ADRIAN FRUTIGER

SWISS FOUNDATION TYPE AND TYPOGRAPHY

TYPEFACES. THE COMPLETE WORKS

EDITORS · HEIDRUN OSTERER & PHILIPP STAMM

BIRKHÄUSER

Content

Kurt Weidemann

Adrian Frutiger – The standard-setter

With Gutenberg's invention of the adjustable hand mould, no less was achieved than the industrial-scale production of a commodity – metal type – in any desired quantity and with consistent quality, effectively ushering in the modern era. Master scribes were replaced by master printers. This invention would last half a millennium before it, in turn, was pushed aside by photosetting, by information being transmitted at the speed of light. The end result, however, was still a printed letter on a page. Unfortunately a correspondingly fast improvement in human comprehension has not been forthcoming. The composition of our brains is basically unchanged since the time of Adam & Eve. An a is an a, and always will be.

At the threshold of this new era in printing technology, one name stood out: Adrian Frutiger. The measurer and standard-setter of all things typographic. In his 1951 diploma submission, Adrian Frutiger produced nine wooden panels on which he had engraved, letter by letter, examples of Western alphabets – from Greek inscriptional capitals to humanistic minuscules and cursives. It was already apparent in this work that he was a master of space, proportion and order. It was clear even then that his career path would be characterised by his passion for the criteria of legibility and the beauty of form. During his time in France, typefaces such as *Méridien, Serifa, Iridium* and *Linotype Centennial* were produced, typefaces that captured the zeitgeist, and which are still proving their worth today.

Around the middle of the last century work began on the production of a typeface family with the name *Univers.* A system ordered and classified into 21 members was a totally new approach at the time. These 21 members would find their application in every area of use: from gracing posters to appearing on the smallest packaging leaflet. The first step in the generation of every printed product developed by a highly specialised profession is the choice of a typeface and its design. As much for movable type as for photosetting and the compositor, this typeface is still the lynchpin at the end of those 500 years. It represents both the end of an era and the beginning of a new one. If survival down the ages is an important criterion for art, then this is also true for the art of typography. And it is all the more true for a typographic art that neither displays nor has need of modish showiness.

With Adrian Frutiger there has always been a seamless transition between applied and fine art. The glyphs of his Indian typeface and of his logotypes have also been applied in his sculptures, reliefs and woodcuts in a free and unique manner. They spring from the same sense of form and strength of expression as his applied art. Everything that takes and assumes shape in his works has been filtered through his depth of knowledge and his power of thought. However, Adrian Frutiger has always remained a great, yet modest man, a man who, in his dedication to his work in the service of type and the word, and in his ceaseless invention in the form and material of his fine art works has been, and will remain, a standard-setter.

Adrian Frutiger

A typeface is a tool

Working with hot metal was my first experience of the power of type to make the whole world of thought legible simply by re-arranging the same letters over and over again. This made it clear to me that optimum readability should always be foremost when developing a typeface. But then we found ourselves in an era in which type was no longer set using lead characters, but with beams of light. Transforming the typefaces of the old masters from the old to the new process was the best learning experience for me. But when it came to the grotesques, I had an idea of my own. And from that idea arose the *Univers* family. Technical progress took a great leap forward. Moving typefaces to electronic representation brought with it the jaggies and later the vectorisation of the outlines. Given my sense of form, it was quite a painful experience. Now, though, with font creation programmes and their resolution-independent Bézier curves, and with lasersetting, it looks to me like our journey through the desert is finally over.

Other tasks fell to me. *OCR-B* set me the problem of designing characters that were readable not only to the human eye, but also to mechanical ones – something that stirred up, shall we say, an aesthetic conflict that taught me how to think about things in a different way. With the signage concepts for the airports and the Paris Métro I worked on large-scale typefaces. That's how I came to realise that, in all sizes, readability follows the same rules about counters and sidebearings. When I was asked to think about the Indian typefaces, this uncharted territory amazed me. Only when I began to write and draw the characters, did I become aware of the deep-seated connections between the Indo-European cultures. It took only a short time for me to grasp that my task consisted of imparting 500 years of Western experience in setting and printing technology. My Indian colleagues would have to find their own way forward from there.

The evolution of these letters – this continual simplification from symbol to sound – is something that has always preoccupied me. I was always fascinated by the symbol as the expression of a signature, a brand, and above all, a cipher. This connection between letters and symbols brought me into the commercial world of the logo as an area of operation. In the course of my working life I built up knowledge and skill. To impart those achievements and experiences to the next generation became the most important thing. In May 1968 the intellectual climate changed. In their impetuousness, the students pushed their craft to one side and tried to solve problems simply by force of intellect. I could never express myself only through words, without using my hands and the tools of my trade. So I have chronicled my legacy in my books, through my writing and my drawing.

On my career path I learned to understand that beauty and readability – and up to a certain point, banality – are close bedfellows: the best typeface is the one that impinges least on the reader's consciousness, becoming the sole tool that communicates the meaning of the writer to the understanding of the reader.

from *Adrian Frutiger. Denken und Schaffen einer Typographie*

The book that you are holding is the result of many conversations between myself and friends from the profession, conducted over a period of two years at my studio in Bremgarten near Bern. Erich Alb, Rudolf Barmettler and Philipp Stamm used their subtle but – at the same time – direct questioning and discussing to awake in me memories that, for years, had been deeply buried. For that I am grateful to them. We met once a month, and talked about my typeface design work in chronological order. It was almost like living my professional life all over again, beginning with the school in Zurich, through my time at Deberny & Peignot and then on to Linotype.

Without the discussions between specialists, my friends in the profession, and other advisors, this book would never have happened. My thanks go to Heidrun Osterer, Philipp Stamm, my above-mentioned colleagues, and to Silvia Werfel, who transformed the transcripts into proper German.

Introduction

How to use this book

Book structure
This book is divided into three sections: typeface chapters, explanations of typesetting technologies, and pages dedicated to logos. They have been ordered chronologically. In order to follow the development of Adrian Frutiger's type designs clearly, the typeface chapter sequence is based on the year of the design of the typeface, not of its publication or production; in many cases the dates are very widely separated. Since the designs are seldom dated, and the correspondence does not always provide the relevant information, in some cases the sequence cannot be definitively verified. In addition, many typefaces were developed in parallel.

Typeface chapter structure
The structure within the chapters themselves is largely chronological, from the conception of a typeface through to its development, publishing and marketing. For the analysis at the end of every chapter (sample text, typeface dimensions, typeface comparison, height comparison), the digital version of the typeface was used, since it contains the character sets of every available weight.

Chapter titles
Lowercase letters are not available in every one of Adrian Frutiger's typefaces. To maintain visual cohesion throughout the book all chapter titles were set in capitals.

Column titles
Adrian Frutiger's typefaces are classified as book typefaces, jobbing typefaces, signage typefaces, corporate typefaces and type-design projects. This classification can be found next to the page number. Additionally, logos, wordmarks and typeface production are similarly annotated.

Typesetting technology pages
Adrian Frutiger developed many of his typefaces in light of the then-current typesetting technologies, beginning with *Egyptienne F* through to *OCR-B* and to *Frutiger Neonscript*. So that readers who are not overly familiar with the technology may better understand the reasons behind a particular typeface design, the most important typesetting technologies have been given short descriptions in this book. Each technique is introduced before the typeface chapter where it is first used.

Logo pages
The myriad logos and wordmarks produced by Adrian Frutiger and his co-workers are extremely hard to date. Often the companies are no longer in business, or they do not keep an archive or record of such things. Often it is simply not possible to find out for whom a particular logo was designed, and whether it was indeed ever used. For this reason the logos are gathered together in unequal time periods on a single page. The arrangement and descriptions are as precise as the available information allows.

Wide text columns
These contain Adrian Frutiger's own words from the conversations with Erich Alb, Rudolf Barmettler und Philipp Stamm. The editors have checked the accuracy of the names, dates and other facts as far as possible, and have also expanded the information where necessary. Additionally, where necessary, the text has been supplemented with quotations by Frutiger from other sources.
The first-person text has been set in *Egyptienne F*. By doing this, this typeface – which had fallen somewhat out of fashion when it was chosen in 2002 – should reach a new audience. Indeed, in the last few years it has become a popular body text for magazines in Switzerland.

Narrow text columns
The text in these columns is set in the sober, geometric *Avenir*. Written by the editors, it illuminates the further interrelation of Adrian Frutiger's type design work with reference to context, creation and use. It also contains each typeface's history and technology.

Character set comparison
Each chapter contains a comparison of the character set in the original setting technology and in the digital font.

Sample text
As an illustration of the text image, each typeface available in digital form is given a page with trilingual sample text in various point sizes. The sizes are adjusted from chapter to chapter for optical consistency. The kerning and leading are harmonised with each other. The respective details are found underneath the sample text.

Typeface measured analysis
For typefaces with several weights, the proportions of height to width of the normal face are given as well as the black and oblique. For the calculation of the proportions a fixed cap height of 10 cm was chosen. The letter proportions of H n o were measured, along with the weight of vertical and horizontal strokes.

Typeface comparison
This compares Adrian Frutiger's typeface with two other similar typefaces from different designers. The choice of comparison typefaces was made according to similarities in character and form, as well as the year of creation. The printing typeface classification plays only a subsidiary role. Using the chosen characters, the differences between Adrian Frutiger's typefaces and the others are demonstrated.

Height comparison
In the more comprehensive chapters the typeface comparison is supplemented by a height comparison. For the measurement of typeface height (red figures), a cap height of 1 cm was used. Additionally, the proportional relationship of ascenders and descenders to the x-height is given (black figures).

Name of typeface	Commissioned by	Designer	Design | Publication
Univers Swiss 722 | Zurich• Linotype Univers••	Deberny & Peignot	Adrian Frutiger	1953 | 1957

Typesetting technology
Handsetting
Photon-Lumitype photosetting
Machine setting | photosetting
CRT and laser digital typesetting
PostScript digital typesetting

Manufacturer	Weights
– Deberny & Peignot	20
– Deberny & Peignot	20 | 21
– Monotype	21
– D. Stempel AG | Linotype	21
– Adobe | Linotype	27
Bitstream•	22
Linotype••	63

UNIVERS

As work on the Lumitype progressed and the first classic fonts had been drawn, we turned our attention to sans serif fonts. Charles Peignot was in no doubt that the foundry's best-selling typeface, *Futura* – known in France as *Europe* – ought to be included in the range. I suggested another project to him because I felt that *Europe* was no longer contemporary. In the 'Univers special edition' of *TM* 1/1961 **/33/** I stated my reasons:

"[...] The simple rhythm of classical architecture is reflected in the typefaces of the time; inner spaces and blank spaces have the same value, their arrangement is determined by one unit of space. Modern architecture seeks new rhythms. Even sans serifs no longer possess the classical equal space for counters and right side bearings; the counters are more open and the spaces between letters narrower. This is one of the most pressing questions of design asked of new sans serifs. The influence sans serif type has had on typography has gone hand in hand with all other kinds of revolutions over the course of the last hundred years. Lithographic business card fonts were cut by most type foundries at the end of the last century. Some of these old sans serifs have had a real renaissance within the last twenty years, once the reaction of the 'New Objectivity', with its geometrical principles of construction, had been overcome. A purely geometrical form of type is unsustainable over a larger period of time. The eye sees horizontal lines thicker than vertical ones, a perfect circle looks misshapen when used as an O in a word. Our time seems to have found its expression in concrete. Modern concrete buildings aren't necessarily geometrical; their forms have tension and liveliness. Type has to have these things too. [...]"[1]

I had learned as a student under Walter Käch in Zurich to model sans serif shapes on those of classical antiquas. My first drafts of a sans serif face date from this period (see page 21). As a continuation of these studies I finished the first drawings for *Univers* in winter 1953 with the word 'monde' **/16/**, which I sent to Emil Ruder, the typography teacher at the Allgemeine Gewerbeschule in Basel, for his opinion. He suggested minimally widening the characters **/06/**. He also thought that the letter shapes should be oriented around classical – antiquas. We determined that "in the regular weight, applying the roman principle to the capitals would be desirable, that is narrow letters with two square shapes on top of one another (B E F P R S) in contrast to the wide shapes that touch on being square (O C G N H). Looking to the planned narrow and expanded weights, all letters would have to be more or less evenly balanced."[2] So I came up with some designs based on Capitalis Monumentalis **/09/**, because even the M with its spread legs **/15/** wasn't consistent in the various degrees of width and boldness. The classical double loop shape of the g was rejected for similar reasons, it looks forced in narrow, small and italic weights.

Before I started drawing the typeface I designed a construction diagram for myself **/12/**. These are only sketches, as I wanted to know first of all whether it was doable to go

About Univers *Univers* owes its existence to the courage and progressive spirit of Charles Peignot, who had the foresight to back such an unprecented project. For the first time ever a large typeface family was launched without first testing a few weights on the market.[3] Frutiger's sans serif design from his time as a student at the Kunstgewerbeschule in Zurich in 1950/51 served as the starting point.[4] (see page 21). Made easier by new inexpensive type production methods for Lumitype photosetting, 21 weights **/01/** were conceived in the sense and knowledge of a demand for a functional, contemporary typeface.

In the *Swiss Typographic Magazine TM/STM* 5/1957, Emil Ruder writes that "it seemed hopeless to embark upon such a huge venture that would try the endurance of both the designers and the company. What convinced us that it would be a success? We believe in the need for a big step in the field of type design. One can feel the urge to rise above the superficiality of the day and create something of real substance. Moreover we believe in a sans serif renaissance."[5]

Emil Ruder is talking about sans serif in the sense of a universal typeface for all kinds of uses including book and newspaper setting. He thought *Univers* was proving versatile enough to fit the bill, and it was proved so when TM editor, Rudolf Hostettler, started setting his magazine entirely in *Univers* from 1961 onward. Other exemplary designs and publications followed, particularly from the Basel school, giving *Univers* ever more exposure and so contributing to the worldwide reputation of 'Swiss Typography'. Special merit goes to Emil Ruder and some of his Basel students who would go on to be famous typographers: Fritz Gottschalk, Hans-Jürg Hunziker, Hans-Rudolf Lutz, Bruno Pfäffli and Helmut Schmid to name but a few.[6]

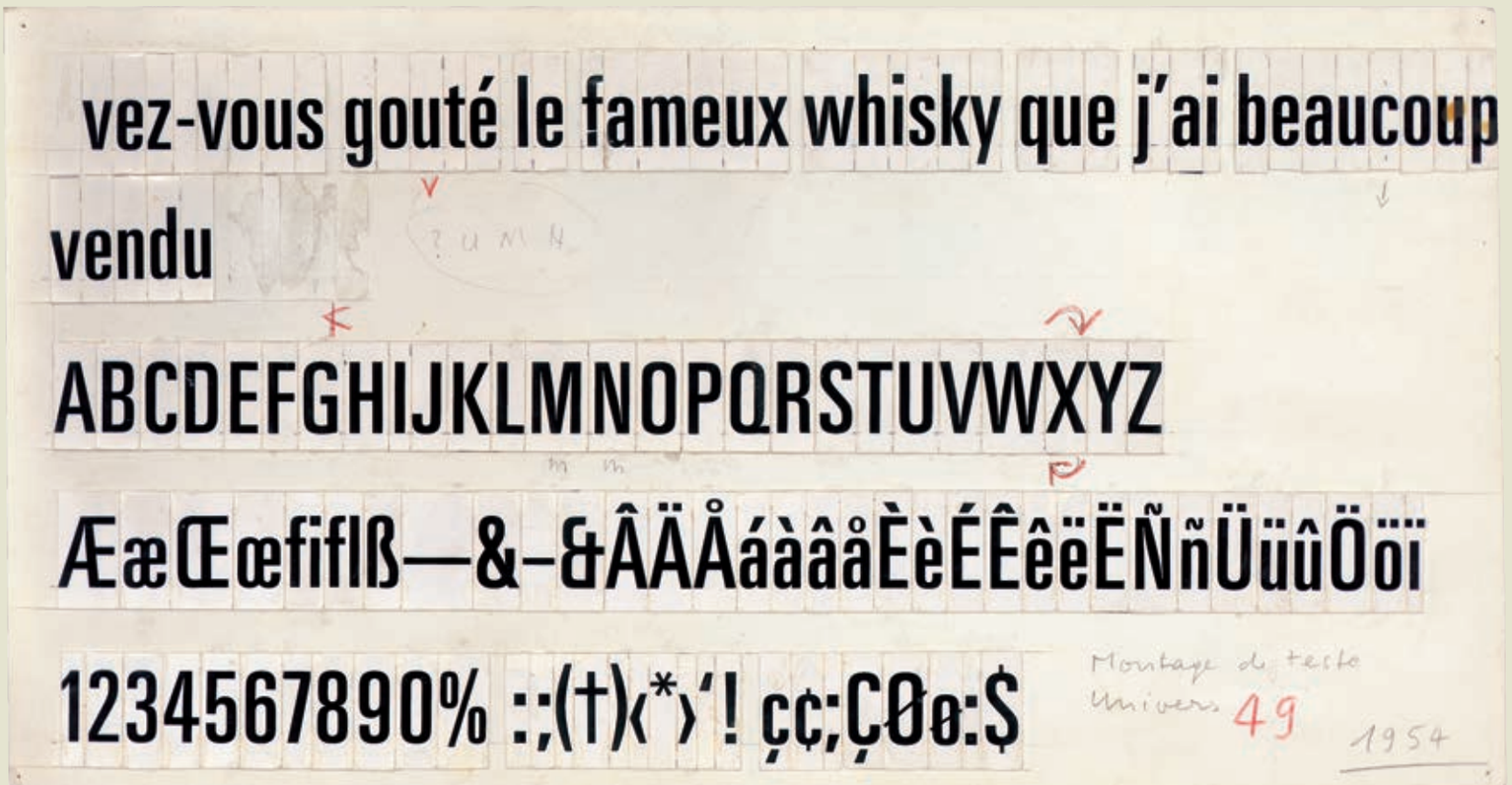
In the plain, objective, unembellished world of 'Swiss Typography', asymmetrically arranged and set in only a few, contrasting weights and point sizes, the elegance of *Univers* was especially noticeable. *Univers* brought international fame to Adrian Frutiger. It showed that a great type designer was at work.

/01/
Bruno Pfäffli's display of the original 21 Univers *weights is clever and concise.*

/02/
First artwork of Univers *55 for Deberny & Peignot, 1953/54 – the curves are rounder and smoother in the finished version.*

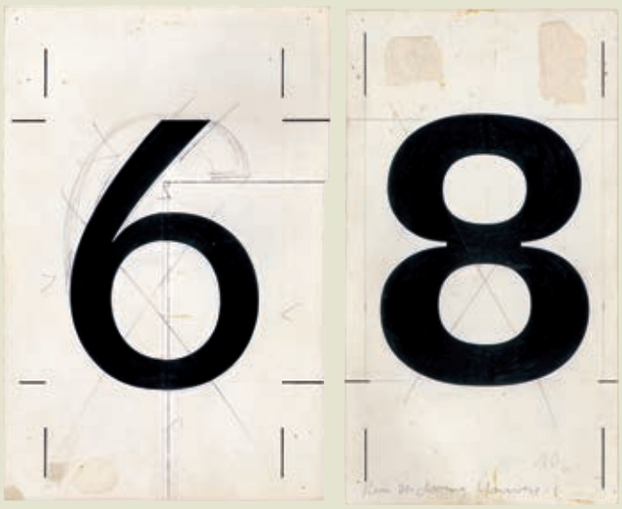
/03/
Adrian Frutiger (seated) inspects the final artwork of Univers *83 by Ladislas Mandel, with Lucette Girard in the foreground.*

/04/
Paste-up of Univers *49 with photographic reductions of the hand-drawn originals – the upper-case X has been stuck on upside down.*

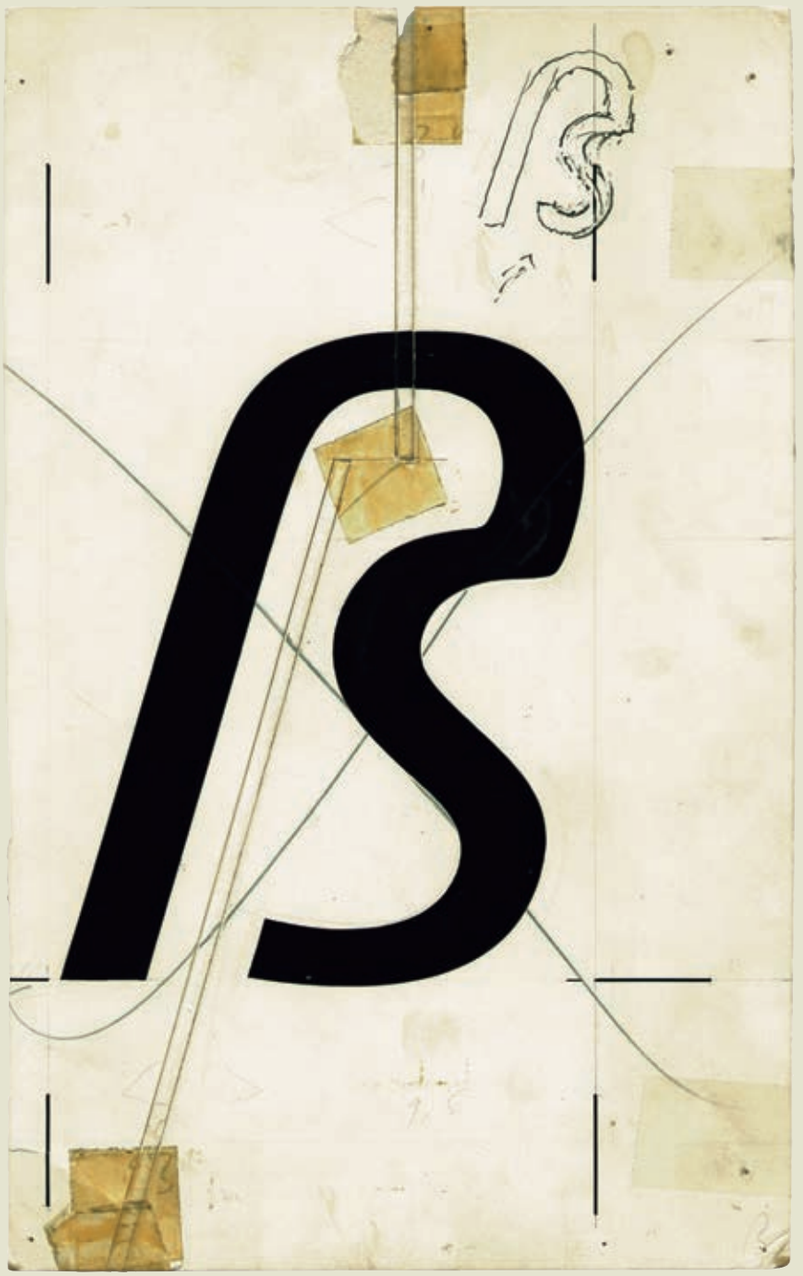


/05/
Final artwork with baseline and widths marked – black ink on card with corrections in pencil.

/06/
Widened counters, at Emil Ruder's suggestion, made by cutting the card and inserting a strip.



/07/
The diagonal 6 was rejected, the deep cuts in the 8 for photo-setting make it appear like a caricature.



/08/
The curved end was drawn according to the sketch, but the transition from the long s to the round s is much smoother.

from tight, fine letters to wide, bold ones. I just wanted to check the whole spectrum. I decided that the vertical axis should be the right side of the stem. The line had to be the same for each weight. The stroke width was on the left, it was exactly the same within each weight. On the right were the widths, from narrow to wide. This 'accordion' wasn't mathematical, I determined the stroke widths of the single weights and also the letter widths by feel. The letters became almost equally wide in their corresponding widths. That means that an n from the light weight had – from the right edge of the first to the right edge of the second downstroke – almost the same width as an n from the bold weight. This diagram represents the idea, the whole thing isn't identical to the finished *Univers* shapes. I used the n for the diagram published in *TM* 5/1957, but I changed it to h in later publications because of its ascender. There too the letter widths were presented as being mathematically identical, which looked more scientific **/33/**.[7]

During my first visit to Photon Inc. in the USA, who, after *Méridien,* had also taken on *Univers,* one of the people responsible for type came up to me and showed me a whole batch of films with *Univers* letters. He laid them one on top of each other on a light box and confronted me with lots of calculations. He was looking for a mathematical connection between boldness and width and couldn't figure out how I'd calculated it. Some of his results coincidently led to a connection with the Golden Section. When I told him that I had worked out the basic type grid by intuition, he was nonplussed, not to say disappointed.

I constructed *Univers* on a horizontal-vertical axis. That was my starting point. All the different weights of width and boldness came from this cross, even the terminals fit inside in **/33/**. *Univers* has horizontal terminals at the ends of the curves like uncials **/09/**. I was aware that in the regular weight a diagonal, classic curved end would have been nicer, but I wanted to make 21 weights and I couldn't cut the narrow weights diagonally, it just didn't look good. The horizontal ending was a matter of consistency for me, with respect to the whole font family. The t is an exception. The t arc ends vertically rather than horizontally **/11/**. All letters with a tight radius have this ending, that's fjr and t. The slanted cut of the t demonstrates my respect for writing with a pen. I never liked it horizontal, a t is not a cross. I didn't do a slanted cut in the ampersand **/28/**, because to me that character is composed of two capitals, E and T.

Much later, in the 70s, there was a further diagram **/14/**. This study for the Linotype company, with the title 'The Definition of Medium' had the following problem: readers are used to a certain proportion between black and white. As soon as that proportion changes a bit, readers find it unpleasant. It's a subconscious thing. A lot of foundries had to add another weight, the so-called 'book', to the regular one because of that. They'd seen that

Historical background Greek lapidary script **/09/** is the origin of sans serif type. The idea was seized upon some 2000 years later for typefaces in the early 19th century. In France, sans serifs are known as antiques, in reference to their ancient origin, and some contemporary typefaces include it in their names, such as *Antique Olive* by Fonderie Olive, or *Antique Presse* by Deberny & Peignot **/40/**. *Univers* too, prior to being named, was known simply as Antique **/15/** at Deberny & Peignot.[8]

The Roman form principle of letters, based on square, circle, triangle and upright double square **/09/**, may seem an ideal archetype for *Univers,* but impractical for planning a typeface family made up of four different widths and two slopes. Frutiger brought the cap widths into line like Greek lapidary script and unlike *Futura,* which is based on the Roman principle of Capitalis Monumentalis. In doing this, he conformed to the neoclassical sans serif proportions of the 19th century.

