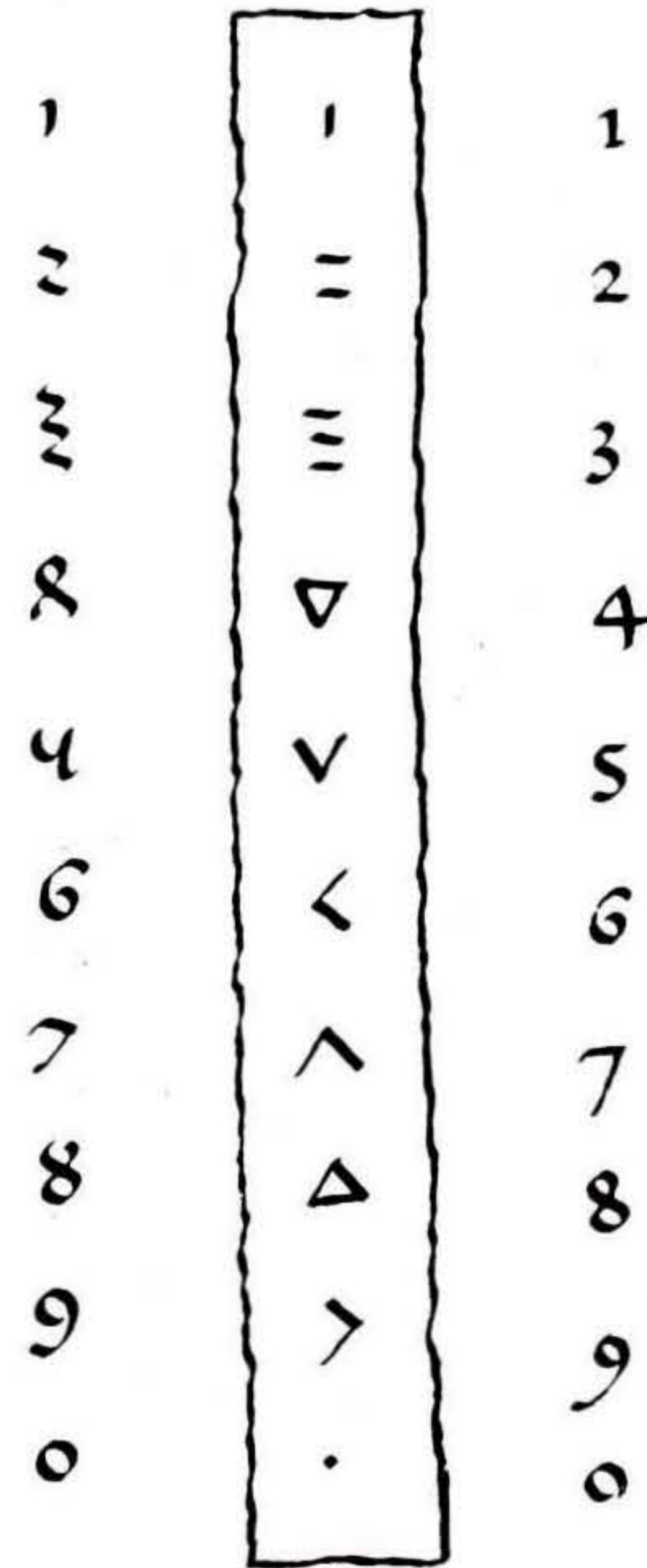
covering the period between 1585 and 1630, when the town was a Spanish fortress becoming increasingly isolated in the part of Brabant that had become a hunting field of the Republic.

The design of the numerals was governed by different associations. The stone cutter could consider the shape of 8 as a composition derived from 0, 3 or 4. Because the second 3 was quite frequent I tried to find the second 8 as well. Finally the sexton asked me what I was looking for. I made him a sketch of my hypothetical 8. He nodded and guided me through the aisle to a bench in the front of the nave. He drew the bench aside and the 8 showed up which completed my collection of photographs.

The shapes of numerals seem to have moved around a concept of formal numerals. This concept can only be shown in a hypothetical reconstruction as formal numerals did not exist beyond the well-known typographic set. The oldest appearance I know of the typographic range 1-2-3-4-5-6-7-8-9-0 is from about 1520. I do not know its origin. In my hypothetical canon I devised shapes that can explain all varieties. The different shapes of 5, for instance, can be understood as deviations from

the different shapes of v (u and u, minuscule versions of v, included).

The hypothetical link helps me to understand the shapes of sixteenth-century epigraphic numerals which are very common too in the work of print-makers (Albrecht Dürer and Lucas van Leyden) and cartographers.



THE NUMERALS OF THE ALPHABET

MAINLY WITH THE help of common dictionaries I have made up a table with the names of the Hebrew and the Greek numerals. The Hebrew column contains the names of nine units, nine tens and four hundreds, as far as the alphabet reaches. The Greek column contains five more names which are completing the set of nine hundreds.

<i>Semitic</i>		<i>Greek</i>						
1	alef	1	A alpha	10	י	jod	10	I jota
2	ב bet	2	B beta	20	כ	kaf	20	K kappa
3	ג gimmel	3	Γ gamma	30	ל	lamed	30	Λ lambda
4	ד dalet	4	Δ delta	40	מ	mem	40	Μ mu
5	ה he	5	Ε epsilon	50	נ	noen	50	Ν nu
6	ו waw	6	Ϝ fau [digamma]	60	ס	samech	60	Ξ ksi
7	ז zajin	7	Ζ zeta	70	צ	ajin	70	Ο omicron
8	ח het	8	Η eta	80	ק	pe	80	Π pi
9	ט tet	9	Θ theta	90	ר	sadhe	900	(sampi)
				100	ש	kof	90	(koph)
				200	ק	res	100	Ρ rho
				300	ש	sin	200	Σ sigma
				400	ת	tau	300	Τ tau
							400	Υ ypsilon
							500	φ phi
							600	Χ chi
							700	ψ psi
							800	Ω omega

To appreciate the columns we have to distinguish between numerals and numbers. This is difficult with our numerals because they have the same names as ten natural numbers. In the table the distinction is easier. The number five is *penta* in Greek and it can be written with the numeral *epsilon*. When we want to write the number ten we make a composition of the numerals 0 and 1. In Hebrew and Greek the number could be written with the numeral ten (*jod* and *jota* in the table). To illustrate the use of Greek numerals with an example from classic literature: in most manuscripts the apocalyptic number 666 is written as six hundred and sixty-six. Some manuscripts, however, have this number written in numerals: *XEF*.

Essentially the Greek names are the Hebrew names adapted to the Greek preference for ending a word with a vowel, but from *pi* onwards the meaning of the Greek names is one position back from the meaning of the Hebrew names. One might think that the Greeks adopted an incomplete set of letters first and added *koph* and *sampi* only later to complete the set of numerals. The latter signs are not in the dictionary; they were not used in Greek or-

thography. (In untidy linguistic speech: these letters were not needed in Greek language.) However, *vau* has always been the sixth letter in the Greek alphabet though it has only one entry in my dictionary: the numeral six. Here one might think that the Greeks adopted the set of Hebrew numerals first of all.

To the believers of linguistic simplifications the Greek alphabet contains more letters than the Hebrew alphabet to meet the needs of Greek language. This belief is in contradiction with the facts. German and French are written with more signs than Dutch and English, not because the German and the French language require diacritical marks, but only because the current German and French orthographies are prescribing them. If we wanted we could clean up any orthography by removing all diacritical marks and some letters (e.g. *j*, *y*, *q*, *x*) as well.

Linguistic particularities cannot explain orthographic anomalies but from another point of view I can understand the Greeks. They completed the set of hundreds by extending the alphabet with the letters υ , ϕ , χ , ψ , and ω . Our scholars have to invent a new history of the alphabet.

It might be rewarding to consider the possibility that the alphabet has its origin in a set of numerals. Linguistic authors only see the thrilling idea of an analytic orthographic system which allows one to compose any word with a small number of signs. The invention of a practical system of signs for writing numbers would have required a more modest level of abstraction. If the system of orthographic signs could be considered as a next step, the invention of the alphabet would be easier to understand.

The Bible (my eternal example of ancient Semitic literature) can in many respects be understood as propaganda for a religious and cultural independence of West (Egypt) and East (Babylon). Psalm 75 is a poetic expression of this balance. It is expressed as well by the preference of some authors for the duodecimal numeric system of Babylon whereas others prefer the Egyptian decimal system. In this cultural balance the alphabet is on the decimal side. Comments in the (Babylonian) Talmud often show a duodecimal preference.

In many places the Bible uses numeric allusions to the message of the text. In Exodus 2:10 Moses is baptized as waterman: he was called Moses because he was found in

the water. Water and 40 are two meanings of the name of the letter M, and the story of Moses is told in three periods of 40 years. His successor is Joshua (*Jesus* in the Greek version of the Bible), the son of Nun (fish). The letter *Nun*, the successor to *Mem*, has the numeric meaning of 50. Pentecost (50), the fiftieth day of Easter, is celebrated as the fulfillment of the voyage of 40 years through the desert. Guided by the fish-man, the son of 50, Israel crosses the Jordan.

If 'being 50' was a euphemism for having died (much like 'crossing Jordan') the episode of John 8:57 acquires a new dimension. With the sarcastic expression 'You are not fifty and you should have seen Abraham,' (wait until you die) the gospel relies on our awareness of the connection between the number and the name of the numeral: Jesus (Joshua) has always been the man of 50 (the son of Nun) indeed. Many other instances could be found where the propaganda of the Bible is wrapped in a play with the numeric meaning of the alphabet. Behold: *The Messianic symbol of the fish (50) is a thousand years older than art historians believe.*

This looks like an esoteric game, but that might be an

optical illusion. We have been successfully trained to neglect the ambiguity of the Bible and to take it or to leave it as a collection of simple stories, though we might have felt that it cannot have been a very primitive story that swept away the extremely sophisticated Hellenistic civilization within a few decades. In its literary play with numerals the Bible takes full profit of the mnemonic power of numerals in a world where books and reading were rare. This support for memory is not very esoteric if we have learned the rules of the game.

They should persuade us to reconsider the commonplace notions about the alphabet as a phonographic system. I take my examples as an indication that the origin of the alphabet might have been closely connected with its numeric meaning.

This is almost as speculative as science. Its scientific value depends on its contribution to our understanding

of the alphabet; it should solve some problems at least.

The consistency of alphabetic order (for more than 3500 years) is an official problem in the official history of writing. Some scholars suggest that the conventional order was preserved in mnemonic songs. (So do Aaron Demsky and Meir Bar-Ilan in 'Writing in ancient Israel and early Judaism,' in *Compendia Rerum Iudaicum ad Novum Testamentum: Mikra; Text, translation, reading and interpretation of the Hebrew Bible in ancient Judaism and early Christianity*, Assen, Maastricht, Philadelphia 1988.)

I do not need hypothetical songs as a preservative of cultural treasures. The order of the alphabet, the Hebrew alphabet as well as its Greek descendant, is as consistent as the order of 1, 2, 3... a consistency requiring no further explanation.

SAINT DENIS

AFTER BEING BEHEADED on Montmartre, St. Denis walked, his head in his hands, to the place in Saint Denis in which he had chosen to be buried. He and his noisy company of singing angels would not likely be admitted again in his church where now everybody seems to be determined to keep his head on. I got a ticket to have a look at the almost complete collection of dead kings and queens around and under the choir. The stone faces, pointing to the West, smiled peacefully. I put a few faces and some of the nice little lions which supported the stone feet into my sketchbook. Then, standing at the tomb of Léon vi of Lusignan, my attention drifted away to the small inscription along the body:

lan de grace m. ccc. iiij^{xx}. et xiiij. pries pour luy

This example of so called roman numerals has to be read logographically according to the rules of the French language:

Mille trois cent quatre vingt [et] treize

1000 + 300 + 80 + 13

The sign for 80 was new to me. The Spirit I supposed to be waiting for me in Holland had arrived in Saint Denis before me.

M · CCC · ^{xx}IIII · et · XIII
1000 + 300 + 4 × 20 + 13

THE TRUTH ABOUT THE SERIF

OF OLD, TYPOGRAPHY could be distinguished from handwriting. This illusion is reflected in all what has been said and written about type and its design. All this accumulated wisdom has become useless. It is even a dangerous obstacle for our approach of typography. Typography is now something else than what it was supposed to be in our books. It is different in every detail. You have only to drop a word and there is a new subject for a new study. Examples can be found in previous issues of *Letterletter*. Just say *Bodoni* (*The Franklin Letter*, page 65) or *numeral* (*A Matrix of Writing*, page 80) and you have a new entrance to writing. This time the theme is *serif*.

I have tried to free the subject from worn conceptions. In a short-sighted view this could be seen as a break with the tradition of writing; all our classic teachers are put aside for a new illusion. In a wider view the same operation might appear as an attempt to restore the conception

of writing that has been obscured for quite a while by type foundries, composing-rooms and piles of romantic literature.

Anyhow, *Letterletter* is highly practical because it is strictly theoretical.

NOTHING BUT THE TRUTH

Usually serifs are considered in relationship with the terminals of the letters in Roman inscriptions. For me stone cutting is an entirely different subject that might be treated in a lapidary issue of *Letterletter*. If you cannot wait that long, take a chisel and invent the story of stone cutting yourself. At the scaffold the tools and the stone demand an approach that cannot be invented at the desk of a scholar.

When something has to be done, all our books are leaving us alone. The theories of *Letterletter* do not offer a substitute for work either, but they have the practical

advantage of being invented in the workshop. Good theory drags us to a new point of view from which reality exposes its relevant aspects. Our classics are not relevant. They have all been written from an irrelevant point of view in an attempt to embrace the subject without ever touching it. If I should be mistaken in this judgement, you might be so kind as to show me where I am wrong. But even then our classics will remain irrelevant in an even more essential aspect; everything they pretended to observe from their disputable point of view cannot be observed anymore, because its reality itself has disappeared. We have to invent a new truth anyhow.

This essay is about the serif in type design and its story begins in northern France and the southern Netherlands. It is a story from the end of the Middle Ages: about 1000 years after the last Romans had left the scene.

LINGUISTIC SPECULATION

Σκαριφάομαι

The words *scrape*, *score* and *scratch* (Dutch: *schreef*, German: *Schraffe*) and Latin *scribere* (Dutch: *schrijven*, German: *schreiben*) might well have a common root re-

lated to the Greek stem: *skarifa*, but it is only by the accidental effect of a few sound shifts that they coincided again in the Dutch word *schreef*.

Schreef is the simple past tense of *schrijven* (to write) and also the scratch made by carpenters and metal workers as a guide for cutting. In punch cutting a *schreef* is first of all the initial scratch on the blank punch marking the terminal of the stroke of a letter. This initial part of the work is common to all metal workers and it can be described in common language. In punch cutting the meaning of the word was extended to the terminal itself and finally restricted again to the protruding parts of the terminal (English: *serif*) so that a letter with cold terminals (*schreven*) is now referred to as a letter without *schreven* (sans serif) which, of course, does not mean a stroke 'without terminals' but a letter without protruding terminals. In common Dutch, the typographic expression *schreefloos* (sans serif) would be as absurd as a shape without outline. The word *schreefloos* only received a meaning in typographic Dutch. It was introduced in the Enschedé type specimen of 1932.

According to English publications the word *serif* came

into use in the beginning of the nineteenth century. Such information has to be founded on the oldest written records, but the word must have been imported much earlier. If Caxton had not already brought it home from Flanders, where he had been living for thirty years, the next great occasion might have been the seventeenth century, when English typography relied on supplies from the Dutch Republic. I could not imagine an adoption of the word in the eighteenth century when the leading position in the world had been taken over by English typefounders. The 'artist' Caslon was the last great imitator of Dutch design. Later generations of English punch cutters had little reason to look for examples in the Low Countries; they had John Baskerville to imitate.

THE DUTCH CONNECTION

That much knowledge of the Dutch language should be sufficient to assess speculations about the origin of the word *serif*. The history of a word and its meaning can be used to obstruct discussion. My homemade etymology of the word *serif* should not be understood as the 'real' meaning of the word. The actual meaning of a word can

only be learned by trying it in contemporary conversation. Often the same word has different 'real' meanings in different cultural and social circles. Foreign languages cannot take direct benefit of the fact that a Dutch craftsman considers any intentional scratch as a *serif*. However, understanding of design could gain a lot if we could forget for a while the distinction between serif and sans serif type. With some attention to the scratch, the terminals of all kinds of strokes can be studied beyond the blunt distinction between sans serif typefaces and common typefaces.

This distinction was invented to avoid the study of writing by strewing simplicity over the subject. But I do not feel at ease with this kind of simplicity. In fact it does not make things easier. Conventional distinctions are conspicuous and they do not allow orderly escape from the triteness. Even universities conform to it. If you would like to study the history of handwriting in Holland, you could find an opportunity at the University of Leiden. For the history of typography you would have to go to Amsterdam; in Dutch scholarship the distance between handwriting and typography is about 30 kilo-

meters. If, however, you would prefer to study writing without a preoccupied restriction to handwriting or to writing with prefabricated characters, there is no place to go. The real simple solution would be to stay at home and to bridge artificial distances by reading *Letterletter*.

The distinction between handwriting and typography is a silly commonplace. We do not need a university to emphasize it. The common sense of a child is sufficient to understand the difference. The same degree will do for the distinction between sans serif typefaces and common typefaces.

If the child survives in us we will arrive at a more interesting question: what do these different things have in common?

A GREAT IDEAL

When I was still very young I read an interview in a Dutch printer's magazine with the type designer Sjoerd de Roos. His greatest ideal was devising a typeface that would be like the roman of Nicolas Jenson. I tried to imagine how it would be to have a great ideal that had been realized 500 years ago. I do not have such a conven-

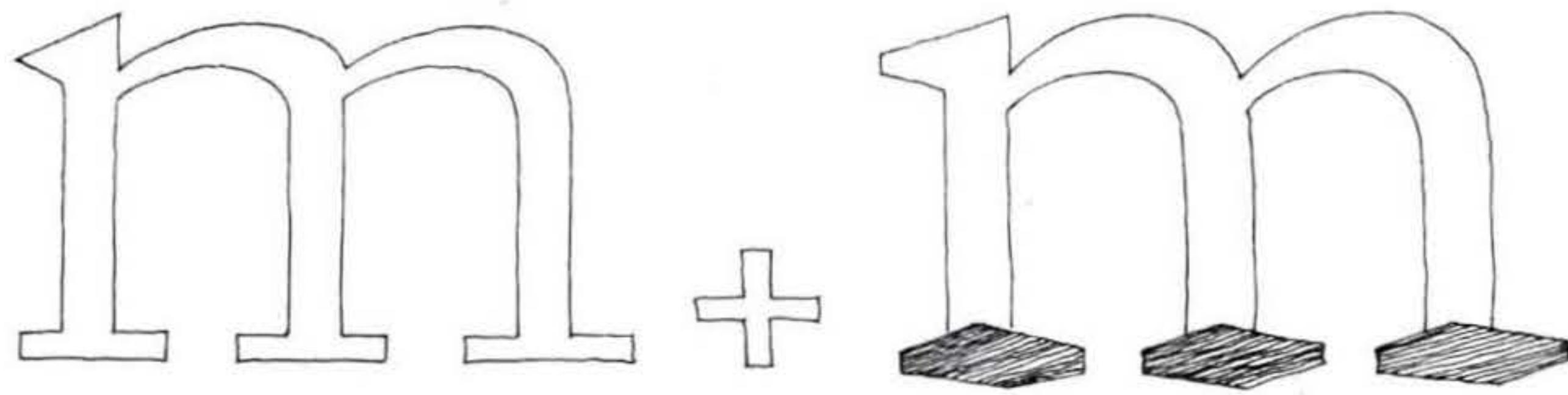
ient ideal and Jenson did not either. What is fascinating in the typeface of 1470 is the ideal Jenson was after rather than what he achieved. For this interest the reconstruction of one letter would do.

The outline drawing on the facing page is my interpretation of Jenson's punch. I added the full point to the m because it is one of the most jovial points in type design I know. My point, however, is in the serifs.

Jenson interpreted handwriting. The example had lozenges as footings. Jenson could have copied this shape faithfully in his punches, but the extra work would not have paid. On the press the load of ink would have distorted the lozenge into a shape that would differ very little from a distorted rectangle. For the punch cutter, however, the difference is important: rectangular footings are cut much more easily than lozenges.

The old type designers did not bother about so-called bracketed serifs. They had to live with the filling of ink in the corners of their letters. In this respect (of course not in any other respect) that bastard Rockwell is a more faithful interpretation of Jenson's roman than Bruce Rogers' elegant Centaur.

In the old days big sizes were cut for special occasions. Only in the area of jobbing printing, serifs with rounded joints might have been common for a while (chiefly the seventeenth century). For this feature I have three more or less suitable explanations, which is too many.



1. The corner-filling ink spread was found very beautiful and designers anticipated that effect in their punches. In a big size the effect of ink spread is relatively small; if you are fond of it you have to design it. Garamond seems to have rounded outer corners of his typefaces in big sizes only occasionally; they might have been intended to look like enlargings of the *printed* small sizes.

2. Jenson's approach looks very bare on such a big size as 18 point. Designers might have been tempted to decorate the big shape a little, as it is tempting for me to smooth a big outline drawing. (A steel punch of 18 point

is at least as big as a drawing of 20 centimeters. If you don't believe me, try.)

3. The gab about the classic shapes of capitals might finally have reached the punch-cutters too, just as it eventually reached the designers who worked for the pantographic punch engraving machine. However, body sizes for text composition as mechanical reductions of big drawings are a novelty of the century of the composing machine. In this regard, typefaces with bracketed serifs are a sideway in the development of type design.