Uncials originated in the 3rd century AD. The use of parchment paper and pen changed the shapes of capitals. They became rounder and softer, and some ascenders and descenders started to appear. Small letters began to emerge from the capitals. This was perfected in the Irish-Roman semi-uncials **/09/**, where the stroke ends are broader with horizontal terminals. This is what Adrian Frutiger is referring to when he speaks of uncial terminals in *Univers* **/11/**.

Adrian Frutiger always lets his visual intuition guide him, and only afterwards does he try to find principles to explain the facts. A comparison he made between the proportions of classic and modern typefaces relates them to classic and modern architecture (Greek temples, Bauhaus) **/10/**. The missing serifs mean that sans serif faces do not have equal spaces for counters and side bearings any more as they had before. The counters are more open, the spaces between letters (sidebearings) narrower. This reflects the thoughts of his tutor, Walter Käch. Some of the essential form principles of *Univers* were adopted by Frutiger from Walter Käch.[9]

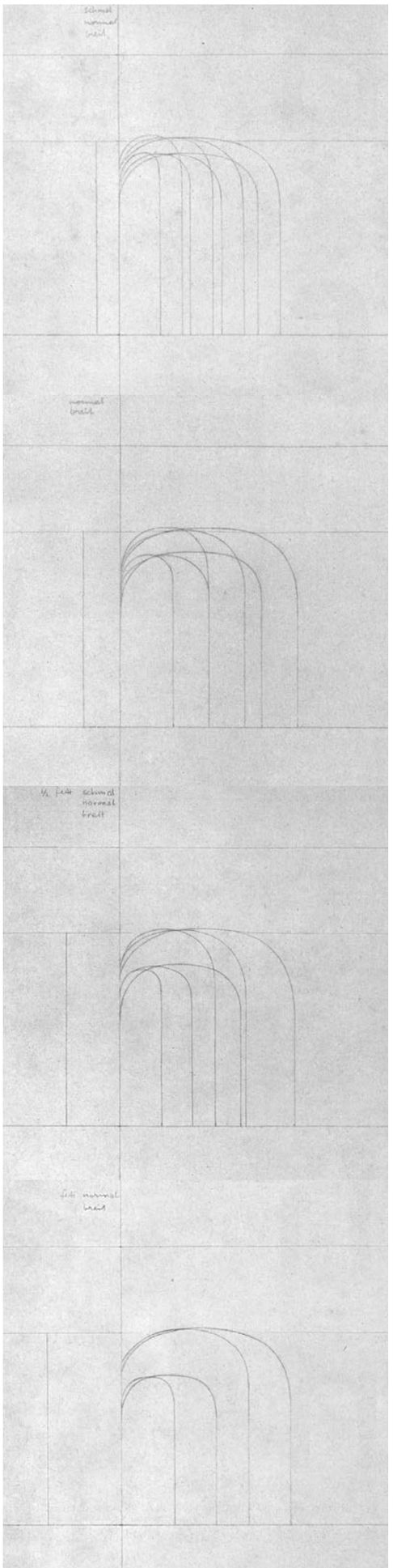
/09/
Historical scripts: Greek lapidary, 5th–4th century BC; Roman Capitalis Monumentalis, 1st century AD; Anglo-Irish semi-uncials, 8th century.

/10/
The downstrokes are evenly spaced in serif typefaces – sans serifs have a more varied rhythm like modern architecture.

mundi
mundi

tc

/11/
Adrian Frutiger talks of uncial terminals since uncial is the only historical script with letters that sometimes have horizontal curved ends.



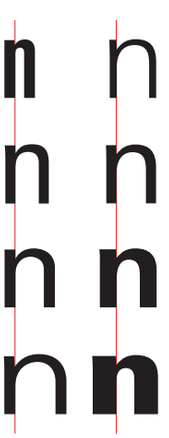
their first version was too delicate or too strong for a text face. That's why I found it interesting to define what a regular weight is. I laid a grid over the letters of classic typefaces and could later see exactly what relationship there was between both parts. I now had the means to apply this ratio to a sans serif typeface. Converted into a grid with units it gives a lowercase n with the stroke width of one unit a counter width of three units and one unit each for left and right side bearing. A whole letter is then five units wide, with a relation of five and a half units in height.

I determined the regular weight of *Univers* together with Emil Ruder. He was a great help to me. We looked at it in the reduction and discussed it for a long time, how the width should be in relation to height and white space. He'd written his corrections, like opening the counters, on card in the final artwork. That's how *Univers* was made, after many constructive discussions with Emil Ruder. *Univers* 55 is my most successful 'Medium'.

The choice of name was important commercially. It was talked about early on, when the project was first laid on the table and journalists started to write about it. By 1956 it couldn't simply be called the 'the new sans serif by Deberny & Peignot' any longer. General director Stanislas Boyer, Charles and Rémy Peignot and I chose the name.[10] We started with my test word 'monde' – after *Europe* we were anxious to branch out further than Europe – I was sure that 'monde' wouldn't work, because it would be understood as 'Mond' (moon) in German. Boyer suggested 'Galaxy', and Rémy came up with 'Universal'. If we were talking large dimensions, then why not go all the way? So Charles Peignot turned it into 'Univers', French for the universe.

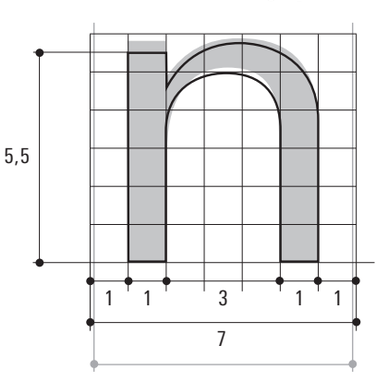
To represent the 21 weights of the *Univers* font family I used uppercase H and E and the word 'monde' in my diagram **/16/**. I would show the regular weight first and put the four bold weights next to each other. At the bottom I put the narrower weights and right at the very bottom I added the wide ones. I quickly realised that the wide weights belonged at the top instead **/17/**. Then I mirrored the whole diagram and turned it 90 degrees, so that the bolds were at the bottom, the lights at the top and the wides on the left with the narrows on the right. That's how the weights were numbered in ascending order **/18/**.

As already mentioned in the 'Caractères Lumitype' chapter, there was trouble in naming the weights **/16/**. I had already introduced a numbering system for Lumitype fonts in order to make ordering easier (see page 76). That served as the basis for the *Univers* numbering, the first digit stands for the stroke width and the last digit is width and slope. Uneven last digits are upright weights, evens are italics. *Univers* is constructed like a star. "55 was the starting point; its black-white relation is meant for book setting. Its neighbours to the left and right (all the fifties) have exactly the same stroke thickness. What changes are the inner spaces and side-bearings, which result in the narrow and compressed weights



/13/
Identical stroke widths in different widths and near-identical widths in different weights of Univers *by Deberny & Peignot.*

/14/
Frutiger's definition of the Medium (1970s) showing the ratios of the x-height to stroke width, counter and character width – Univers *55 is behind it in grey.*



/12/
Schematic diagram in four weights – development of curves and counters of the compressed, condensed, regular and extended typefaces.

/15/
First type sample of Univers *from 1954 with text in four weights – the uppercase M still has spread legs.*

Les périodes de grandes architectures correspondent à des sommets de la civilisation et c'est un lieu commun que d'apprécier les nuances de la forme des civilisations au style de leur architecture respective.
Mais l'architecture d'une époque reste, en tant que moyen d'expression d'un idéal, celui d'un groupe d'hommes, d'une communauté, d'un peuple.
La typographie est un moyen d'expression non moins complet.

antique

a b c d e f g h
i j k l m n o p q
r s t u v w x y z
A B C D E F
G H I J K L M
N O P Q R S T
U V W X Y Z

Rien de surprenant au fait que le graphisme d'une époque, correspondant à une évolution de la culture chez un peuple, détermine, révèle ou exprime un tempérament ou une tendance dominante de la culture de ce peuple. Il est notoirement évident que la typographie allemande a été très longtemps marquée par la gothique, considérée comme caractère représentatif

Le vingtième siècle cherche son expression typographique; sans doute attend-t-il l'intervention des machines à composer photographiques qui ne manqueront pas d'influencer le graphisme de la deuxième moitié du siècle. Enfin il faut considérer qu'il existe aussi une typographie dont le rythme de renouvellement accéléré correspond aux appétits démesurés de la publicité

a B c D e

Les périodes de grandes architectures correspondent à des sommets de la civilisation et c'est un lieu commun que d'apprécier les nuances de la forme des civilisations au style de leur architecture respective
Mais l'architecture d'une époque reste en tant que moyen d'expression d'un idéal, celui d'un groupe d'hommes, d'une communauté, d'un peuple
La typographie est un moyen d'expression non moins

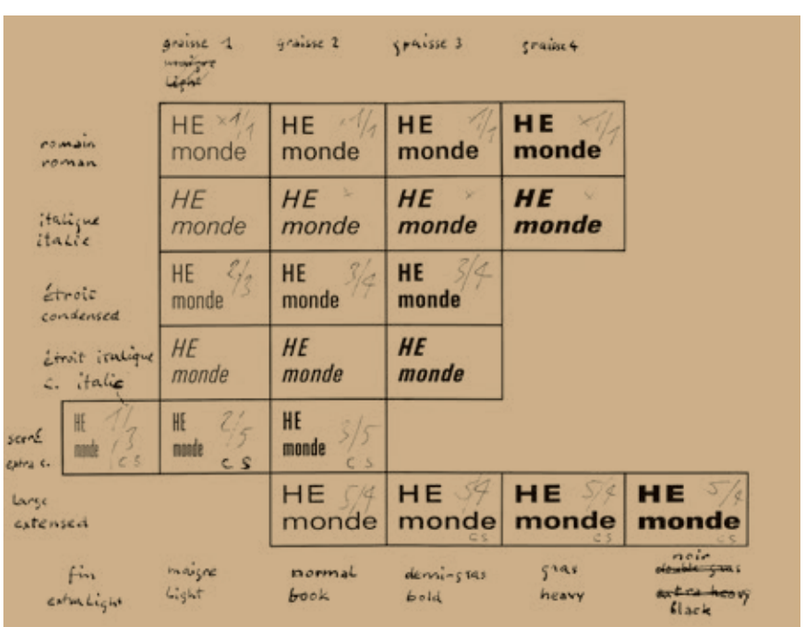
Rien de surprenant au fait que le graphisme d'une époque, correspondant à une évolution de la culture chez un peuple, détermine, révèle ou exprime un tempérament ou une tendance dominante de la culture de ce peuple. Il est notoirement évident que la typographie allemande a été très longtemps marquée par la gothique, considérée comme caractère représentatif

Le vingtième siècle cherche son expression typographique; sans doute attend-t-il l'intervention des machines à composer photographiques qui ne manqueront pas d'influencer le graphisme de la deuxième moitié du siècle. Enfin il faut considérer qu'il existe aussi une typographie dont le rythme de renouvellement accéléré correspond aux appétits démesurés de la publicité

Il existe une évolution de la typographie parallèle à celle de l'architecture, sa puissance d'expression est plus subtile sans doute mais évidente. Elle se manifeste dans tous les domaines et ce serait une erreur que de rechercher la typographie exclusivement dans les livres édités à l'intention des bibliophiles. La lettre est par définition une création spirituelle

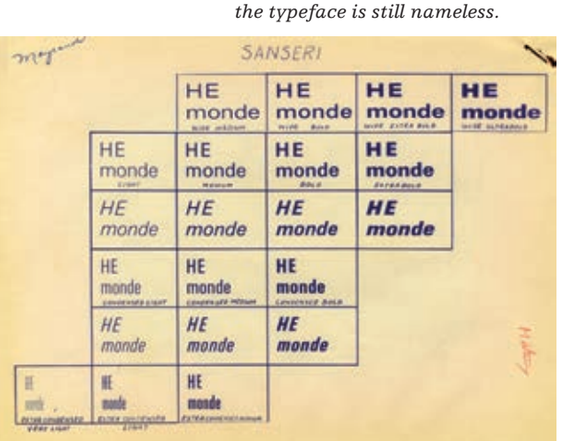
F g m *H* n

Il existe une évolution de la typographie parallèle à celle de l'architecture, sa puissance d'expression est plus subtile sans doute mais évidente. Elle se manifeste dans tous les domaines et ce serait une erreur que de rechercher la typographie exclusivement dans les livres édités à l'intention des bibliophiles. La lettre est par définition une création spirituelle



/16/
First Univers *diagram c.1955 with descriptions of the 21 weights in French and English, but still unnumbered.*

/17/
Second Univers *diagram from 1956 with horizontal arrangement – the typeface is still nameless.*



Univers diagrams The 'HE monde' diagram **/16/** shows the 21 *Univers* weights in a first undated slightly rough depiction. The handwritten names of each weight in two languages are still numberless on the yellowed photographic print. Two slightly reworked diagrams in English titled 'Universal family' and 'Sanseri' **/17/** probably followed soon after, accompanying a memorandum by Louis Rosenblum from February 1956. The weights have different names in all three samples, which shows how problematic the definitions were. In the same note some names are mooted about for the new 'Sans Serif' by Deberny & Peignot. 'Universal', 'Constellation' and 'Cosmos' are suggested.[11]

In *TM/STM* 5/1957 there is an improved, more clearly arranged version.[12] It is the first to include Adrian Frutiger's (Lumitype) numbering system, integrated in the 'monde' diagram **/18/**. This weights diagram would become a sort of trademark for *Univers*. D&P, ATF, and, later on, Haas foundry used it for type samples and advertisements. Rémy Peignot in particular created innovative versions of this diagram: sometimes the rectangles are frames, sometimes they are black or coloured areas, and sometimes they serve as a window to the universe **/37/**. Rémy was also responsible for the 'univers' **/19/** diagram with empty spaces for possible extensions of the type family. It served to demonstrate the dimensions of the *Univers* concept.[13]

Bruno Pfäffli, typographic designer and colleague (later to be studio partner) of Adrian Frutiger's, also made a *Univers* diagram **/01/** which later became a real trademark of *Univers*. Designed for American Type Founders ATF in 1962, it was first displayed in *Monotype Newsletter* 130/1963. Reduced to the essentials, with only the letter u in all weights, he takes on the task of designing the arrangement of the diagram. What stands out is the 16° incline of the *Univers* italic weight, unusual for a sans serif.[14] Along with its large variety of weights, this eye-catching italic became one of the main typographic merits of *Univers*, as can be seen in the advertisements for Monotype by Hans-Rudolf Lutz **/36/**,[15] but also as a working typeface. Words set in *Univers* italics can be found most easily in text bodies, which, sadly, is normally not the case with other sans serifs.

appear semi-bold and bold. In the extended weights, on the other hand, this makes them look thin. This principle was applied to all weights. For this reason it was necessary to attach a bold 80 for the extended widths and a 30 for the compressed ones."[16] The 83 appears nearly as bold as the 75. The same goes for 39 in comparison with 47. Later I asked myself whether it was right that this way a light stroke width appeared to become a regular stroke width in a compressed weight, or whether it would have been better to adapt the stroke width optically. I happened to have it like that in my diagram, and figured if I corrected anything the grading wouldn't be right anymore. In the end it was more of a matter of logic for me than harmony. It could be regarded as an error, but I did it consciously. In later adaptations for photosetting this was changed.

Initially *Univers* was intended for Lumitype. Nevertheless I did my final artwork independently of photosetting methods, on Bristol board with opaque white paint. For me the only way was to deliver drawings ready for cutting and casting. At that time I already had colleagues to help with the final artwork. My best helper was Lucette Girard. I finished all the regular weights with her, based on the drawings stuck together, which Emil Ruder had reviewed. Ladislas Mandel tackled the wide weights **/03/**. He introduced new working methods, scraperboards and stencils for drawing curves. Albert Boton, who was new in the studio, did the narrow weights, which were slightly easier to draw. Only once the final artwork was ready were the optical corrections for photosetting addressed. The regular weight was more or less okay, but the bold and compressed weights were pretty bad. I had to draw some awful caricatures, put serifs on and make huge cuts in the angles so that the type would look right when exposed **/07/**. It was one heck of an ordeal!

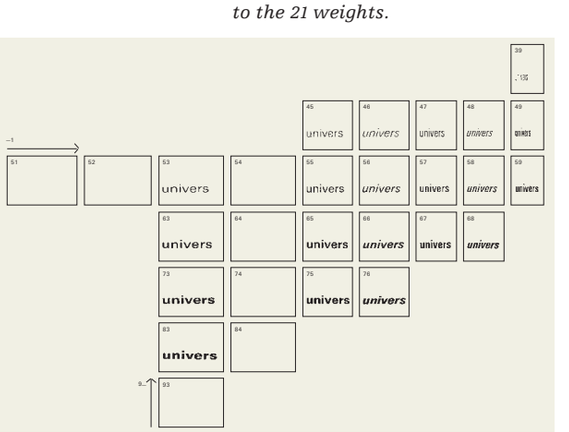
The fact that Charles Peignot had taken on the *Univers* project was an enormous gift for me. It took quite some courage on his part to decide to make it for hot metal too. I worked out that there were 35000 punches to cut. Peignot saw that sales of *Europe* were dwindling rapidly and that the foundry was in danger of going down. *Univers* gave the many engravers much-needed work and the foundry could survive another few years.[17]

When manufacturing the lead characters, we determined that *Univers* had a good set on Lumitype, so we kept the character widths. So that they always remained the same, I devised a system of steel templates. They were inserted in the casting device with the corresponding width and then the letter was cast. The casters worked in the morning when they were still sober and tidy. In the afternoons there were some who filled their bellies with a few litres of wine. Unfortunately I left too much right side bearing and they had to be recast.

Of the originally planned 21 weights for hot metal setting, 20 were made, though not the 49 weight under 10 pt. There were only 20 weights for Lumitype photosetting, the 39

/18/
The diagram from TM *5/1957 has the correct arrangement of the 21* Univers *weights, which are numbered accordingly.*

/19/
Rémy Peignot's Univers *diagram from 1957 – published in* TM *11/1963 – shows possible extensions to the 21 weights.*



weight was missing as it led to problems with exposure. The entire range was completed for Monotype and Monophoto. The vast number of font weights – the first time for ones based on the same basic concept – enabled the designers to fit the 'clothing' to the content and not the other way round. Something light and dainty could be set in light condensed, something very heavy in black extended *Univers*. Later Linotype and other manufacturers added more weights – whatever they may be called, they're not all mine. I felt like the sorceror's apprentice who forgets the magic word.

One of the things to decide about shape was the size of the capitals. The different cap heights was just theory in the *Univers* project **/33/**, it would have complicated the whole hot metal production. The engravers would tell me that it was out of the question for a caster to take an E that wasn't on the base line, it had never occured in their lifetimes. I instantly backed down. However, Emil Ruder thought it was good to draw the uppercase letters slightly smaller than the ascender, which was also discarded because of the relatively tall x-height. He was of the opinion that a text image ought to look roughly the same in any language, no matter if it was German with lots of capitals or a romance language with few of them **/35/**. In TM 1/1961 Ruder demonstrates a text in three languages – German, French and English – and says that *Univers* works for all of them, which is not entirely true in my opinion. Anyway I've changed my views on it with the passage of time, because the reader benefits from a clear distinction between upper- and lowercase. The capitals aren't conspicuous in *Univers* because of the white spaces. In M and N, for example, the leg isn't covered by the main stem, it's next to it. This sideways shift allows as much light to enter as possible. There is no concentration of black, due also to the conical shape of the downstrokes **/33/**. This was important for the project as a whole and for the gray areas of the text. *Univers* doesn't form patches in print, like *Akzidenz Grotesk* for example, because the uppercase letters are only drawn slightly bolder than the lowercase.

I made myself stencils in order to get the curves, like the o exactly right. I remembered just how much time we used to spend drawing under Walter Käch until he was satisfied. I would draw an o and cut a stencil out of tracing paper from the best quarter. I would then hold the tracing paper against the edge of the table and sand it until the curve was perfect. I drew my o using this stencil, both inner and outer shapes. I also drew g p q d b the same way. The inner shapes of both round and half-round letters were the same in principle. What varied, on the other hand, were the curves in the stem connections. As long as the counters were equally round, that was the main thing. Ascender and descender were just added. It doesn't require different letter widths. It's simply like a knitting mesh, and each square in the mesh is the same. I always stuck to this basic principle. Apart from the c, which I drew narrower. Because of the white entering it, the narrow c looks as wide as the o.

Static grotesque The first sans serif typeface dates back to William Caslon IV in England, 1816 (see page 335). Going by the circular O, it can be classified as geometric in style. Some twenty years later English type foundries started engraving more and more static grotesques, based on the classical fundamental shapes of rectangle and oval. The capitals are of the same width optically, round letters tend to have the closed form, like in classical roman and uncial. The stroke contrast varies greatly among early sans serifs, sometimes strong and sometimes low contrast.

To begin with, sans serifs were jobbing faces for posters, advertisements and packaging, mostly in bold or bold condensed type, always capitals only. Outline and shadow varieties appeared early on. In 1834 the first sans serif face with lowercase appeared, Thorowgood's bold condensed *Seven-line Grotesque*.[18] The leap from jobbing fonts to text fonts would take another forty years. In 1870 Schelter & Giesecke in Leipzig released *Breite Magere Grotesk* and in 1880, *Breite Fette Grotesk*.[19] Despite the width implied by their names, both typefaces have normal widths – in the lowercase at any rate – and are only wide compared to other sans serifs, which were mostly bold condensed. The Schelter grotesque is the mother of all static grotesques. *Royal Grotesk* by Ferdinand Theinhardt was very important to the next generation. It, too, was released in 1880, and has been available as *Akzidenz Grotesk* light from Hermann Berthold in Berlin since 1908.[20]

The British, German and American static grotesque typefaces from the 19th century and early 20th century that are still well-known, such as *Akzidenz Grotesk, Monotype Grotesque, Venus Grotesk, Franklin Gothic, News Gothic* etc. all feature the same diagonally cut curve ends **/22/**. There was, however, no consistency. In old type specimens, horizontally and diagonally cut curve ends alternate, even within the same character set **/21/**. The ends are inconsistent in both upper- and lowercase. This comes as no surprise, because fonts by several different manufacturers were slung together to form a 'family'. There is yet no sign of the uniformity that was to become so characteristic of sans serif design in the 1950s.

It was this essential aspect that split Swiss designers forever into two camps. Emil Ruder extolled the advantages and optical measurements of *Univers* in *TM/STM* 5/1957 and in the special edition 1/1961, **/33/** and let

/20/
Breite Magere Grotesk *by Schelter & Giesecke around 1870 – the version shown is by Haas'sche Schriftgiesserei.*

BÖRNE: Hätte die Weltgeschichte ein Sachregister, wie ihr Namensverzeichnis, so könnte man sie besser benützen.

/21/
The a shapes of the original Akzidenz Grotesk *vary greatly in comparison to* Univers, *which was conceived of as one family.*

/22/
Sans serif faces from the first half of the 20th century have diagonally cut curved ends – they look as though they have not been properly executed yet.

Akzidenz Grotesk
News Gothic
Venus Grotesk
Monotype Grotesque
Record Gothic
Reform Grotesque

/23/
Sans serif faces from 1954–62 have horizontally cut curved ends and are more balanced and matter-of-fact.

Univers
Helvetica
Folio
Mercator
Recta
Permanent

/24/
The uppercase M of Maxima *by Gert Wunderlich has spread legs like the original* Univers *design.*

Maxima

students experiment with *Univers*. On the other hand, some designers – for example the Zurich school – regard it alongside Berthold *Akzidenz Grotesk* or *Helvetica*. They deem *Univers* too smooth and conformist. The same goes for former Basel students Karl Gerstner – who designed a system for *Akzidenz Grotesk*[21] – and Wolfgang Weingart. The latter, who taught typography at the Schule für Gestaltung in Basel from 1968, prefer the lively, more archaic character of original sans serifs. Weingart writes; "Univers became an untouchable, almost sacred institution, while Akzidenz Grotesk lay forgotten in dusty old cases."[22]

It would appear that Swiss type design had not achieved a great deal in the intervening fifty years when Emil Ruder wrote, "One has the impression that most of these typefaces weren't made to last. Type design often runs dangerously parallel to fashion crazes and the restlessness of our times. Thus we see more than a few typefaces whose style is dated long before their technical application is. This hunger for change and for all things unusual is a genuine need, and to some degree we ought to honour that. However, in the face of changing fashions we have to create something really durable, in our case a standard typeface."[23]

Folio, *Mercator* and *Neue Haas Grotesk* (which was taken over by D. Stempel AG in 1961 and named *Helvetica*) were released at the same time as *Univers* in 1957. *Recta* followed in 1958 and *Permanent* in 1962. All of these typefaces have horizontally cut curve ends in common.[24] A *Univers*-like face called *Maxima* was released in East Germany in 1970. *Univers* was also one of the starting points for *Haas Unica*, a reconceived version of *Helvetica* in 1980.[25]

I made the numerals narrow on purpose. Their character widths vary in the hot metal version, but for Lumitype photosetting they're all 10 units. This is most noticeable with the zero, which is impossible to confuse with the O. My numerals were always narrower than the uppercase alphabet. This is also the case with classic typefaces, apart from old style numerals, of course. On Lumitype we only had lining figures to start with because there wasn't enough room on the Lumitype disk. So there was only one 1. Monotype made an alternative narrow version with less side bearing.