I have already weakened the third explanation. It would fit to the time when everybody was eager to hear stories about a typography which could be independent of handwriting. When the connection of type design with handwriting was given up, designers were cut off from inspiration. It was compensated by imitation of old typefaces. In fact Stanley Morison and his fellows propagated second-hand design. The great ideal was imitation, be it of Jenson, as in the case of De Roos, or of Garamond, as in the case of Tschichold and Morison himself. Even if we believe this worn propaganda, we should still not impose this enlightened view of design on the humble

craftsmen of old who just tried to render handwriting decently in type. The choice between the first and the second explanation is up to you; for your convenience I have already done with the third one.

LO, YOUR HERITAGE

A theory is a provocation. It attacks established theories in an attempt to refute them. Quite often the attack fails and then the new theory is itself refuted. Recently this has been the fate of a theory of nuclear fusion and of a new approach of immunity deficiency (AIDS). In both instances, there is no reason for satisfaction about the failure. There is, however, a lot of satisfaction in the damage it has done to the authority of scientific magazines. The censorship of magazines is a serious obstacle to progress in science. A theory does not need the approval of an editor; it only demands criticism. If it survives a test, we have to devise a more severe test and so on until the theory has to be given up for a better one. Otherwise the theory is a myth.

The test requires criteria, and these are difficult to

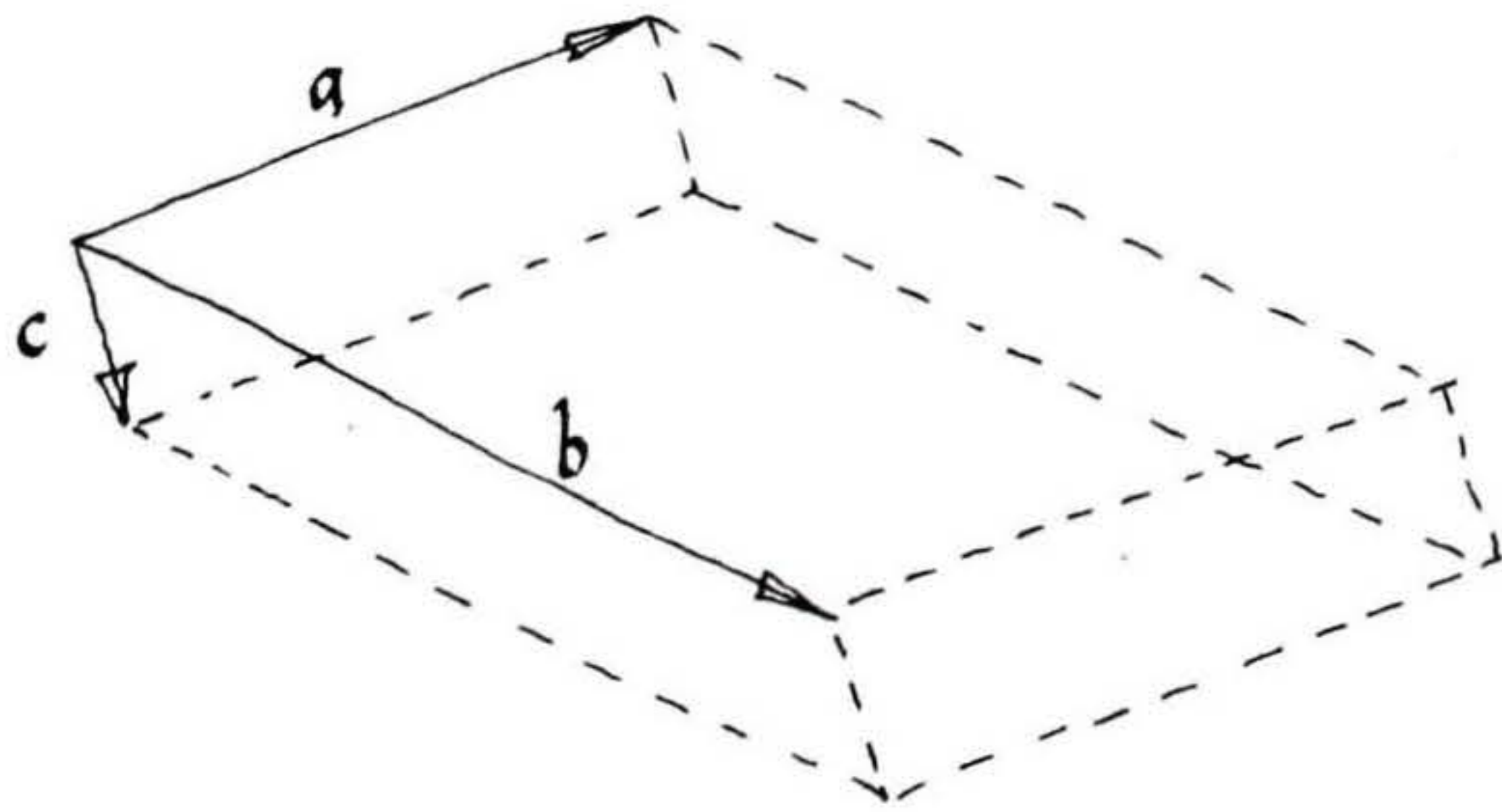
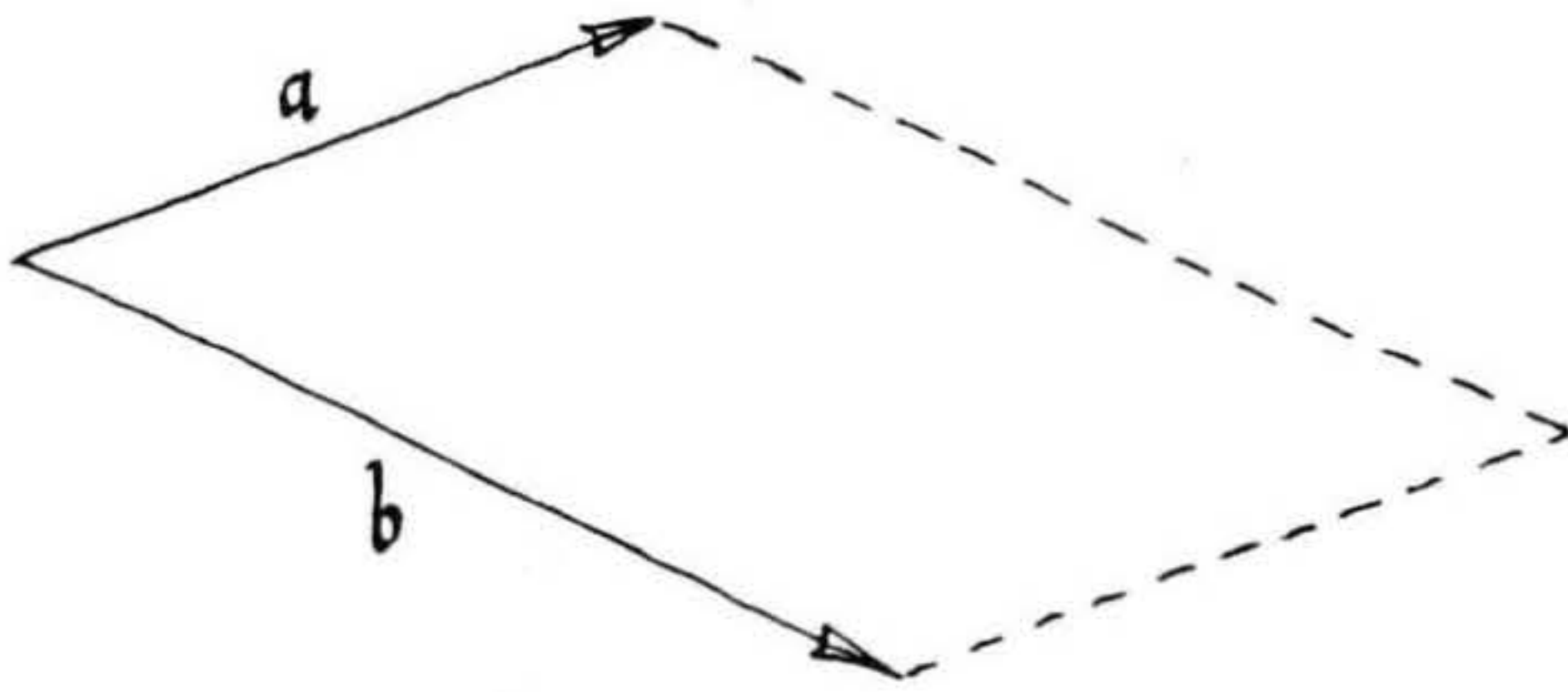
formulate in humanistic studies. The discussion is often dominated by affections and speculations which can be exchanged against any other opinion.

The Italian humanists said that they were guided by antiquity. This fact (that they said so) is sufficiently documented. But there is no proof available of what they said. The extremely remarkable fact that the Italian authors never mentioned the Burgundian culture, which makes all their stories unworldly unrealistic, is a strong argument for the skeptic. But it is not a reliable proof either. Because the decision cannot be left to a magazine or to scientific authorities, I am looking for facts which can be examined in empirical observations. The moving counterpoint meets this scientific condition for the material aspects of the question at least.

The drawing shows two vectors, *a* and *b*.

We might consider *b* as a stroke drawn with pen *a*. (We do not have to; we might as well consider *a* as the translation of the direction *b*. In this ambiguity is the power of the theory of writing. It is the condition of our grip on type design by enabling us to *depart* from hand-

writing.) When I want to simulate the stroke of a small pen, I have to consider its thickness as well. It is expressed in a third vector, c , perpendicular to a . This construction is founded on a simplified analysis of the retracted terminal stroke.



I have repeated this simple shape in the serifs of a typeface digitized with Ikarus M.

To compare my design with Jenson's roman from 1470, I have reproduced at actual size the first page of *De bello Gallico*, printed by Jenson in 1471, from the copy in the Plantin Museum, Antwerp. For this occasion my typeface Ruit should be shown in a Latin text as well. I have chosen the first verses of Psalm 127 (Hebrew numbering).

The confrontation should prove that Jenson could reduce the lozenge of the retracted terminal to a rectangular shape without giving up the calligraphic example. Any attempt to copy his model more faithfully would have lost its effect on his press.

HISTORY FROM SCRATCH

The terminals of a straight pen stroke are symmetrical about a point; they can be exchanged. For this story it does not make a difference if you turn my pictures upside down.

A stroke starts and ends parallel with the counter-

ecce hereditas Domini

ABCDEFGHIJKLM-
NOPQRSTUVWXYZ &
abcdefghijklmnopqrst
uvwxyz;

1234567890?

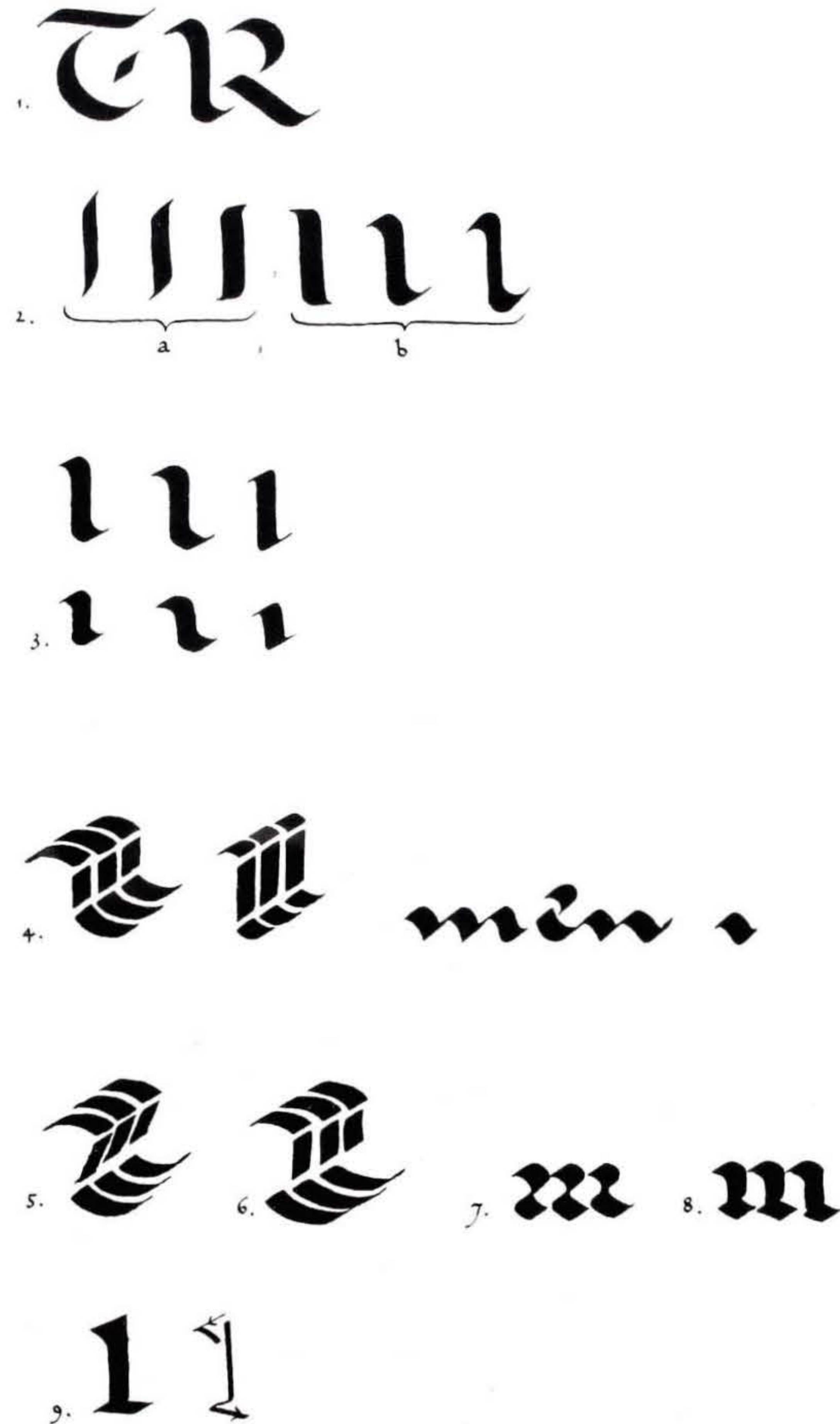
ABCDEFGHIJKLM-
NOPQRSTUVWXYZ &
abcdefghijklmnopqrstu
vwxyz;

1234567890?

CANTICVM GRADVVM SALOMONIS
Nisi Dominus aedificaverit domum
in vanum laboraverunt qui aedificant eam.
Nisi Dominus custodierit civitatem
frustra vigilavit qui costodit.
Vanum est vobis ante lucem surgere,
surgere postquam sederitis;
qui manducatis panem doloris:
cum dederit dilectis suis somnum.
PSALMI IVXTA LXX / CXXVI

heluetiis diuidit. iis rebus fiebat : ut & minus late uagarentur : & minus facile finitimis bellū inferre possent: qua de causa hoīes bellandi cupidi magno afficiebantur dolore . p̄ multitudine autē hominum: & p̄ gloria belli: atq; fortitudinis angustos se fines hīe arbitrabātur: q̄ in lōgitudinē milia passuū ducēta quadraginta: in latitudinē centum octoginta patebant. his rebus adducti & auctoritate Orgentorigis p̄moti constituerūt: ea quæ ad p̄ficiscendū p̄tinerent parare. iumētorum & carroꝝ q̄ maximū numerꝝ coemere: semētes q̄ maximas facere : ut in itinere copia frumenti suppeteret. cum proximis ciuitatibus pacem & amicitiam confirmare: ad

point as demonstrated in the 12 terminals of the 6 strokes in figure 1. This movement of the pen gives a sharp finish to the stroke. It accentuates the terminal of a stem when it makes a sharp angle with the main part of the stroke (2b). Otherwise the terminal is suppressed (2a). For more than 4000 years, the mainstream of our civilization has been accentuating the terminals of stems. Curves are beginning and ending in nothing, which is characteristic for the suppressed terminal. If you should insist on considering the end of the stroke as an element with a suppressed terminal, you might call it a curve to avoid confusion. Beyond the distinction between stems and curves, the suppressed terminal is restricted to decorative swashes. In this regard j is an impossible letter, as all type designers know by experience. The y is impossible in any respect. Together with the diacritical marks, the letters j and y are a typographic disaster. In silent eloquence the old type founders complained about the existence of such 'improvements' by showing their typefaces in *Quousque tandem abutere* etc. This text is not spoiled by our improvements of the alphabet.



The balance of the stem is controlled by the width of the terminal (3). In a balanced stroke the top of an accented terminal lies on the axis of the stem. Longer terminals pull the stroke anti-clockwise. This is why type designers will always give such letters as a and t a slight slant if they have to make the impression of standing upright. In a stem with shorter terminals the axis is overshadowed by the long diagonal of a parallelogram.

In the seven centuries between the invention of reading and the invention of printing, the Middle Ages formed Western civilization. Before it became solidified in metal type, the development of writing can be understood as the continuous consolidation of reading by reducing the white shapes in the word. In respect to the size of writing, the weight of the strokes was increased. I have indicated this increasing weight (on page 101) with parallel strokes. To keep the top of the terminal on the axis of the stroke, I had to increase the width of the terminal curve as well.

Figure 4 shows that this treatment reduces the straight part of the stem considerably. Many cursive hands of the fifteenth, sixteenth and seventeenth centuries seem to

compensate for this effect on the balance of the stem with backward slant. These scripts are neglected in the general history of writing, perhaps because the study of real writing might sweep away our official history.

Diplomatics is a remarkable exception. This branch of the history of writing is thriving by organizing courses in 'deciphering' the real documents of our ancestors. In its overall effect cultural history obscures the development of civilization. My small collection of matchbox labels contains a few thousand splendid wood engravings cut at the end of the nineteenth century. Art historians specialized in this period could tell me everything about the French Salon of that time but nothing about the matchbox world we all come from.

Figure 5 is a theoretical compensation of the backward pressure which is executed by the terminals of heavy stems. By slanting the straight part of the stem, I can obtain a better balance of the black spots in the stroke. Figure 6 is a more satisfying alternative: only the terminal has been retracted; the stem is kept in its upright position. Both theoretical possibilities have found practical application in the history of writing. In Beneventan writ-

uanum est uobis
 ante lucem surgere
 surgere postquam sederitis
 qui manducatis panem doloris
 1. cum dederit dilectis suis somnum

uanum est uobis
 ante lucem surgere
 surgere postquam sederitis
 qui manducatis panem doloris
 2. cum dederit dilectis suis somnum

nisi Dominus / canticum graduum

uanum est uobis
 ante lucem surgere
 surgere postquam sederitis
 qui manducatis panem doloris
 cum dederit dilectis suis somnum

3. cxxvi psalmi iuxta lxx

4. **mí mí mí**

ing (7) the straight part of the stem can only be recognized in an analysis of the stroke. The Burgundian approach (8) had a better outlook; its invention of the retracted terminal has become permanent in the serifs of roman type.

Figure 9 (page 101) shows the characteristic stem of roman type together with the choreographic description of the characteristic Burgundian stem. This twirl is the basic pattern of type design. It is the scratch from which a new history of typography can be written.

THE TALKATIVE PICTURE

It is the problem with a picture that it tells more than a thousand stories. When you have figured out the right story it is often the wrong one.

From a distance, the pictures of Psalm texts make a pattern of alternating density. This is a nice story for a designer, but it is not the story I have in mind. I want the pictures to be watched closely and this was one reason to write the indices small. (The other reason is obvious.)

The story I want the next column of pictures to tell is about the terminals of the letters. In fig. 1 (page 103) the terminal is just turning away from the stem; fig. 2 and fig. 3 have been written with retracted terminals. From this point of view figures 2 and 3 belong together and not, as might be expected from a few other points of view, figures 1 and 3.

Figure 4 supports the intended point of view; 4a and 4c may have the curved top and the proportions of the letter in common, but this feature is superseded by the pattern of terminals which distinguishes 4b and 4c from 4a.

There is an academic rule that one must not depart

from his conclusion. At many occasions I have asked for an alternative, but I have never gotten an answer. I cannot imagine how something should ever come out of my mind which I did not have in mind already. Perhaps it is only a rhetorical trick to hide the fact that you have something special in mind. Of course, you could tell your audience that you had found your splendid idea after a lot of thinking about a problem and everybody might enjoy such lies. Yet it might be better rhetoric to start with the beginning conjecture just as the geometers have always done with their theses. The thesis comes down from heaven. Only afterwards is it laid down on a foundation of observations. *Science is reversed architecture: the roof is built before the house.*

This time I am late with my conclusion, but here it is: Roman type has its origin in Burgundian handwriting. Under the shelter of this roof I am selecting the facts which should make the impression of supporting the fantastic construction.

What I am showing in figure 2 (page 103) has been called *textura*, *textualis quadrata* or *Gothic book script*. In

typography other names have been used as well, such as *black letter*, *old English* and *Dutch text*. In my view this script is closely connected with the fifteenth century cultural genius which inspired the Burgundian provinces of Flanders and Brabant. By calling this spirit *Burgundian* I do not suggest that it should have been restricted to the southwestern Netherlands. Its writing and its language had their origin in northern France, and its duchess came from England. Yet Burgundy was the focus of a cultural attitude, a style of life, which is still proverbial Burgundian.

For the crowded Burgundian text (fig. 2) the retracted terminal is a clever invention which saved this book hand from magnificent illegibility. The open countershapes of the old-fashioned text script (fig. 1) did not require such an invention. I do not see a substantial difference in legibility between fig. 1 and fig. 3. The necessity for the introduction of retracted terminals in the Burgundian text script is absent in the humanistic text script. Only the Burgundian example explains the occurrence of the Burgundian solution in a script where it has nothing to solve.

I did not have to manipulate the originals too much to arrive at the convincing illustration of this explanation in fig. 4.

Perhaps the retracted terminal does not seem to be very important for the study of humanist handwriting if the study of handwriting is separated from the study of typography. Only a minority of the manuscripts I have seen have been written in this 'Burgundian' style. It looks like a rather unimportant aberration which could be neglected.

The scene changes dramatically when typographic writing is taken into consideration. In 1470 Nicolas Jenson showed a typeface that can be looked at as the typographic interpretation of the text script of fig. 3. It superseded all attempts of rendering in type the script of fig. 1. Jenson's peculiarity became the standard of the typographic text script which is called *roman*.

History has made the Burgundian humanistic hand the most important script of mankind. This could be a reason to study it.

THE LOGIC OF BOOK DESIGN

A BOOK IS A THING

A book is used by looking into it. Usually the visual quality of the book is the *first* concern of book design. For me, the bookbinder, it has always taken the *second* place.

Before a book can be looked into it has to be taken up and opened. First of all the book designer has to make sure that the book can be handled.

Quite often a book is made of paper. The paper of a book may be cheap or expensive but the grain of the paper may not be in one or other direction. The grain is parallel to the back or the book is a rotten thing.

Any work of man is done in space. It begins with the definition of space. In book design the space is defined by the format of the book. (It is worth learning again this most common meaning of the English word *format*.)

The first decision in book design is the choice of paper and the definition of the size of the page. There is no de-

sign without knowledge of paper and its behavior. A designer is making a thing of paper; he is not just decorating the surface of paper.

The worst thing I have ever made is *Letterletter*. Twelve times now I have been designing a thing that cannot be handled because the grain of the paper is in the wrong direction. The argument comes from the office of the Association Typographique Internationale. The format of *Letterletter* is A4. I thought this to be a good format because the papers which are mailed by the secretary of ATypI have the same dimensions. It is also easy to get covers at this size. However, the secretary prefers to fold the mail to A5 because this saves the funds of the association.

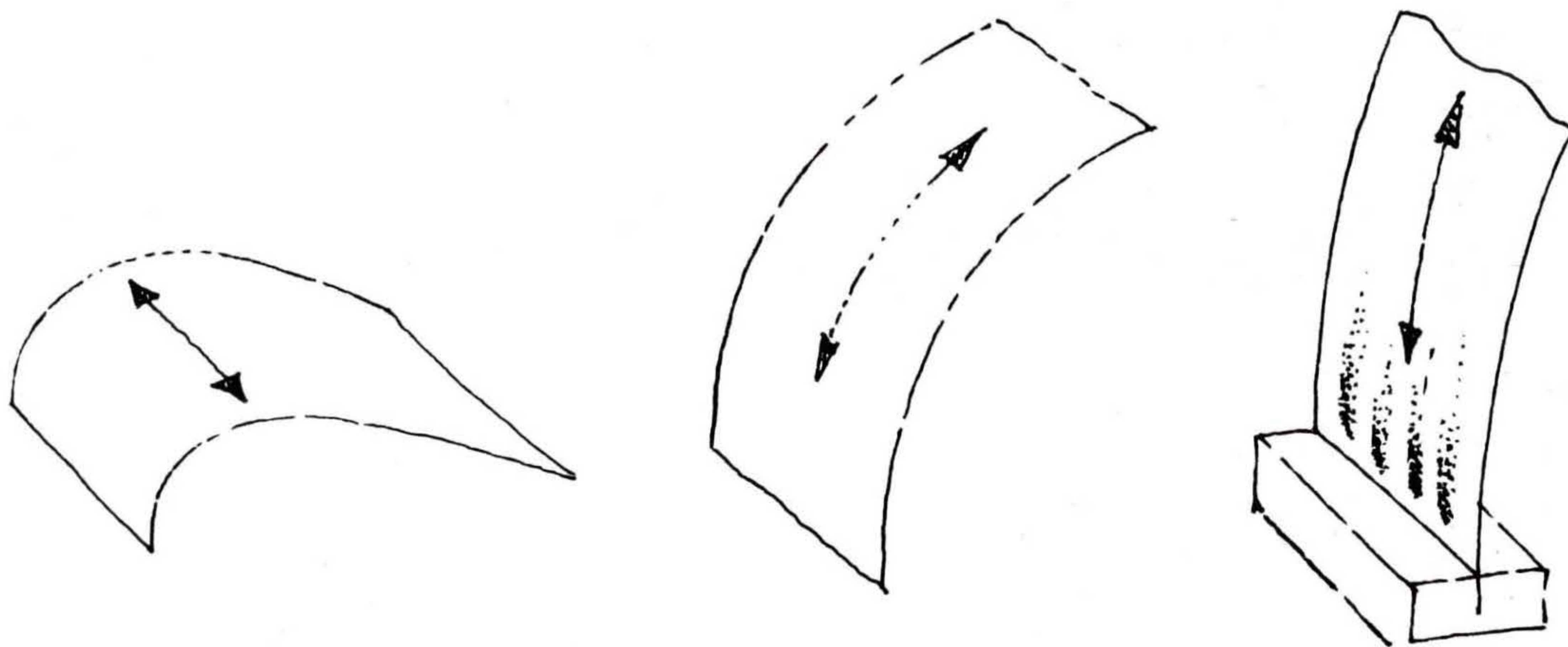
Letterletter is mailed at A5 whereas you are supposed to read it at A4. I should have made *Letterletter* at A5 to meet the conditions of mailing and reading equally. As an experienced designer I should at least have discussed the

conditions of production and mailing with the publisher before making *Letterletter 1*.

The importance of the grain is played down by comparing figures 1 and 2 only. In the wrong direction paper bends less easily. This is true for plain sheets. When sheets are folded and bound in a book the situation is different (figure 3).

Paper is hygroscopic. It reacts to fluctuations in humidity by expanding and shrinking across the grain. In the spine of the book, the paper cannot move. When the

grain is not parallel to the spine the leaves are corrugated, which is an effective method for stiffening sheet material. By specifying the orientation of the grain the designer makes sure that the leaves will bend. Designers, printers and publishers who do not care for this first condition of graphic production will probably never learn what design is, but perhaps their customers should be educated to refuse their rubbish. Remember for now: A book is a thing.



THE TALES OF THE TYPOGRAPHER

1 : SYLLABLES

Many years ago I was asked to design a new edition of the first lecture that was given at the university of Amsterdam. The university library had left the production of the book to the printer of the city of Amsterdam. The printer was my patron. This does not work. Printers and advertising agencies are bad patrons because they try to look with the eyes of other people which will never work. There are often obstacles between principal and designer but there cannot be a mediator between them.

I had not yet seen the trial pages which I had specified when the printer handed them to the librarian. The librarian was at once satisfied and the printer leaned back in comfort. When the librarian showed me the pages I returned them immediately with the observation that the word spaces were 30% wider than in my specification.

‘Is that true, Mr. Stork?’ the librarian asked.

‘Yes, professor, that is true. We had to deviate from the designer’s specification because the measure is rather narrow in respect to the body size of the typeface. Otherwise we would get more than 4 hyphens in succession at many places and that does not look well.’

The librarian understood.

I asked him to turn up folio 100 of *Barlaeus*. With the dignified pages of the famous edition by Johannes Blaauw before him the librarian was again ready with his admiration: ‘Today we cannot make this anymore, Mr. Stork.’

I asked him to look closely at the hyphens. All lines except for the first one and the last one ended with a word break. By drastically hyphenating the text, the compositor had ensured legibility. This is how I wanted to proceed as well.

The librarian appreciated that I seemed to know his

folio and the printer was relieved to be discharged from his responsibility for the design. The edition of the *Mercator sapiens* was saved.

Though he made almost more word breaks than I, Johannes Blaauw was not a good typographer. His repute may have been founded on his merits as a merchant of books and maps, a business I do not understand. However, the repute of dead colleagues is often useful. Many designers are recommending their newest imitations with a cadaverous smell.

2 : V E R S E

Paul Renner is the only author in my library who has devoted fundamental consideration to the composition of poetry:

‘One could read poems even if they were composed as plain text, without any emphasis on verses and stanzas, but then we would not have poetry composition which starts a verse on a new line.’ (*Die Kunst der Typografie*)

Paul Renner does not need poetry composition to compose poetry, and this pleases me. To justify poetry

composition nevertheless he says that the great difference in rhythm between prose and poetry requires typographic discrimination. This does not please me at all. I have never observed a great difference between both modes of language, and a great difference would also be sufficiently different without my discriminating support. Bold words do not need bold letters.

In poetry composition, Renner concludes, a verse is a line.

This leads me to another story. My visitor was a famous poet. Between us were the proofs of his collected verse. I showed my visitor that the length of a few verses could have forced me to compose the whole book in a body size that would be too small for most poems. In the proofs the longest verses were running over. I was not satisfied. ‘What do you want from me?’ sensed the poet.

‘I would make two verses of each long verse.’

The poet asked for a pencil and scribbled a little in the proofs: ‘Do you like this better?’

I saw that he had adapted his collected works to my proposal. He explained that he had his problems with

long verses too. The narrow columns of magazines have no space for long verses. The shortened verses would have a better chance to survive trendy typography.

When a poem has neither rhyme nor a strong meter it can only be distinguished from bombastic prose by typographic tricks. If a poet renounces the technical characteristics of the poetic mode he has to rely completely on the technical characteristics of the composition. I have to conclude that poetry is only made by the typographer.

The typographer would at once become aware of the impact of these abstractions if he accepted the general instruction to set the poetic passages of the Bible in poetic composition. A great difference between prose and poetry should make any further indication unnecessary. But where does poetry begin? Only in the bragging veteran song of Lamech in Genesis 4:23–24, or already in Genesis 1, where the chorus ‘and God saw that it was good’ transforms an improbable cosmogony into a cosmic hymn? And where does poetry end? Already with the last verse of 1 Corinthians 13: ‘So will remain faith, hope and love, the three of them, but love is the greatest of all,’

or only with the first verse of the 14th chapter: ‘Aim at love’?

The difference in rhythm between prose and poetry is a relative difference. In prose the rhythmic intervals are generally greater than in poetry. The intervals cannot be smaller than in nursery rhymes, the most compact kind of poetry, whereas they are very long in 19th century novels; almost too long for short-winded modern readers. With intervals of any size the Bible levels out the barriers between poetry and prose. All prophets are balancing skillfully between prose and poetry. In the confrontation with the language of these giants the typographer is forced to give up any pretension of interpreting or even paraphrasing a mode of speech.

But what if the poet himself takes up the pencil and specifies the lines?

When this happens the poet has taken the position of the typographer, prescribing how the reader is to read. My engagement is with the reader. I would like to give him the freedom to read for himself if there is any poetry at all in the prose.

3 : DIPLOMATICS

This is a story about the legacy of a poet who believed that the specification of body size, typeface, font, line feed and orthographic details is an aspect of language. He is said to have crossed the country with his motorbike to exchange a colon for a semicolon on the press, only to call the printer by night on his way home to undo the improvement. Though he had raced to death with his machine many years ago, his subtlety had survived in his editors. They were of the breed that abstracts meaning from ellipses by counting the number of the dots. Their scrupulousness was not extended to the consistent treatment of the apparatus that I would expect from editors.

With the legacy of Adriaan Roland Holst (1878–1976), the most famous Dutch poet of his time, I could on the contrary do what I wished. It is said that he preferred to correct the proofs of his poems by having them read aloud by a visitor. He would listen carefully whether all his words were there in the right order. When he could recognize them all he was satisfied. Everybody who wanted to could fuss about orthography and punctua-

tion; he did not. When he was told that it was nowadays no longer fashionable to begin a verse with a versal, he ordered that in the reprints of his poems superfluous versals should be removed. Accordingly his editors left the responsibility for the text to me.

The edition of the semicolon-poet has drawn a scholarly correspondence about the current view on a diplomatic edition. When I had dug through the pile of paper, I had arrived at the conclusion that a diplomatic edition is an illusion.

4 : WRITING

In a magazine for Bible translators, a philologist has demanded an edition of the Bible which can be read aloud conveniently. The designer of the edition would have to keep this condition in mind. In the same magazine I have explained that it is difficult for a designer to meet this condition when translators are anticipating design by translating different names of God in different typography. The words Lord, LORD, lord, *Lord* and *LORD* will all be understood by the listener as *lord*. Recently

(since the sixteenth century only) philologists have persistently been trying to translate words into scripts. If they ever succeed, we will get holy scriptures indeed.

In typography, author and designer meet.

Author is any person who devises the language of the text.

Designer is any person who specifies the writing of the text.

Writing is any system of signs which is used to symbolize language.

Language and *writing* are different systems which do not depend on each other. The realms of a writing system and a language can only be connected by a bridge that is anchored in both realms. The bridge, an orthographic system, is a set of semantic conventions. Any orthography bridges one specific language and one specific writing. In one civilization there may be many different languages, but their orthographic systems link them to one writing because a civilization coincides with a system of writing. Western civilization, for instance, is the cultural community which uses Western writing.

Cultural history is most violent on the fault lines of writing systems. Japan is such an eruptive region. This is why Japanese language needs one orthographic bridge to Western writing as well as one to Chinese writing. The Japanese example demonstrates that a language can have different orthographies: language must not be identified with orthography. Yet I am afraid that you will nevertheless continue to think that the English language requires all the atavisms of the current English spelling.

There are signals that Chinese civilization is losing its stability too. It is such a signal when Chinese clerks are emitting the message that in a Western transcription of Chinese, Peiping should from now on be spelled Beijing instead of Peking. Just think of our customs to see how alarming this message should be. I would never care how the Chinese want to spell Denver, Utrecht and Graz in Chinese writing, and I will continue to write Florence and Vienna when I have Firenze and Wien in mind, without asking permission from any Italian or Austrian clerks.

5: CUSTOMS

There are habits that are not anchored in the great conventions of writing or in the small conventions of languages and that are nevertheless crimping the freedom of the typographer. They are bridges leading into the misty realms of metaphysics and marketing.

The editions of the Bible offer many examples of such bad habits. There is, for instance, the universal habit of compressing about 65 books (depending on the different opinions about the biblical canon) into one volume. The typographer and the bookbinder are burdened with the complications, but the translator is also hampered by them.

The Bible is ambiguous and it is intentionally so. In most cases the double meaning cannot be translated with a single expression. The second, third and fourth meanings require additional translations. Yet nobody would consider such a tree of interpretations because it would explode the volume. As a Bible publisher once told me, 'After all, the Bible should be easy to handle.'

He cannot know why this should be so because no-

body knows who is reading the Bible nowadays, nor why this unknown reader is reading the Bible and how far he is served by such a compressed volume.

I am overstating a minor problem, don't you think? Let us see. *Pedigree of Jesus Christ*. This is the meaning of the first sentence of the New Testament according to every translation I know. This translation leaves you with the question why this part of the Bible begins with an extract of the records office. A commentary on the first sentence of the New Testament has never been published. I guess that such a commentary simply does not exist. Perhaps I am not supposed to ask such questions. Yet I do.

My question leads me to the original text. Here are the first words:

Βιβλος γενέσεως Ἰησοῦ Χριστοῦ

(Biblos geneseos Jesou Christou)

Scholarly folklore requires that Greek, unlike Russian, Arabic, Chinese etc., is not transliterated though a transliteration would be good enough.

Now take a Greek dictionary and see the beginning of the New Testament evoking the beginning of the Old Testament: *The book Genesis (of Jesus Christ)*. Hidden in an announcement of the ancestry of Jesus there is the message from the author to the reader that his book wants to be read as a paraphrase to the Old Testament, that it cannot be understood without understanding the source, and that this is also the main purpose for reciting the ancestry of Jesus. With its word-play the New Testament tries to resist any attempt to separate the assumed Christian book from the assumed primitive corpus of Jewish writing. The ambiguity of the gospels is expressing their unambiguous engagement with the Old Testament. If our habits had not insisted on the single volume which leaves no room for alternative versions, history might have taken a different course.

Throughout the New Testament, but notably in the gospels, the authors have extensively used the second meaning of words and expressions to explain the purpose of stories. The ambiguity of the text is not incidental. Its structural importance is charmingly illustrated by the mannerist design which encompasses the four gospels.

This runs from *biblos*, the first word of Matthew, to *biblia*, the last word of John. One might almost think that he is reading a *bible*.

There is a good chance that I am totally wrong with my interpretation of the Bible. But even then it is still the original text which is initiating my speculations. As far as our translations do not allow this kind of thought, they are falsifying the text. However, an attempt to avoid this corruption would result in a translation that cannot be bound in a single volume. The bookbinder decides what is in our Bible. Is he entitled?

6 : TEXT

The battle of Waterloo performed at small scale with leaden soldiers. This is how author and designer are playing out in miniature the great cultural battle of the bridge between language and writing. It is not language and writing which are at stake but the text. The text is already a product of graphic design and many authors are opposing the destruction of their design by the typographer. Many authors imagine they have versified colons, indents and capitals.

In the story about Roland Holst, the poem and its text are different entities. The author devises the poetry and the text is the responsibility of the designer. The text is not the poem but a graphic sign symbolizing language. The word images of the text are not the words of the verses, and verses are not necessarily the same things as the lines of the composition.

In the story about the famous poet Gerard Reve (page 109), even the verses are adapted to the requirements of design, but the poetry is not changed. The *text* of the book is bound to orthographic rules; its *language* is not. The evidence of this observation might be somewhat inconvenient for the conventional classification of literature. As far as a sonnet is a poem of 14 verses, the sonnet is a typographic construction†. Generally this typographic

† *This is arguably true for some 20th-century sonnets, including many of Rilke's best. But for all earlier sonnets – including those of Dante, Shakespeare, Quevedo and Elizabeth Barrett Browning – the essential form is acoustic. There are fourteen audible units which all trained listeners will hear. The typographer can emphasize this form or he can hide it, but he does not construct it out of nothing.* – ROBERT BRINGHURST

construction is specified by a typographic amateur (the poet) but it is nevertheless a typographic decision.

Considerations of this kind could have saved the poet Jan Hanlo (page 111) his dangerous night-time expeditions. The question whether sentences should be separated by a colon or a semicolon is more a typographic than a poetic question, even if it is asked by a poet. Our motorized poet quibbled with typographers because typography was more important to him than poetry.

From this point of view, late romantic literature appears in a slanting light disclosing bulges in its structure. To the lexicographic poets of the nineteenth century, text was more important than language because regulated orthography was a condition for the dictionaries they were fond of.

When I was young it seemed clear to me that the orthography and the typography of the text have their reason in the language which is therefore more important than the text. Now I know too much to say this with the old confidence.

I do not remember anything important from the Irish literature of the sixth, seventh and eighth centuries

PLECHTIGE INZEGENING VAN HET HUWELIJK
VAN HARE KONINKLIJKEHOOGHEID
BEATRIX WILHELMINA ARMGARD
PRINSES DER NEDERLANDEN
PRINSES VAN ORANJE NASSAU PRINSES VAN LIPPE BIESTERFELD
EN CLAUS GEORGE WILLEM OTTO FREDERIK
GEERT VON AMSBERG
IN DE WESTERKERK DER HERVORMDE GEMEENTE
TE AMSTERDAM
OP DONDERDAG 10 MAART 1966

(Roland Holst did). Nevertheless Ireland has sheltered the whole civilization by preserving faithfully Western writing. Text comes before poetry but only in this sense: that writing, the eternal, precedes fugitive languages to be at their disposal in advance.

7 : ROYALTY

I once designed a program for the wedding of Beatrix, the present queen of The Netherlands. I could have made a better arrangement of the title page, but I expected difficulties if a name or a title should run over.

The design was composed and printed and handed

to a servant of the court. He passed it to somebody else who passed it to somebody who showed the princess the whole run of one copy. Her comments were returned along the same way to the printer who interpreted them in a new design. The end of the story will be in my memoirs.

The royal design is typical for the general illusion that typography should express meaning. I had already violated the first principles of design in my arrangement of the lines. It was not enough. Nothing, absolutely nothing could be left to the understanding of the reader.

The opinion that typography should symbolize the

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meaning of the text is not limited to small royal circles. It can be found in many handbooks of typography. A more edifying discussion was reported to me by the teacher of the small school in our village.

The school has a tradition of discussing the design of a new book before it is taken in use. This practice stimulates the critical sense of the children (in fact everything is discussed in a similar way) and it is also an advantage

when from the beginning the children are aware of the structure of the books from which they should learn something. Listen.

—I do not like this design because bold type is spoiling the appearance of the pages.

—I think that you are wrong. When you look carefully you would see that the designer has accentuated important paragraphs by printing them in bold type. What you

do not like has been done in your interest.

—That would only make things worse. If you are right the greater part of the book is not important.

In the middle voice I recognize the royal point of view. My sympathy is with the other little speaker.

8 : CONTENT

Content is the meaning which we are attributing to form. Content does not exist as empirical reality. Content comes from my interpretation of the phenomena; you might interpret the same phenomena differently and create a different content by doing so. I do not take the beginning of the Bible as information about the origin of heaven and earth, but as a poetic bid to accept design as our dire duty. Strange enough, not everybody sees this meaning; we are making different contents.

While conceiving content we only *see* form. We might safely say that behind the surface a content is hidden, for this statement cannot be verified. When a surface can be scratched away, only a new surface is brought to the surface. When peeling onions we had better stop in time if

we do not want to look through our tears at our empty hands.