There are differences to other typefaces in the *Univers* individual letters. With Capitalis Monumentalis **/09/** in mind, I attached the Q tail to the exterior shape. I didn't want to disturb the counter. The fact that the tail emerges horizontally from the Q is one of my characteristics, it's in most of my typefaces. The curved indent in the upstroke of the 1, like in *Akzidenz Grotesk* **/29/**, was something alien to me. An upstroke is something simple and not so fanciful, horizontal with a bump in it. Accordingly, my 1 is simple, like the 7 is too. I always clearly distinguished symbols, numerals and letters. The same goes for the question mark **/27/**; its curve is cut vertically at the top, and not horizontally like the numerals and letters. On the printed page it should look more like an exclamation mark and less like a 2. My ampersand **/28/** was adopted by the European typesetting systems; only when Linotype took over my *Univers* for photosetting for the American market did it get swapped for the looped 'meat-hook ampersand'. The Americans were radical, they didn't want my ampersand at all. The diaereses on ä, ö, ü **/32/** were designed with technical considerations in mind. They're arranged by cap height for reasons of even alignment. The Germans criticised this, because diaeresis and letter are always one unit to them where everything has to be close together. However, I couldn't set the dots any lower because although the x-height for all Lumitype fonts was variable, the position of flying accents was set to a specific height.

The best *Univers* remains the hot metal one cast by Deberny & Peignot. All the other adaptations are something of a sorry tale. In 1959 the contract with Monotype was signed – a wise move for Peignot because the expansion of these machines was a worldwide sensation. Stanley Morison made the decision for Monotype. He said that *Univers* was the least bad sans serif face. In their adverts advertisements they wrote, "Univers – a synthesis of Swiss thoroughness, French elegance and British precision in pattern manufacture."[24] The version for machine setting from 1960, where I even had some influence, is already incoherent. There were technical difficulties. Transferring the 36 unit system of Lumitype to the 18 Monotype units didn't work very well. The small f, the t, the capitals – they all seem squashed. I would discuss it for hours with John Dreyfus and the technicians. I could point out that they needed to be wider than the t, but nothing could be done about

/25/
Univers *was consulted for the reworking of* Helvetica *into* Haas Unica *by A. Gürtler, Ch. Mengelt and E. Gschwind.*

Unica

/26/
ß is a ligature of the long s and the round s – in Adobe Caslon *(left and middle) the long s is included in the character set.*

ſs ß ß

/27/
One of the few inconsistencies of Univers *– in two weights the curve is cut vertically, while in the others it is horizontal.*

????

/28/
Because his ampersand was largely unaccepted, Frutiger designed a traditional looped one as an alternative.

& &

/29/
Compared to Akzidenz Grotesk *(left) and* Helvetica *(right),* Univers *(middle) has the simplest form.*

111
777

/30/
Univers *(below) appears more harmonious and much smoother than the earlier sans serif faces like* Akzidenz Grotesk *(top).*

GKR
GKR

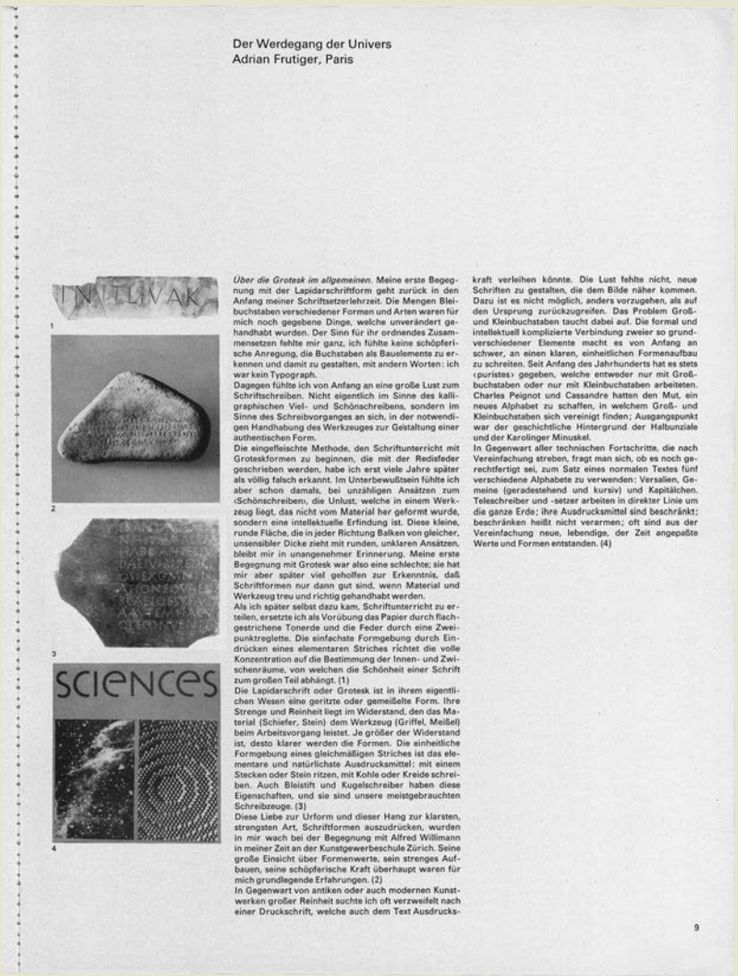
/31/
Curve endings have been unified on Univers *lowercase – they are cut off horizontally at the same height.*

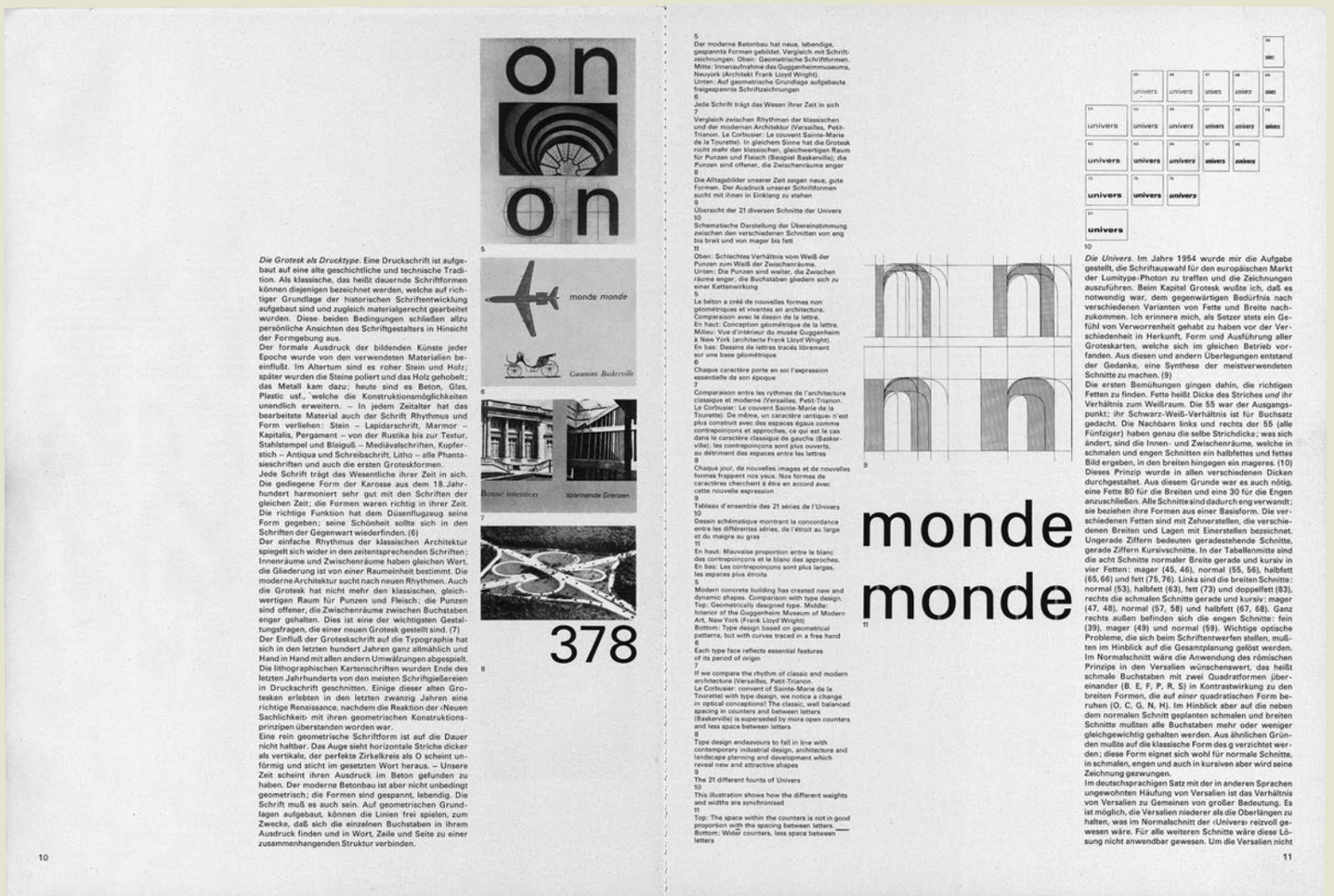
acegs
acegs

/32/
The heights of the letters are not uniform in Akzidenz Grotesk *(above), whereas in* Univers, *unusually, even the accents are aligned.*

H5äliè
H5äliè

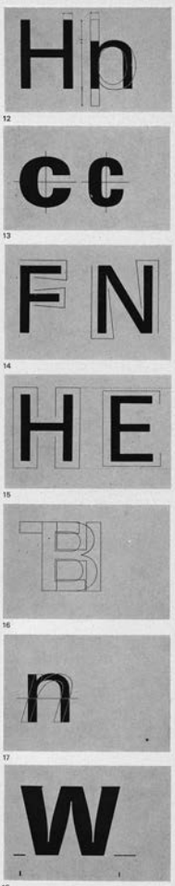
/33/
TM *1/1961 is devoted entirely to* Univers *– A. Frutiger, E. Ruder and P. Heuer write about its conception and production over 60 pages.*





zu stark werden zu lassen, entschloß man sich für eine verhältnismäßig große n-Höhe, was in allen Schnitten durchgeführt werden kann. Dadurch erhält sich die Schrift in den kleinsten Graden eine gute Lesbarkeit; die Schrift hat das sogenannte ›große Bild‹. Gegenüber der knappen Oberlänge ist die Unterlänge noch einmal verkürzt. Dieses Verhältnis ist in allen Schnitten das selbe. Die Versalien sind nur wenig fetter als die Gemeinen, was sehr viel zu einem ruhigen Schriftbild beiträgt, selbst bei einer Häufung von Versalien. (12)
Die Ziffern sind auf Versalhöhe in der Fette der Gemeinen gezeichnet, um den relativ kleinen Innenräumen der Ziffern Rechnung zu tragen. Bei der Planung der verschiedenen Fetten und Lagen stellte sich in weiteren die Frage, ob die Abschlüsse von c, s und e schräg oder waagrecht zu halten seien. Es hat sich gezeigt, daß die einzige Lösung für alle Schnitte der waagrechte Abschluß im Sinne der Lapidarschrift ist. (13)
Die Art der Reihung der Buchstaben zum Wort ist entscheidend. Das Weiß in den Buchstaben steht in Beziehungzum Weiß zwischen den Buchstaben. In den ersten Versuchen zur ›Univers‹ ist diese Beziehung von der üblichen und gebräuchlichen Art; die beiden Weiß sind sich zu ähnlich; das Licht dringt zu stark zwischen die Buchstaben und gefährdet die Bandwirkung der Zeile. Dieser Fehler wurde behoben. Die Buchstaben sind verbreitert worden und damit auch die weißen Innenflächen; das Weiß zwischen den Buchstaben ist verengert worden. Die beiden Weiß stehen in einem Mengenkontrast zueinander; die Punzen sind expressiver geworden. Die Buchstaben halten sich gegenseitig wie die Glieder einer Kette, die Zeile ist dichter und die Führung der Buchstaben in der Zeile besser geworden. (11) Balken, die sich zusammenfügen, sind leichtkonisch gezeichnet. Das freie Balkenende ist leicht verdickt, das andere Ende verdünnt, um die Schwarzanhäufung aufzulockern und das Zuschmieren zu verhindern. (14)
Die Versalhöhe ist leicht differenziert. Versalien, die mit der Schmalseite der Balken die Höhe begrenzen (H), sind größer als solche, die mit der Breitseite der Balken die Höhe einnehmen (E). (15)
Die Dicke eines Striches ist wohl optisch von einem Buchstaben zum andern identisch, praktisch wurden aber an kompakten Zeichen, wie B, R, M usf., die Dicke verringert, wodurch einem dunkleren Hervorstechen in der Zeile vorgebeugt wird. (16)
Die Kursivalphabete wurden von den Geradestehenden abgewandelt. Auf einer horizontalen Mittellinie dreht sich die Vertikale zur Schräge. Der gewählte Winkel ist ziemlich groß, damit der Unterschied zwischen Geradestehender und Kursiv besser betont ist. Mit diesem Konstruktionsprinzip hat die Kursiv genau die gleiche Weite wie die Gerade, das heißt, die Grauwirkung ist die selbe. (17)
Der Fotosatz stellt noch andere Forderungen an die Zeichnung eines Buchstabens. Die Matrizenscheibe der Lumitype dreht sich mit 8 Umdrehungen in der Sekunde. Die Buchstaben werden durch die sich drehende Scheibe hindurch belichtet mit einem Blitz von der Dauer von 5 Millionstein einer Sekunde. Dabei muß die Lichtstärke sehr groß sein. Das fotografische Gesetz ist, daß durch eine kleine Öffnung proportional weniger Licht durchgeht als durch eine große Öffnung. Es ist also notwendig, daß zum Beispiel i-Punkte und Punkturen, hauptsächlich in mageren Schriften, sehr stark verdickt werden müssen. Dagegen müssen Verdichtungen, wie zum Beispiel ein W, in einer schmalfetten Serie sehr stark geöffnet werden, aber auch nur so viel, daß in großen Graden die Übertreibungen nicht als Fehler gesehen werden. (18)
12 verschiedene Grade werden von der gleichen Scheibe fotografiert; die Zeichnung muß also so angelegt sein, daß sie im Corps 5 nicht zufließt, dagegen im Corps 28 auch nicht einen auseinandergezerrten Eindruck macht. Dazu kommt, daß sich an die Fotografie des Films die Kopie auf Offsetplatte oder Kupferzylinder anschließt. Heikle Stellen können im einen Falle zufließen, im andern aufweiten oder brechen! Ein weiteres Problem ist dasjenige der Breitenbestimmung der Buchstaben. 23 Einheiten stehen in der Lumitype zur Verfügung, ein ganzes Alphabet von i bis W zu gestalten.
Das Schriftgestalten ist nicht ausschließlich ein ästhetisches Problem, sondern zum großen Teil ein Verstehen der technischen Gegebenheiten, auf welche der Formen aufgebaut werden. Und die Schrift ist dann schön, wenn sie richtig im Dienste einer strengen Gesetzmäßigkeit des Materials und der fortschreitenden Technik steht.

12



13

14

15

16

17

18

Die Herstellung einer Drucktype
Adrian Frutiger, Paris

12
Der Größenunterschied zwischen Groß- und Kleinbuchstaben ist ziemlich gering, damit wir ein ruhiges Satzbild erhalten
13
Die Abschlüsse von c, e, s usf. sind waagrecht im Sinne der Unzialschrift. Das Prinzip wurde in allen Schnitten durchgehalten
14
Balken, die sich zusammenfügen, sind leicht konisch gegen außen, wodurch Schwarzanhäufungen aufgelockert werden
15 16
Fette und Höhe der Buchstaben sind nach optischen und nicht nach mathematischen Regeln bestimmt
17
Die Kursiven sind von den Geradestehenden abgewandelt. Auf einer horizontalen Mittellinie dreht sich die Vertikale zur Schräge
18
Notwendige Übertreibungen beim Zeichnen einer Schrift für den Fotosatz. Innenwinkel sind sehr stark geöffnet, Außenwinkel sind teilweise verstärkt durch leichte Ausladungen
12
La différence de grandeur entre capitales et bas-de-casses est réduite au minimum pour obtenir une composition sans rupture
13
Les boucles de c, e, s, etc. ont une terminaison horizontale, comme dans l'oncíale. Ce principe a été appliqué dans toutes les séries
14
Les traits liés à un autre sont légèrement coniques pour éviter une accumulation de noir dans les angles intérieurs
15 16
La graisse et la hauteur des lettres ne sont p s fixées d'après des lois mathématiques mais d'après des lois optiques
17
Les italiques sont dérivées des romains. Sur une ligne médiane horizontale, la verticale pivote
18
Exagérations nécessaires pour le dessin d'une écriture destinée à la photo-composition. Les angles intérieurs sont très ouverts et certains angles extérieurs sont renforcés par un léger empattement
12
The difference in height between capitals and lower case characters is small, and this ensures a well-balanced composition
13
The end strokes of c, e, s, etc. are horizontal (like those of uniciàls). This applies to all founts
14
Joining strokes are very slightly thickened. Patchiness is avoided by slightly conical strokes in all letters with joins
15 16
Weight and height of letters is governed by optical instead of mathematical rules
17
Italics are directly derived from upright founts. A horizontal line in the middle of the x-height serves as an axis
18
Such exaggerations are necessary in type design for filmsetting. The interior of acute angles is opened up considerably, while the outside is slightly strengthened

Das Grundprinzip des Fabrikationsprozesses eines Bleibuchstabens wurde von den ersten Gießern des 15. Jahrhunderts erfunden und erlebte seither keine fundamentale Änderung, außer derjenigen, welche zur direkten Matrizenbohrung führte.
Das Endprodukt ist ein erhabener Buchstabe. Er entsteht als Mengenprodukt, indem eine Metallegierung in ein Muttersttück, die Matrize, gegossen wird. Aus einer künstlerischen Gefühlsmäßigkeit und aus verschiedenen technischen Vorwänden ist es richtiger, diese Matrize mit Hilfe eines erhabenen Originalmodells, des Stempels, herzustellen, als sie direkt vertieft zu bohren. Warum? Es ist schwer und handwerklich kompromißvoll, in verkehrter Arbeitsweise in der Vertiefung zu gestalten, was erhaben erscheinen soll. Die feinste Fräse erlaubt es nicht, rechte und spitze Winkel bis aufs Äußerste auszubohren. Zudem ist Retuschieren in der Matrize unmöglich. Letzte Feinheiten können aber nur richtig und sauber ausgearbeitet werden in der definitiven Größe des geschnittenen Grades. Der Rauchabzug des Stempels oder des Zeugschnittes ist eine unfehlbare Kontrollmöglichkeit vor der Fabrikation. Aus diesen Gründen hat die Gießerei Deberny & Peignot mit der alten Tradition nicht brechen wollen und ist auch in den jüngsten Schriftschnitten dem Stahlstempel treu geblieben.
Eine neue Schrift entsteht logischerweise zuerst im Kopfe des Gestalters. Bevor der erste Strich überhaupt skizziert wird, muß Klarheit über ganz bestimmte Punkte herrschen. Außer der elementaren Stilfrage ist zuerst diejenige des Zweckes zu beantworten: Handelt es sich in erster Linie um eine Textschrift, um eine Auszeichnungsschrift? Welche Grade sind in der Abstufung die wichtigsten? In welchen Druckverfahren muß die Schrift am besten reproduktionsfähig sein? Ist mechanischer Blei- oder Fotosatz vorzusehen? usw. Die Bedingungen all dieser Fragen umgrenzen schon von Anfang an das Bild der zu schaffenden Schrift.
Die ersten Skizzen werden für die formal wichtigsten Buchstaben erstellt: i, o, n, v, p, d, H, O, A, mit welchen sofort Worte gebildet werden, um die Schrift von Beginn an als Wortbild zu gestalten.
Die ersten Schwarzweißzeichnungen (1), die ungefähr 10 cm hoch ausgeführt sind, werden mit Hilfe eines Mikrofilmapparates auf einen mittleren Grad verkleinert. Die Fotoabzüge werden genau auf die vorausbestimmten Breiten den Hilfslinien nach ausgeschnitten und zu einem Text zusammengeklebt. (2) Das Ganze wird auf die kleinsten Grade weiter verkleinert. Oft kommt es so weit, daß von einem solchen Probesatz ein Strichklischee oder eine Offsetplatte hergestellt wird, um dem Druckresultat näher zu kommen.
Nach den nötigen Korrekturen oder Änderungen auf den Zeichnungen, vielfach auch erst nach einem zweiten und dritten Klebesatz, werden Vergrößerungen der Zeichnungen angefertigt. Diese großen Fotografien werden auf Karton aufgezogen, der Karton auf eine Metallplatte aufgeleimt und die Buchstabenform mit aller Sorgfalt von Hand aus dem Karton ausgeschnitten. Diese Arbeit geschieht mit einer Präzision von zwei Zehntelmillimetern. Von dieser Originalschablone wird eine Fabrikationsschablone in drei- bis fünffacher Verkleinerung auf dem Pantographen in eine Messingplatte gefräst. (3) Nach dieser Messingschablone werden auch mit Hilfe des Pantographen die Originalstempel und -zeugschnitte hergestellt, in Reduktionen von 5 bis 15, je nach Grad. (4) Die vorerwähnten Toleranzen von zwei Zehntelmillimeter sind durch die beiden Reduktionen um das Zwanzig- bis Fünfzigfache verringert, so daß die vom Handausschnitt herkommenden Fehler praktisch schon ausgetilgt sind. Trotzdem werden diese Rohschnitte vom Stempelschneider unter dem Mikroskop kontrolliert und nachgeschnitten. Innenwinkel werden nachgestochen und dies dem Schriftgrad entsprechend mehr oder weniger betont, was dem Zuschmieren beim Druck vorbeugt. Der Konus der Gravuren ist sehr steil gehalten, was einem raschen Verdicken des Schriftbildes bei starker Abnützung vorbeugt. Die Rauchabzüge der retuschierten Schnitte ergeben ein ganz klares Bild des Zustandes vom Schriftauge. (8) (9) Das ganze Alphabet wird so im ungefähren Weitenlauf der Schrift abgedruckt und kontrolliert nach Einzelheiten und Gesamteindruck. Nach letzten Retuschen werden die Stempel gehärtet und in Kupferblöcke geschlagen. (5) Die Zeugschnitte der großen Grade kommen in ein galvanisches Nickelbad zur Abformung. (6)
Dem Matrizenjustierer und dem Gießer werden die genauen Angaben über Linie, Weite, Fleisch und Stellung in Minimalwerten von einem Hundertstelmillimeter angegeben. Die Matrizen werden nach diesen Referenzen mit Hilfe eines Präzisionsmikroskops justiert und geprüft.
Die fertige Matrize kommt in die Gießmaschine. (10) Nachdem sie im Anschlagwinkel befestigt worden ist, befindet sie sich automatisch in der richtigen Stellung vor dem Gießmund. Der Gießer braucht nur noch die angegebene Dicke einzustellen. (7)
Von jedem Schriftzeichen und von allen Graden wird ein Probeguß angefertigt. Davon werden Probesätze hergestellt, auf Grund deren letzte Korrekturen angebracht werden und das ›Gut zum Gießen‹ erteilt wird.
Der Guß erfolgt mit erprobten Legierungen, die nach Schriftgrad verschieden sind. Die Legierung bezieht sich auf den Widerstand großer oder kleiner Flächen, feiner, grober oder auch überhängender Formen. Der fertige Guß wird mit Fehlertoleranzen von 1 bis 3 Hundertstelmillimeter kontrolliert, je nach Schriftart und Schriftgrad.

Ich möchte diese Gelegenheit nicht unbenützt lassen, die Mitarbeiter zu erwähnen, welche an der Entstehung der Univers am engsten beteiligt waren: Lucette Girard und Ladislas Mandel als Schriftzeichner und Marcel Mouchel als Leiter der Gravurabteilung Deberny & Peignot.

13

Die Univers in der Typographie
Emil Ruder, Basel

Die Druckschriften historischer Prägung. Viele unserer noch heute im Gebrauch stehenden Druckschriften vergangener Epochen sind Schrifttypen von hohen Qualitäten, die das Überdauern der Jahrhunderte begreiflich machen. Die Antiqua der italienischen Renaissance, die Barock- und die klassizistische Antiqua, scheinen in funktioneller wie formaler Hinsicht unübertrefflich. Der richtig dosierte Fettenwechsel, das gute Verhältnis von Mittel-, Ober und Unterlängen und die schöne Grauwirkung der älteren Antiqua im besonderen ergeben nicht nur eine schöne, sondern auch eine mühelos lesbare Schrift, und es fehlt nicht an Stimmen, welche in der Medäval alle Tugenden einer Druckschrift vereinigt finden. Oft hört man die Ansicht, die Mediäval sei der nicht mehr zu übertreffende Endpunkt aller Drucklettern überhaupt.
Bei aller objektiven Würdigung unbestreitbarer Qualitäten darf nicht übersehen werden, daß Schriften wie die Bembo, die Garamond, die Caslon, die Baskerville oder die Bodoni Schriften *vergangener* Epochen sind. Diese Schriften sind zudem mit ihren Namen eng verknüpft. Die Baskerville, in englischer Sprache gesetzt, zeigt dort ihre volle Schönheit, und im deutschen Satz verändert sich ihr Charakter. Häufung der Versalien und andere Wortbilder bewirken eine spürbare Abwertung ihrer formalen Qualitäten. Die Antiqua kann allen Anforderungen, die heute an eine Schrift gestellt werden müssen, nicht genügen. Sie wurzelt in einer Zeit, für die Werbung und Publizistik unbekannte Dinge waren, und ihre ursprüngliche Form zeigt nur eine Normalbreite, mageren und kursiven Schnitt. Ihr Wesen ist Intimität, und nicht ohne Bedenken kann sie für Werbedrucksachen und für Arbeiten in größerem Format eingesetzt werden. Die Vergrößerung der Garamond zum Beispiel über die Typengröße hinaus ist ihrer Wirkung abträglich. Wir benötigen heute große Buchstaben, halbfette, fette, schmale, breite, kursive und normale Schnitte. Derartige Ansprüche kann nur die Linear-Antiqua, die Grotesk erfüllen, nicht irgendeine Grotesk – eine gute Grotesk.