The author devises a shape of language which can be interpreted in a literary content. The text symbolizes the form of the language in a written form. This form has a calligraphic or a typographic content, but definitely not a literary content. If I have to know the 'real' content of the Bible first, I can never design an edition of the Bible. A typographic idea, however, is sufficient. But this typographic conception is my own creation as well; I cannot rely on the decrees of famous colleagues. And if an author ever wants to explain to me how I have to understand his book, he simply could have written his book that way.

The Bible, my example for everything, is an excellent example of the chilling effect of established content. Generations of believers and scholars have been preaching the final meaning of the Bible. We are no longer looking at its many forms, for we are at once 'seeing' the petrified contents. As the terrible result of this agreement, we cannot read anymore. Where content is conspicuous, the book is finished. May God send us heretics.

THE THREE BARBARIANS

HANS HOLBEIN II

ERASMUS OF ROTTERDAM

JOHANN FROBEN

THERE IS NO LOGICAL program for hyphenating. The rule makes a reasonable impression: words can be broken between syllables. But syllables are different in different orthographic systems. If you want to know whether a sequence of letters is a syllable you have to look it up in a list which has been arbitrarily composed by our servants, the ministers. By consequence automatic hyphenating is impossible. The logical structure of the microprocessor is a menace for the sophisticated art of word breaking. The computer will eventually throw us back to those barbarous times when there were no orthographic rules. Artists and scholars made word breaks at every possible position, which is any position between two characters.

In 1518 a book was made by Johann Froben, a printer, Hans Holbein, a designer, and Erasmus of Rotterdam, an author. I have copied the arrangement of the title (the original has INTSITV on the first line).

With such stuff the three men pretended to teach good manners to the would-be Christian princes of their time, which was a time without rules for hyphenating. The three did what they liked. There is no pretext for their arbitrary breaking of words, sometimes between syllables, sometimes halfway through a syllable, sometimes indicated with a hyphen, sometimes without notice, sometimes going together with a shift from capitals to lower case and in two instances with a change of typeface (in those barbarous days every body-size was a typeface).

INSTITV

TIO PRINCIPES CHRI

stiani, saluberrimis refer

ta praecipis, p. Eras-

mum Roteroda-

mum, ab eo-

dem reco-

gnita

cu. alijs no.-

nullis eode. p.tine.-

tibus, quoru. catalogu.

in p.xima reperies pagella.

APUD INCLYTAM

BASILEAM

It would have been easy to make a nice arrangement of the title without any word breaks. They did not try, for they did not care.

We cannot isolate them as artists from whom extravagances are to be expected. Froben, Holbein and Erasmus were meeting the typographic standard of the sixteenth century. The name of the standard is Mannerism and its mood is freedom. It is in mannerist freedom that the three excelled.

Even the clerks of our administrations are counting my three barbarians among the great teachers of our civilization, but beware: *you are not supposed to learn their lessons.*

A. sign

B. symbol

C. reality

In this list A is a sign symbolizing a number.

A sign

A word

A thought

In this list A is a sign symbolizing a word.

ABCDEFGHI

JKLMNOPQRSTU

VWXYZ

In this row A is a sign symbolizing A.

∞ is a sign (lemniscate) used in mathematics as a symbol for the infinite number. My dictionary says *an* infinite number but I would not say so. As a mathematical symbol ∞ is a numeral just like 1, 2 and 3. I would not say that 4 is a symbol for *a* number four either, because I only know of one number four.

In technology ∞ has been introduced recently as a symbol for durability.

In photography ∞ is a symbol for the minimal distance at which you may focus your camera for pictures that are not conspicuously unsharp when you do not enlarge them.

∞ and A, the two signs of these examples do not have a meaning of their own. Any sign can have any meaning that is assigned to it. Without assignment a sign has no meaning. To summarize: *a symbol is a sign with a meaning assigned to it.*

The problem has not yet been solved in this summary. I try another sign: *vis*. The new sign is composed of three other signs. This composition is called *word*, a graphic word; being a sign, it has no meaning of its own.

Accidentally this picture has been assigned a meaning in English, French and Dutch orthography. In the three different systems the graphic word *vis* symbolizes a lingual *word*.

In its turn the lingual word *vis* is a sign symbolizing a thought. *Vis* symbolizes *power* in English thinking. *Vis* symbolizes *vice* in French thinking. *Vis* symbolizes *fish* in Dutch thinking.

Fish should finally be the ultimate meaning of *vis* in Dutch but it is not. Even Dutch thinking does not necessarily come to an end at this level. The notion *fish* is symbolizing a category of *animals* or a category of *food* etc. I have italicized *animals* and *food* because these notions are

Dies irae, dies illa, solvet saeculum in favilla: Teste David cum Sibylla. Quantus tremor est futurus. Quando iudex est venturus, cuncta stricte discussurus. Tuba mirum spargens sonum per sepulchra regionum coget omnes ante thronum. Mors stupebit et natura cum resurgit creatura. Iudicanti responsura. Liber scriptus proferetur in quo totum continetur, unde mundus iudicetur. Iudex ergo cum sedebit. Quidquid latet apparebit: Nil inultum remanebit. Quid sum miser tunc dicturus? Quem patronum rogaturus? Cum vix iustus sit securus? Rex tremendae maiestatis, qui salvandos salvas gratis, salva me, fons pietatis. Recordare, Iesu pie, quod sum causa tuae viae; ne me perdas illa die. Quarens me, sedisti lassus; redemisti crucem passus; tantus labor non sit cassus. Iuste iudex ultionis, donum fac remissionis ante diem rationis Ingemisco, tamquam reus; culpa rubet vultus meus: supplicanti parce, Deus. Qui Mariam absolvisti et latronem exaudisti, mihi quoque spem dedisti. Preces meae non sunt dignae, sed tu bonus fac benigne, ne perenni cremer igne. Inter oves locum praesta et ab haedis me sequestra, statuens in parte dextra. Confutatis aledictis, flammis acribus addictis, voca me cum benedictis. Oro supplex et acclinis, cor contritum quasi cinis, gere curam mei finis. Lacrimosa dies illa, qua resurget ex favilla iudicandus homo reus Huic ergo parce, Deus, pie Iesu Domine, dona eis requiem.

THE CLASSIC

There is a great tradition of writing poetry as solid text, filling the measure of the column like any prose text. This is still the common way of composing the oldest hymns of Western civilization in liturgical books. Try to read the column at left as prose.

This example of current practice should demonstrate that typographic rules about paragraphs are arbitrary. There are alternatives for the classic mode.

The custom of setting verse as lists of lines is extremely artificial but it makes some sense. However, the noise about the widow, the closest relative of verse, is sheer nonsense. Widows are the consequence of paragraphs. It would be easy to avoid them by avoiding paragraphs. When I am in need of a funny statement I take Bookmaking by Marshall Lee. Explaining widows he says: a line of conversation is not a widow but the last line of a paragraph is. He is also suggesting that a widow is only a widow when the composition is justified. I care for typography. I do not care for widows. A designer who is dreaming of neat rectangles should keep his hands from typography.

signs symbolizing other categories of phenomena etc. The complete number of these speculations is ∞ . They would arrive at an end if we were able to face reality immediately without the interference of symbols.

In the thirteenth chapter of his first letter to the Corinthians, Paul explained beautifully why an ultimate statement about reality is beyond human imagination. In the speech of our time, Paul might have said:

Science is fiction

Sign and symbol are brothers, the prophet and the priest. The prophet Moses had led his people out of slavery into the desert of freedom. In his absence the priest Aaron takes his chance. From our treasures (the signs) he makes a glossy symbol, a holy prejudice.

THE WORSHIP OF THE GOLDEN CALF

Typography does not go that far. The designer need not worry about symbols and meaning, and he should

not. His business is the arrangement of signs in the right order. My order is not the sequence of letters and sentences, which is the business of the author, but the order of shapes and countershapes of letters, (graphic) words, lines and margins.

In this point of view, the only one which can be defended, the graphic word evokes a lingual word.

The graphic word also evokes prejudice. This symbolism can be silly in design. Thirty years ago the director of Querido (a Dutch publishing house) was fond of green. Whenever I presented a sketch for a violet book jacket she said automatically: we are not catholic. By trying yellow I could trigger the same automatism. Finally I turned to green, knowing that she would say: that is beautiful; why did you not make this at once?

Turning away from the sign to the 'meaning' looks wise and deep. I have only met cultivated illiteracy or just humbug in symbolism.

GOTHIC

GOTHIC IS HOW American printers used to call a letter when it looked like my picture of an E. Nowadays they likely say sans serif because learned men have explained to them that the word Gothic has a different meaning. This is not true. For us a word has the meaning that we append to it. You might just look up in a dictionary the expression desert storm for advanced contemplation of meaning. Anyhow, by the united efforts of learned men the word Gothic has lost the meaning I started with, not because this meaning was wrong, but only because we do not use the word in this sense anymore.

I wish there was a learned man who could disclose the origin of the old American meaning of *Gothic*. I am not sure that it came from ignorance. If you would take *Gothic* for a moment as the label of an art style at the end of the Middle Ages that had its center and its origin in Northern France, nothing could be more Gothic than my Gothic E.

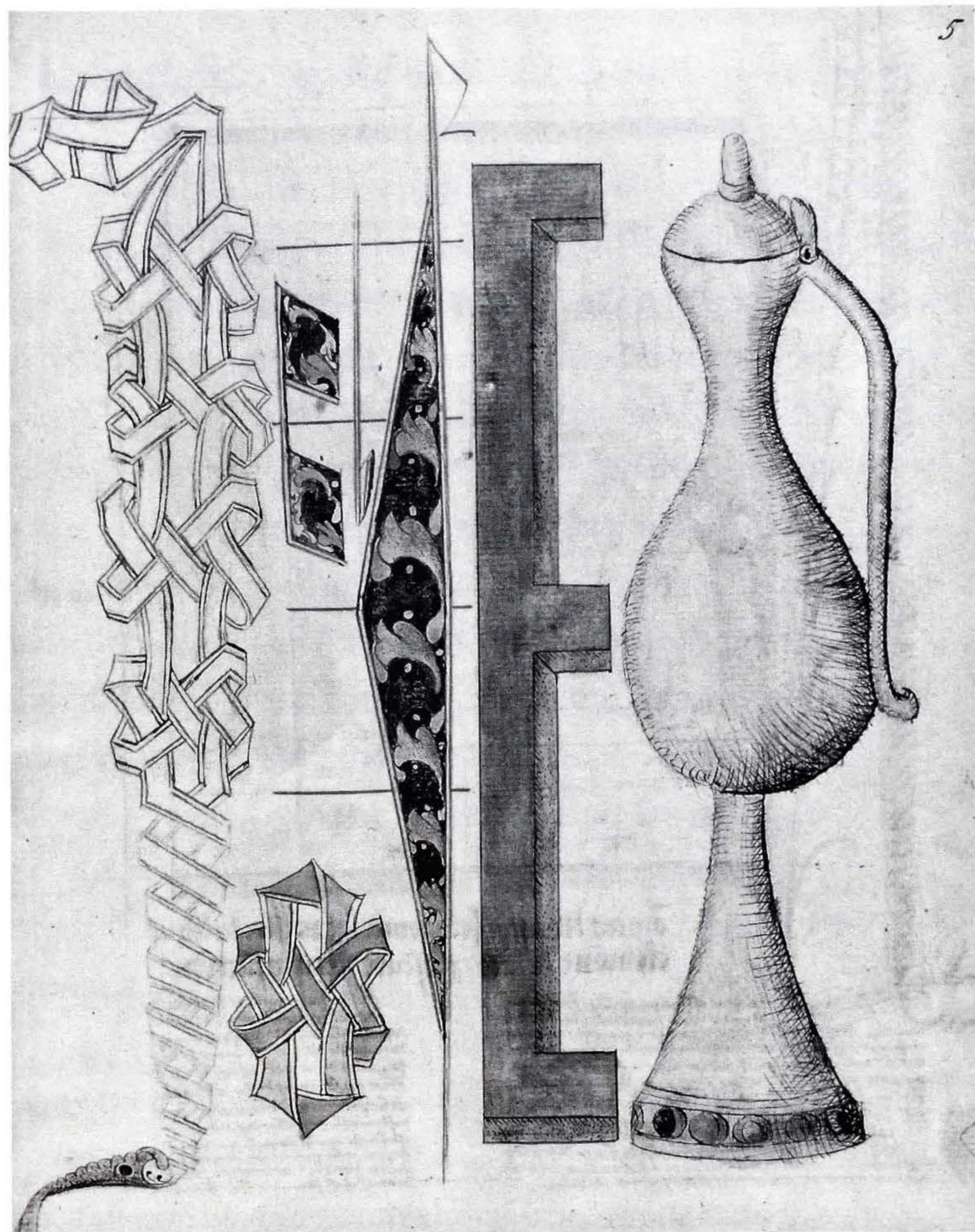


In the summer of 1959 there was an exhibition of Flemish miniatures in the Rijksmuseum, Amsterdam. Of all the splendid things I must have seen at that occasion only one picture has survived oblivion: an E in bright yellow water color with light gray shading. I lost my note with the signature of the manuscript immediately. Only recently it was reconstructed in an illustrated correspondence with Fernand Baudin. Fernand went to Paris, found the book and got the photograph that is reproduced on page 3. The original drawing was made by Jean Miélot in Rijsel (*Lille* in French) in 1468. It is in a draft manuscript (*minutes* in French) on paper.

My drawing is the picture as it has been shuffling around in my mind during more than thirty years, twisting my understanding every time when something was said about civilization.

Thanks to Fernand I can now show in print the mental picture that separates me from established scholarship.

Bibliothèque Nationale, ms. fr. 17001



PROPORTIONS

1. The white shapes in words.
2. The shapes between words.
3. The space between lines
4. The space between columns.
5. The background of text.

This list is the hierarchy of white space in typography. Its order is a condition of legibility. That is to say: you can neglect the condition, but because it is a condition you cannot get legible text by doing so. Perhaps your illegible typography will be beautiful. Some monumental Roman inscriptions are striking examples of illegible beauty. Yet the hierarchy cannot be broken because it is an instance of a law, not an aesthetic rule, but a law in the scientific sense of the word.

Though you are probably conditioned to consider lines as horizontal structures, the law forces you to recognize at once the second arrangement as made up in verti-

cal lines; you simply have to because the law does not allow you to exchange the second and the third class of the typographic hierarchy. Of course, you might call the vertical lines columns, but there is no verbalistic escape from law: the space between signs of the first arrangement has now taken the value of the space between lines.

8888888888	8	8	8	8	8
8888888888	8	8	8	8	8
8888888888	8	8	8	8	8
8888888888	8	8	8	8	8
8888888888	8	8	8	8	8

In type design the rule cannot be demonstrated with the same simplicity as in typography. The typographic example should make clear that the law of perception has no connection with my private preferences. Sometimes I prefer to combine numerals with numbers in horizontal

lines of text and at other occasions I want to arrange them in vertical lines. The law does not prescribe to me my preference, but it predicts for me its effect. The law is basic knowledge of design.

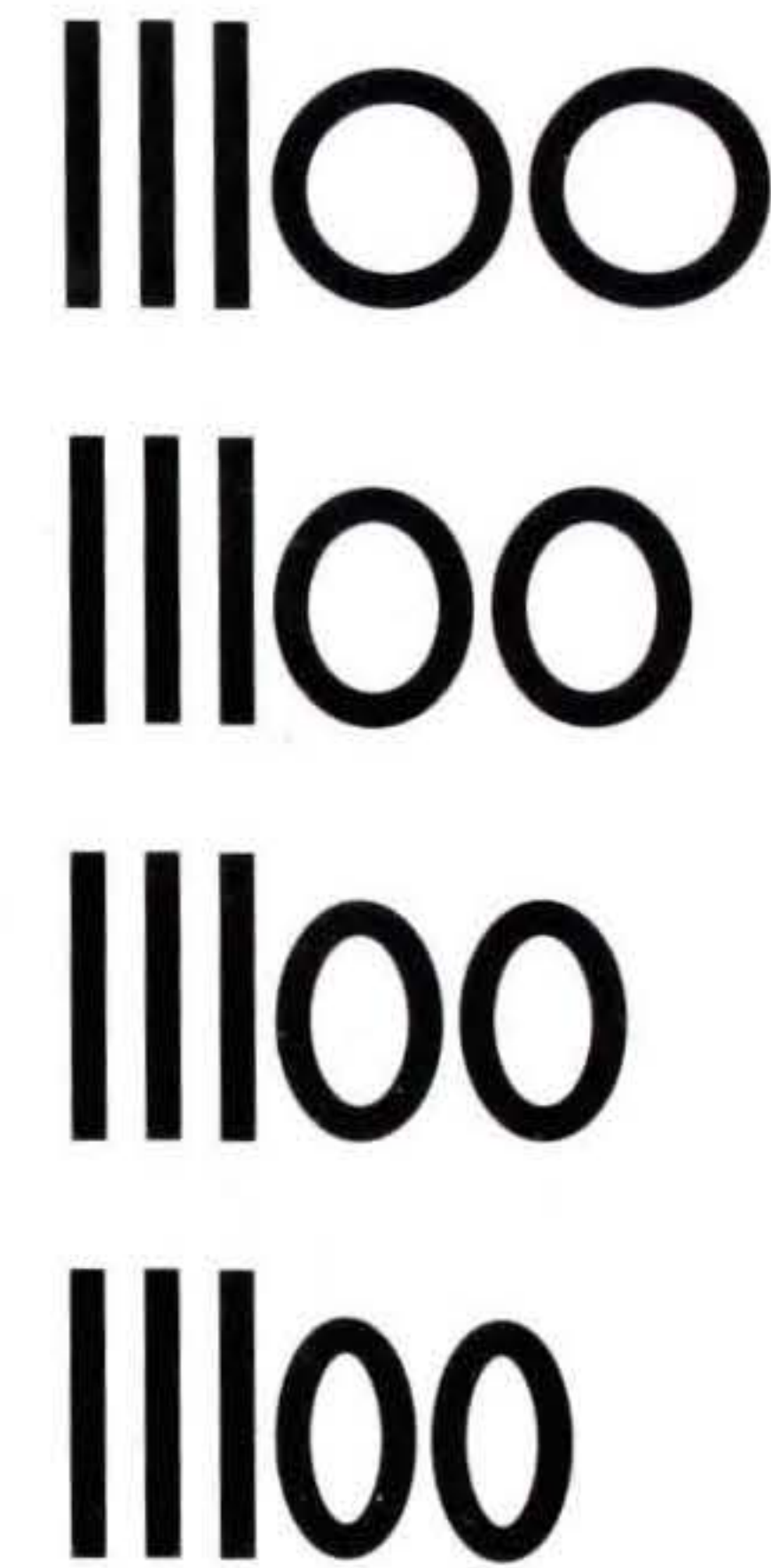
If you should guess now that you cannot reduce ascenders and descenders of a typeface without changing the hierarchic order of a design, you have got it. What type-merchants with the support of scholars are telling you about the space saving effect of such improvements is not true. Any distortion is under control of the law. For anything I take beyond what the hierarchy allows, I have to give legibility in exchange.

I am talking common design, not especially type design. Therefore I illustrate the more complicated part of the story with simple shapes, a few rectangles and a ring.



Imagine the three rectangles as indications of letters. The first question is: What kind of letters could be represented by the set, ascenders or letters at x-height?

To answer this question I have added the round shape to the set of straight strokes. The big countershapes of the ring crowd the straight shapes proportionally; the arrangement cannot produce the rhythmic unity of a word. Now assume that I have a high degree of legibility (a strong rhythm) in mind. When legibility matters I cannot be satisfied; the round counter is too big.



In the next group I have reduced the round counter successively; first by reducing the ring and then by compressing it. Every step is an improvement of rhythm. In the final step I have reduced the ring vertically.

It is hardly necessary to write down the answer to my first question. There is no doubt: rhythm (legibility) urges me to consider the place-holding rectangles as ascenders; even in an extremely compressed typeface they would not fit in the rhythm of words if they were at x-height.

At increasing compression, the ascenders in the middle group fit more harmoniously in the arrangement. They are becoming more convincing as well. In the

first line the ascenders are rather deviations from the x-height, disturbing the unity of the arrangement. Only with a further reduction of the counters do the ascenders become self-evident: they look higher than the rings.

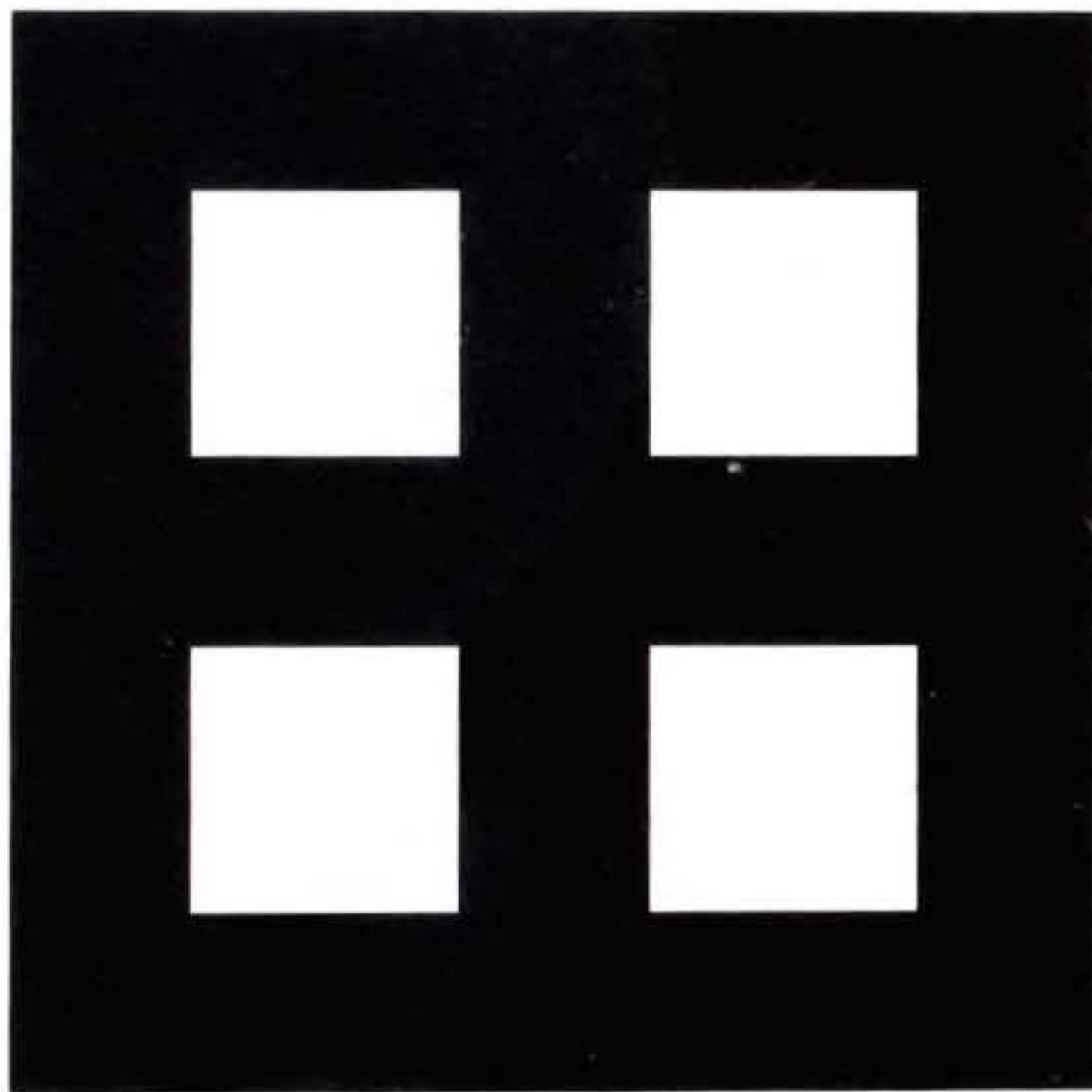
What if I do not want the extreme horizontal compression of the rings horizontally? The last specimen is the answer: then I have to increase the ascenders.

llloo

Again, you do not need to respect the law. Feel free to make cluttering and useless typefaces.

DESIGN AND TYPE

THE DISCUSSION OF type deals with weight, slope, contrast and proportions of serifs, curves, stems, ascenders and descenders. It is all about black shapes. As a character the big square is either a framed cross or a crossed frame.



Design considers the same picture as a set of four white squares in a black square as well. The perception of

the framed cross cannot suppress the perception of the white squares. In my perception the image twinkles at intervals of about 1 second.

Real characters have built-in stabilizers that keep the black shapes in the foreground. The writer creates the white shapes while drawing black shapes. A good writer anticipates this result by drawing his strokes in balance with the still imaginary white shapes.

The conventional type talk distracts from design. It looks for the secret of writing in the details of the black shapes. It is neither there nor in the proportions of the white shapes. The secret of writing is the balance of black and white. Change this balance slightly, be it only by underexposing the composition or by overinking the plate, and you have different writing. To make typography understood, we must teach design by teaching handwriting as the art of visual equilibrium.

Wang Xuan is professor of computer science at the

university of Peking. He told me that type design has no cultural status in China. It is considered as just another profession along with bicycle repair, accountancy, surgery and brick laying. It does not have the rank of an art, let alone a position like calligraphy, the first of the arts. Only gradually the Chinese mind is becoming aware of type design as a condition for embedding modern technology in the Chinese tradition. This explains, Wang said, why there are twenty good Chinese type designers at most against more than a thousand excellent calligraphers.

With due respect for that great civilization I could not believe at once that China would outnumber all other civilizations of the world with as many as twenty good type designers.

Afterwards I came to doubt. Chinese calligraphers

do not easily go astray in artistic noise and trendy decoration, and they do not have to look for a traditional background either. Simply by being Chinese they are breathing the inspiration of a great tradition. There is no need for them to learn how the principles of design could be applied to calligraphy because their handwriting is already the principle of design in a complete fashion. As a master of the square, every Chinese calligrapher is a potential type designer.

Non-Chinese are dreaming of type design that could exist independently from handwriting. This view cannot explain type design; it has no future because it has no past.

Learn this much Chinese at least: the future of a civilization is founded on its tradition.

LADY OF STEEL

BURGUNDY IS AN IDEA owing its name to a region of France. Even as a worldly power it was a dream rather than a territory with a capital. In a schematic history of Burgundy the political entity got moving because it was confronted with difficulties in France and with opportunities in the Netherlands. Notably the wealthy Southern Netherlands were attractive. A drifting state has little use for architectural monuments. The Burgundian court preferred portable art, paintings and books. The most precious gift Charles the Bold could present to his daughter was a prayer book.

Maximilian has told an allegorical story about Burgundy in *Weißkönig*, the white king. The book is about the knight of white arms (Austria) and his love for the lady of *Feuereisen*. (The badge of Burgundy is a sparkling steel; German *Feuereisen*, French *briquet*, Dutch *vuurslag*. The links of the chain of the order of the Golden Fleece are golden steels.)

Pages of the *Weißkönig* are often reproduced in publications on the history of typography. The book does not have as many readers as spectators. When I took it up to see whether Maximilian's interest in books and writing is mentioned in his book (it is not) I became fascinated by his zeal to remodel history. The archduke of Austria, the emperor of the Holy Roman German Empire, presents himself as the Burgundian count of Holland and Flanders. His ability to speak in their native language with his Flemish servants and with the English archers of his stepmother-in-law is recorded with the same pride as the great deeds of his glorious ancestors who are always Burgundians or Dutch but never Habsburg Austrians or imperial Germans. Maximilian does not supply us with real facts but with the dream that generated the reality of Burgundy.

When his adored Mary died, Maximilian inherited her position together with her prayer book that her father

had commissioned from Bruges. When Maximilian became king, he commissioned a prayer book from Bruges. When emperor, he commissioned a typographic prayer book from the Augsburg printer Schönspirger. To this commission from Flanders by the lord of the golden steel, Germany owes its tradition of *fractura*.

The origin of *fractura* is a fascinating enigma for German scholars. They want to find it in Germany or Austria. The facts about Maximilian point in another direction. Maximilian found his script in his precious treasure, in the heritage of Mary of Burgundy, Lady of the Steel.

Lady of Steel

THE CONSTRUCTION NAMED Bastarda

I write the history of the Burgundian script in technical terms. The construction of writing (building characters with pen strokes) is beyond the scope of learned authors. The subject and its terminology are exclusive topics of Letterletter. Because I cannot refer to shared knowledge, I have tried to make this article self-reliant.

HAND AND WRITER

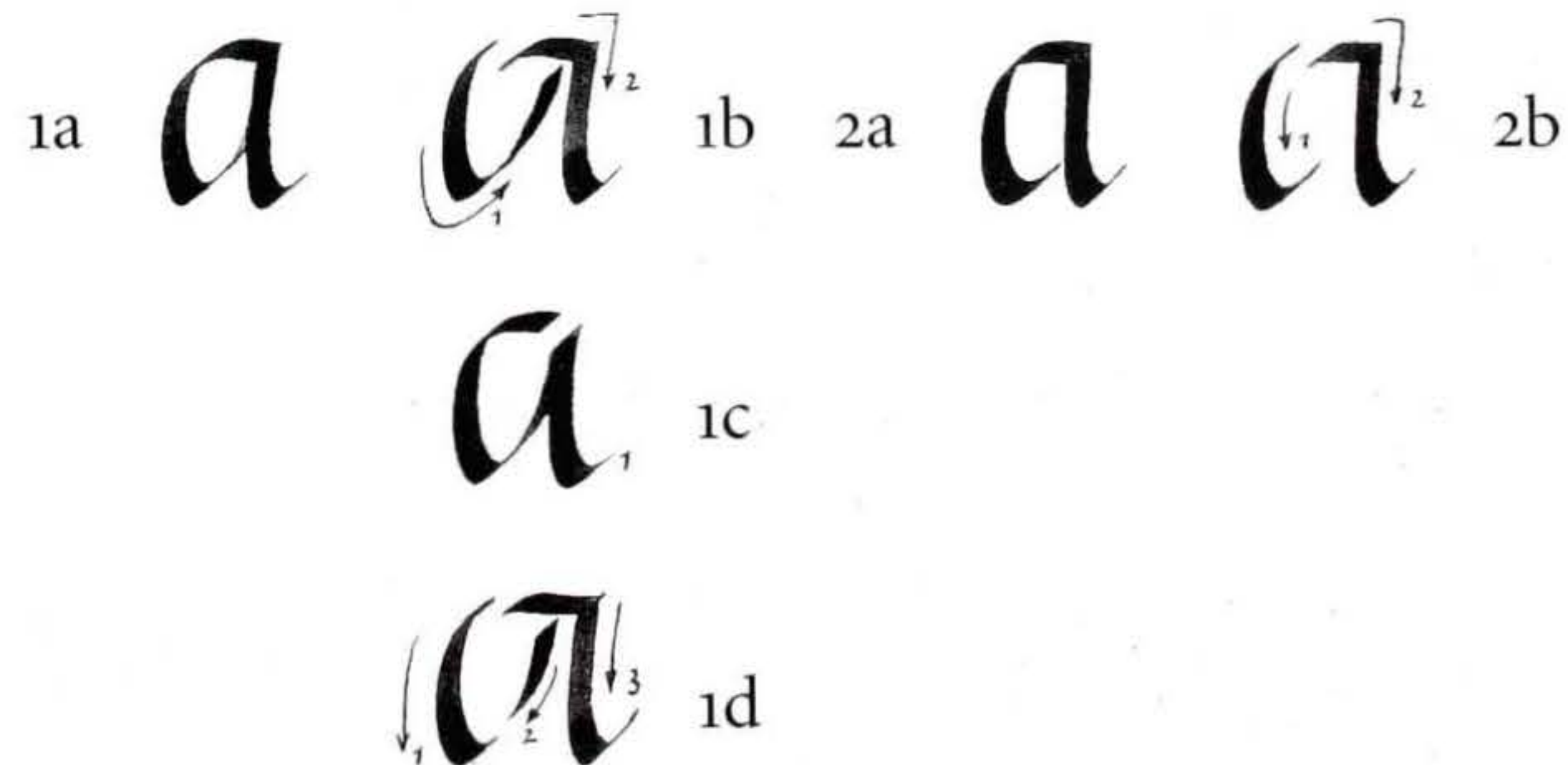
A few years ago the newspapers wrote about a man who was sent to prison for robbing a bank in The Hague. He had denied the charge but an expert had demonstrated convincingly that a scrap of paper lost by the culprit was written in the hand of the suspect.

One year later a burglar was caught in the act. When interrogated he also confessed to the bank robbery. The prisoner was released and the expert continued his convincing demonstrations.

Letterletter says: forensic graphology should be for-

bidden because any assessment founded on graphology insults the dignity of man. I cannot recognize a hand and neither can you. Graphology is humbug with criminal effects.

A *hand* is a basic conception in palaeography. A hand is a group of phenomena that are considered as characteristic for a style of writing (more precisely *a script*), a school of writers or an individual writer *from the point of view that is taken by the observer*. A hand can fall to pieces



when the observer changes his point of view a little. When the point of view is not specified a reference to a hand is necessarily vague.

Because the first cursive *a* (1*a*) has an upstroke, I cannot see whether it has been written as two (1*b*) or more strokes in *interrupted* construction or as one stroke (1*c*) in *running* construction. This *a* could even have been written as three strokes with the upstroke converted into a downstroke (1*d*).

The second cursive *a* (2*a*) can, however, at once be recognized as written in at least two strokes (2*b*) because there is no upstroke. This letter can only be completed by lifting the pen before returning to the top.

It is remarkable that in Western civilization nobody has ever been aware of this obvious disclosure of interrupted construction. This is very convenient too, enabling me, the outsider, to solve some tricky palaeographic problems.

FORM AND CONSTRUCTION

The next picture shows a Gothic cursive. In the first line (3*a*) the *a* is all right. In the second line (3*b*) the top of

3*a* *arum*

3*b* *a a a*

4*a* *arum*

4*b* *arum*

5*a* *arum*

5*b* *our m*

the first *a* is not closed. In informal writing such an *a* could assimilate to *ci* or to *u*; the running *construction* conflicts with cursive *form*.

This happens easily in a wide cursive script as Gothic cursives had to be. Do you remember Gothic art explained as perpendicular? Then you have nonsense in memory. You had better learn why Gothic handwriting had to be wide.

Anyhow the broken *a* needs repair. A very common solution is drawing the stem of the *a* backwards to meet the beginning of the stroke. Another solution was invented in Paris in the fourteenth century. The concluding downstroke of *a* has a retracted turn containing the top of the *a*. I have shown the construction more clearly in 5*b*.

The weak point in my otherwise satisfying explanation is the retracted downstroke at the bottom of *r*. There is no constructive necessity for it. I could save my story with the help of some aesthetics: *r* might have been considered as an incomplete *a* written upside down. If you are not impressed, I could point at the compensation that the retracted stroke offers for the white gap under the flag of *r*. The retracted downstroke can reinforce the rhyth-

mic unity of the word. In many old books the retracted downstroke seems to have been used for this purpose. But the point is not whether I can explain the facts to your satisfaction. I have invented my explanations only to draw your attention to the essential aspects. And in this regard you can be sure, this is one.

BASTARDA

The manner of writing *a* with the retracted downstroke is, probably from the onset, known as *bastarda*, and in a *bastarda* the *r* has a retracted downstroke as well (4*a*). I have shown the turning path of the pen in big letters in fig. 6. When written with a small pen the construction results in the German current hand (5*b*) which is not current anymore. This so-called German writing is a *bastarda* (of French origin) written with a thin stroke.

Why not extend the retracted downstroke to every sharp turn between upstroke and downstroke (*u* and *m* in 4*b*)? Because it is a waste of time.

Why then did the Burgundian scribes introduce this extension after the introduction of typography? Because they were paid for splendor rather than for speed. Mean-

while they were able to write a full ornate *bastarda* quickly. A striking example of such command of hand, a manuscript on paper written by Brito, is preserved in the library of Leiden University. I regret that I cannot show it here.

This elaborated script is now known as *Burgundian bastarda* (some palaeographers say *lettre bourguignonne*, but that is not English).

BURGUNDICA

Burgundy was a conception of a state. Eventually it could be attacked and destroyed just like a real state, but it has survived as an invincible exuberant way of life. The state drifted to the northeast, away from its French homelands, to the wealthy Low Countries, Flanders in the broadest sense of the word. Everywhere in these Southern Netherlands, workshops were soliciting commissions from the court which was the focus of cultural life. About 1450 the calligraphic workshop of Jacquemart Pilavaine in Bergen (which is called Mons in French) seems to have introduced an elongated version of the Burgundian cur-

sive (5a). The elongated script is distinct enough to deserve a name of its own: *Burgundica*. In the high days of Burgundy this *Burgundica* was the favorite book hand in the Southern Netherlands.

Attention: *Burgundica* is my invention; do not use this expression without reference if you want to be understood outside. The same care should be observed with the distinction between running and interrupted *construction* and between cursive and text *scripts*, or with analytical terms in general: There is no theory of writing outside *Letterletter*.

In any past, present and future civilization, material conditions will result in a running construction next to an interrupted construction, and always and everywhere aesthetics will formalize *running hands* in *cursive scripts* and finally over-formalize the cursive script in an *interrupted construction* again. Just look what your own hand is doing when you are trying to make 'very good letters.'

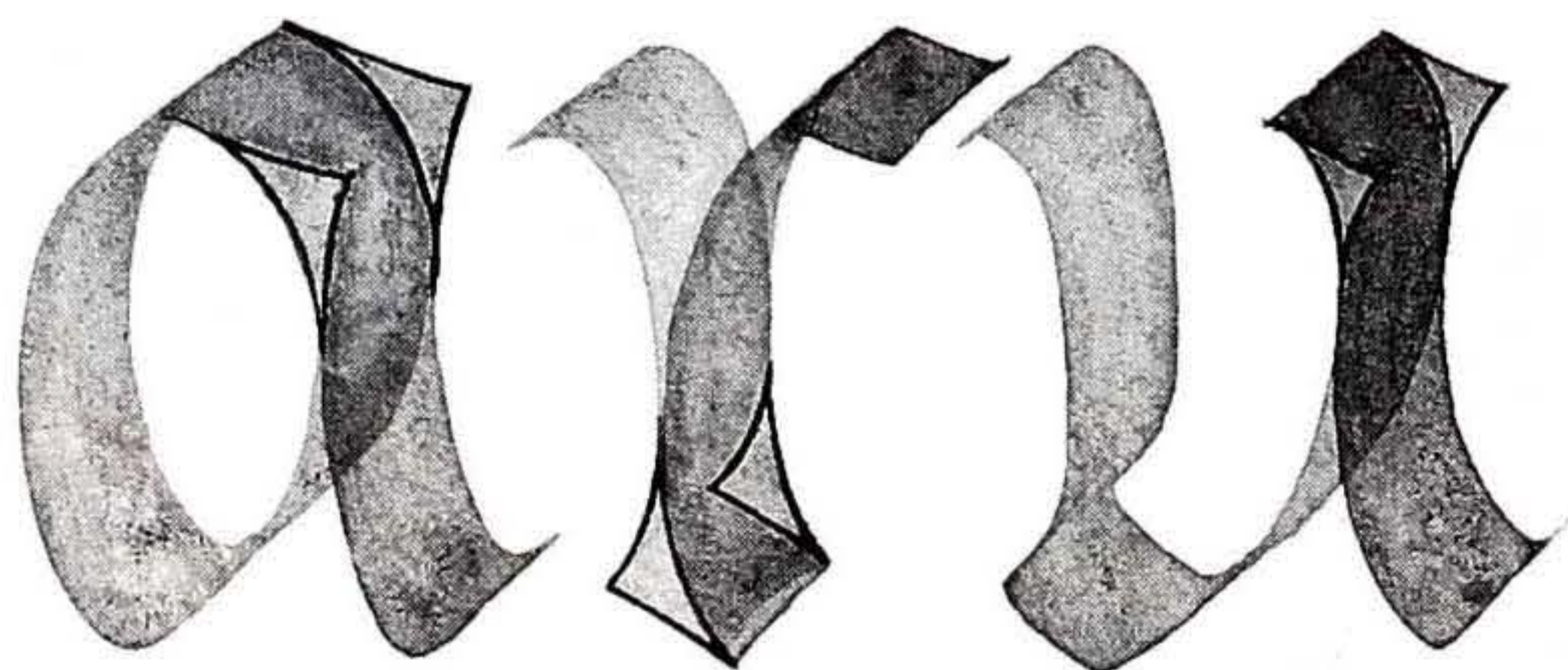
From the very beginning *Burgundica* was also written in an interrupted construction just like any other cursive (7b). Superficially the important elements of the running

hand are there, except for the upstrokes that could explain the elements. Whenever you want to understand an interrupted cursive hand, as, for instance, Palatino's cursive examples, put it aside until you have found the roots. This is also necessary in analyzing the Burgundica; 7b has to be understood against its origin in 7a.

Once you have seen it, the difference between a running and an interrupted construction is obvious. Before I started to look at it nobody in Western civilization had ever seen it. Otherwise this distinction would have been mentioned in every treatise on writing because it is essential for learning how to write. If scribes had been aware of the distinction they would not have mixed both constructions as carelessly as they have always done. Johann

Neudörffer has described the construction of the running Bastarda rather precisely in his 'analysis,' but if he has ever been understood he has always been neglected too. Stanley Morison even recommended the neglect of Neudörffer. Obviously he did not like him: 'a nauseous hybrid of gothic and baroque, remarkable for the puerile degree to which embellishment is preferred to legibility.' (*Early Italian Writing Books*, edited by Nicholas Barker, 1990, Edizioni Valdonega, Verona.) It becomes important for Morison to do away with Neudörffer when he wants to praise Arrighi for the first writing book, because Arrighi was not the first. Even Stanley Morison has to admit the fact that a few years earlier Neudörffer had published his *Fundament* (1519). By claiming that the *Fundament*

6



7a

arum

7b

arum

was 'never regularly published' whatever this may mean, Morison saves his story at the expense of the facts and of his position as a scholar too.

If you accept Morison's condition, you may as well conclude that the *New Testament* precedes the *Odyssey*.

INVENTED FACTS

Any attempt to explain historical facts is speculative and, what is worse, the selection of the facts is also speculative. You could find the workshop of Jacquemart Pilavaine mentioned in the same historical works where I have found it, but you would look in vain for its use of the new Burgundica, which is not mentioned either. This fact is my own invention made for my own purpose. I could also invent a number of explanations:

Error: The inventor of the Burgundica might have been mistaken by confusing the formal bastarda with the perpendicular textscript of his time.

Assimilation: He might have elongated the Burgundian bastarda intentionally to have the cursive Burgundica more easily accepted as a book hand.

Astigmatism: Distorted eyesight could have been a more trivial origin. I have often sent students to the ophthalmologist when they complained of their poor control of proportions. Many of them returned with cylindrical glasses. Art historians like to explain the elongated figures in the paintings by El Greco with the same impairment.

Affection: Obviously the inventor liked his invention.