Die Groteskschriften vor der Univers. England schuf die ersten Schriften ohne Endstriche, welche bei ihrem Auftreten auf dem Kontinent die bekannten Schockwirkungen auslösten. Die Schriftbezeichnung Grotesk (– absonderlich, lächerlich) ist so erklärbar. Bis auf den heutigen Tag wurde diese Bezeichnung beharrlich auf die Schrift angewandt, und es ist offensichtlich, daß der diffamierende Name an der negativen Einstellung zur Schrift wesentlich beteiligt ist. Für den Buchdrucker besteht das typische Merkmal der Grotesk immer noch darin, daß ihr etwas *fehlt:* die Endstriche und der Fettenwechsel. Diese Beurteilung ist allgemein verbreitet und umfaßt Groteskgegner wie -befürworter; letztere sind sich wohl kaum bewußt, daß sie mit diesem oberflächlichen und nur im Negativen verharrenden Urteil mit zur Verfemung der Grotesk beitragen. Der Wert einer Sache kann nie darin bestehen, daß ihr etwas mangelt. Paul Renner schrieb in der Einführung zu seiner Futura: ›Unsere Zeit zieht den kunstlosen Werkbestand, die technische Form, jeder Kunst vor.‹ Sympathie und Verständnis für diese Formulierung dürfen nicht hindern, auch hier wieder das Negative herauszuhören. Für Renner ging es darum, den Ballast vergangener Jahrhunderte abzuwerfen und sich vom Diktat klassischer Schriften zu befreien.
In den ersten Schnitten der Futura waltet weitgehend das Prinzip der Konstruktion, wenn auch Renner in den späteren Futuraschnitten einsehen mußte, daß optische Korrekturen unumgänglich sind. Die Futura bleibt aber das Beispiel der vorwiegend konstruktiven Grotesk, und der aufmerksame Betrachter wird im fetten Schnitt des Versal U ohne große Mühe dort die optische Knickwirkung sehen, wo die Zirkelrundungen auf die Geraden aufstoßen.
Die Futura wurzelte im Konstruktivismus in Architektur und Kunst der zwanziger Jahre, und mit diesen gemeinsam demonstrierte sie für eine Überwindung des Individuellen (in den Künstlerschriften des Buchdrucks) mittels der Konstruktion. Der demonstrative Charakter und ihre enge Verflechtung mit den positiven, aber auch negativen Zeichen ihrer Zeit haben bewirkt, die Bedeutung der Futura für unsere Zeit in Frage zu stellen. Die Drucktype, welche das Auge als ›richtig‹ empfinden soll, kann nicht konstruiert sein. Das menschliche Auge hat die Tendenz, alle waagrecht gelagerten Werte zu vergrößern, die senkrechten Teile als schwächer zu registrieren; im rechten oder spitzen Winkel aufeinanderstoßende Balken müssen konisch verjüngt und verdünnt werden; dies hilft die Zudunklung einzelner Teile vermeiden. Der geometrischen Ebene der Konstruktion ist die Ebene der Empfindung überlagert, auf welcher im Gegeneinander von Schwarz und Weiß die definitiven Entschlüsse zu fassen sind.
In der Schweiz fanden Gestalter und Drucker in der Akzidenzgrotesk der Jahrhundertwende die Tugenden, welche der Futura mangelten: Sachlichkeit, undemonstrative und unpersönliche Haltung, Robustheit in der Strichstärke, großes Bild und damit Offenhaltung der Punzen bis in die kleinsten Grade. Diese Eigenschaften gewährleisten eine Verwendung auf fast allen Gebieten, und die Akzidenzgrotesk hat ihre Brauchbarkeit bewiesen, ist sie doch seit zwei Jahrzehnten die bevorzugte Grotesk des Gestalters.
Es mag in ihrer neutralen und zurückhaltenden Art begründet sein, daß die offensichtlichen Mängel der Akzidenzgrotesk nicht so deutlich in Erscheinung treten. Ihr Mangel an Sensibilität erklärt sich aus der Zeit ihrer Entstehung. In der Zeitspanne von 1850 bis 1900 entstanden Typen banaler Art bis zu solchen schlimmster Entartung, und es ist eigentlich erstaunlich, wie gut sich die Akzidenzgrotesk im Vergleich zu ihren zeitgenössischen Schriften hält. Jener Zeit mangelte vor allem die Einsicht, daß auch die Drucktype vom geschriebenen Buchstaben abzuleiten sei und daß die Gesetze des Schreibens, obwohl verändert durch die Technik des Stempelschnittes, sichtbar bleiben sollen. Der Fettenwechsel in der Akzidenzgrotesk ist mehr oder weniger willkürlich und nicht durch den Fettenwechsel der Schreibfeder bedingt. In einigen Graden und Schnitten sind die Versalien im Verhältnis zu den Gemeinen zu groß oder zu fett, was vor allem im deutschen Satz zu schlechten Satzbildern führt.

18

Die Univers. Mit der Univers wird eine neue Wertung der Grotesk eingeleitet. Ihre Formen greifen weder auf alte Groteskschnitte zurück, noch haben sie den demonstrativen Zug einer Schrift, die gegen die Vergangenheit rebelliert. Die Univers wurde aus einem gründlichen Wissen heraus um die Schriftformen der Vergangenheit geschaffen. In ihr ist die Erkenntnis wirksam, daß Schrift ein von unseren Vorfahren übernommenes Kulturgut ist, welches weder vernachlässigt noch gewaltsam geändert werden darf und das unseren Nachkommen in gutem Zustande wieder übergeben werden soll. Es zeichnet sich so die Möglichkeit ab, den Gegensatz Antiqua Grotesk zu überbrücken, ja ihn illusorisch zu machen.
Die bisherige negative Deutung der Grotesk, ihr Wesen bestehe im Weglassen, wird durch eine positive ersetzt: *Die Formen der Grotesk zeigen das Wesentliche einer Schrift.* Keine Endstriche oder anderweitige Auszierungen lenken das Auge von der wesentlichen Form ab, die außerordentlich empfindlich ist und kleinste formale Verstöße registriert. Anstelle eines sturen Konstruktionsprinzips waltet in allen Buchstaben der Univers ein vielfältiges Spiel von optischen Werten. Die verhältnismäßig große n-Höhe gibt selbst in den kleinsten Graden das große Bild und trägt zu einem ruhigen Schriftbild bei, aus dem die Versalien nicht hervorbrechen.
Die Weite der Buchstaben regelt das Verhältnis der weißen Räume in und zwischen den Buchstaben. Die Weißmenge im Buchstaben ist deutlich größer als das Weiß zwischen den Buchstaben. Die Typen halten sich so gegenseitig wie die Glieder einer Kette; die Zeile ist dicht und führt den Blick in der Leserichtung.
Schwarzanhäufungen sind durchweg, selbst in den schmalsten und fettesten Schnitten, aufgelockert, was das Zuschmieren verhindert.
Reich differenziert sind die Fetten, von denen grundsätzlich drei wirksam sind: der senkrechte Balken ist der fetteste, der waagrechte der dünnste, und die Fette der Diagonale liegt in der Mitte. Die drei Waagrechten beim E sind etwas dünner als der einzige Querbalken beim H. Bei kleinen Punzen (B) sind alle Striche dünner als bei großen Punzen (O). Der Balken des I ist etwas fetter, damit sich der Buchstabe neben den andern behaupten kann.
In einem größeren Grade ist leicht erkennbar, daß die Buchstaben ein- und ausfließen. Einläufe sind an den oberen Teilen von g, m, n, p, q und u, Ausläufe in den unteren Partien von a, b, d und u.
Das c ist schmäler als das o, damit es durch das von rechts einfließende Weiß nicht breiter scheint. u und n sind nicht von gleicher Breite, weil das beim u oben einfließende Weiß aktiver ist als das von unten einfließende beim n.
Zum ersten Male in der Geschichte des Buchdrucks wurde eine reich verzweigte Schriftfamilie nicht auf Grund der ersten erfolgreichen Schnitte, sondern von Beginn an planmäßig aufgebaut. Ausgangspunkt und wichtigster Schnitt ist der normale (Univers 55), von dem aus alle weiteren entwickelt worden sind. Wichtige optische Probleme mußten immer im Hinblick auf diese Gesamtplanung gelöst werden.

Die Einwirkungen der Univers auf die Typographie unserer Zeit. Die Univers entzieht sich der bis heute üblichen minderen Bewertung der Grotesk und ist gleichgewichtiger Partner der übrigen Druckschriften. Ihre graphischen Werte rechtfertigen ihre Verwendung in subtilen Druckwerken selbst intimen Charakters.
Subtilität der Form, richtiger Fettenwechsel, Verbundenheit mit der traditionellen Schriftentwicklung und Offenhaltung der Punzen in den kleinsten Graden werden eine gute Lesbarkeit gewährleisten. Die Univers gibt den Anlaß zu einer neuen Überprüfung der von Vorurteilen etwas verbauten Frage, ob eine Grotesk in großer Menge (im Buche beispielsweise) mühelos gelesen werden könne.
Die Qualität der einzelnen Type bedingt eine Kompositionsart, in der sich die Schrift frei entfalten kann. Eine banale Schrift mit wenig künstlerischen Werten wird den Typographen immer wieder dazu verleiten, entweder die Schrift nur als Grauwert einzusetzen, ihr eine dekorative Rolle zuzuweisen, oder aber mit einer virtuosen Kompositionsart die Schwäche der Schrift zu übertönen.
Die Typographie der Bauhauszeit in den Arbeiten von El Lissitzky, Moholy-Nagy, Joost Schmidt, Piet Zwaart und anderen spricht sich alleinig in der Kompositionsart aus, in der Asymmetrie, den dynamischen Flächenbeziehungen und in den Richtungskontrasten. Die Typen, grobe oder gesichtslose Antiqua- und Groteskschnitte der Jahrhundertwende, waren vom Elan jener Zeit nicht erfaßt, und ihre Qualitäten standen weit unter denjenigen der Komposition. Die Degradierung der Drucktypen zu Grauwerten ist nicht einmal bei Schriften minderer Qualität gerechtfertigt. Es soll nicht bestritten werden, daß jede Schrift und Satzart ihre Grauwerte besitzen, die vom guten Satzgestalter registriert und richtig eingesetzt werden. Aber: vorgängig jeder Grauwirkung ist die formal und funktionell richtige Satzart. Es ist ein Symptom beruflicher Unreife und modernistischen Gebarens, die Graufläche als Ausgangspunkt und Basis der Gestaltung zu nehmen, eine Fläche, der sich die Typographie zu fügen und zu unterziehen hat. Eine Druckschrift, in der Größe von 6 Punkt auf eine Breite von 40 Cicero gesetzt, ergibt ein schönes und vielleicht sogar kostbares Grau und ist trotzdem ein typographisches Gebilde mit schweren funktionellen und formalen Mängeln.
Die große Mittellänge und die vergleichsweise kleinen Ober- und Unterlängen zeitigen nebst dem großen Bild im kleinen Grad ein weiteres, höchst erwünschtes Ergebnis: Die Versalien sind weder zu groß noch zu fett und brechen nicht aus dem Satzbild aus. Dieses Größenverhältnis der Versalien zu den Gemeinen gestattet den Satz in verschiedenen Sprachen, ohne daß sich das Satzbild entscheidend ändert. Im Beispiel 1 führt der deutsche Text von Adalbert Stifter mit starker Versalanhäufung keineswegs zu einer fleckigen Satzwirkung, die sich bei betonteren Versalien sofort einstellen würde. Der französische und der englische Text, aus der selben Schrift gesetzt (Beispiele 2 und 3), ergeben annähernd die gleiche Satzstruktur, und es kann daraus gefolgert werden, daß sich die Univers in den verschiedenen Sprachen ohne Qualitätseinbußen bewähren wird.

19

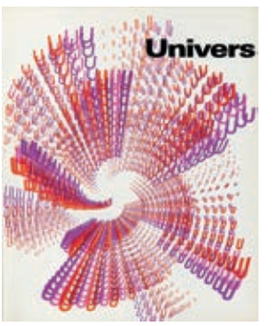
einflußt. Im Altertum sind es roher Stein und Holz; später wurden die Steine poliert und das Holz gehobelt; das Metall kam dazu; heute sind es Beton, Glas, Plastic usf., welche die Konstruktionsmöglichkeiten unendlich erweitern. – In jedem Zeitalter hat das bearbeitete Material auch der Schrift Rhythmus und Form verliehen: Stein – Lapidarschrift, Marmor –

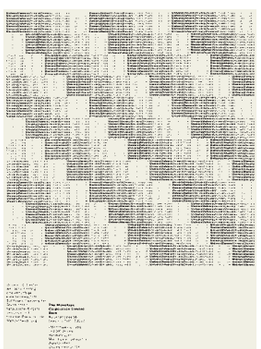
Ende 1962 dürften die vier erwähnten Grundschnitte mit Kursiv in den meisten Graden zwischen 6 und 48 Punkt zur Verfügung stehen, und zwar mit sämtlichen europäischen Akzenten und in den Kleinkegelgraden mit liniehaltenden Bruchziffernligaturen, hoch- und tiefstehenden Ziffern und Buchstaben und den üblichen Spezialzeichen.

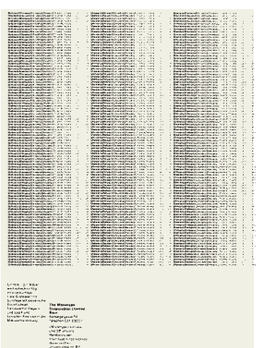
AGJrvwyz *ACJOWgirvwxyz* **AJVXaegwxy**

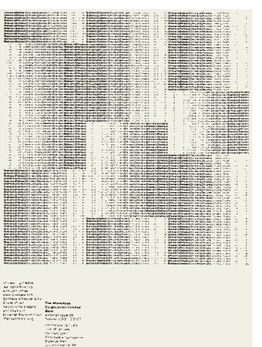
/34/
Monotype Univers *in* TM *1/1961 (above) and some characters with side bearing corrected in* TM *1/1962 (below).*

/37/
Publicity material by Deberny & Peignot for Univers *– designed by Rémy Peignot in the 1950s and '60s, it shows a spiral galaxy.*









/36/
Advertisements by Hans-Rudolf Lutz from the 1960s for Monotype showing the spatial modulation of Univers.

/38/
Otl Aicher's corporate design for the 1972 Olympic Games in Munich used Univers *throughout.*

/35/
Texts in different languages appear homogenous in Univers, *unlike* Futura *(left) – the relation of x-height to ascenders and descenders is the key.*

Sie fragen sich, warum es notwendig ist, so viele Schriften zur Verfügung zu haben. Sie dienen alle zum selben, aber machen die Vielfalt des Menschen aus. Diese Vielfalt ist wie beim Wein. Ich habe einmal eine Weinkarte studiert mit sechzig Médoc-Weinen aus dem selben Jahr.

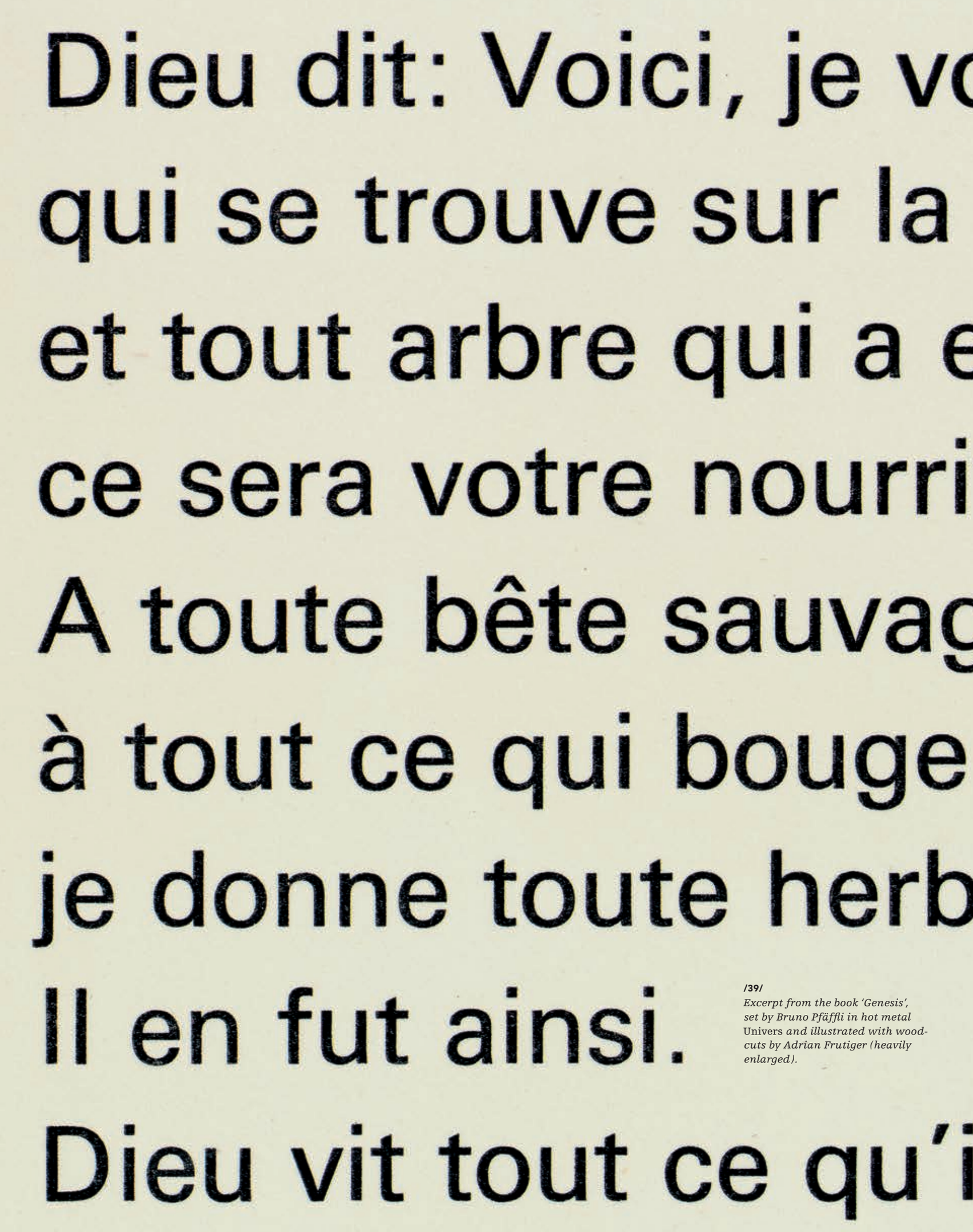
Sie fragen sich, warum es notwendig ist, so viele Schriften zur Verfügung zu haben. Sie dienen alle zum selben, aber machen die Vielfalt des Menschen aus. Diese Vielfalt ist wie beim Wein. Ich habe einmal eine Weinkarte studiert mit sechzig Médoc-Weinen aus dem selben Jahr.

You may ask why so many different typefaces. They all serve the same purpose but they express mans diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty different Médocs all of the same year. All of them were wines but each was different.

You may ask why so many different typefaces. They all serve the same purpose but they express mans diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty different Médocs all of the same year. All of them were wines but each was different.

Pourquoi tant d'Alphabets différents! Tous servent au même but, mais aussi à exprimer la diversité de l'homme. C'est cette même diversité que nous retrouvons dans les vins de Médoc. J'ai pu, un jour, relever soixante crus, tous de la même année. Il s'agissait certes de vins, mais tous étaient différents.

Pourquoi tant d'Alphabets différents! Tous servent au même but, mais aussi à exprimer la diversité de l'homme. C'est cette même diversité que nous retrouvons dans les vins de Médoc. J'ai pu, un jour, relever soixante crus, tous de la même année. Il s'agissait certes de vins, mais tous étaient différents.



/39/
Excerpt from the book 'Genesis', set by Bruno Pfäffli in hot metal Univers *and illustrated with wood-cuts by Adrian Frutiger (heavily enlarged).*

it, the character set in the die case just wouldn't allow it. Some things were corrected in 1962, but it still wasn't optimal **/34/**. Nevertheless *Univers* was influenced by Monotype in the end because many small foundries simply cast the Monotype matrices, used it for hand composition as well, even though it was a poor second-hand copy to start with.

The *Univers* versions for the various photo- or lasersetting systems, be they Compugraphic, Linotype, Adobe or Bitstream, are all based on the inferior Monotype matrices. The best *Univers* adaptation is by Günter Gerhard Lange, initially for Diatype by Berthold. It comes very close to the original *Univers,* even though Lange allows himself some minimal liberties.

Linotype's early adaptations, on the other hand, were a catastrophe. I can vividly recall the fruitless discussions at D.Stempel AG when the first *Univers* adaptations for Linofilm were produced. The uppercase italics were just slanted uprights with no reworking whatsoever. There wasn't enough room on the master for italics. The tilt angle, which was originally 16°, became 12°. The reduced tilt angle was for linecasting. The original angle of 16°, however, came from Lumitype photosetting. The first time it didn't matter technically whether there was an overshoot or not. I found that for photosetting, having no physical body, one could try a completely different slope, so that it would really show a clear contrast. *Univers* came about at the same time that PR and advertising agencies emerged – that's why I wanted a snappy typeface, and that's why there are so many weights and such a strong tilt angle. Maybe I went a bit too far, that's arguable, 15° might have been sufficient, but it's precisely the 16° that has become one of the features of *Univers.* At Deberny & Peignot I could also insist upon the 16°. The sharp inclination was immediately criticised. They said it was on the verge of falling over, it was always a topic of discussion. Some of them thought it was fun, while to others it was a thorn in their side. I stuck to my opinion that there ought to be a real difference between an upright and an oblique.

At Linotype *Univers* was for a long time a necessary evil, an orphan that nobody really cared for. I really suffered for it. *Helvetica,* however, was preened and constantly improved, so becoming a top successful product. It was only Bruno Steinert, managing director at Linotype, who initiated the reworked *Linotype Univers* in 1994, which actually went back to the hot metal originals. The impetus for renewal came from Deutsche Bank, who were changing their corporate design. The agency responsible for the corporate design chose the *Univers* – like Anton Stankowski – as their inhouse typeface. They choose the Berthold version, but that wasn't available worldwide, so they turned to Linotype. Thereupon I was invited to work on it by Bruno Steinert and Otmar Hoefer. I was overwhelmed and felt a certain amount of satisfaction. They asked me to help determine the extreme poles. Interpolating was easy, but extrapolating was impossible. I corrected the slanted fonts by

Antique Presse and Univad In the early 1960s, *Antique Presse* was made as foundry type after requests from the sales department at Deberny & Peignot. It is an extension of *Univers.* It says in the *Antique Presse* brochure that clients had complained they had no fonts for large scale newspaper headline setting, and so they had to make their own photographic enlargements and photo-engraved plates.

An article about Ladislas Mandel in *Etapes Graphiques* states: "Antique Presse, 1964. This is the first creation by Mandel."[26] A design from 1963 titled 'Antique Presse, Mandel' **/40/** shows clear differences to later versions, for example S and C, and in the whole arrangement. Mandel explains that he designed non-classical shapes for a, S and G, so as to fill the empty spaces and achieve a homogenous colour.[27] The design was rejected, and it was reworked along the lines of *Univers.* The undated 'Univers bis' sheet **/40/** shows the reworked version. *Antique Presse* was made in three weights with upper- and lowercase letters from 48 to 94 pt. The lowercase 69 and 89 were omitted after being transferred to the Haas'sche type library. The typeface disappeared altogether with the demise of hot metal setting. Linotype did not make it for photosetting. Adrian Frutiger included *Antique Presse* in a list of his own creations for the first and only time in 1988.[29] In conversation dated 28 May, 2001 he has reaffirmed the attribution.

Another relative of *Univers* is *Univad* **/41/**, a typeface designed by Ladislas Mandel in 1974 for photosetting on Photon in the smallest point sizes. The counters are as open as possible in order to be acceptably legible in such small sizes. Its increased stroke contrast and widening of letters also improved legibility. As a result, *Univad* 55 looks like *Univers* 55 but is strictly speaking a 53.

The shapes of some letters were altered from those of *Univers.* R has a straight downstroke, W is steeper, 5, 6 and 9 are more open. Q, like *Antique Presse,* has a slightly downward offset cross-stroke. This typeface has been unavailable since photosetting stopped being used.

/40/
Design by Ladislas Mandel, 1962/63 (top), Univers*-style corrected version (middle), finished version of* Antique Presse *from an undated brochure (bottom).*

/41/
Univad *(right), a* Univers *designed by Ladislas Mandel for agate sizes – here in 5 pt – was made in 1974 for photosetting on Photon machines.*

Non-latin typefaces In the 20th century there was increasing modernisation of non-Latin typefaces, whose shapes were simplified to sans serif shapes. They were based on roman models in proportion, rhythm, stroke contrast and also form. Among others, *Univers* is the source of many adaptations.

From 1973–76, Frutiger drew what was to be *Univers Cyrillic* **/43/** together with Alexei Chekoulaev for Stempel foundry. Seeing as only a few letters coincide between the Cyrillic and Latin (roman) alphabets, Adrian Frutiger explained in a letter to Walter Greisner that he regarded this design as a new creation.[30] Compugraphic made a new version too, which led to an issue of copyright infringement.[31]

Ladislas Mandel had already designed a Cyrillic version of *Univers* in 1967 called *Mir* **/42/** for the International Photon Corporation. He took his cue from the Cyrillic cursive script, whose letter shapes often vary greatly from the printed forms. Adrian Frutiger consulted this typeface before working on his, but was critical of Mandel's stance because "in my opinion 15–20 of the shapes are unusual for the reader."[32] He decided to stick with the more common printed upright alphabet.[33]

Given that Greek lapidary script **/09/** is the basis of sans serif faces, it is interesting to note Frutiger's adaptation of *Univers* to the Greek alphabet. The O of *Univers Greek* **/44/**, drawn by Adrian Frutiger around 1967 for Monotype[34] is oval, whereas in lapidary script it is a circle.

In 1968 Asher Oron[35] designed *Oron* **/45/**, a Hebrew typeface based on *Univers*. He adapted his typeface to match the *Univers* widths. The traditionally strong horizontal strokes of Hebrew were made thinner than the vertical strokes, following the Latin rhythm.[36] Yet the Hebrew alphabet has little in common with its Latin counterpart. It runs along two lines only, with some exceptions. Having *Oron* adjusted to *Univers'* x-height makes it appear a little small next to it. The square basic shapes of its characters are hard to reconcile with the proportions of *Univers*. It seems appropriate that this typeface is not called 'Univers Hebrew' since their differences are so great.

rounding off the outer shapes with scissors and drawing strokes with a felt-tip pen on the insides. This *Univers* enlargement was, despite help from software programs, a mammoth task. After two years of intensive work with Reinhard Haus, the monumental project was complete. The new *Linotype Univers* is, on the whole, better than most other versions, but to be frank I find it a little exaggerated to develop such a huge family.

A stolen version was released by Bitstream. They gave *Univers* a different name: *Swiss 722*[37]. Today it's called *Zurich.* All the different adaptations for various systems are a real muddle. What should young designers do when confronted by them? I just hope they have an educated eye, so they can see and feel the differences intuitively, and not with their heads.

/42/
Cyrillic Univers *for photosetting called* Mir *from 1967 by Ladislas Mandel for the International Photon Corporation.*

АБВГДЕЖЗИКЛМНОПРСТУФХЦ
ЧШЩЪЫЬЭЮЯVЙ
абвгдежзийклмнопрстуфхц
чшщъыьэюя

/44/
Univers Greek *upright and oblique, drawn by Adrian Frutiger for English Monotype in 1967.*

ΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩς
αβγδεζηθικλμνξοπρστυφχψωςϐϑϑ
ᾐὐύῦῦῦῦῦῦῦῦῦ

ΑΒΓΔΕΖΗΘΙΚΛΜΝΞΟΠΡΣΤΥΦΧΨΩς
αβγδεζηθικλμνξοπρστυφχψωςϐϑϑ
ᾐὐύῦῦῦῦῦῦῦῦῦ

/43/
Linotype digital font Univers Cyrillic *by Adrian Frutiger and Alexei Chekoulaev in four weights with corresponding Oblique.*

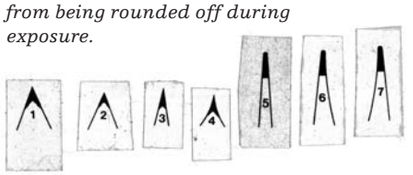
АБВГДЕЖЗИЙКЛМНОПРСТУФХЦ
ЧШЩЪЫЬЭЮЯ
абвгдежзийклмнопрстуфхцчшщъыьэюя
Алфавет Алфавет **Алфавет Алфавет**
*Алфавет Алфавет **Алфавет Алфавет***

/45/
The Israeli graphic designer Asher Oron designed the Hebrew sans serif typeface family Oron, *which matches Univers, in 1968.*

אות עברית זאת, הראשונה שעוצבה בארבעה משקלות, הותאמה במיוחד לשימוש עם סדרת יוניברס הלטינית. זאת הפעם הראשונה שאות עברית הותאמה לאותיות הקטנות באלף בית לטיני כך שיתאימו במיוחד, זו בצד זו, לטקסטים דו לשוניים ארוכים, בהם השימוש באותיות הגדולות (caps) בלבד יפגע מאוד בקריאות.

This type face, the first in Hebrew to be available in four weights, is also the first designed specially to align with the lower case of a Latin type face, for use together in bilingual printing of extended texts.

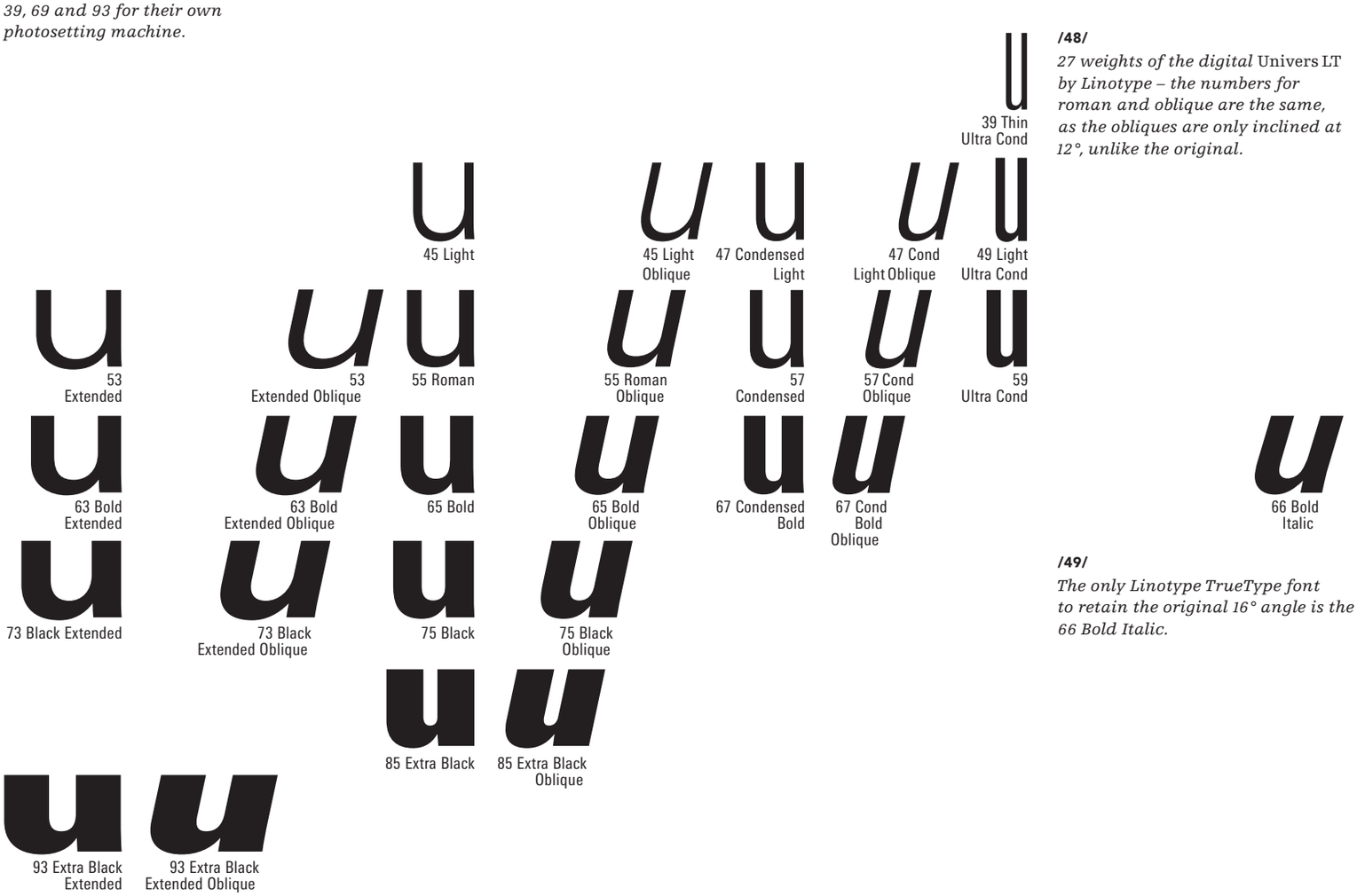
/46/
Stuck-on 'daggers' from Haas'sche Schriftgiesserei, used to prevent corners of their photosetting fonts from being rounded off during exposure.



Univers extensions Further weights were added to the initial 21, *Univers* 69 for Photon in 1965, and later on *Univers* 93 by Haas for photosetting **/47/**. It was a very different story over at Linotype, even though Adrian Frutiger worked almost exclusively for Linotype from the end of the '60s. In 1984, fifteen years after the first *Univers* weights were released by Linotype, there were still only 19 weights in their type specimen, including *Univers* 65 reversed. Compugraphic also had two reversed weights, Berthold had three outline weights. In 1987 the extra-black *Univers* 85 was re-released, *Univers* 93 followed five years later, but *Univers* 83 is still missing. Only in 1990 was the *Univers* family extended by Adobe/Linotype for PostScript technology with four new wide italics **/48/**. Altogether there have been 35 weights produced by various manufacturers,[38] not including *Univers* 55 phonetic **/53/**, which is no longer available.
Adobe went back to the Linotype version when digitising the typefaces for PostScript. Unfortunately this tends to be the case with manufacturers, because users want the same fonts they were used to from the previous version, but at the same time they need them adapted quickly for the new technology. Repeated adaptations make typefaces differ from the originals, as is the case with *Univers.* The oblique weights changed the most. Linotype made two versions[39] prior to PostScript, one with a 12° tilt (which was used for the PostScript version since it was the only one that included narrow obliques) and

Univers 39 **Univers 69** **Univers 93**
hamburg **hamburg** **hamburg**
HAMBURG **HAMBURG** **HAMBURG**
1245-6780 **1234-5780** **1245-6758**

/47/
Univers *69 was made in 1965 for Photon – much later, Haas'sche Schriftgiesserei produced weights 39, 69 and 93 for their own photosetting machine.*



/48/
27 weights of the digital Univers LT *by Linotype – the numbers for roman and oblique are the same, as the obliques are only inclined at 12°, unlike the original.*

/49/
The only Linotype TrueType font to retain the original 16° angle is the 66 Bold Italic.

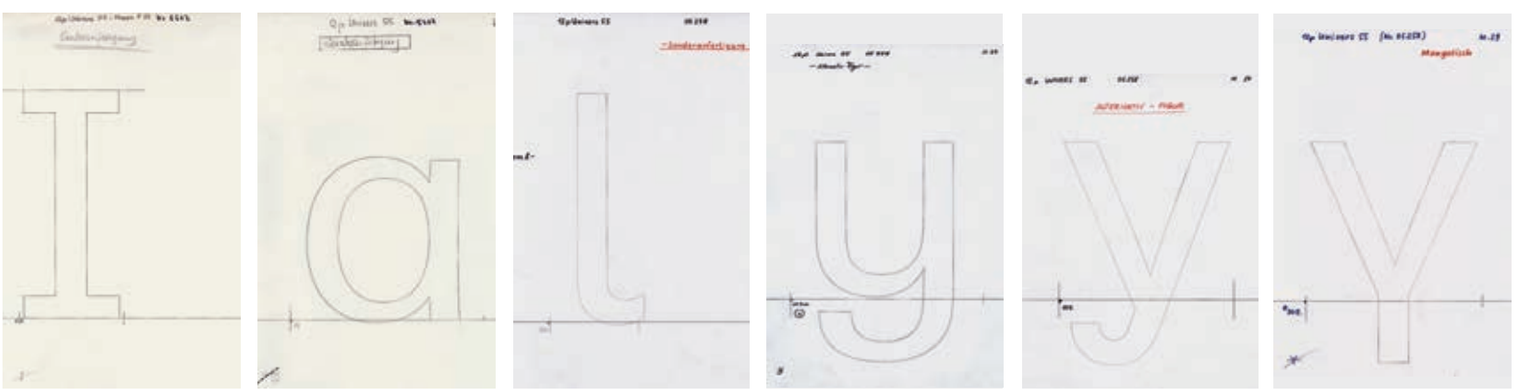
a second one with the original 16°. The naming of the 12° oblique weights is good, even though they are actually given incorrect odd numbers, and so is the added oblique **/48/**.

The first PostScript version of *Univers* by Adobe from 1987 is full of mistakes.[40] Hans-Jürg Hunziker intervened at Adobe, and in 1994 a slight reworking was finally undertaken. The result was more or less the same as the current *Univers* by Adobe/Linotype **/48/**.

In 1993 Linotype agreed to Adrian Frutiger's proposal to undertake a TrueType GX character extension for *Univers*, similar to *Helvetica GX* with 596 characters instead of the usual 256 for PostScript.[41] The extension is done in part by using existing characters for photosetting such as the special I and a for use in schoolbooks **/51/**, small caps **/52/** and the different varieties of ampersand, and also by using new characters. Extended characters include old-style figures (like small caps still in demand), more f ligatures[42], the most frequently used accents in European languages, as well as swashes and mathematical symbols. Whether Adrian Frutiger had *Univers Flair* **/50/** in mind[43] for the swashes is unclear from the letter. The typeface *Geschriebene Initialen zur Grotesk* (Written Initials for Grotesque) (see page 400) is enclosed as an alternative, combined with *Kabel* by Rudolf Koch.

/50/
Univers Flair *by American Phil Martin (Alphabet Innovations) for the VGC Photo-Typositor photosetting machine, 1970s.*

/51/
Linotype final artwork for the 12 pt design size of schoolbook and phonetic characters in Univers *55.*



Italy Italy Italy Italy

/52/
Small caps for Univers *55 are available from Monotype and Linotype; the latter also has alternative shapes for 4, 6 and 9.*

/53/
Linotype final artwork of letters from the international phonetic alphabet corresponding to Univers *55.*

Nn NR 469

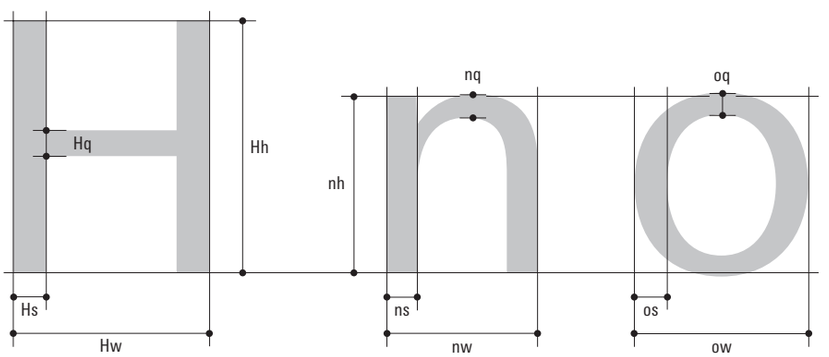
Typeface comparison The fact that *Univers*, *Helvetica* and *Folio* (all shown below) were released practically at the same time demonstrates that there was a real need for a modern sans serif face.[48] *Univers*, unlike *Helvetica* and *Folio*, was conceived of and developed as a large family right from the beginning.[49]

All three typefaces have similar characters to traditional 19th-century sans serif faces. The closed shape of the curves, which is unlike other existing sans serifs, is a typical feature, as are the consistently balanced character widths and ascenders reduced to the cap height throughout the typeface. The x-height of *Univers* is halfway between that of *Helvetica* and *Folio*, although all three have rather tall x-heights **/70/**. *Helvetica* regular is slightly heavier than *Univers*, whereas *Folio* is lighter. The fact that there is no *Folio* roman weight has to be taken into account. In the example shown *Folio* light is used.

That *Univers* has something lively about it in spite of its static appearance is due to its stroke width contrast, which is highly pronounced. On the whole, *Univers* is the most balanced typeface of the three, due not only to its optimal black and white relationship, but also to its clear shapes free of excess elements, most clearly visible in G K a and y.

/68/
Measurements of stroke widths and proportions of the Linotype Univers *430 Basic Regular weight.*

Regular	Hh = 10.00 cm	nh = 6.99 cm	oh = 7.31 cm	Hh : Hw = 1 : 0.77	nh : nw = 1 : 0.85
	Hw = 7.77	nw = 5.96	ow = 6.90	Hw : Hs = 1 : 0.16	nw : ns = 1 : 0.20
	Hs = 1.30	ns = 1.21	os = 1.31	Hs : Hq = 1 : 0.78	nh : oh = 1 : 1.06
	Hq = 1.02	nq = 0.93	oq = 0.89		nw : ow = 1 : 1.16



/69/
The black and white relation of Univers *is optimally balanced when compared with the other two typefaces.*

Hofstainberg

Linotype Univers
Adrian Frutiger
1957

G Angular connection to the stem, stem without spur

K Legs come to an angle

Q Horizontal tail with slightly concave shape

a Straight connection into stem

t Oblique start, end of loop is vertical

y Horizontal terminal

ß Ligatureform long s and round s

1 2 Upstroke on 1 slightly hollow; arc on 2 with straight finish

Hofstainberg

Folio
Konrad F. Bauer / Walter Baum
1957

G K Q a t y ß 1 2

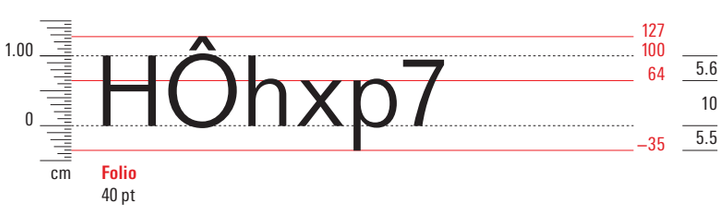
Hofstainberg

Neue Helvetica
Max Miedinger
1957

G K Q a t y ß 1 2

/70/
Height comparison showing the differences of x-heights to ascenders and descenders – the cap height is the starting point.

Linotype Univers
39.5 pt



Folio
40 pt

Neue Helvetica
40 pt

Name of typeface	Client	Designer	Design | Publication	Typesetting technology	Manufacturer	Weights
OCR-B	European Computer Manufacturers Association	Adrian Frutiger	Since 1963 | since 1965	Letterpress, Computer Composition, Typewriter Composition PostScript digital typesetting	– Several computer and typewriter manufacturers – Adobe | Linotype Bitstream Elsner+Flake	1

OCR-B

In 1961 thirteen computer and typewriter manufacturers founded the 'European Computer Manufacturers Association' – ECMA – based in Geneva.[1] The main objective for its founding members was the creation of an international standard for optical character recognition to be used, for instance, in payment transactions. But most of all they wanted to avoid the wider adoption of *OCR-A* **/02/** – we used to call it 'robot type' – in Europe. It was one of the first machine-readable typefaces that came from the United States. For the European OCR manufacturers it was a given that the shape of its capitals would never be accepted over here, and they were intent on coming up with a European answer, *OCR-B,* that would be aesthetic and pleasant to the human eye. In 1963 I was approached by Robert Ranc, director of the École Estienne, and Gilbert Weill[2], an engineer from the R&D department at Compagnie des Machines Bull, asking me to develop *OCR-B.* In a first meeting they explained their goals: they wanted to suggest an international standard using a non-stylised form of the alphabet. The problem with this task was that all companies that were members of ECMA had developed their own readers and each of those worked in a different way; some read the counter, others the contours and yet others the centreline.

Over a space of five years we would meet up every three months at one of the companies' offices. First they had to agree on a common grid. Then, at one of the following meetings, they gave me a template and said the typeface would be read according to these points. The cells were only a few millimetres big and the system was considerably finer than the matrix of *OCR-A* with its 5 by 9 cells **/03/**. I would always draw curves in my designs. The engineers said that adjusting them to the grid wasn't the task of the designer, it was the task of the computer. In my studio we created hundreds of drawings, all filled in with black. The grid was only superimposed later for copying purposes, so that the manufacturers could read the character's mass precisely. If a cell was more than half full it counted as a plus, if it was less than half full it counted as a minus. Initially only horizontal steps were possible but later the cells could also be divided diagonally. The resulting computations were done by the computer firms. They looked after legibility and the typewriter manufacturers looked after the execution of the typeface. The characters had a consistent line weight and the most important thing was to determine the form-giving 'centreline'. It was needed for the milling of the typewriter face **/01/**.

Since I insisted, it was agreed to develop a differentiated 'letterpress font' for book printing in addition to the font with the consistent weight. Up until this point only numerals and capitals had been important but now we also had to deal with lower case characters. As far as the letterpress shapes were concerned, it was important that I built them up from the centreline. The shape of the type around it, the difference between fine and bold, didn't matter in technological terms. The discussion revolved around the question

Worldwide standardisation Since the beginning of the 20th century many countries have devised national standards – for electrical sockets or paper sizes, for example. Due to growing globalisation an increasing need emerged to make these national standards compatible with each other. This resulted in the foundation of the International Organisation for Standardisation – ISO in 1947.[3]

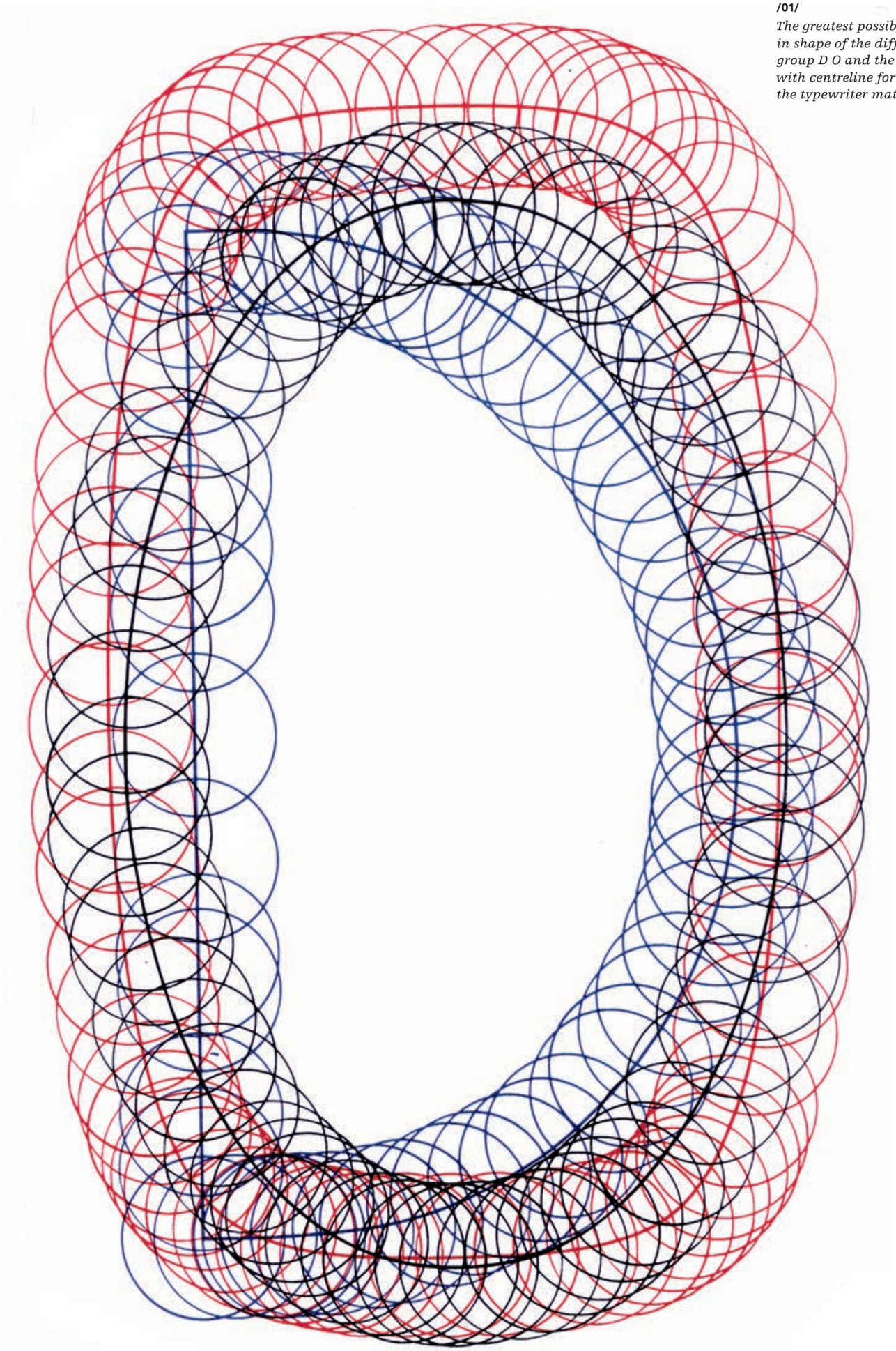
It is this organisation to which ECMA[4] submits its applications for the certification of worldwide standards. The increasing use of computers, which were being produced by a growing number of manufacturers to their own standards, created the need to standardise basic operating technologies for software applications. With the main objective of coordinating the different computer standards, three companies – Compagnie des Machines Bull, IBM World Trade Europe Corporation and International Computers and Tabulators Limited – initiated a meeting of all major European computer manufacturers that led to the foundation of ECMA in 1961, a private standards organisation for the standardisation of information and communication systems.

One of ECMA's projects dealt with automatic character recognition. Adrian Frutiger developed two versions of *OCR-B*: the first one featured constant stroke weight and round terminations. In the second, called *'Letterpress'*, the stroke weight was adapted according to optical criteria and the terminations were angular. Initially *OCR-B* was monospaced. Additionally the width of the glyphs varied, i.e. it was a proportional typeface.

Besides the drawing and manufacture of the typeface, the technology for reading and processing information was important. The computer manufacturers agreed on the 'system curve of merit' as a common basis for the differentiation of individual characters.

OCR-B, which was initially developed for typewriter setting, was swiftly adapted to other typesetting systems (for example Monotype in 1971)[5] and is still used in contemporary computerised technologies. Frutiger was one of the first designers worldwide who – with regards to machine-readable typefaces – dealt with questions of aesthetics in combination with technology. This led to his giving numerous talks on the subject, the first of which took place in 1967 in Paris at the ATypI conference.

After a first recommendation by the ISO committee in 1966, *OCR-B* was declared a worldwide standard in 1973.



/01/
The greatest possible difference in shape of the difficult character group D O and the numeral 0 – with centreline for the milling of the typewriter matrices.

of what machine-readers would be able to read in the future: only typewriter faces or also typefaces for book work or even handwriting? The people responsible at the time understood that there were two different worlds: the simpler shapes of letters typed on a typewriter – that was the reality we were dealing with – and the more complicated typographic shapes in bookprinting. Back in the 1960s, being able to machine-read books was still a dream. But we all agreed that this would be ideal. There was a fountain of ideas, we were even talking about automatic translation. But even the most far-sighted engineers wouldn't have been able to predict desktop publishing.

In the meetings I would always hand out photocopies of the drawings produced in my studio to each participant. Each of them would then go off and do their own maths in their respective companies and come up with a different result. Initially it was just some impenetrable gobbledygook for me when the engineers were discussing all their paper computer print-outs full of numbers, but after a while I began to understand what they were talking about. I never interfered with the finer details of the engineers' work. If they came to the conclusion that part of a shape was too wide, too narrow, too high or too low, we would note the changes with a pencil on the drawings right there and then in the meeting. The translation into coordinates **/20/** was carried out by the participating firms.

For the readers the distance between the characters was very important **/16/**, each character had to be clearly separated from the next one. The shapes had to be clearly distinguishable too **/11/**. To check this there was the so-called 'system curve of merit': each character was compared with every other in the computer by superimposing them two-by-two **/10/** based on the centreline **/08/**.