If you like you might invent lots of other explanations yourself, but their number reduces their meaning. They do not always contribute to our understanding of the subject. It would do good to historical publications if the authors could hold back their explanations.

I would like to avoid explanations beyond the unavoidable manipulation of facts which makes the art of history.

My facts about the Burgundian book are not found in literature but in the sources only. Scholars keep silent about the Burgundian culture, yet it cannot be neglected completely. Jan van Eyck, the Van Limburg brothers and Rogier van der Weiden cannot be overlooked. They are not easily pushed into obscurity by labeling them as

^aSpecimen
Igitur perfecti sunt
caeli et terra et omnis
ornatum eorum

'primitives.' Books containing their paintings and drawings are in high esteem. Or I should say the pictures are in high esteem, and not in fact the books.

For scholarship the Burgundian book is inconvenient. The rise of a new calligraphic book script after the introduction of typography is in contradiction with the postulate of palaeography and of the history of typography which demands that typography should have put an end to the development of book scripts. It is in contradiction with Morison's economic gospel of efficiency too. But first of all it is in contradiction with the premise of a renaissance, of a miraculous enlightenment amidst the darkness of medieval barbarism. A study of the Burgundian civilization would make clear that the Florentine renaissance had its equivalent in Flanders and that both movements were equally medieval. And this would imply that our cultural conception is fallacious. Having arrived at this point I again took up Huizinga, *Herfsttij der Middeleeuwen* (The Waning of the Middle Ages), and now the sentence was there that I needed for my purpose: 'What distinguishes a Burgundian knight from an Italian humanist? Charles the Bold read his classics in translation.'

The history of Jacquemart Pilavaine should be forgotten again because it is against the rules of history. The *Burgundica* should not exist. It is an affront to everything that has been said about book production. Nevertheless it is a beautiful history telling that technological development can come from ideas, from design, and not from greed only.

The myth of fractura

The Germans say *Fraktur*. Fractura is a script that has survived in type only. In German public opinion, fractura is a German script. This is true for its spread; if Danish, Latin, French and English applications could be neglected, the use of fractura type was restricted to German texts. German mythology reversed this observation by distinguishing fractura as German script from Latin scripts, though any Western script is 'Latin.' The upside down reasoning wants to forget that Maximilian introduced the Flemish script in German typography for printing his Latin prayer book. Instead we should believe

that German orthography or even German language should require *fractura* and that the Emperor's Latin script in a Latin book should not be a genuine *fractura* for that. Finally the rule was imposed that words from other languages have to be composed in roman instead of in *fractura* text type. If, however, the Latin, Greek or otherwise alien origin of a German word is not observed in the spelling it has to be composed in *fractura*. Do you understand? This rule freezes typography.

Mythical regard is also reflected by the special position of *fractura* in German orthography. The current German orthographic system has accepted the disappearance of the long *s* from Western usage in writing; of course, one might think. It is, however, a serious mistake to neglect the obsolete *f* in a German text as soon as it is composed in *fractura*. Go, tell your computer.

It is easy to detect extravagances in another cultural circle, just as it is difficult to analyze your own folkloric oddities. The absurdities in Dutch conventions that I am aware of have been revealed to me by outsiders; for me they were too evident. Scholars should also be aware of their near sighted view. In the case of *fractura*, however,

German investigations have always observed mythical opinions. German authors are inclined to disqualify the more objective observations made from the safe distance of an outsider because of their objectivity. In German studies the origin of *fractura* has to be found in Germany because it is a German script. Imagine a study of italics restricted to Italy and a study of roman to Rome, and imagine accepting the competence of Italians and Romans only.

German type design was obsessed by word fetishism. Everywhere you are told that *fractura* is an angular script because the word *fractura* 'means' *broken*. Yet even German scholars would be surprised if a scientist were to teach that plastics should not be made rigid because the 'real meaning' of the word *plastic* is *flexible*. This reminds me of a forgotten meaning attributed to *fractus*; apparently the word has also been used in the sense of *soft* or *weak*.

GERMANY HISTORY

In 1538 the manual by Johann Neudörffer, *Eine gute Ordnung*, was published (if Stanley Morison allows the

expression). Neudörffer describes the construction of the retracted downstroke that merges with an upstroke along a path that encloses a triangle. From my point of view this is one of the most important observations in the literature on writing: Neudörffer speaks of *fractura* when a script is constructed with such triangles. *Fraktur* is the name given by Johann Neudörffer to the *construction* of the *Burgundica*. The important moment is the appearance of construction in his description of writing.

The Dutch mannerist writing masters were aware of the identity of the German and the Burgundian script. Boissens, for instance, refers to *Burgundica* as *Nederlandse bastarda* and as *Fraktur* alternately. By that time, in the first half of the seventeenth century, German printers had already forgotten a construction which could only be studied in handwriting. Preoccupied with assumed meaning, they were 'breaking' *fractura*.

The accumulated efforts of schoolmasters, scholars and designers effectively weakened the position of the script. In January 1941 Adolf Hitler could blow the remnants away with one crazy sentence.

German history

The German discussion avoids the typographic issue. A comparison of German typography with English or Dutch book design would reveal this at once: the latter have always used different scripts together to 'italicize' structural levels in the text, whereas German book design cultivated stylistic and grammatical purism.

This essay of *Letterletter* might mobilize this difference. German readers might ask how I can mix *fraktur* with roman and use it in English or Latin text like the Burgundian emperor of Germany, whereas others would simply criticize my design. A typographic discussion can only be founded on this other position.

Despite the mystification in German history, German typography and German type design maintain a high standard. Sensitivity and practical craftsmanship compensate for theory, but the price is high: the substitute cannot be taught or explained.

THE DUTCH SCENE

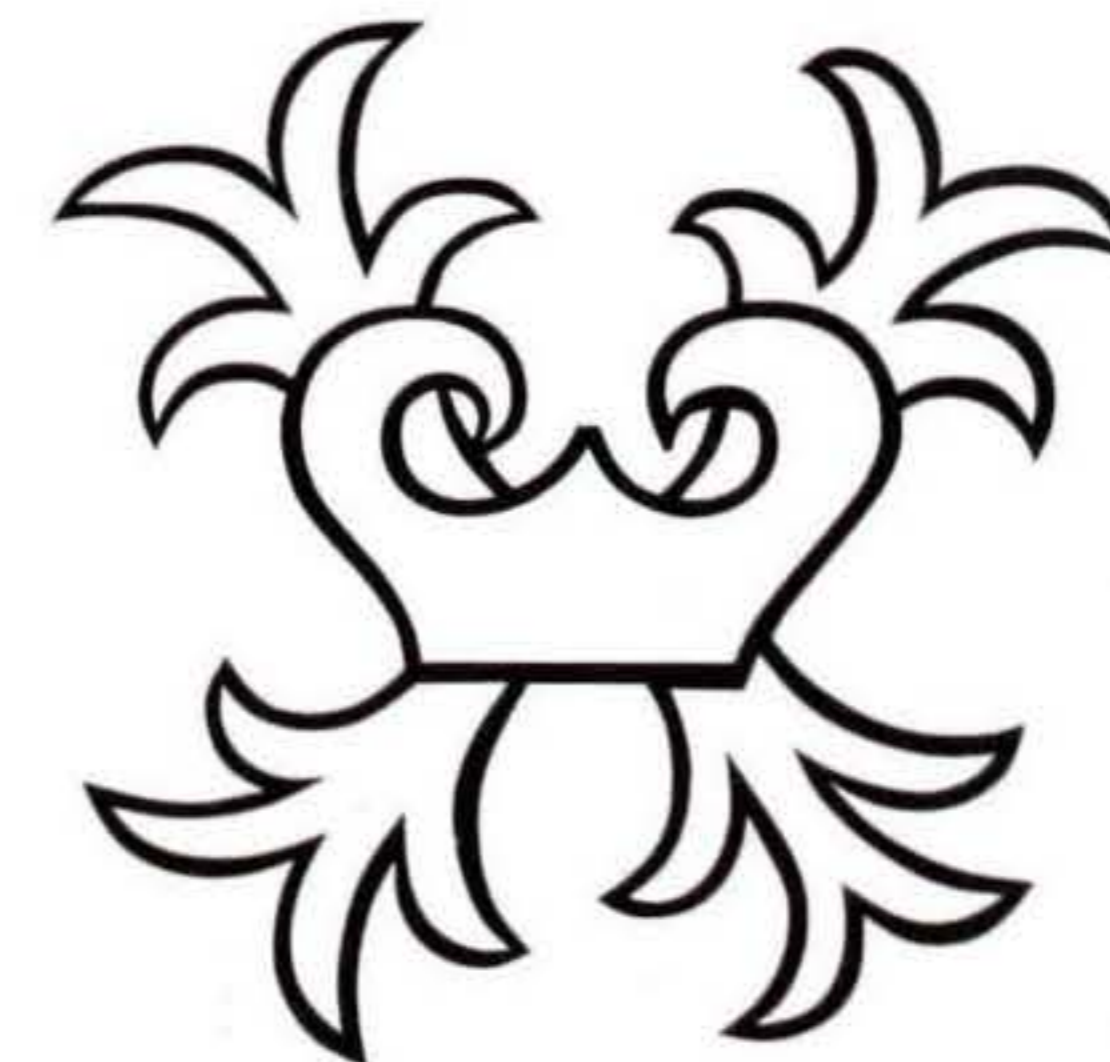
For the Dutch republic, 1585 is an important turning point. The young commonwealth had to surrender Antwerp to the Spaniards. It was the last great loss. From then on the small republic which had been thrown back on Holland and surroundings remained more or less victorious during the rest of the Eighty Years War. The part of the immigrant Calvinist elite from Flanders in the rise of the republic is impressively illustrated by the spectacle of the so-called Dutch writing books. Of over thirty authors, one was Frisian, one was from Zeeland and only one from Holland. The others are Flemish, among them Jan van den Velde (from Antwerp) who in cooperation with Simon Frysius (the Frisian) produced the main work of the movement, *Spiegel der schrijfkunst*. The pretext of the mannerist writing books was to provide examples of handwriting. The issue was rather the desire for abstract art. The same desire inspired the earlier German and Italian writing books.

The emigration of the Flemish aristocracy shifted the Burgundian civilization northeast once again, leaving the

devastated territory as a shell empty of its princes. The immigrants brought the Burgundica with them, but the script did not sprout in the new environment, which was already occupied by textura and roman. The use of the Flemish hand remained restricted to gilded text panels and tombstones in churches commissioned by immigrants. In some instances the engraved calligraphic model can be traced, but the script was not cut in type again. When the immigrants became settled in Dutch society their Burgundica faded away.

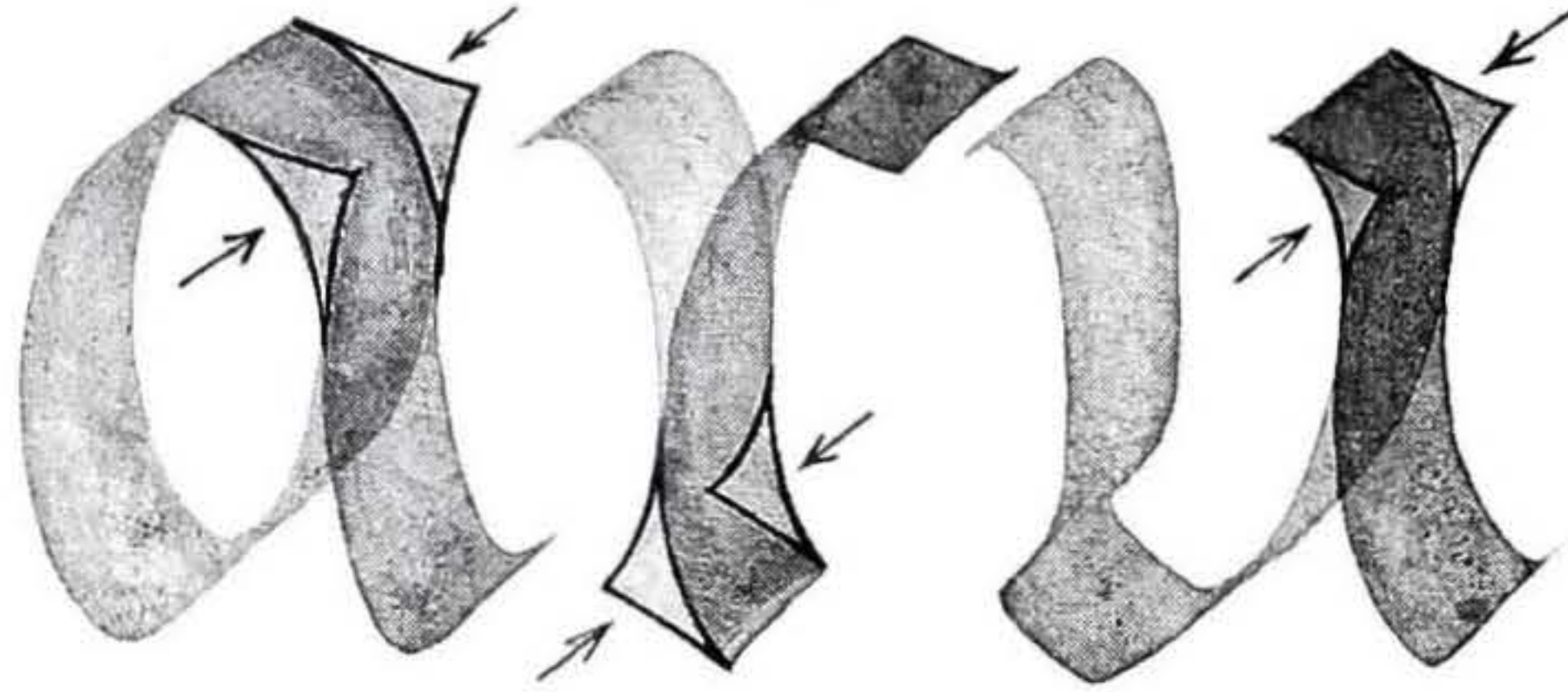
THE BADGE

The badge of Burgundy, a sparkling steel, can be found on Burgundian and Dutch coinage. In numismatic publications the steel is described as a crown and the sparks as sticks. Beware of scholars.



CONSTRUCTION AND SHAPE

You might wonder how Neudörffer's clear and precise characterization of bastarda (fractura) could have been overlooked. The answer is simple: you cannot see it.



Neudörffer is pointing at *triangles* where the observer sees *lozenges* only. Addressing *craftsmen* Neudörffer has described how fractura is *made*. This is hidden to the *spectator*. The remarks about Neudörffer by Stanley Morison betray the revenge of the frustrated ignorant. To avoid a disaster of this kind I have written my diagram with diluted ink. This helps the spectator to imagine what the craftsman sees. In the case of fractura the difference between *construction* and *shape* is the difference between a triangle and a lozenge.

MANNERIST WRITING

SELDOME, IF EVER, is the handwriting of Jan van den Velde shown. The picture overleaf is from a manuscript written in 1597. According to the late art historian Jan van Gelder, it was found about twenty years ago in an attic in Antwerp. Before entrusting the original to the Institut Néerlandais in Paris he gave me a set of photographs, a fascinating glimpse of the desk of the master.

Works on the history of art do not always distinguish Mannerism, assigning it arbitrarily to Renaissance or Baroque. From a renaissance point of view, mannerist art appears perverted. This might explain Stanley Morison's exclamations of disgust with regard to the purest examples of mannerist writing, notably when they happen to be of German origin. Nicolette Gray takes a romantic point of view by assuming that the mannerist writers depended on their engravers for the quality of the plates. However, my specimen demonstrates the supreme crafts-

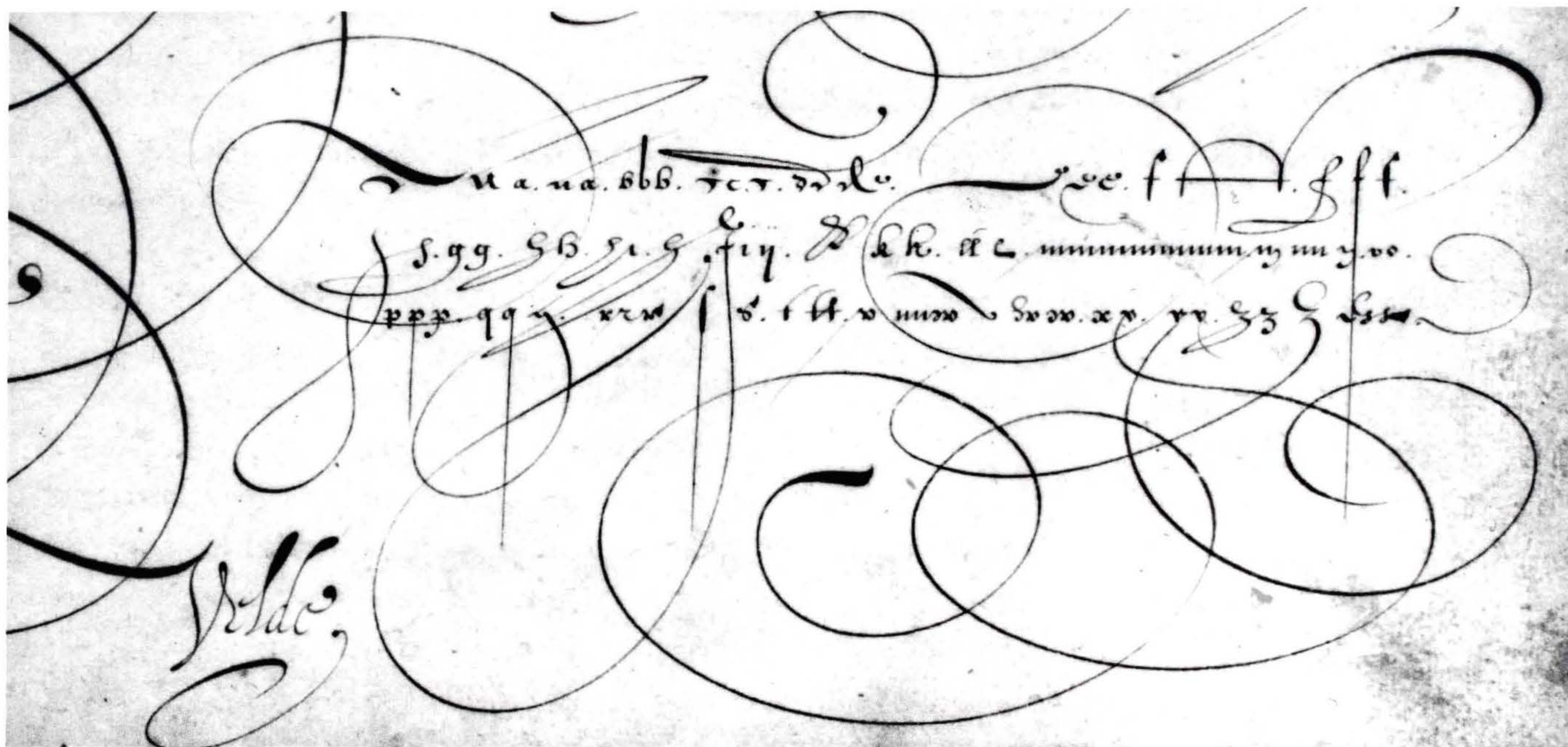
manship of Jan van den Velde; he needed the engraver for adapting his work to print, not for improving or embellishing his handwriting.

On Copperplate (page 159) is about the part of the engraver in the mannerist writing books. This essay gives the background. It is a wide scene exposing a general cultural attitude. Mannerism has laid the foundations of the world we live in. Our social, political, scientific and religious institutions, in short our culture has its roots in Mannerist inventions. This dynamic attitude deserves our interest for its own merits too.

THE GREAT PATTERNS OF CIVILIZATION

There are three patterns in cultural attitude.

Classic is the attitude in harmony with place and time in a harmonious universe. In verse: *I rejoice that things are as they are.* (T. S. Eliot, *Ash-Wednesday*).



Mannerist is the attitude that creates its own little cosmos amidst the chaos, joining the chorus in *Porgy and Bess: It ain't necessarily so*.

Romantic is the attitude dreaming of better times and better places than here and now: *The happy highways where I went and cannot come again*. (A. E. Housman, *A Shropshire lad*)

Cultural history transposes cultural attitudes to periods or styles. This is convenient but paralyzing. Simplified history is inclined to present a cultural attitude without continuity as an attribute of a period; time is classic, mannerist or romantic at best. Such historical writing is largely an extravaganza of romantic attitude. It fails in appreciating other attitudes.

Instead of lines of verse, I could take stages of life as symbols of the basic attitudes. In its acceptance of life childhood is classic, the rebellion of adolescence is mannerist, and the nostalgia of old age is romantic. Reality loosens the links between these impressive symbols; everybody knows adults who will never come of age and others who have never been a child. Historical labels do not stick tight either. In a classic period a classic attitude

dominates mannerist and romantic inclinations. The underlying attitudes are germs of change and as such more important for understanding history than the dominant attitude of a period. Without them we get a fragmented history of sudden changes without roots in the past.

The examples of dissident attitudes are sitting on our bookshelves. The general pattern of antiquity is classic, but in the *Politeia* Plato dreams the romantic dream of times better than his own. With their mannerist battle-cry *metanoete* (convert), the Gospels attack the classic framework from the other side.

For some four thousand years the world stayed in a stable position. This classic world collapsed at the end of the fifteenth century. Within decades all its conceptions, cosmological (Kopernik, or Copernicus if you prefer pseudo-Latin), geographical (Columbus, or Colón if you prefer Portuguese), metaphysical (Luther) and political (the Turks) converged into the greatest catastrophe in history. In the entry in his diary for 17 May 1521, the 'Luther lament,' Albrecht Dürer gives an impression of the *Apocalypse* as he experienced the chaos of his time. Many more descriptions of the universal consternation

are preserved in calligraphic labyrinths (for the occasion I mean their texts), all speaking of a lost universe.