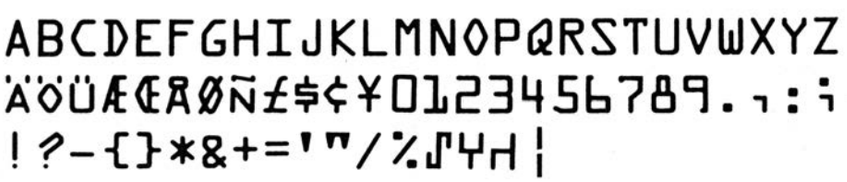
Machine-readable typefaces Initially the shapes of OCR typefaces (optical character recognition) were solely determined by the reading technology of computers. They had to be simplified or stylised. The only criterion was that of correct recognition.

The numerals face *E13B (MICR)* of the American Bankers Association **/04/** was part of the 'first generation' of stylised, machine-readable typefaces. It was based on a matrix of 7 by 10 cells. Another typeface for magnetic readers was *CMC-7* (Caractères Magnétiques Codés) **/04/**, developed in 1961 by the French Compagnie des Machines Bull. Its numerals and capitals were each constructed using seven strokes of constant weight whereas the counters varied.

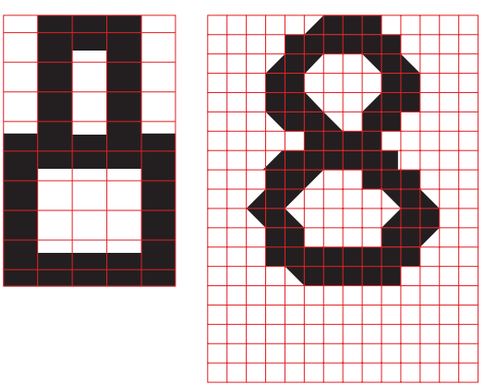
In 1961 a committee of the USA Standards Institute (USASI) agreed on the creation of *OCR-A* **/02/** as a national standard for machine-readers. This typeface with its still extremely stylised shape based on a matrix of 5 by 9 cells **/03/** belonged to the 'second generation'. *OCR-A* was preceded by fonts from different manufacturers, including Farrington, NCR (National Cash Register) and IBM **/05/**. Initially it only contained numerals, capitals and a few special characters but was later extended to include lowercase letters as well. Together with *OCR-B* it was recommended by ISO in 1966.

Like Adrian Frutiger's typeface, *Farrington 12L/12F* **/07/** belonged to the 'third generation' featuring a look that was more pleasing to the human eye.

/02/
The standard character set of OCR-A *developed in the USA from 1961 onwards and given USASI standard status in 1966.*

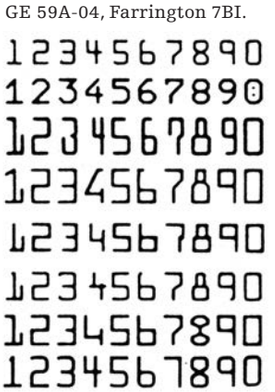


/03/
The computer-readable shape of the numeral 8 is based on a matrix of 5 by 9 cells in OCR-A, *and 14 by 19 cells in* OCR-B.



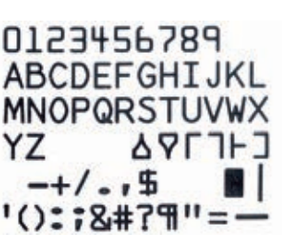
/04/
Stylised characters for the printing of banking forms with magnetic ink – E13B *(top) USA and Canada;* CMC-7 *(bottom) Europe.*

/05/
Progenitors of the numerals in OCR-A: Farrington 12F1, RCA, NCR C6000, IBM X9A-120, Remington Rand NS-69-8, Burroughs B2A, GE 59A-04, Farrington 7BI.



/06/
Machine-readable numerals and capitals, based on a grid of 7 by 9 cells – manufacturer unknown.

/07/
Farrington 12L/12F Selfchek – *machine-readable character set by the credit card company Farrington Manufacturing Company.*

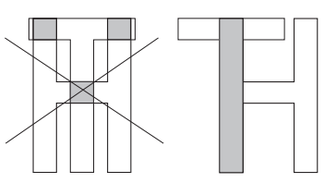


Character recognition The formal principle of *OCR-B* was based on the premise that each character must differ from another by at least 7 per cent in the worst possible case. To check this, two characters were superimposed in such a way that they covered each other optimally **/08/**. Additionally, this test was carried out using two different printing weights: a fine weight caused by weak pressure on the keys of the typewriter keyboard or through a lack of ink on the typewriter ribbon, as well as a fat, squashed weight caused by strong pressure on the keys or by bleeding ink. Even if the fine and fat weights were superimposed – the original weight could be fattened by a factor of up to 1.5 – the difference of 7 per cent still had to be guaranteed **/12/**. A test print demonstrates the principle **/10/**. It shows a vastly fattened N and a thin M, which the computer had to clearly identify as such based on the difference (shown in red).
Generous character spacing was needed to guarantee correct processing **/31/**; serifs, on the other hand, were rather detrimental to performance since they increased the coverage ratio of the characters **/09/**. Furthermore, the paper should not be reflective and the type should not bear any stains.
There followed a period of rapid technological progress: by 1970 standard typewriter faces were machine-readable, as are books, newsprint and handwriting today.

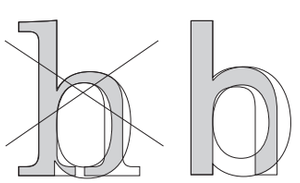
While the width of each single character was the same for all manufacturers, the height would partly differ **/18/**. Following the demands of the bigger companies, we would eventually have three heights **/19/**, since it was cheaper to adapt the typeface than to change the production of the machines. It made no difference to us, we just had to do the work three times over. For one year we were practically fully occupied with the development of these matrices. André Gürtler was part of the team at the time and in 1964 Nicole Delamarre joined us as well. Of utmost importance was the difference between capitals and numerals. For a long time we experimented with identical heights but there would always be pairs that didn't work. The B-8 combination caused us some major headache: specifically, the machines that read the counter would never recognise the difference correctly. Eventually I came up with the idea to keep the numerals higher than the capitals – that was the solution **/23/**. Since the numerals were of correct proportions right from the start and thus formed the basis for the standard, all the capitals of the typeface were eventually scaled down.

For the typewriters all characters had to be of even width, these were monospaced faces. Therefore we had to draw a narrow m **/25/**. I staunchly refused to introduce any serifs if it wasn't absolutely necessary. But with i j and I we had no choice, because of the danger of them being confused **/15/**; the l got a curve at the bottom. That the D eventually turned out to be a bad shape might have been due to technical issues. In the first version it is very beautiful **/24/**, in the final one it seems to be narrower **/26/**. The C too turned out far too narrow in the end. With the K, the arm and tail don't come to an acute point on the stem. I've never done that anywhere else but there was no other option technically. If there had been a gap in the centreline, the reader would possibly have read the K as a stroke and a chevron.

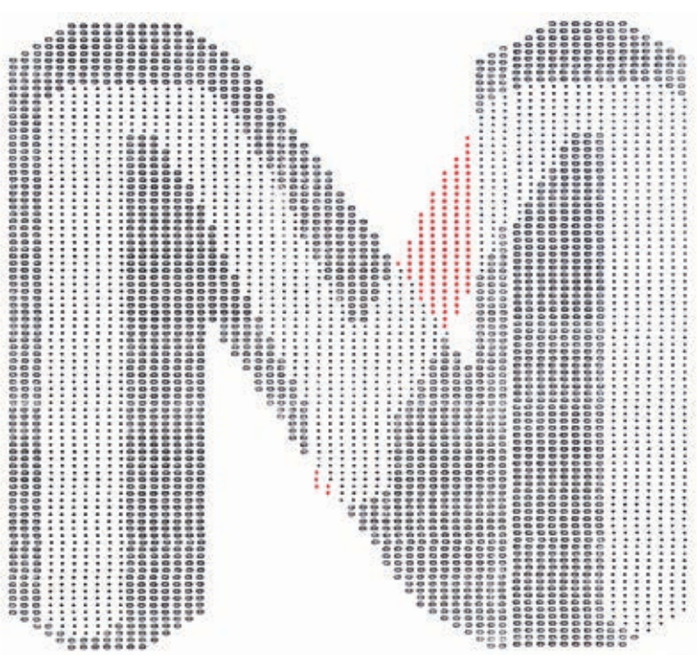
/08/
All characters, here H and T, are compared according to their greatest overlapping area.



/09/
Serifs increase the similarity between characters and are therefore less suitable for machine-readers.



/10/
The computer printout shows the difference (in red) – it has to be at least 7% in order to clearly differentiate the fine M from the N.



/11/
In the design, it is important to strive for the greatest possible differentiation whilst avoiding a stylised look.

/12/
The differentiation, and thus correct recognition, must still be guaranteed in the worst possible case where a character is fattened by a factor of 1.5.

/13/
B8& are difficult to differentiate for a machine-reader – very similar in Univers *(top) compared to* OCR-B *(bottom).*

B8&
B8&

/14/
With Univers *(top), the majuscules are wider and higher than the numerals; the opposite is true for* OCR-B *(bottom).*

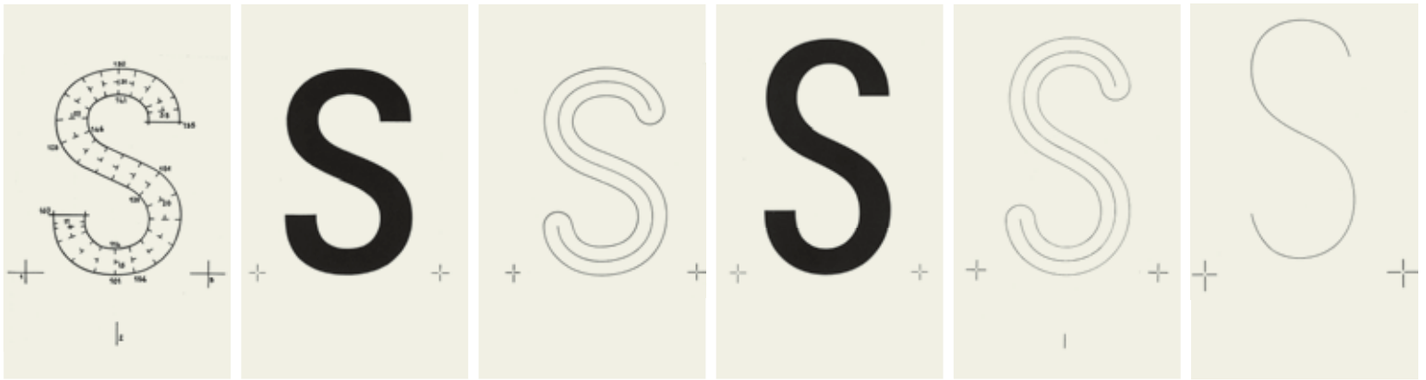
CDOQ0
C D O Q 0

/15/
Characters that are very similar in shape get a serif, horizontal bar or curved stroke in OCR-B *(bottom).*

1lijl!)
1Iijl!)

/16/
In contrast to the letters and to Univers *(top), the numerals of* OCR-B *(bottom) feature dynamic curves.*

2359
2359

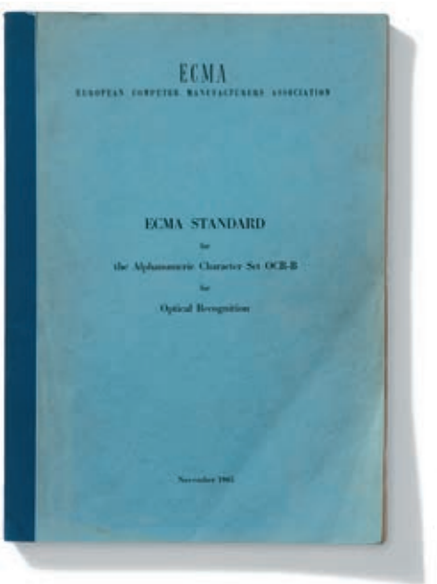


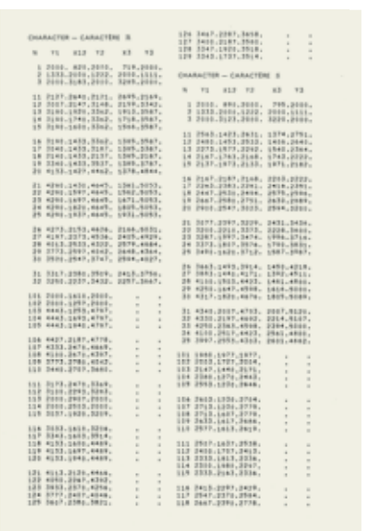
/17/
OCR-B *1965 – Size I: Reference point drawing, Letterpress version with stroke contrast and outlined skeleton letter shape with centreline.*

/18/
OCR-B *1965 – Size II: Letterpress (angular) and linear version (round) with taller proportions – neither was developed further.*

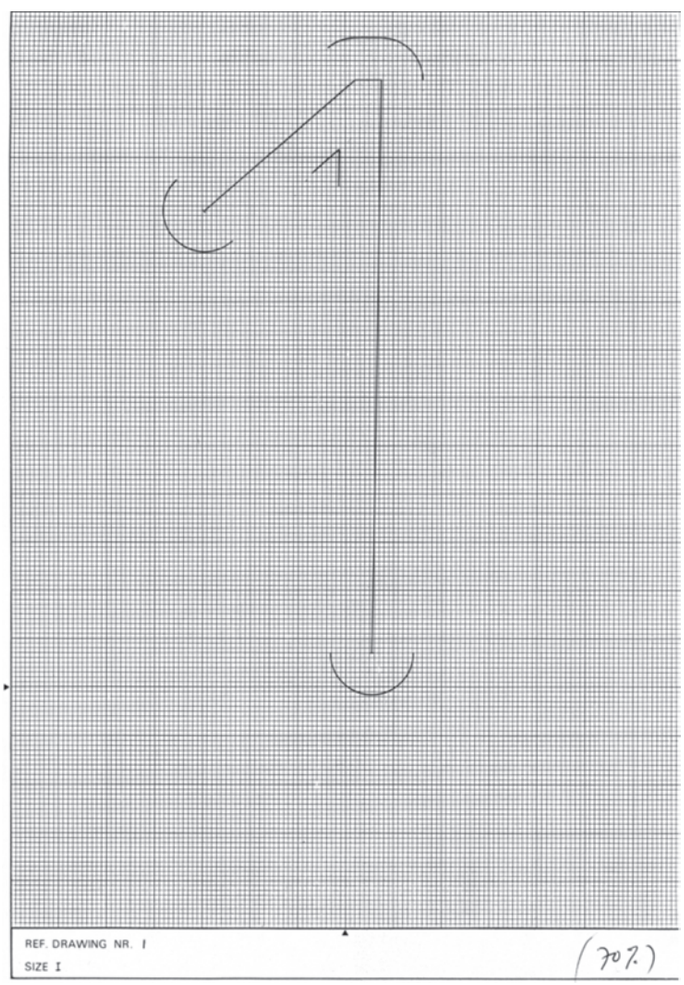
/19/
OCR-B *1965 – Size III: Centreline of the capital S in the linear version with even greater vertical scaling.*

/20/
Cover and interior page of the ECMA manual from 1965 – the table lists the coordinates of the reference points for R and S in µm.

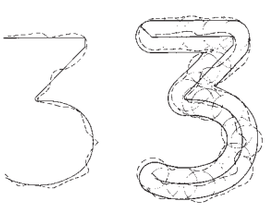




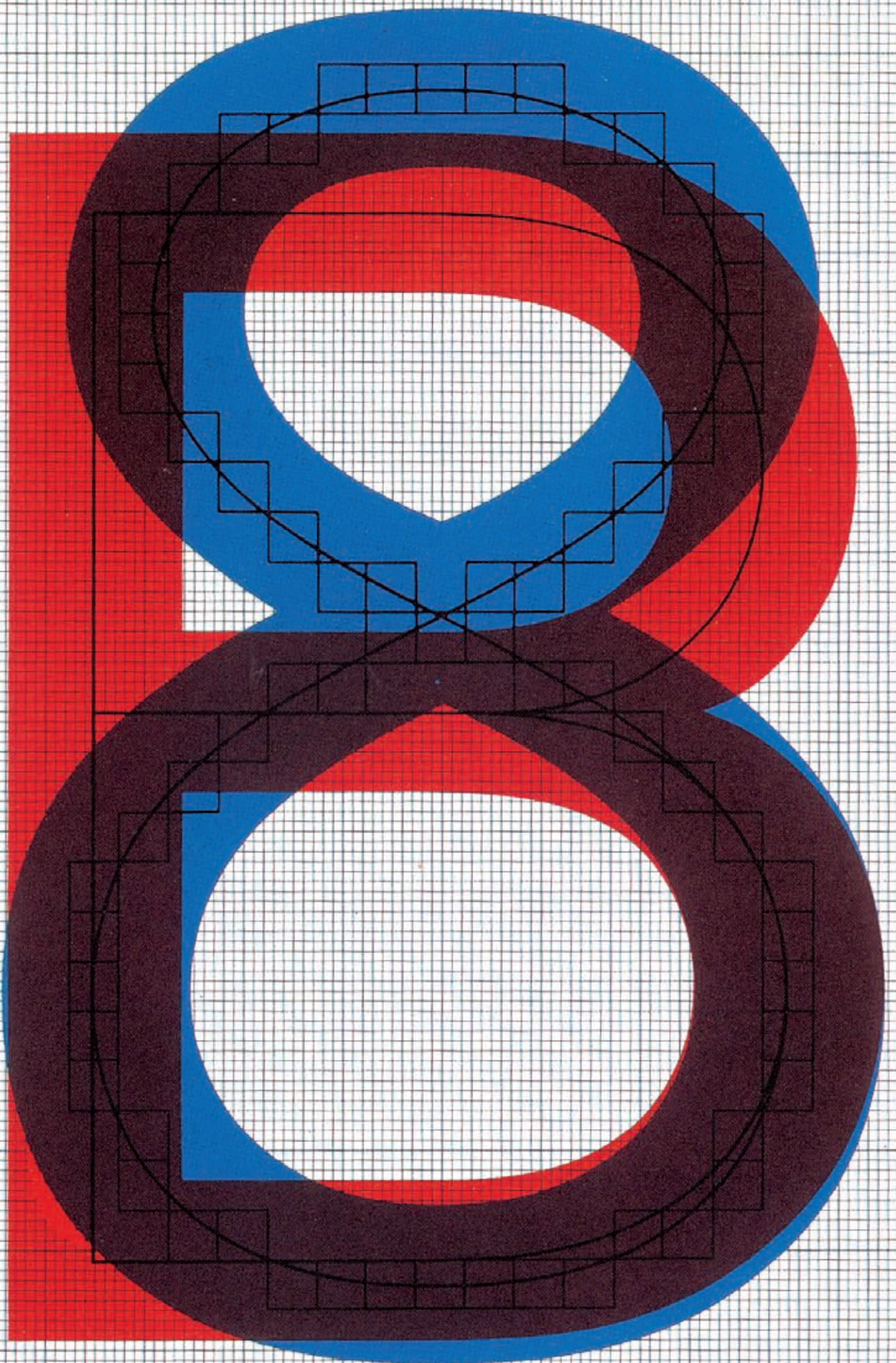
/21/
The numeral 1 leans slightly to the right – construction drawing of the 'Constant stroke width font' according to ECMA-11.

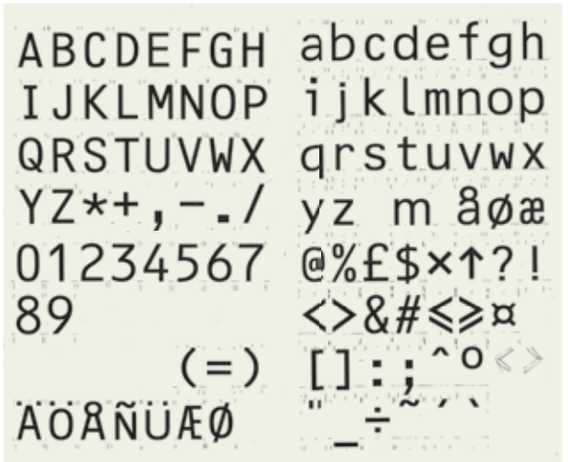


/22/
Correct character recognition of the skeleton line and contour in spite of interference caused by squashing or staining.



/23/
Comparison method – point resolution for data capture in black; final artwork and difference between B and 8 in colour.





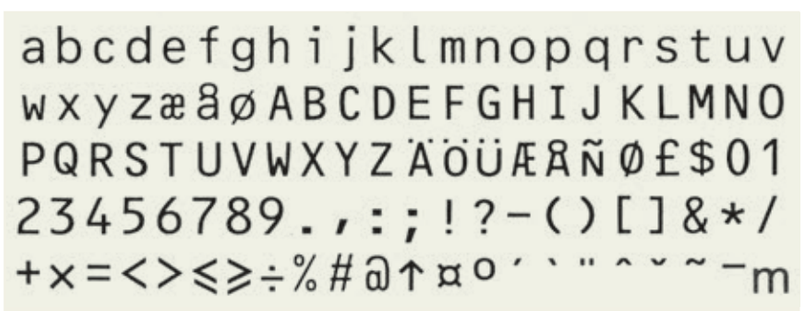
/24/
First test version of OCR-B *from 1963 with dynamic curved strokes for b g q, alternative m and similar shapes for capital O and the numeral 0.*

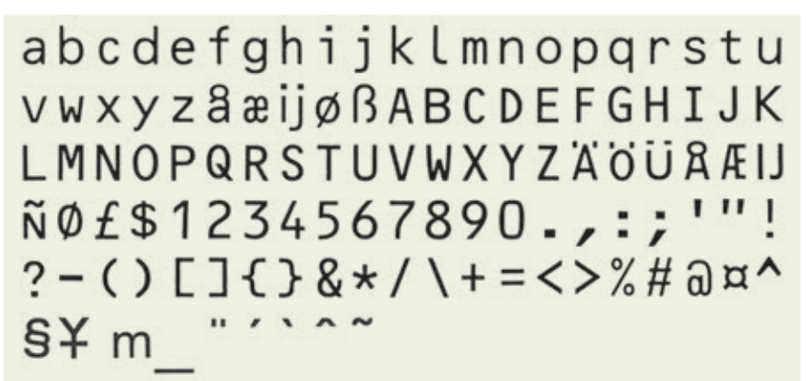
Designing OCR-B The first test version of *OCR-B* dates from 1963[6] and contained 109 characters **/24/**. The bowl shapes of the majuscules were static, while there are two types of bowl shapes in the minuscules: a round, static bowl, for instance in c d p, and a flat, dynamic one in b g q. All numerals had dynamic shapes but the curves varied: flat curves in 2 3, leaning towards the diagonal in 5 and clearly diagonal in 6 9. Initially Frutiger designed the majuscules so they were of the same height as the numerals, but for the first test version the former were scaled down to differentiate them more clearly.

The version published as Standard ECMA-11 in 1965 contained 112 characters including three additional letters with diacritics **/25/**. Some characters had undergone considerable correction. This is obvious with the W, whose outer diagonals became curved; with the numeral 0, which received a more oval shape to differentiate itself better from the capital O; with j, which now had a normally placed dot; as well as with the aforementioned b g q, which now featured static bowl shapes. The same was true for the $ sign. The @ had obviously changed, whereas the slight incline in the numeral 1 was hardly visible. Altogether the typeface now had a more consistent shape compared to the test version.

A further extension and correction phase took place from 1969 onwards **/26/**. Five more characters were added: the section mark §, the two Dutch ligatures IJ ij, the German esszett ß and the Japanese currency symbol ¥.

/25/
First published version of OCR-B *from 1965 with curved diagonals for W, greater difference between O and zero and different crossing for 8.*





/26/
OCR-B *from 1971 with horizontal bar for j, curved descender for y, very wide B, and altered shapes for capital O, lower case o and zero.*

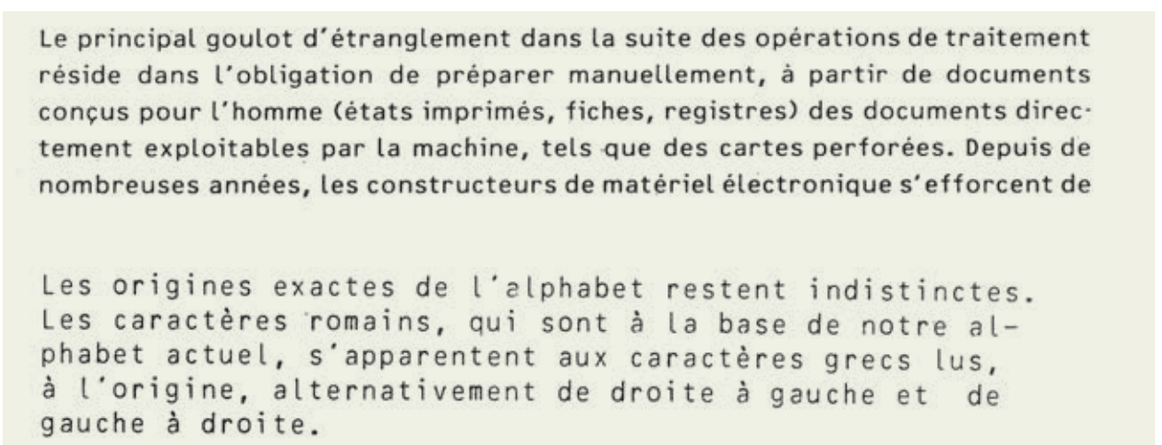
/27/
Extension of the alphabet from 1994 with additional accents and diacritics for several European languages.

The British pound sign £ was changed considerably. There were still problems in differentiating D O 0 and B 8 &. With the D, the curved stroke now started directly at the stem, the O was more oval; the zero, on the other hand, had become more angular. The Q was adapted in shape to the O and the tail of the Q was altered. The B now featured a markedly wider shape that resolved the conflict with the 8, whereas the ampersand & got a smaller lower bowl at the expense of the upper one. The j was changed yet again and, similar to the i, it now had a horizontal bar while the y received a curved descender. Additionally, with the Ü, the trema was changed slightly and so were the comma and the semicolon. Eventually all corrections – those that are listed here and others – were not beneficial in terms of shape; instead Frutiger had acknowledged the overarching goal of character recognition.