The elite, in any time the model builders of a new world, now got a chance. When everyone feels safe, the elite is pushed aside or encapsulated in established administrative structures such as universities. Now they were needed, they could indulge in their craft of universe making, Mannerism. A small garland of mannerist genius: Thomas More, Michelangelo, William the Silent, Claude Goudimel, William Shakespeare, Leonardo da Vinci, John Dowland, Johann Kepler, Desiderius Erasmus, Hans Holbein, John Calvin, Ignatius de Loyola, Johann Neudörffer, Martin Schöngauer, Claudio Monteverdi, Albrecht Dürer, Hans Memlinc, Hieronymus Bosch, Pieter Breughel, Hans Burgkmaier, Miguel de Cervantes Saavedra. No other period of the Christian civilization is as studded with genius as the sixteenth century.

If not explaining Mannerism, the list gives a feeling for it. We can interrogate any genius on the list for his personal contribution to the general awareness of the catastrophe and of the need to substitute for the old universe a homemade Utopia.

A genius does not care for his feelings or how to reveal them to the world and if he should wish at all to save his own soul, he would only do so by saving the world he is condemned to live in. The Mannerist 'has the whole world in his hands.' His greatness does not need a pedestal; it always descends from its generic heights.

This is a central issue in the gospels: they may be read as mannerist literature in the service of mannerist propaganda for a mannerist conception, for a new world. The repeated question who will be the greatest in the coming Kingdom is an intentional opportunity for repeating the mannerist answer: the little one (Greek *mikron*, Latin *paulus*) is the great one, a mannerist labyrinth in the mirror of one sentence.

In crisis the genius has his finest hour. He got a long hour in the sixteenth century since the crisis was unequaled.

GENIUS

When asked how I could attract so much promising talent to my program at the Academy in The Hague, I answered: 'I do not attract talent, I make talent because I am

a teacher.' In a reckless moment I might even say that I could make genius too, but that is not as easy. A genius is not a graduate. To become a genius the student should gain absolute independence. A genius acknowledges no classics. He never quotes others. He is his own classic. If genius refers to classic sources, a closer look reveals a mannerist twist. In his emblem William the Silent puts Ovid's metamorphosis of Alcyone upside down. Waves and wind are not calmed by the cynical mercy of gods; it is the small bird keeping its balance amidst chaos: *Saevis tranquillus in undis*. Genius does not even touch the trend. It devises its own place and its own time, making a new universe. The genius is the hero of Mannerism.

Meanwhile genius dwells in normal man, as vulnerable, shy and feeble as anybody else; and, at that, not always good company.

COPPERPLATE

The mannerist print maker is an engraver, an artist of the cut edge. All important mannerist prints are engravings and all important engravings are mannerist. Not all important romantic prints are etchings, because lithog-

raphy provided another technique of romantic print making, but all important etchings are romantic. The important exemptions are six etchings on iron by Dürer and *Eine gute Ordnung* by Neudörffer. Important because they belie the historian's assumption that the mannerists did not know etching. They tried and rejected the blurred bitten line. The story of copperplate engraving goes along with the story of mannerist writing, but the assumed influence of engraving on writing has no factual support.

CHANGING TIMES

European history of the first half of the seventeenth century is the history of Holland and its surroundings. The nature of the Republic is the reason to look for Dutch examples. Every country had to endure the universal catastrophe in its own way, and no country suffered more than poor Germany, but the Republic was an original mannerist creation itself. A mannerist song, now the national anthem of the Netherlands, recording proudly three terrible defeats, mused the Republic into victory. Because nowhere else has the mannerist attitude been as

apparent, nowhere else can the decline of Mannerism be seen as distinctly as in the Netherlands.

In 1648 the Treaty of Münster confirmed conditions that had taken shape a few decades and many thousands of victims earlier. For the Eighty Years War, 1600 was the turning point. A republican raid to break the siege of Ostende ended in a victory that had nearly become a disaster (the battle of Nieuwpoort). This was an occasion to relinquish the mannerist conception of the independent Netherlands. The rebellion of an elite changed into the war of a new Dutch empire against the Spanish remnants of the Holy Roman Empire. For the first time since the Roman republic a free republic had attained great power, but again at the price of freedom. The Republic of the Seven United Netherlands remained a stronghold of tolerance and individual freedom, but liberty had become a mere epithet that a powerful establishment could cherish and indulge in. It was no longer the prominent issue the previous generation lived and died for.

It became dangerous again in the old-fashioned way to belong to the elite. Remember Johan van Oldenbarneveld, Johan de Wit, Hugo de Groot, Baruch d’Espinoza,

The essential part (with the modest signature of the calligrapher) at actual size of a representative page from Jan van den Velde, Spiegel der Schrijfkunst, 1605. The vigorous stroke of Simon Frysius, the engraver, contributes greatly to the splendor of the plate. However, the design of the plate with all its details comes from the writing master.

The text has little to say:

De sonderlinghe liefde die U.L tot de hoochloffelijke Vederkonste / draghende zijt, heeft mij veroorsaect U.L onder mijne beste vrienden mede / ghedachtich te wesen, ende U.L met dese weynighe regelen gheschrifts / te vereeren. Vriendelijck versoeckende deselve soo aenghenamel. te / ontfanghen. Als ick wete dat uwe gheneghentheynt tot alle goede konsten alle / andere konstbeminders my bekent, daerinne te boven gaet; onder de / welcke ick U.L estimerende een Paragon te wesen geensins en twij / fele off u.l en zal dese myne toe eygheninghe goetionstelyck aenveerden / ende my altyts houden voor uwen onveranderlycken goeden Vriendt. / JAN VAN DEN VELDE

René Descartes, outcasts even in the tolerant Dutch Republic, banned, exiled or killed. The printmakers turned to etching and the abstract art of writing lost its prominent position to romantic painting. Genius and mannerism got the romantic meanings recorded in our common dictionaries and fixed in common minds. The print market expresses the romantic appreciation of mannerist art in figures; an indifferent Rembrandt etching might cost 100 times the price of a Dürer engraving or even 1000 times the price of an engraving by Hendrik Goltzius who in his time was considered to be the greatest printmaker of the world.

APPRECIATING MANNERISM

Each attitude has its preferences. In romantic or mannerist perspective, the cultural reform of Pharaoh Ikhnaton has the fascinating flavor of innovation. In classic perspective, the same experiments were rather destructive. Much of what has been written on mannerist writing reveals a romantic mind. Stanley Morison scorns the 'overloaded' design of a written labyrinth. It does not come to him that a labyrinth cannot be straight. When

writing about mannerist writing examples Nicolette Gray likes to add: 'no doubt under the influence of the burin' (*Lettering as drawing*). However, by excluding such doubt from the onset we would exclude understanding too.

To appreciate mannerist art we must forget romantic propaganda for individual expression of personal feelings. The mannerist artist is preoccupied with tools, techniques and science. He builds a shelter for all instead of erecting a scaffold for his private interests. Together with beautiful things, a new branch of geometry arose from the workshops of painters and engravers. Geometry was not an interesting hobby but the standard of art. A design or a universe could claim beauty if its proportions could be expressed in geometrical terms, as Albrecht Dürer teaches in his *Books of Proportion*, 1528: *It would be to his [the master's] avail, if he would understand in his heart what should be the right proportion and no other; so that he could indicate it in the work. [...] For untruth is in our knowledge, and darkness is so deep in us that our groping fails. What, however, proves its case by geometry and shows its fundamental truth is to be believed by everybody.*

Examples of mannerist symbols are plenty in politics,

sciences and other arts but nowhere more direct than in calligraphy, because in handwriting the plan is already its realization; its execution does not depend on patrons, their money and whims. The calligraphic example is a mannerist invention itself. With the exception of the rather straightforward writing manual by Gerard Mercator, all writing books are stuffed with symmetrical and labyrinthine arrangements.

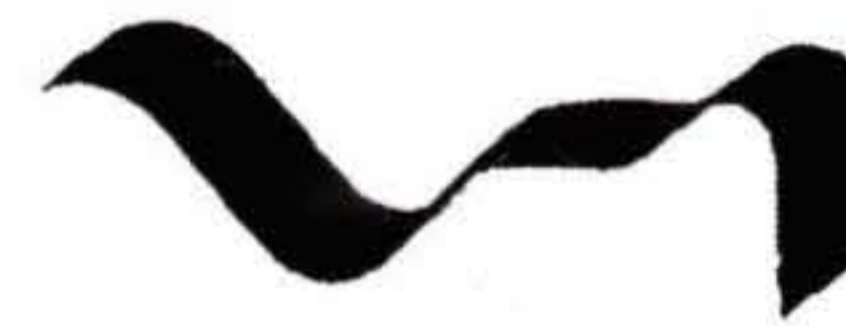
In the calligraphic masterpieces, the standards of the Renaissance are not corrupted but rejected. Scholars have tried to show that the sixteenth-century writing books served the propaganda of renaissance handwriting. Even if we neglect the German inventors of the genre, we can see that this theory cannot be upheld. Just skim through the Italian books to find complicated patterns, rebuses, enigmatic monograms and other secret writing, more often founded on gothic writing than on its renaissance counterpart; and what looks like a renaissance hand has in fact little to do with it, as Cresci rightly observed. When Cresci returns to the sources, Mannerism is over; his interest is not mannerist or classic anymore but already [neo]classicist (romantic).

THE MANNERIST PENSTROKE

Handwriting is a civilization's graph. Hidden in the shape of letters is the character of the penstroke. The clue for understanding the stroke was revealed in *Letterletter 1*. I italicize the key words of my classic text:

A stroke is a shape that is produced by a *continuous front* of points.

In any position, the *frontline* intersects the outline of the stroke in a pair of points, the *counterpoint* of the stroke. The subsequent positions of the frontline may be parallel (in *translation*) or not (in *rotation*) and its length may be constant or not (in *expansion*). In mathematical terms the front is a *vector*.



translation—the classic stroke



rotation—the mannerist stroke



*expansion—the romantic
(or [neo]classicist) stroke*

This is almost all you need to describe any writing, hieratic hieroglyphs included. You can learn it in only one year. Then you can start to write history:

In *classic* writing the stroke-describing vector has a constant length and a constant direction (translation).

In *romantic* writing the length of the vector changes, but the direction of the vector is constant (expansion).

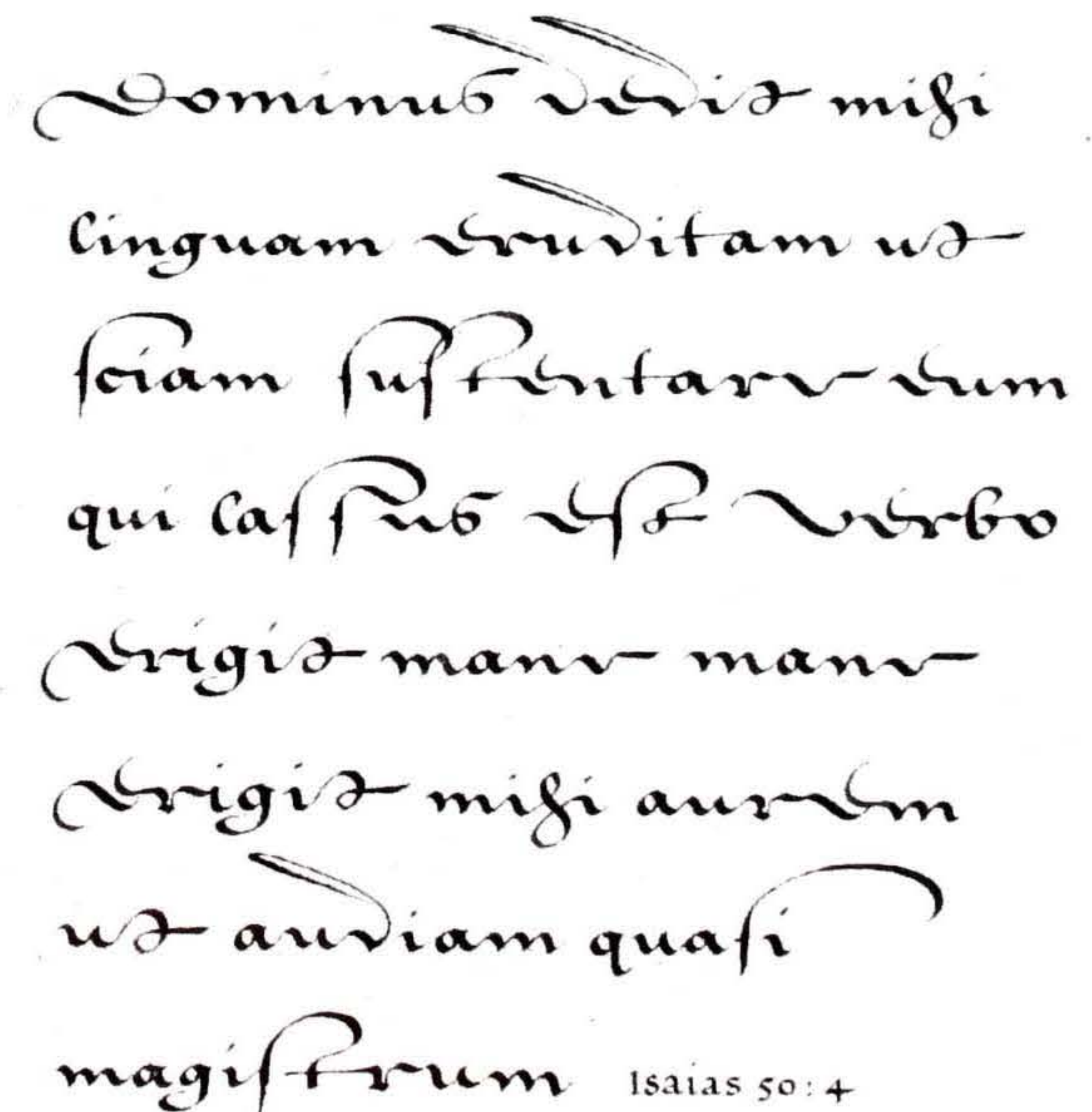
In *mannerist* writing both parameters are variable (rotation).

To make this even more simple I provide a specimen of each type of stroke.

The Dutch mannerists held their featherlight pen steeply, so that the shaft rolls easily between the fingers. If we are not aware of this trick, we might ascribe the changing thickness of the stroke to a pointed flexible pen. The mannerist pen was flexible, but not pointed. To be sure about this I paraphrased the Dutch hand of Van den Velde in the teachers hymn from Isaiah 52 with a broad steel nib. Before exposing in public an opinion on writing, I try it in writing. My analysis of the bastarda in the previous essay depends entirely on similar exercises.

Nicolette Gray has suggested that embellishment was

more important to the mannerist calligrapher than legibility. I agree. Calligraphy appears as a pretext for abstract art; it is the mannerist dream rather than the often trivial texts that justifies the splendid penwork. However, the aesthetic ideal never became a mannerist pretext for illegible writing. Everything Van den Velde has written is legible. If you cannot read it, nothing is wrong with the master. It is just you who have not yet learned his splendid Dutch hand.



Dominus dedit mihi
 linguam eruditam ut
 sciam sustentare eum
 qui cassus est verbo
 erigit manum manum
 erigit mihi aurum
 ut audiam quasi
 magistrum Isaias 50:4

THE COURSE OF WRITING

SCIENCE IS SUPPOSED to seek the truth on the slippery path of trial and error. The faithful scientist nourishes the illusion that this journey will bring him a little nearer to the truth. I prefer a different and yet equally moving story of science. My upside-down story of science begins with profound dissatisfaction about truth, not truth as it is preached and has to be believed, but undeniable absolute truth as it surrounds us in self-evident truisms. Truism is always trivial, but often it comes clad in dignity and prestige. An impressive example is the famous expression coined by Herbert Spencer (not the designer, of course) about *the survival of the fittest*. The prestige of the saying depends entirely on the magnificent last word. When put bluntly (and more precisely, at that) it shrinks to plain nonsense: *the survival of the survivor*. Absolute truth is absolute nonsense, the profound knowledge by which I know 'that things are as they are.' A great poet might transform such truth into verse.

An inventor would exchange the truth for something more risky, as far away from truths as possible and yet tenable: he devises a theory.

ECONOMICS

On many occasions Stanley Morison advertised economic thrift as the agent of change in the development of writing. In a trivial sense Morison is right. Any purpose is economic, seeking to obtain the highest profit at the lowest costs.

In Morison's economics the profit is money. This is not true, not even absolutely. Money is only a provisional purpose. You do not have to specify your needs if you want to impress your friends with a second house and a third partner. Just say: I need money. Were I rich, I would teach writing, design books and typefaces and edit *Letter-letter*.

My 1955 edition of the *Britannica* contains the article

Design by W. R. Lethaby, with the remarkable sentence: 'The end of design is utility, fitness and delight.'

Lethaby's design is the end of all economic ends because he was a designer. In my history 'writing' substitutes for Lethaby's 'design.'

In typography commercial economics wants to see compactness increase and margins shrink. Manipulation of facts can produce such a development alright, just as it can the contrary. To get precisely the opposite of Morison's newspaper economics, you only have to arrange pages by Gutenberg, Jenson, Garamont, Baskerville and Bodoni in a chronological order. I can reverse any straight continuum. To make my own continuum of history invulnerable to this dirty trick, I avoid straight symmetry; I make it oscillate between the opposite agents of speed and articulation.

SPEED AND ARTICULATION

The *speed* of writing depends on *the writer*; his skill and condition, *the script*; its construction,

tools and materials; surface tension of ink, capilarity of pen and paper, friction of pen on paper, *articulation* of writing.

Given script and utensils the *cultured* writer can only write more or less formally by adapting speed. Without speed he would get nothing and without articulation he would not get writing.

In an articulate hand the writer eventually meets the limit of his speed. From that point on any increase of speed impairs the articulation of the script.

The writer can return from an informal version to the canonic model as long as he remembers the joints - between letters as inarticulate penlifts. The observer, however, will likely distinguish a different hand with continuous letters as a specialty, and more readily so when horizontal segments are suppressed in ballistic upstrokes, which always happens in running hands. The scribble can be formalized to a new continuous script, as in the Japanese hiragana, or more ostentatiously in Arabic writing. On their way to a formal Western continuous hand, the mannerist writing masters were stopped by the

fashion of italic and the spread of typographic writing that became the standard of formal writing. A continuous script matches neither the fundamental idea of typography (writing with prefabricated characters) nor the technical limitations of casting type. Western civilization left the formalization of continuous writing to pedagogy, where it was distorted into the illusion of single-stroke words.



UPS AND DOWNS

The hypothetical diagram reduces the history of writing to the interaction of speed and articulation. It has a formal and an informal level. The course of history, as indicated by arrows, proceeds in ups and downs. You have always known this, but now you can see it too.

The history of *e* begins in the remote past of Semitic writing. The first up assumes that the inventor of the cap-

ital took the sloped stem for an untidy upright stem; the first up corrects the supposed error. A swift stroke rounds the hook of the capital which is readily misunderstood as an irregular curve in the first down. The second up 'improves' the curve in the uncial. At high speed a joint unifies the second and the third stroke of the uncial. If the second stroke (rather than the joint) is taken for an addition, it can be 'repaired' in the minuscule. The final down comes from misunderstanding the second stroke of the minuscule as the beginning of a loop. Its introduction in common education has abraded current handwriting. The *e* occupies nearly 20% of all writing. Its frequency drags handwriting into a continuous loop. The scribble of unconscious writers is little more than an inarticulate string of uniform loops. It is here that a reform of education must start. My simplification does not go as far as the propaganda for 'italic handwriting.' To keep a distance to aesthetic moralism I show two alternative shapes from the Dutch running hand as reproduced on page 1. Do what you like, but at least write *e* in two strokes, always – not because I tell you, but because this is the minimal *e*.

The stages of the schema should not be taken for an account of historical events. I just try to break the straight line of history into a story of ups and downs. Obviously speed draws the canonical script down to a debased scribble. It is remarkable that there is no return. The scribble is not recognized as an informal version of the canon, but as the state of handwriting that needs to be improved in a new canon of articulation.



This misconception is not a privilege of the past. All current handwriting is derived somehow from the Italian cursive we have at hand in a vast range of formal typo-

graphic versions. It seems natural to take one of these typefaces as a model for improving corrupt handwriting. The suggestion, however, would not be accepted as natural. Common feeling cannot relate a current hand to the text script it comes from. A new start is only expected from a new formal script that is derived from the previous informal stage. Rather than the great examples of a glorious past, the rubbish under our hands directs the course of history. History (and civilization) ends when we do not care anymore.

It is here that I differ from Stanley Morison and his disciples. They want to make economics, in the narrow sense of greed, the agent in the development of writing. My history is guided by the tenacious dream of something better that often turns into something worse.

ON COPPERPLATE

MUCH HAS BEEN written on the chemical aspects of etching. There is almost no literature on the technique of engraving, because there is little to say. These are the essential stages: Grind a graver, hone its face and its backs to a polish, and cut the lines you want as grooves in a polished copper plate. Keep the graver so sharp and the grooves so shallow that the graver cuts without much pressure. A precise description would take a long treatise that cannot be as instructive as watching an experienced engraver. Still better, have an experienced engraver watch your attempts.

Swelling strokes come from increasing the angle between the graver and the surface of the plate but this effect is not very spectacular. The swell is not sufficient to render a pen stroke of normal size with one stroke of the graver. Only very small writing could be rendered in this way. The strokes in the engraved writing books have been cut as filled outlines.

A translated paragraph from *Gravure en lettres*, in the *Encyclopédie*:

‘This method of building up the letter in repeated strokes is not common among the majority of engravers, who are unfortunately urged to work in a hurry because the purpose of the work is the profit of their employer rather than perfection and the honor of the craftsman, but we believe that we should prefer the described method as applied by the famous Bailleul, whose memory will remain precious to the apprentices he left behind.’

PATTERNS OF STROKES

Simon de Vries or Frysius (the Frisian) was an excellent engraver of writing examples because he was an excellent calligrapher as well: he understood what he saw. His masterpiece is the plates for *De spiegel der schrijfkunst*, 1605, by Jan van den Velde. The book opens with

*Frysius*

the text of James 1:17 ascribing any perfectness to God. The authors leave it to the reader to conclude from this motto that the divine perfection descended upon their hands. The photographic reproduction shows a detail of this print. The letters are deep solid black. I got the embroidered effect by illuminating the print with slanting light. What you see is the last layer of strokes with which Frysius filled the outlines.

I show a schematic picture of this pattern as well. The

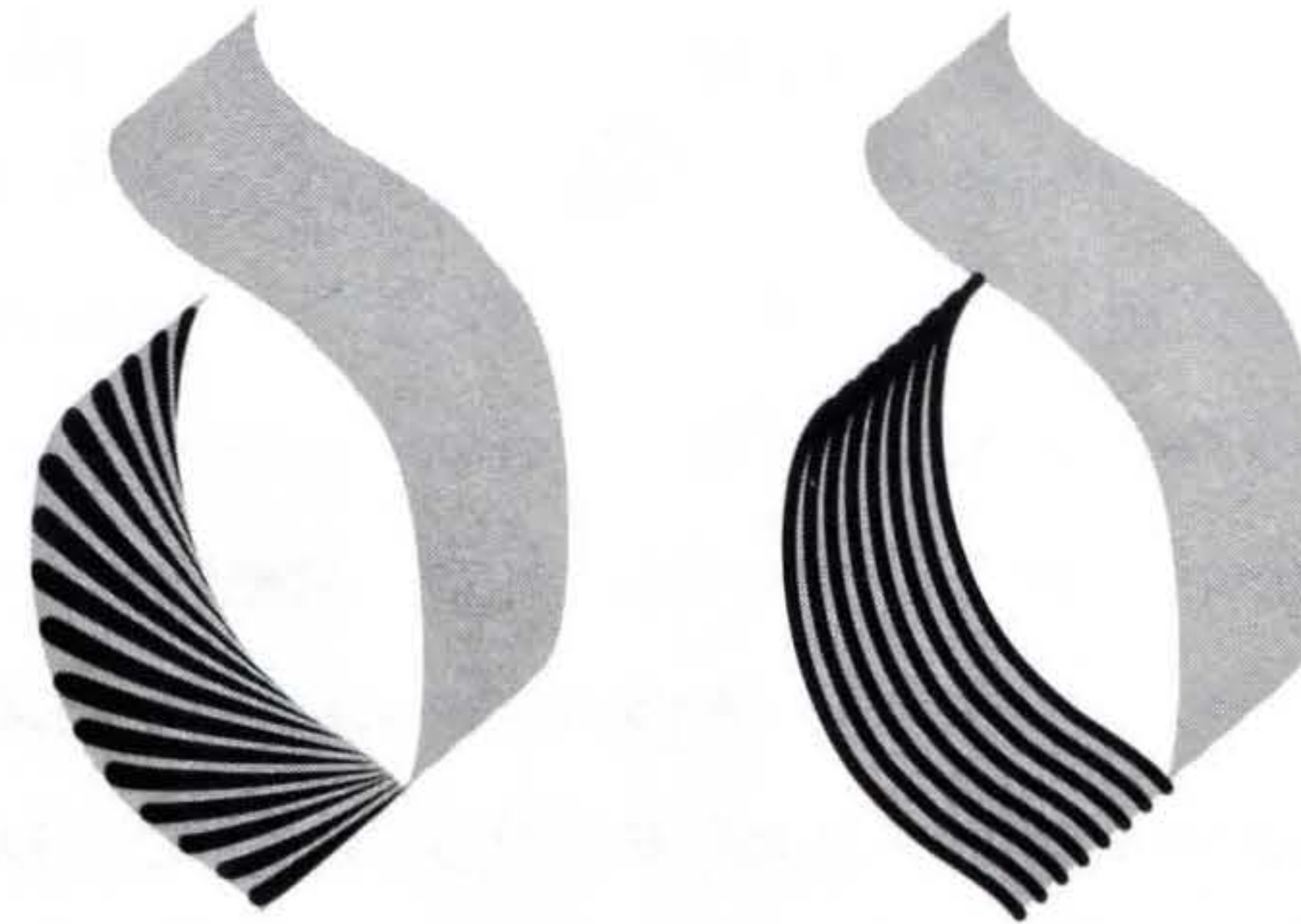
*Boissens*

strokes are running from the thin end. I have exaggerated their swelling. I assume underlying pattern of translated (parallel) strokes (of threading, as engravers say) that is crossed by the reproduced pencil.

Amy Worthen and I might make you believe that we can identify the engravers by the pattern of their strokes. In fact we cannot. We just distinguish two basic patterns, *pencil* and *translation*. A pencil is a set of lines in the same plane meeting in the same point. In translation, the

*Gauw*

points of a line are shifted along the same distance in the same direction. A pencil is characteristic for Van den Velde and translation is characteristic for Boissens. I assume that Van den Velde started with translation and Boissens with pencils; both applied the same patterns but in a different order. In his careless manner, Gerard Gauw did not maintain an order in his application of the pat-

*pencil**translation*

terns. He laid them out in a hurry, trying to fill the gaps with the other pattern, but again too wide. Moreover he did not understand the penstrokes he was supposed to follow. This is the real characteristic of this engraver. However, rather than identifying engravers, our ambition is a reliable description of engraving.

AN ART OF CRAFTS

THE SOUND OF Mannerism is mannerist music. Because Mannerism is not complete without its music, I threaded the names of great musicians in my garland of mannerist genius in *Mannerist Writing* (page 148). The music of Mannerism, persistently labelled as Renaissance music in musicology, cannot be understood apart from Mannerism. It also cannot be fully understood apart from its favourite instrument, the lute. The instrumental connection with craftsmanship is typical for Mannerism. To appreciate mannerist printmaking, we have to understand the fundamental difference between etching and engraving. The mannerist artist had the easy technique of etching at his disposal, but he preferred time-consuming engraving for the same characteristics that make the romantic artist reject engraving.

In these remarkable connections Mannerism appears as an attitude with special attention to the instrumentation of its conceptions. Its dreams and great ideas depend

on its tools and techniques: 'a kingdom for a horse'. Our romantic historians do not care much for craftsmanship and least of all for engraving. Their neglect of technique belongs to their own self-portrait. In a faithful portrait of Mannerism, technique cannot be neglected. The history of Mannerism must be rooted in craftsmanship. The same can be said of calligraphy. In the romantic appreciation, artistic writing has a position only insofar as it can be considered the graph of an individual artist, preferably illegible. In Mannerism, writing is the ultimate art, the pure concept of a new well-ordered universe, sheer form as the champion against chaos. Hence the historian of Mannerism must study handwriting first.

In his manual, *Eine gute Ordnung*, from 1538, Johann Neudörffer describes the construction of the Burgundian bastarda, and *Letterletter 13* explains Neudörffer's analysis to contemporary designers.

In *Early Italian Writing Books*, Stanley Morison writes about the physical aspects of the German manual:

‘In the struggle for the calligraphical fittest it was the intaglio technique, first used in Germany for the elder Neudörffer’s *Gute Ordnung und Kurtze[r] Unterricht* that triumphed. The Nuremberg master, it is relevant to notice [*why?*], included two plates of Roman capitals and one of classical Roman Chancery, used for Latin texts in a sort of supplement to the body of the work, which was devoted to German Chancery scripts, with German texts, that originated in the court of the emperor Maximilian. They represent a nauseous hybrid of gothic and baroque. The script is remarkable for the puerile degree to which embellishment is preferred to legibility; copperplate was a godsend to these artists even if at first it involved, apparently, highly complicated cutting and printing problems. Apparently Neudörffer’s engraver could not master cutting in reverse, which is necessary for printing, and so the examples were transfer-printed on to another place [plate] for recutting in reverse.’ (Stanley Morison)

Now read on and try to keep in mind that it is about the same book:

‘The first writing book printed by means of intaglio plates was made by Johann Neudörffer of Nuremberg. In 1538 he published *Eine gute Ordnung*, which was etched and printed in counterproof. Neudörffer found that it was infinitely easier to write in the accustomed direction on the plate. The advantage of etching was that it was far closer to his actual pen line than a woodcut could be. But perhaps due to the unreliability of etching grounds and the poor line quality, Neudörffer’s experiments with intaglio were abandoned for the time being. Later in the 16th century when writing masters again turned to intaglio for the reproduction of their scripts, it was to engraved, not etched lettering.’ (Amy Worthen)

To appreciate this tribute to mastership to its full extent one should try how ‘easy’ it really is to write on a slippery plate. To appreciate the clarity of this description one only needs to compare it with the passage by Stanley Morison.

Morison has not understood his sources about Neudörffer: The plates were not engraved at all, but etched. Nor were they recut in other plates: From each intaglio

print, 'offset prints' were made until the master print was exhausted. This method was not only more faithful to the original handwriting than any other reproduction technique, it was practical as well, because a considerable number of offset prints could be made in the same time as one intaglio print. For the purposes of teaching this was the most efficient method for reproducing the master's example that the technique of the time allowed. Later calligraphers abandoned this technique that demanded complete control of writing. What was excellent for demonstrating straightforward handwriting did not meet the demands of the splendid design the later mannerists were after. In this interpretation I differ from Amy Worthen, but not from her description.

A few years ago, Ton Croiset van Uchelen, keeper of manuscripts at the Amsterdam University Library, introduced me to the American scholar Amy Worthen. She was investigating calligraphy in Dutch mannerist prints and she had shown interest in my method for analysing engravings. Her study was published as *Calligraphic Inscriptions on Dutch Mannerist Prints*, in *Nederlands kun-*

sthistorisch jaarboek 1991–1992, vol. 42–43: *Goltzius studies: Hendrik Goltzius (1558–1617)*.

Amy Namowitz Worthen is a special investigator of printmaking because she is an accomplished engraver herself. For me it is also exciting to read a careful study on a subject that I have only touched loosely. Moreover this study is in the opposite direction. I talk about writing and how it is engraved whereas Amy writes about engraving and how it is applied to writing.

Like any good historian, she finds and arranges facts in a meaningful pattern. However, instead of imposing our romantic meaning on the historical attitude, she starts from the mannerist meaning of Mannerism. And by choosing the calligraphic inscriptions in mannerist prints as her subject she cuts off any attempt to explain the calligraphic explosion from the economic needs of expanding trade and diplomacy. In her prints, calligraphy has a more self-sufficient reason than a poem or a painting; it is there for its own sake only. For the sake of abstract graphic art the writing books were designed and written, and this is why they were engraved on copper.

As long as romantic readers want romantic stories, such as told, for instance, in the romantic transformations of the classic Middle Ages by Walter Scott and Umberto Eco, Amy should not expect much attention to her approach. Typographers and type designers, however, have a reason to follow her guidance in the history of Mannerism because she refutes the opinion that copperplate engraving has influenced handwriting. This refutation is important if we ever hope to understand something of typography and the history of type design.

AN EXTENDED QUOTATION

Though essential, the following paragraphs on technique are only a small part of the study by Amy Worthen.

In detaching them from their context, my selection exaggerates the role of technique and includes almost nothing of the historical scene that Amy evokes. The reader who wants to form an impression of sixteenth and seventeenth century Dutch art still has to read the original essay.

I omitted secondary details. In square brackets I have indicated such omissions. A few additions are indicated in the same way. I inserted them in places where the craftsman could take some profit from details that are less relevant for the general reader. At other occasions I just wanted to show that the same stuff allows different conclusions. Amy generously left the selection to me. I hope that the result will not alarm her.

TECHNIQUES OF ENGRAVING LETTERING

Extracts from Amy N. Worthen, Calligraphic Inscriptions on Dutch Mannerist Prints

[annotated by Gerrit Noordzij]

THE AUTHORS OF writing-books were reluctant to entrust their precious manuscripts, often the products of years of work, to an engraver in whose hands their reputation might rest. Calligraphers were torn between the desire to publish and the fear that an unskilled or insensitive engraver would distort their letterforms. Ideally, the calligrapher would be an engraver, or would have the engraver under closest supervision. The English calligrapher Martin Billingsley expressed this concern in his book, *The pen's excellencie*, but he also explained that sometimes an engraver could improve the work of the calligrapher.

Osley has contended that the graver stroke influenced the look of late sixteenth-century writing for the worse. But as much as the swelling line of a printed 'pen stroke'

may look like the track of the square or lozenge graver cutting through copper, the act of cutting a line to look like a pen stroke is highly artificial and alien to the engraving process, and is unlikely to have influenced writing styles one way or the other. The engraver's job was simply to reproduce the writing master's calligraphy. The various styles of Italian and northern scripts had been established with pen and paper and were originally published in woodcut. Copperplate engraving was merely the happy innovation in 1569 that made the printed reproductions of the lettering more nearly facsimiles. Line engraving was well suited for imitating the swelling strokes of the rounded, pressure-sensitive pen used in the late sixteenth century for the chancery hand, but it was also suited for the running secretary scripts. Once copper-

plate engraving became a possibility for reproducing any style of writing, calligraphers never looked back to woodcut. Had lithography been available at that time, there is no question that it would have been used instead. [*Remains the question why a few contemporary printmakers such as my American lady prefer copperplate engraving to lithography.*]

Few descriptions of the techniques for engraving lettering on metal printing plates have survived from the past. In the following discussion of technique a certain amount of information is extrapolated from the visual evidence of the lettering itself as well as from the techniques of traditional letter hand-engravers practising today.

The first step in preparing a plate for lettering was to design and transfer the lettering to the plate. Simple lettering, such as the basic italic used for maps and prints, could be easily scribed (drypointed) backwards, freehand, with a needle, directly on the plate on which guide lines had been ruled, and then engraved. [...]

Another method for more complex designs, such as

title pages, would have involved the transfer to the copper plate of a design first drawn in ink or chalk – in reverse – on paper. [...]

The magnificent engraved writing books of the Netherlands could not possibly have been scribed freehand and backwards directly on the plate. It isn't conceivable that even the astonishing virtuoso Jan van den Velde has been able to execute all his original exemplars backwards for a book like the *Spieghel*. Such a major calligraphic performance has to have been written by the master in his accustomed way, with quill and ink on paper, and somehow transferred to the plate. [*Contrarily I am sure that both Van den Velde and Frysus could have transferred the original freehand and mirrorwise on copper because it would not even be too difficult for me, though I have much less experience than these giants. The essential trick is to turn the plate 90° for writing. The technique of the following description, however, is more convenient.*]

Late seventeenth-century printmaking manuals discuss a lettering transfer process. The two earliest descriptions known to this writer are in William Salmon's

Polygraphics. The critical procedure revealed by Salmon is the use of ungummed transfer ink. Normal writing inks used by a calligrapher, such as oak gall ink, which included a binder of gum arabic, would not transfer to engraving plate. [*This is true but not entirely. The ferrosulphate in the ink etches copper. I got a perfect transfer by just laying a copperplate on the dry writing. After a day or so the writing had dulled the polished surface of the plate with a distinct image. To make this method practical, it should be speeded up. I made some attempts without much result. Ferrochloride, a common agent for etching on copper, might yield a better result.*] But letters written in ungummed ink (essentially pigment suspended in water) do not adhere to the paper writing surface and therefore transfer to the plate when pressure is applied with a burnisher. Although the dry ink pigment transfers to the waxed plate, much remains on the paper as well, so the engraver can consult the original written in the proper direction. [*Burnishing might be suitable for small subjects; for elaborate designs I find it safer to pass the plate covered with the original through the press. Pressing does not stretch the paper as much as burnishing and you can be sure that nothing is for-*

gotten. Amy says: 'much remains on the paper.' I found that the original does not even look faded. Ungummed or ink with little gum also writes more crisply than common ink with a lower surface tension.]

In an extraordinary example of survival, the original manuscript for one of the greatest of all writing books, Jan van den Velde's *Spiegel*, is preserved at the Rijksprentenkabinet. It is mounted in an engraved copy of the *Spiegel*, with each manuscript page facing its engraved twin. There are several striking things about the manuscript which reveal valuable information about the design and transfer process. First, as Van Uchelen has noted, the intense black ink does not resemble the brown-toned oak gall inks commonly found on sixteenth and seventeenth century drawings and manuscripts. [*Beware: artists of the time were fond of brownish bistre as pigment in drawing inks. Rembrandt is a famous example.*] Surely then, Van den Velde wrote his manuscript with a lamp-black or other carbon-based ungummed transfer ink. Second, there are no construction lines on the manuscript. Although it appears to have been executed freehand, without resort to ruled guide lines, Van den Velde

must have used a false rule. These are guide lines on a separate sheet placed underneath, a fairly standard procedure described by many writing masters. The manuscript is mounted down, but in places it is possible to slide a printed card underneath and see that the paper is relatively translucent. Finally, there are several places in the manuscript where corrections were made by cutting out an error and piecing in new paper with the improved design or letters. But the corrections are few, and the manuscript demonstrates Van den Velde's dazzling mastery of the art of writing.

[...]

The lettering engraver faces a number of technical problems not encountered either by the calligrapher or by the pictorial engraver. The sequence of cutting is not simply right-to-left, following the order of written letters. No single letter was entirely cut at one time; rather, all the verticals in a line might be engraved at once, followed by the bodies, then the serifs. Like the pictorial engraver, the letter engraver often sees his work upside down and backwards, but where the pictorial engraver might have had to make himself familiar with a few

artists' differing drawing styles, the calligraphic letter engraver had to deal with a variety of specialised, fanciful and even bizarre hands written in a variety of foreign languages, all seen written right to left. The letter-engraver really had to understand what he was engraving.

The width of lines in lettering is often considerably greater than the widest line ever cut for a picture. The engraver had to develop strategies to cut wide lines that would print black. The engraver can't cut a single line wider than about 3 mm because the line won't hold its ink when the plate is wiped. Moreover, the resistance of the copper to the engraving tool is great, and the excessive force required to cut a deep, wide line works against all-important precise control. [*This is why I use hammer and chisel for cutting deep wide lines in metal, not for print making but for name plates and brasses. Without a mallet I cannot control a stroke in copper as wide as 3 mm. Perhaps Amy intended to write '0.3 mm.'*] The calligraphy engraver's job was to reproduce exactly the mark made by the writing master's flexible quill pen. Since this pen stroke could be considerably wider than any graver cut, the engraved line had to be built up out of many strokes.

Engravers seem to have developed personal systems for cutting an ostensibly wide line to imitate the calligrapher's pen stroke.

Recently, the contemporary Dutch graphic designer Gerrit Noordzij originated a method for studying early Dutch letter engravers' techniques. He photographed selected examples of engraved calligraphy under a strong light set at an extreme raking angle. His enlarged photographs clearly reveal the characteristic techniques of four Dutch engravers: Gerard Gauw, Simon Frysius, Hans Strick, and Cornelis Boissens. Under magnification it is easy to see that each engraver first outlined the shape of the letter, then filled it in. Gauw used haphazard cross-hatching. Even seen with the naked eye, Gauw's letters were the least precise or attractive of the group. Noordzij found that Simon Frysius filled in the letter outlines by cutting strokes which lie in continuous tangent to the changing direction of the letterform. The result is a very lively letter. [*From earlier work by Frysius, Amy concludes that he refined his technique after 1600.*]

According to Noordzij, Hans Strick used a more delicate version of Frysius' technique, with very fine lines.



Hans Strick

Cornelis Boissens used a different approach, laying down many parallel lines, similar to today's 'threading' or 'close-lining', to build up width. Each of these engravers used techniques that would only be possible if he worked with a strong magnifying lens. [*In my experience, such a difference as between the stroke of Frysius and that of Strick could well be the difference between working without or with a magnifying lens. The question of the magnifying lens is almost trivial, as a near-sighted engraver only has to lay*

his spectacles aside to obtain the ideal position. I find precise engraving easy when compared to precise drawing. To return exactly to an engraved line, the engraver can slide his graver over the surface of the plate until it drops into the line. However, in such discussions much depends on what is considered as precise.]

Noordzij's photographic identification technique can be applied to any engraver's work.

[The section ends with a few paragraphs about the techniques of several engravers illustrated with details photographed in the described manner.]

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GERRIT NOORDZIJ was born in the Dutch port of Rotterdam in 1931. He trained as a book-binder and spent three decades as a teacher of type design, writing, and lettering at the Koninklijke Academie van Beeldende Kunsten (Royal Academy for Fine Arts) in The Hague.

Noordzij is the creator of several superb text and display types, including Dutch Roman, Batavian, Ruit, Remer and Burgundica. None of these faces has been publicly released, but specimens of several are included in this book.

Noordzij's work and ideas are published in his book *The Stroke of the Pen: Fundamental Aspects of Western Writing* (1982) and in a Dutch version of the same: *De streek: theorie van het schrift* (1985). *Letterletter*, published as it was in 15 issues and with contributions by Nicolette Gray, Max Caflisch, Fernand Baudin and others, gave the author the freedom to try out ideas and provoke conversations and arguments. This conversational and somewhat experimental approach gives readers of *Letterletter* the sense of a great teacher, with all of his irreverence and enthusiasm, at work.

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