Even with the international standard ISO 1073/II in 1976 the *OCR-B* project had not yet come to a close. Instead the number of characters was successively extended. From 121 characters in 1976 the font grew to 147 by 1994 **/27/**. The additional characters were mainly due to the inclusion of special characters for different languages. Some character shapes of Linotype's digitised version of *OCR-B* are not identical to the ECMA original – there is more similarity in Berthold's, but only in the typewriter version **/33/**.[7]

The different national special characters were added successively **/27/**. Every now and again the secretary general of ECMA, Dara Hekimi, asked us whether we wanted to draw the ligatures for a particular country. These characters were no longer controlled by the whole ECMA committee, they were defined as either legible or illegible by the respective country. They were also no longer subject to that complicated comparison process. Special national characters were only available in the respective countries. The ij ligature for instance can only be found in Dutch machines. The French ligature œ was added in the nineties **/27/**. The æ however had been integrated earlier **/24/**, this ligature was important for the Nordic languages. In French, on the other hand, it wasn't seen as a mistake when ae and oe were separated. Contrary to today, œuvre without ligature was totally acceptable.

I've always slightly regretted that eventually only the numerals remained so open in their shapes **/13/**. The rest appears to be fairly *Univers*-like, among other things because of the horizontal termination, although the first drafts of the *OCR-B* actually looked quite different **/24/**. One could have given the C endings, the bottom of the g and also the S a vertical instead of a horizontal termination. This would certainly have been possible in terms of technology and recognition. Although I already had experimented with open letter shapes, as for example in the designs for *'Delta'* and *'Gespannte Grotesk'*, I remained close to the *Univers*-style when designing *OCR-B*. The open shape was already there but I only became aware of its better legibility when I carried out the numerous legibility studies for the signage face *Roissy*. From that point onwards I felt the stroke endings of *Univers* were too closed. But when all's said and done, I'm pleased that at least the numerals of the *OCR-B* are useable because these are the characters that get used almost exclusively.


Le principal goulot d'étranglement dans la suite des opérations de traitement réside dans l'obligation de préparer manuellement, à partir de documents conçus pour l'homme (états imprimés, fiches, registres) des documents directement exploitables par la machine, tels que des cartes perforées. Depuis de nombreuses années, les constructeurs de matériel électronique s'efforcent de

Les origines exactes de l'alphabet restent indistinctes. Les caractères romains, qui sont à la base de notre alphabet actuel, s'apparentent aux caractères grecs lus, à l'origine, alternativement de droite à gauche et de gauche à droite.

/28/
OCR-B *as a proportional font in the Letterpress version (top) and as a monospaced font in the constant-stroke version for typewriters (bottom).*


INTERNATIONAL STANDARD ISO 1073/II

Alphanumeric character sets for optical recognition – Part II : Character set OCR-B – Shapes and dimensions of the printed image

/32/
In 1973 OCR-B *was declared an international standard by the International Standards Organisation (ISO) and was subsequently updated.*

/29/
The search for an unambiguous shape – the numeral zero (top) and the capital O (bottom) in comparison from 1963, 1965 and 1971.


000
000

/30/
The digital 'Letterpress' version by Linotype (left) and the digital 'constant-stroke' version by Berthold.


EK EK

/31/
A generous letter spacing is needed for machine-readable characters – the characters must not touch each other.


xylon

/33/
Slight incline of the 1 in the original (left) and in the digital version by Berthold (right), but not in Linotype's version (centre).

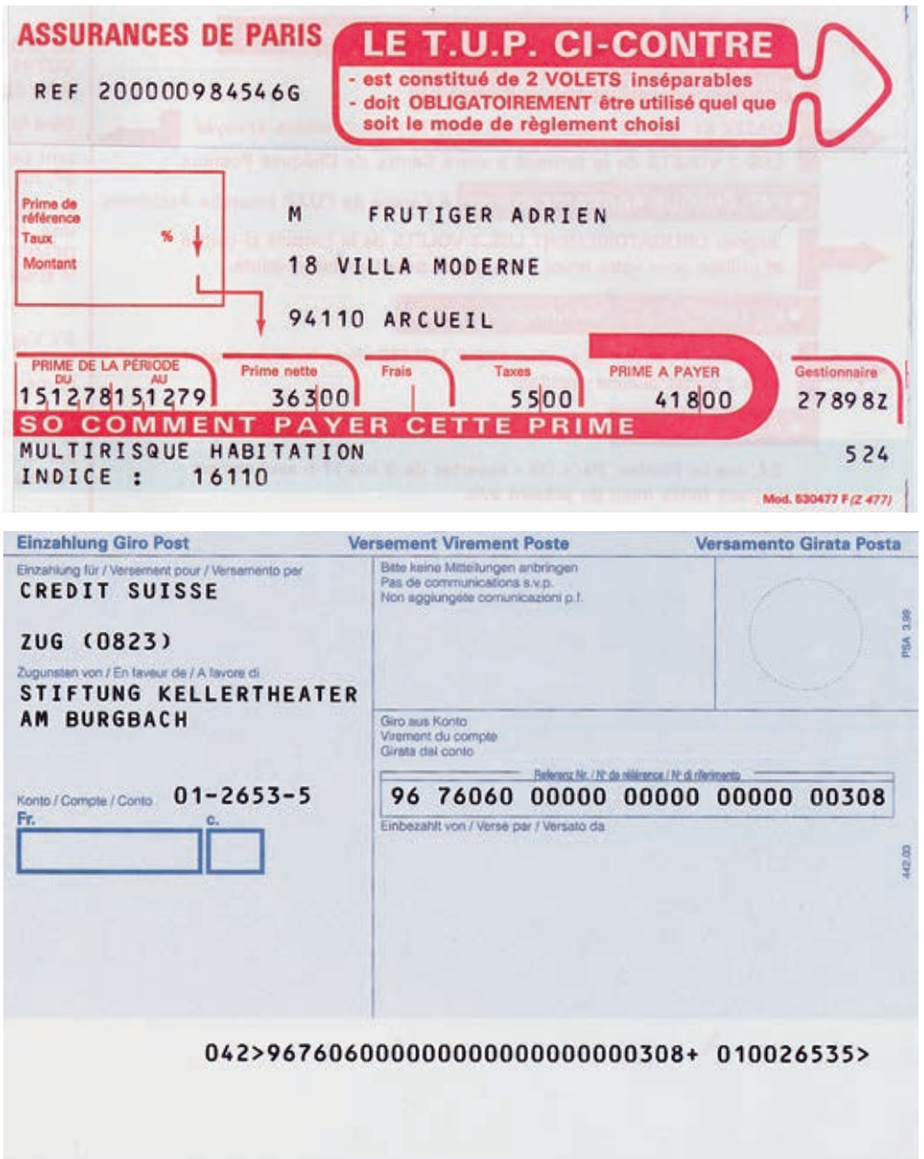

1 1 1

/34/
The numeral 6 appears to be wider in the diagonal in the digital version by Linotype (centre) – original (left), Berthold (right).


6 6 6

/35/
The digital version of the lower case c by Linotype (centre) is rounder than the original version from 1976 (left) and the Berthold version.


c c c



/36/
Use of OCR-B *in a French paying-in form from 1978 and a Swiss post office form from 1999.*

Applications Since the 1960s machine-readable typefaces have been used for data recognition and processing. They can be found on cheques, bank statements, postal forms and credit cards. They are, however, increasingly being replaced by typefaces for typewriters and newsprint or bookwork since those are now equally readable, and because data are no longer transferred via printed type, but stored on magnetic strips or chips.
Adrian Frutiger's *OCR-B* can be found on paying-in forms in some countries, for instance in France and Switzerland, **/36/** but in the latter case it has, for some years now, only been used in the encoding line. There are also three encoding lines printed on the back of Swiss ID cards **/39/**. Furthermore, the barcode numbers on the price tags of consumer goods are often set in *OCR-B* **/37/**.
A totally different application for Frutiger's typeface could be found – up until the 1980s – in text processing. For example the IBM golfball typewriter could read texts typed in *OCR-B* – so-called typoscripts – so they did not have to be phototypeset a second time at the printer's. But this application disappeared with the arrival of data exchange via floppy discs. *OCR-A* and *OCR-B* eventually found their fashionable expression in the graphic design of the 1990s where they were seen as techno, cool and trendy.

/37/
Barcode EAN-13 of a book with ISBN number and stock number set in OCR-B.

/38/
Adrian Frutiger giving a talk on OCR-B *in the Unesco building in Paris at the ATypI conference, 10 November 1967.*

/39/
Swiss Confederation ID card – with three encoding lines on the back in Adrian Frutiger's typeface OCR-B.

zu tauchen in diesen Schlund hinab.*PT.*PT.^-
Die haben wir heute nicht mehr, die Rittersmänner und Knappen. Dafür haben wir einen Haufen mindestens so mutige Bürodamen und Knäppinnen, wo¤¤sowie Büromänner und Büroknappen. Alle müssen sie edelster Abstammung sein, bei dem Mut, den sie tagtäglich beweisen, wenn sie mit dem Lift den Schlund hinauf-tauchen, direkt dem modernen Drachenungeheuer<¤ <Computer<< in den Rachen. Schaurig hallt es durch die geweihten Hallen, wenn er allmorgendlich sein Opfer sucht. Die modernen Unge-heuer fressen ihre Opfer nicht gerade auf, nein nein, aber sie verwandeln durch ihren papierenen, Zahlengespickten¤¤ zahlengespickten Output die Bpr¤¤Büromänner und Damen auf eigenartige Weise. Plötzlich wird ein sonst so munterer und freundlicher Knappe oder eine ebensolche Knäppin, den der Drache in seinen Bann gezogen hat, so merkwüri¤dig. Mit irrem Blick, unverständliches Zeug über die Lipöe¤¤Lippen flüsternd oder rufend (je nach Stadium), wandeln sie durch die Gänge. Meistens steuern sie, einem untrüglichen Instinkt folgend, direkt auf des Ungeheuers Filiale, das Büro des <EDV-Knappen<< zu. Mit papierenen Tatsachen, diese durch wort- j¤und gestein¤¤ gestenreiche Tiraden unterstützt, verlangen sie Abhilfe, auf dass der <EDV-Knappe<<, schwächlich und untern¤ernährt wie er ist, sofort mit stumpfem Schwert das Ungeheuer zur Räs-on bringe.^-
Meistens wird die Wut des Drachen durch die falsche Fütterung

/40/
Original typescript in OCR-B*; suitable for OCR data capture – mistakes like the one in line four are flagged with deletion symbols.*

Name of typeface	Designer	Design | Publication	Typesetting technology	Manufacturer	Weights
Breughel	Adrian Frutiger	1978 | 1982	Digital typesetting CRT	– D. Stempel AG | Linotype	6
			Digital typesetting PostScript	– Linotype	6

BREUGHEL

With *Breughel,* I actually managed to outsmart CRT technology. But running rings around the technology wasn't the main incentive, at least not consciously. First of all, I wanted to design beautiful, new typefaces. I always felt obliged, however, to bring something new to the type selection meetings at Linotype. There were two to three of these meetings per year and I never went there without some sketches or a glued sample character string. But neither D. Stempel AG nor Linotype explicitly commissioned the design of particularly technology-friendly typefaces. All these things developed in my thinking, in my head. Each day was different for me; each day brought a new idea. I was bubbling with ideas. There was an inner urge to do creative work. But I wasn't desperately trying to find something that was suited to the technology. That would have killed me. However, I could never totally ignore the technical aspects.

There were no systematic explorative studies for *Breughel.* During this period, however, many other sketches were developed. The calligraphic *'Breughel Script'* **/04/**, for instance, is a design in its own right. It shows a few similarities but there are also differences. If I had a good idea, I sketched it out for two to three days, polished it, filled the contours in with black and had the letters glued together to make a word image. The 'OHamburgefons' was only created once a proposal had been accepted in a meeting. After all, this represented a first business investment. All sketches and glued samples that I created at home were my own private explorations and didn't cost D. Stempel AG a penny.

Breughel's digitisation-friendly shape played an important role in the decision to implement it. The *Bodoni* shock with Lumitype during the mid-50s was followed by the *Méridien* shock at the beginning of the CRT age during the mid-70s. Back then, when I saw the results of digitisation with all those stepped edges I was horrified. That caricature of *Méridien* was totally unacceptable **/12/**. It was the beginning of a period that I once called the 'dark ages', the 'wandering in the wilderness'. Today I'd rather call it the 'experience of change'. I couldn't really accept IBM's philosophy that technology would be able to do everything one day, that it just needed a bit of patience. Should I have twiddled my thumbs and simply waited? It took almost 20 years to get from the disk-space hungry, cathode-ray-pixel technology to vector representation, which was considerably less data intensive, and then to the Bézier curves of the 80s.[1]

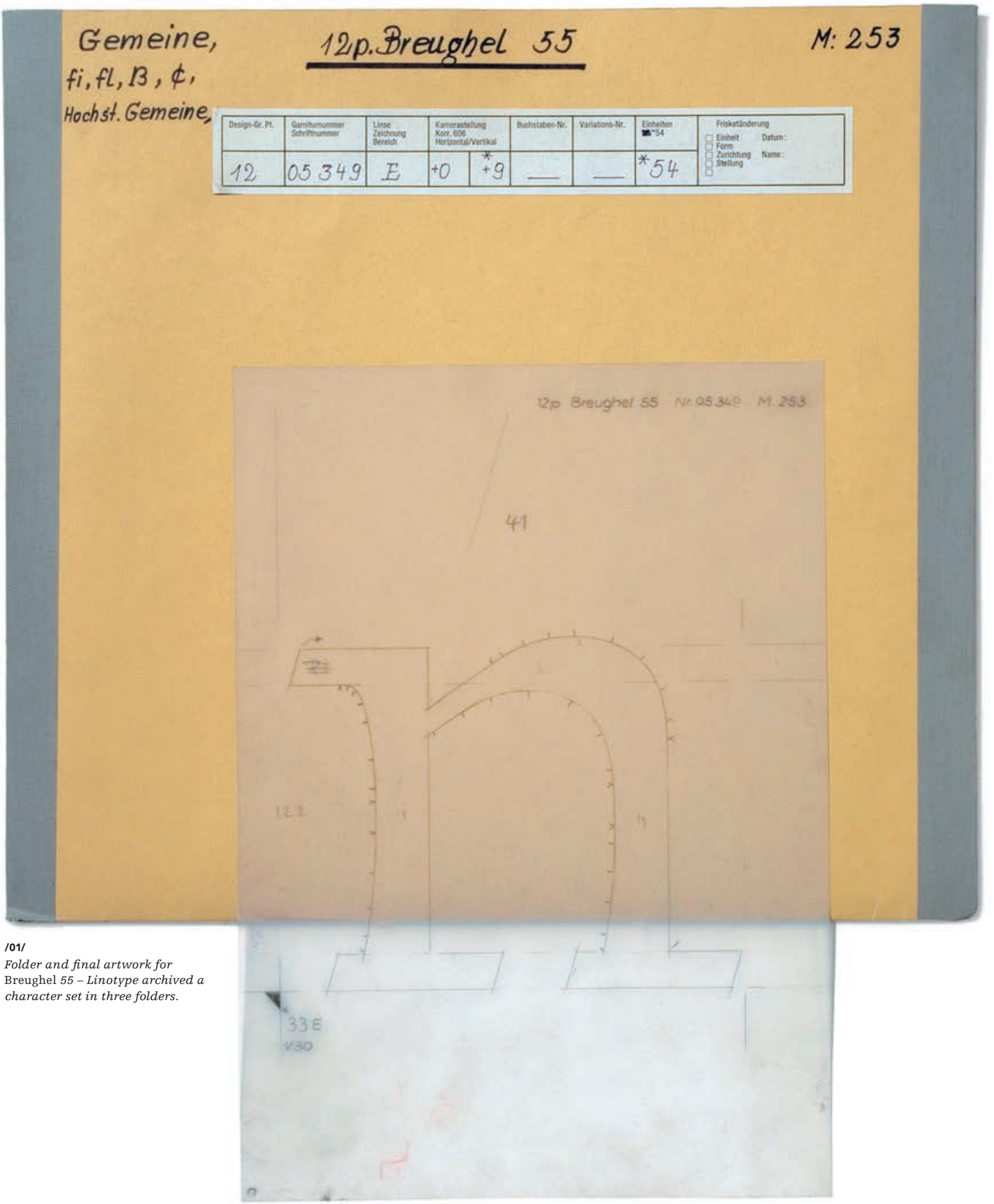
So I tried to circumvent the technological shortcomings by means of formgiving. The long curves of the slightly tapered downstrokes and concave serifs had to be avoided. Just as with *Méridien,* this would only have resulted in jagged pixels. Therefore, with *Breughel,* I kept the right contour of the downstroke vertical, while the left one was strongly concave **/01/**. Through the contrast between the straight line and the deep curve the typeface comes alive; additionally, this allows for it to be digitised without suffering any damage. The

Typographic designs for Breughel At the end of the 1970s and the beginning of the 1980s, Adrian Frutiger developed different but, in terms of shape, related typographic designs. The order in which they were created is not obvious since not all of the designs are dated. What they all have in common is a sturdy composition with strongly tapered strokes, which gives them a certain dynamic appearance. Emerging from these designs with differently shaped serifs came not only *Icone* (see page 276) but also *Breughel* **/01/**, which was conceived in three stroke weights **/02/** with a corresponding cursive published in 1982.[2]

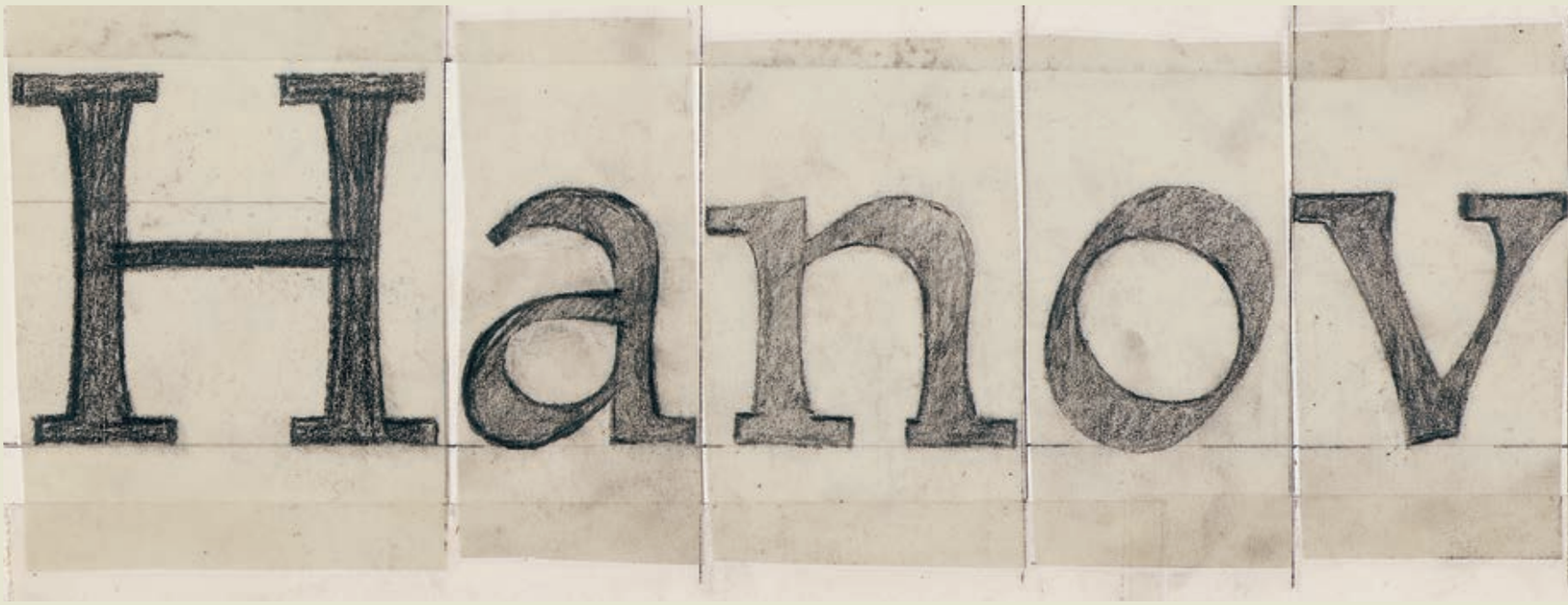
The name appears initially as *Breughel Script* and refers to a set of bold fonts in four weights dated May 1978. The set is shown in Adrian Frutiger's *Type Sign Symbol* **/03/**, where it is printed in red to differentiate it from the black upright cuts. There are outline drawings with a 12.5 cm x-height for some individual letters of *Breughel Script,* some in four different weights and some showing digitisation points **/04/**. This indicates that there were plans to implement this typeface.

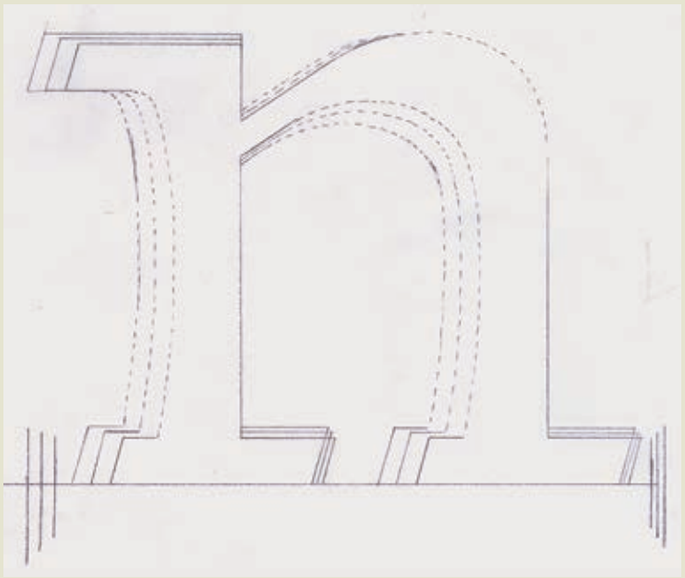
Also, the sample string 'Hanover', drawn in pencil, bears similarities to the typeface *Breughel* **/05/**. There are differences, however, in the shape of the serifs, in the angle of the stress in the o and in the downstrokes, which are tapered on both sides. The same drawings also serve as templates for the adhesive letter set 'Hobnail business' **/06/**. On the same sheet there is a second, similar design called 'Irma's sombrero' **/06/** with triangular instead of square serifs. The stress of the o is less oblique and closer to that of *Breughel.* It is also interesting to compare the lowercase a in both designs. In the top design, the upper terminal is rather pointed, and the transition from the bowl to the stem is strong and bent down in the interior **/06/**. In the bottom design, the upper terminal is pronounced, but the transition is fine and diagonal **/06/**. In the later design of *Breughel,* both parts are kept fine **/18/**.

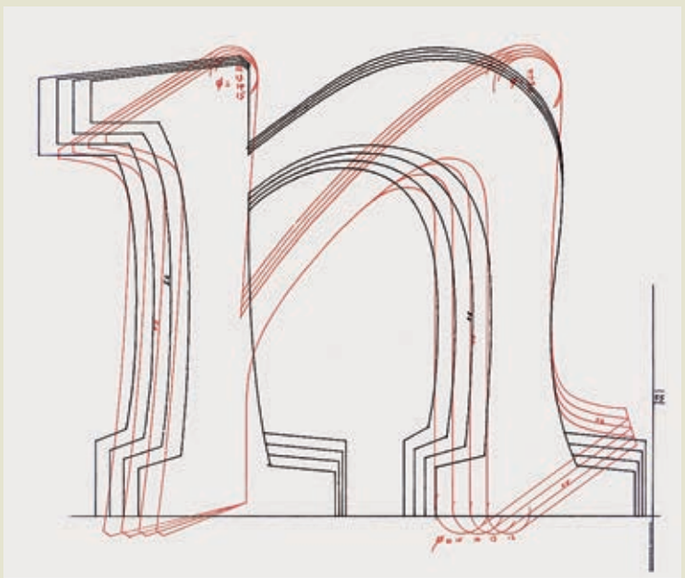
The 1980 *'Ritual project'* **/07/** is a slab serif in the shape of an italienne[3] but with slanted serifs as in *Breughel.* Typical for this kind of typeface are the more pronounced horizontal parts in comparison to the finer vertical ones and often also the narrow proportionof the typeface. In 1989, Adrian Frutiger designed an italienne with his *Westside* (see page 346).



/01/
Folder and final artwork for Breughel *55 – Linotype archived a character set in three folders.*





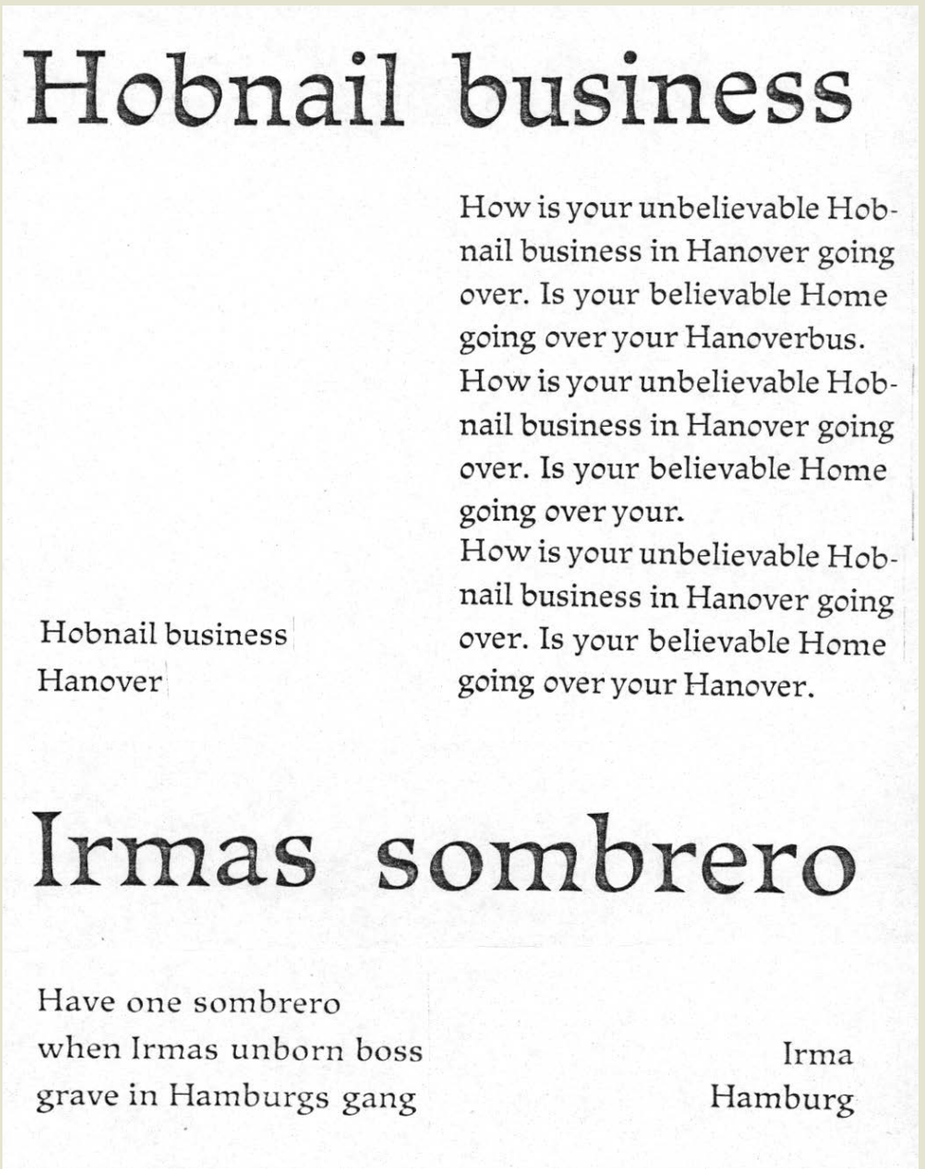


/02/
Proportional template of Breughel *for the data capture of the steps – the strokes are tapered on one side, the serifs are slanted.*

/03/
Proportional template of the design for 'Breughel Script' *(red) and the regular font (black) in four weights each (1978).*

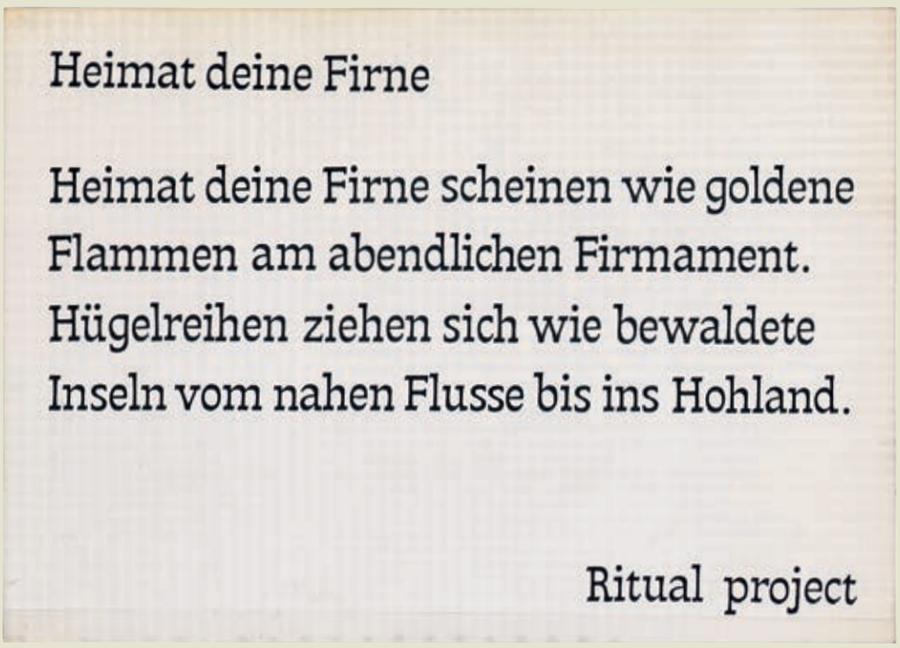
/04/
Pencil drawings for the design of 'Breughel Script' *– the original drawings have an x-height of 12.5 cm.*

/05/
A design similar to Breughel *with strokes tapered on both sides and vertically cut serifs – pencil drawing, original size.*



/06/
Design of a typeface similar to Breughel *(top) and another version derived from it with wedge serifs (bottom).*

/07/
The design of Ritual *(1980) is reminiscent of* Breughel *but also of an italienne such as the later* Westside.



upper and lower contours of the serifs could not be curved either, but I gave them slanted side contours, so they wouldn't be too similar to an egyptienne.

In a brochure of my typefaces available at Linotype in 1983, Horst Heiderhoff wrote that *Breughel* was modelled on the early humanist typefaces, and in particular on *Jenson* **/28/**. I didn't say that. For a long time, I thought that this was an unsuitable statement but now I have to admit that there's some truth to it. If you compare a few lines from *Jenson* with the bold *Breughel,* the relationship becomes obvious **/09/**.[4] These sample sentences, developed at different times and using different technologies, also show that the quality of the stroke is less important than the quality of the whitespace. In the regular cut, the ratio of black to white in one line is approximately 25–30% black and 70–75% white.[5] Therefore, a typeface mainly consists of counters and sidebearings.

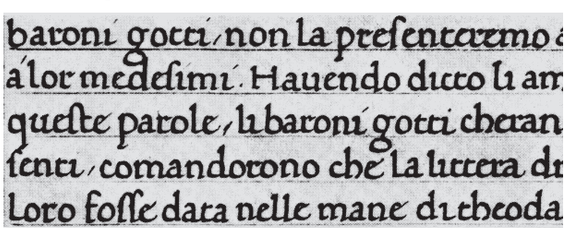
With *Breughel,* b d p q have oval counters **/14/** while with h m n the transition from stem to shoulder is slightly angular **/15/**. Having a rounded transition here would have made the typeface altogether too soft. I could also have drawn an angle in the b, similar to the top part of the q in order to emphasise the movement even more **/14/**. That would perhaps conform more closely to the overall style because angles and edges are part of the basic shape of this typeface. The edginess, which is an intrinsic part, is missing in the lowercase b. What has always been problematic is the letter X, which is influenced so much by the Roman numeral. It is difficult to create a different X shape **/16/**. I would say that the upright ampersand is a compromise. It has neither my own nor a looped shape. It is a bit odd **/17/**.

Breughel was released in 1983, in six sets. There was a tendency at the time to extend typefaces to larger families so that they could be sold at a higher price.[6] A typeface with

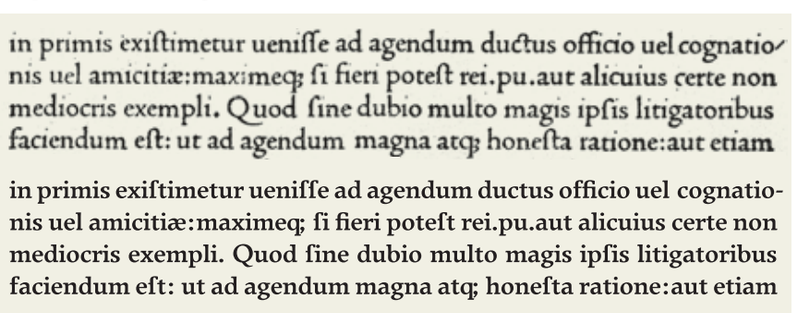
Relationship to Jenson *Breughel,* of course, is not a redesign of *Jenson;* the differences between the two typefaces are obvious **/09/**. There is also no indication that Frutiger deliberately used the 15th-century typeface as a starting point.[7] However, there are some characteristics that justify the comparison made by Horst Heiderhoff. Nicolas Jenson gave his antiqua a very even structure (see page 15). The serifs have a sturdy, asymmetrical shape and the second and third downstrokes in the lowercase m are concave on the left hand side. Through its asymmetrical alignment, there is a slightly inclined movement in Frutiger's typeface towards the reading direction, and through the sturdy serifs it clearly defines the line of text. This kind of design in typefaces goes back to the handwritten humanist minuscule **/08/**. Thus, at the beginning of the design process, we find the development of a hand-lettered typeface: *Breughel Script* **/10/**. A relationship in terms of shape to the earlier *Ondine* (see page 50) is obvious.

With *Apollo* **/22/**, Frutiger had already used slightly asymmetrical serifs and the italic *Opéra* **/24/** already featured unidirectional serifs. The humanistic shape of the tapered downstrokes is another characteristic of many of Frutiger's serif typefaces. Similar to *Icone* – which was developed in parallel – the deep concave shape of the downstroke allows for a smaller radius, distributing pixellation over several steps. This results in a more agreeable appearance, shown in the subsequent comparison **/11/**.

/08/
A humanist minuscule from Ferrara (Italy), written on parchment, first half of 15th century.



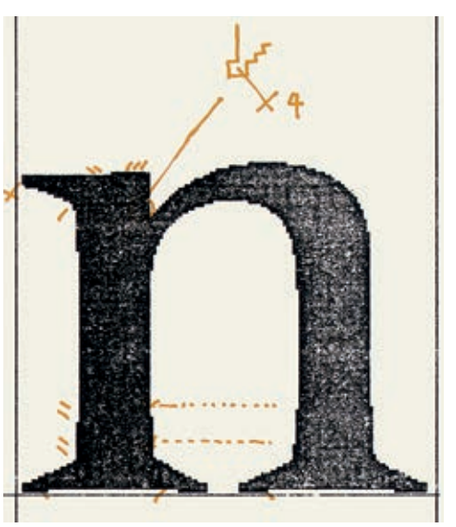
/09/
Excerpt from the 1471 Fabius Quintilianus in the typography by Nicolas Jenson (top) and in comparison with Breughel *Bold.*



/10/
Comparison between Breughel Script *(left),* Breughel *Regular (centre) and Regular Italic (right).*

/11/
Majuscule I of Méridien, Icone *and* Breughel *at a low resolution of 300 dpi – comparison implemented using today's technology.*

/12/
CRT output of Méridien *showing the typical jagged steps – the tapered strokes look unattractive.*



/13/
Humanist typeface suited for low resolution thanks both to the strokes being strongly tapered on one side only, and to flat, slanted serifs.

A typeface suited to digitisation In a letter bearing the greeting 'Lieber Freund Weidemann' (Dear friend Weidemann)[8] Frutiger responded to a 1984 survey[9] by Eurographic Press.[10] Among other points, the following excerpt was published: "When drawing or designing, it has become impossible for me to ignore or forget about the digitisation process. The grid of dividing a curve into single points has become second nature to me. The experience of pixellation has become part of my knowledge and therefore it is an inevitable aspect of the creative phase in the design process. Thus the creation of *Breughel* was the result of the idea of a digitisation-friendly typeface."[11] And in the *Gutenberg-Jahrbuch 1985*, Heiderhoff quoted Frutiger: "Very wide-sweeping curves were deliberately avoided, since the memories of the difficulties with the digital rendering of typefaces such as Meridien were still fresh in my mind. Nonetheless however, for a medieval antiqua, I was not prepared to replace the swelling and shrinking of a lively downstroke with a hard and straight line. This exploration resulted in the idea of having a concave curve on only the one side, although the concavity itself was more pronounced. The right-hand-side contour of the stem is thus a perfectly straight line, while the left-hand-side contour simulates a strong curve that is achieved through a relatively large number of pixellated steps. In the scaled-down version at reading size, however, the eye perceives the curvature of the downstroke as an organic whole."[12]

only three cuts wasn't worth much. Besides the marketing, the cost factor played an important role as well. It takes a lot of time and money before you get a roman, italic and bold right. Once these base shapes are done, further extension is easy.[13] I drew the regular and bold cuts completely myself; the medium one was done by interpolation. We also used the technological possibilities for the cursive. It was a mathematically sloped version, which, however, I refined manually. I only redrew the letters a e f g **/18/**. With its one-sided serifs for the lowercase letters, the cursive is a bit special. It's so consistent – and unique – that the left part of the r serif is also missing **/20/**. I didn't ask: what is allowed and what isn't? If I thought something was good, I did it. *Breughel* had oldstyle numerals and small capitals in the regular cut.[14] Linotype did the initial work for this and I then corrected the shapes. I designed only the oldstyle numerals 0, 1 and 2 myself, which have totally different proportions **/21/** – that might have been a bit lazy.[15]

Apart from the technological aspects, *Breughel* has a character of its own. I used to call it 'rustic', 'gnarly'; I felt it had something in common with the pictures of the painter *Breughel*[16] – that's why I gave it his name. After *Méridien* and *Iridium* on the one hand, and the grotesque typefaces on the other, I wanted to go in a different direction. Instead of elegant and refined shapes, I was looking for something more grounded, with some meat on its bones, as it were, and with robust serifs. For a long time I used to look down on *Breughel* a bit, by seeing it as a transitional solution based on technological restrictions. When I look back at it today, I discover its quality: it is sturdy yet well formed with a strong character.

/14/
The transitions from the bowl to the stem in b d p q are round – the b appears a little soft due to its round shape at the bottom left.

bdpq

/15/
The curves of the lowercase h m n r u feature an angular transition into the stem, which strengthens the appearance of a handwritten shape.

hmnru

/16/
It is a typographic challenge to add some dynamic to the strokes of the symmetrical X-shape.

X

/17/
In the regular font, the & of Breughel *features a slightly pretentious, unlooped shape, which is not the case for the 8 and the italic version.*

&8&

/18/
Only a e f g were drawn from scratch for Breughel *Italic – all other shapes were inclined automatically and then refined.*

aefg*aefg*

/19/
While in the regular font the x has double serifs and the y has single serifs, this is exactly the opposite in the italic font.

xy*xy*

/20/
Humanist typeface suited for low resolution thanks both to strokes tapered on one side only, and flat, slanted serifs.

hr

/21/
As opposed to, for example, Garamond *(top), only 012 are different in the two figure sets of* Breughel *(bottom).*

0123456789
0123456789

/22/
Apollo *(top) and* Breughel *(bottom) display an obvious relationship in shape and construction.*

acehs
acehs

/23/
The letters of the italic versions of Opéra *(top) and* Breughel *(bottom) feature very similar shapes and serifs.*

abdgpq
abdgpq

/24/
Different to the earlier Opéra *(top), the transition from the curves to the stem is angular in* Breughel *(bottom).*

hmn
hmn

/25/
Characters of Breughel *normal in CRT (cathode ray technology) photocomposition by Linotype.*

ABCDEFGHIJKLMN
OPQRSTUVWXYZ&
abcdefghijklmnopqrs
tuvwxyzß1234567890

Leading of a typeface Leading plays a crucial part in the overall look and feel of a typeface. If the leading is too narrow, the beauty of a typeface has no room to unfold **/26/**. Additionally, a change in leading changes the optical colour of a typeface as well as the line rhythm, which is so important for legibility. Today, a rather light density is preferred **/27/**.

The amount of leading depends on the typeface, its size and the line width. While early printers used to set their typefaces with their long ascenders and descenders in a compact form, i.e. without additional space between the lines **/09/**, this would not be possible with most of today's typefaces, without a loss in the quality of the overall impression and legibility. Due to an increase in x-height over time, and with a simultaneous reduction in the length of the descender, line formation gets lost in a compact composition and is replaced by a difficult-to-read, dark block of text.

Typefaces with a vertical alignment, such as the modern ones, and those with a large x-height or with wide counters, need generous leading. Line spacing is also dependent on line width. In a narrow column the same line spacing is perceived to be more open than in a wide column **/28/**. Long lines therefore need more line spacing than short ones. One rule of thumb: the space between baseline and the following mean line should be at least equal to the x-height.

Adrian Frutiger's Breughel reflects its origin in the early Humanist typefaces of the 16th century; in particular, it has its roots in the Jenson type. In designing Breughel, with its assymetric serifs, Frutiger took into account the specific requirements of digitization. All vertical strokes are strictly rectangular on the right side, while ending in marked curves on the left side. The delicately modelled letterforms lend the typeface its dynamic, lively appearance.

Als Vorbild für die Breughel dienten die frühen humanistischen Schriften des 16. Jahrhunderts und dabei ganz besonders die »Jenson«. Frutiger hat bei der Zeichnungsanlage der Schrift die Probleme der verfeinerten Punkt- und Linienauflösung im digitalen Bereich mit eingeplant, indem er die Abstriche und Serifen asymmetrisch gestaltete. Die rechten Stammbegrenzungen sind senkrecht und rechtwinkelig geführt, während die linken in Kurven auslaufen und gut abgetastet und wiedergegeben werden können. Dadurch werden stark modellierte Formteile des Buchstabens betont und die Schrift erhält eine scheinbar nach rechts geneigte dynamische Schreib- und Lesebewegung.

Le Breughel reflète le tracé des premiers caractères humanistes du début du 16ème siècle, et plus particulièrement celui du »Jenson«. En le dessinant, Frutiger a tenu compte des contraintes auxquelles les formes sont astreintes par la digitalisation. Ainsi les montants sont délimités à droite d'une manière parfaitement rectiligne; à gauche par contre, ils sont fortement incurvés, donc facilement digitalisables. Ses traits bien modelés donnent au caractère un aspect dynamique et vivant.

/26/
Set with far too narrow line spacing – text on Breughel from the trilingual Linotype brochure
Typefaces by Adrian Frutiger *(1983).*

/27/
Breughel LT *Regular in 10.2 pt – set solid with 1 pt, 2 pt und 3 pt leading (from top to bottom).*

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty diffe

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty diffe

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty diffe

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty diffe

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find

You may ask why so many different typefaces. They all serve the same purpose but they express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty different Médocs all of the same year. All of them were wines

/28/
Breughel LT *Regular in 10.2 pt size and 12.2 line spacing – the line spacing appears to be different*

Font production:
Digitised by Linotype

Font format:
PostScript Type 1

Also available:
TrueType
OpenType Com

Breughel™
Linotype
6 weights (6 SC | 6 OsF)

ABCDEFGHIJKLMN
OPQRSTUVWXYZ&
abcdefghijklmnopqrs
tuvwxyzß1234567890

Sie fragen sich
warum es notwen
dig ist, so viele Schriften zu
r Verfügung zu haben. Sie dienen alle zu
m selben, aber machen die Vielfalt des Menschen aus. Diese Vielfalt ist wie beim Wein. Ich habe einmal eine Weinkarte s tudiert mit sechzig Médoc- Weinenaus dem selben Jahr. Das ist ausnahmslos Wein, aber doch nicht alles der gleiche Wein. Es hat eben gleichwohl Nuancen. So ist es auch mit der Schri

ft. *You may ask why so many different typefaces.* They all serve the same purpose but t hey express man's diversity. It is the same diversity we find in wine. I once saw a list of Médoc wines featuring sixty different Médocs all of the same year. All of them we re wines but each was different from the others. It's the nuances that are important. The same is true for typefaces. *Pourquoi tant d'Alphabets différents!* Tous servent au même but, mais aussi à exprimer la diversité de l'homme. C'est cette même diversité que nous retrouvons dans les vins de Médoc. J'ai pu, un jour, relever soixante crus, t

ous de la même année. Il s'agissait certes de vins, mais tous étaient différe nts. Tout est dans la nuance du bouquet. Il en est de même pour les caractè res! *Sie fragen sich, warum es notwendig ist, so viele Schriften zur Verfügung zu haben.* Sie dienen alle zum selben, aber machen die Vielfalt des Mensch en aus. Diese Vielfalt ist wie beim Wein. Ich habe einmal eine Weinkarte st udiert mit sechzig Médoc-Weinen aus dem selben Jahr. Das ist ausnahmslo s Wein, aber doch nicht alles der gleiche Wein. Es hat eben gleichwohl Nua ncen. So is es auch mit der Schrift. *You may ask why so many different typef aces.* They all serve the same purpose but they express man's diversity. It is the same diversit y we find in wine. I once saw a list of Médoc wines featuring sixty different Médocs all of t he same year. All of them were wines but each was different from the others. It's the nuances that are important. The same is true for typef aces. *Pourquoi tant d'Alphabets différents!* Tous servent au même but, mais aussi à exprimer la diversité de l'homme. C'est cette même retrou

69 pt | –25 53 pt | –5 35 pt | –5 23 pt | 0 15 pt | 19 pt | 5 10.5 pt | 13 pt | 10 7.5 pt | 10.2 pt | 20 6 pt | 8 pt | 30

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰*†}

Regular

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰†}*

Regular Italic

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰*†}

Bold

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰*†}

Bold Italic

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰*†}

Black

ÅBÇDÈFG
HIJKLMÑ
ÔPQRŠTÜ
VWXYZ&
ÆŒ¥$£€
1234567890
åbçdéfghij
klmñôpqrš
tüvwxyzß
fiflæœøłð
[.,:;·'/–—]
(¿¡"«‹›»"!?)
{§°%@‰*†}

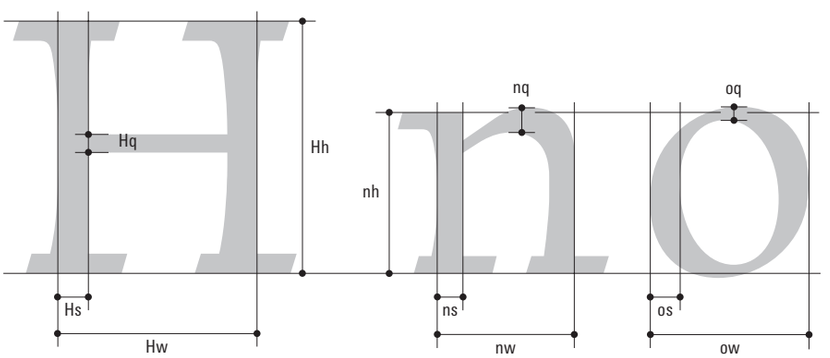
Black Italic

Typeface comparison All three typefaces shown below, *Raleigh*, *Garth Graphic* and *Breughel*, have a unique look and feel. In all three typefaces we can find letters, such as the capital K with its curved diagonal, that lend a very special note to the design **/30/**. Additionally, all three typefaces have a rather sturdy appearance and pronounced, oblique serifs. In terms of shape, these serifs differentiate themselves from the usual, symmetrical ones. The origin of the asymmetrical serifs can be traced back to the use of a broad pen in the 15th-century handwritten minuscule, as well as to Jenson's 1470 antiqua – a style that was soon to be replaced by the work of Aldus Manutius and Claude Garamont and that would only receive renewed attention with the 19th-century Arts and Crafts movement.

The most obvious difference to Adrian Frutiger's *Breughel* can be found in the straight downstrokes of *Raleigh*[17] and *Garth Graphic*[19] (named after Bill Garth,[18] founder of Compugraphic and former president of Photon). But there are also differences in the slanted serifs. In *Raleigh* the transition from the stem to the serifs is curved and the base flat, whereas it is concave in *Garth Graphic*. The serifs are also flatter. In *Breughel* the serif transitions are not concave which results in the serifs having a less three-dimensional appearance. Additionally, the ascender height and the cap height are identical in Frutiger's typeface **/32/**.

/29/
Measurements of stroke widths and proportions of the Breughel *regular weight.*

Roman	Hh = 10.00 cm	nh = 6.39 cm	oh = 6.81 cm	Hh : Hw = 1 : 0.79	nh : nw = 1 : 0.85
	Hw = 7.87	nw = 5.43	ow = 6.30	Hw : Hs = 1 : 0.15	nw : ns = 1 : 0.18
	Hs = 1.17	ns = 0.98	os = 1.18	Hs : Hq = 1 : 0.61	nh : oh = 1 : 1.06
	Hq = 0.72	nq = 0.99	oq = 0.53		nw : ow = 1 : 1.16



/30/
Due to the strokes being tapered on one side only, Breughel *appears softer and more fragile than the comparison typefaces* Raleigh *and* Garth Graphic.

Hofstainberg

Raleigh
Robert Norton
1978

K P W a b m y 3 6

Hofstainberg

Garth Graphic
Constance Blanchard / Renee Le Winter
1979

K P W a b m y 3 6

Hofstainberg

Breughel
Adrian Frutiger
1982

K P W a b m y 3 6

K
Stem tapered on one side, foot serif shorter on the right than on the left

P
Open counter, foot serifs elongated on the right

W
With centre serif

a
Terminal without emphasis

b
Stroke transitions directly into the curve

m
Angular transition into the stem, dynamic curves

y
Descender with vertical serif

3 6
Open shape, round counter

/31/
Comparison showing the different weights and angle of the italics.

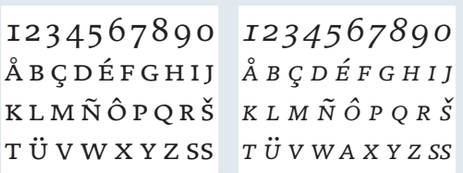
	Hh	Hw	Hs	Hq
Roman	10.00 cm	7.87 = 1	1.17 = 1	0.72 = 1
Bold	10.00	8.49 = 1.08	1.77 = 1.51	0.92 = 1.28
Black	10.00	9.13 = 1.16	2.40 = 2.05	1.09 = 1.51
Italic	10.00	7.61 = 0.97	1.04 = 0.89	0.73 = 1.01

/32/
Height comparison showing the differences of x-heights to ascenders and descenders – the cap height is the starting point.

Raleigh
44.7 pt

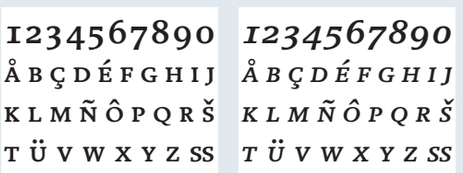
Garth Graphic
41.9 pt

Breughel
40.5 pt



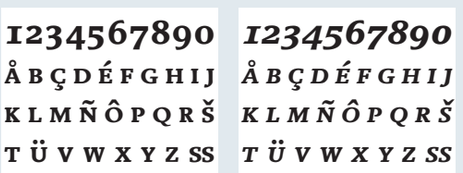
Regular SC

Regular Italic SC



Bold SC

Bold Italic SC



Black SC

Black Italic SC

ISBN 978-3-7643-8581-1

www.birkhauser.ch