THE VIRTUOUS BOOK

The Art of Limits

Project Type:
Typography, Print, Book Design

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The Brief

The first text is a selection from Bruno Munari's book Design is Art. The second text will be of your choosing. Perhaps an excerpt from an essay you've read before, the transcript from a favorite TED Talk, a bit of history, or sourced from a selection of provided texts will be equal to the "value" of the primary text. You decide. Additional content consisting of varied levels of information must be included. The varied levels may include but are not limited to, biographical information, footnotes, annotations, and call-outs that enhance the reader's understanding of the primary text.

Concept Overview

This book will serve as a visual and conceptual dialogue between two distinct design philosophies—one rooted in technical constraints and digital precision (My Life in Typefaces), and the other in artistic expression and human-centered design (Bruno Munari - Design as Art). The theme explores the tension between structure and creativity, reflecting how designers navigate constraints, function, and aesthetics. It presents a contrast between rigid bitmap typography and historic, humanist print design, creating a reading experience that itself embodies the ideas within the texts.

The Experience

- Readers experience the evolution from function-driven design toward a more integrated, aesthetic philosophy.
- The structure reinforces the content: the design of the book mirrors the conversation inside it.
- It’s an invitation to see design not as divided between "useful" and "beautiful" but as a living language shaped by time, need, and imagination.

Understanding the Text

Part I

Design as Art

Bruno Munari

DESIGN AS ART

Today it has become necessary to demolish the myth of the 'star' artist who only produces masterpieces for a small group of ultra-intelligent people. It must be understood that as long as art stands aside from the problems of life it will only interest a very few people. Culture today is becoming a mass affair, and the artist must step down from his pedestal and be prepared to make a sign for a butcher's shop (if he knows how to do it). The artist must cast off the last rags of romanticism and become active as a man among men, well up in present-day techniques, materials and working methods. Without losing his innate aesthetic sense he must be able to respond with humility and competence to the demands his neighbours may make of him.

The designer of today re-establishes the long-lost contact between art and the public, between living people and art as a living thing. Instead of pictures for the drawing-room, electric gadgets for the kitchen. There should be no such thing as art divorced from life, with beautiful things to look at and hideous things to use. If what we use every day is made with art, and not thrown together by chance or caprice, then we shall have nothing to hide.

Anyone working in the field of design has a hard task ahead of him: to clear his neighbour's mind of all preconceived notions of art and artists, notions picked up at schools where they condition you to think one way for the whole of your life, without stopping to think that life changes – and today more rapidly than ever. It is therefore up to us designers to make known our working methods in clear and simple terms, the methods we think are the truest, the most up-to-date, the most likely to resolve our common aesthetic problems. Anyone who uses a properly designed object feels the presence of an artist who has worked for *him*, bettering his living conditions and encouraging him to develop his taste and sense of beauty.

When we give a place of honour in the drawing-room to an ancient Etruscan vase which we consider beautiful, well proportioned and made with precision and economy, we must also remember that the vase once had an extremely common use. Most probably it was used for cooking-oil. It was made by a designer of those times, when art and life went hand in hand and there was no such thing as a work of art to look at and just any old thing to use.

I have therefore very gladly accepted the proposal that I should bring together in a volume the articles I originally published in the Milanese paper *Il Giorno*. To these I have added other texts, as well as a lot of illustrations which it was not possible to publish in the limited space of a daily paper. I have also made a few essential changes for the English edition.

I hope that other designers will make similar efforts to spread knowledge of our work, for our methods are daily asserting themselves as the fittest way of gaining the confidence of men at large, and of giving a meaning to our present way of life.

Design came into being in 1919, when Walter Gropius founded the Bauhaus at Weimar. Part of the prospectus of this school reads:

'We know that only the technical means of artistic achievement can be taught, not art itself. The function of art has in the past been given a formal importance which has severed it from our daily life; but art is always present when a people lives sincerely and healthily.

'Our job is therefore to invent a new system of education that may lead – by way of a new kind of specialized teaching of science and technology – to a complete knowledge of human needs and a universal awareness of them.

'Thus our task is to make a new kind of artist, a creator capable of understanding every kind of need: not because he is a prodigy, but because he knows how to approach human needs according to a precise method. We wish to make him conscious of his creative power, not scared of new facts, and independent of formulas in his own work.'

From that time on we have watched an ever more rapid succession of new styles in the world of art: abstract art, Dada, Cubism, Surrealism, Neo-Abstract art, Neo-Dada, pop and op. Each one gobbles up its predecessor and we start right back at the beginning again.

What Gropius wrote is still valid. This first school of design did tend to make a new kind of artist, an artist useful to society because he helps society to recover its balance, and not to lurch between a false world to live one's material life in and an ideal world to take moral refuge in.

When the objects we use every day and the surroundings we live in have become in themselves a work of art, then we shall be able to say that we have achieved a balanced life.

DESIGNERS AND STYLISTS

What is a Designer?

He is a planner with an aesthetic sense. Certain industrial products depend in large measure on him for their success. Nearly always the shape of a thing, be it a typewriter, a pair of binoculars, an armchair, a ventilator, a saucepan or a refrigerator, will have an important effect on sales: the better designed it is, the more it will sell.

The term 'designer' was first used in this sense in America. It does not refer to an industrial designer, who designs machines or mechanical parts, workshops or other specialized buildings. He is in fact a design engineer, and if he has a motor-scooter on the drawing-board he does not give a great deal of importance to the aesthetic side of things, or at the most he applies a personal idea of what a motor-scooter ought to look like. I once asked an engineer who had designed a motor-scooter why he had chosen a particular colour, and he said: because it was the cheapest. The industrial designer therefore thinks of the aesthetic side of the job as simply a matter of providing a finish, and although this may be most scrupulously done he avoids aesthetic problems that are bound up with contemporary culture because such things are not considered useful. An engineer must never be caught writing poetry. The designer works differently. He gives the right weight to each part of the project in hand, and he knows that the ultimate form of the object is psychologically vital when the potential buyer is making up his mind. He therefore tries to give it a form as appropriate as possible to its function, a form that one might say arises spontaneously from the function, from the mechanical part (when there is one), from the most appropriate material, from the most up-to-date production techniques, from a calculation of costs, and from other psychological and aesthetic factors.

In the early days of rationalism it used to be said that an object was beautiful in so far as it was functional, and only the most practical functions were taken into account. Various kinds of tool were used as evidence for this argument, such as surgical instruments. Today we do not think in terms of beauty but of formal coherence, and even the 'decorative' function of the object is thought of as a psychological element. For beauty in the abstract may be defined as what is called style, with the consequent need to force everything into a given style because it is new. Thus in the recent past we have had the aerodynamic style, which has been applied not only to aeroplanes and cars but to electric irons, perambulators and armchairs. On one occasion I even saw an aerodynamic hearse, which is about as far as the aerodynamic style can go (speeding the departing guest?).

We have therefore discarded beauty in the abstract sense, as something stuck on to the technical part of a thing, like a stylish car body or a decoration tastefully chosen from the work of some great artist. Instead we have formal coherence, rather as we see it in nature. A leaf has the form it has because it belongs to a certain tree and fulfils a certain function; its structure is determined by the veins which carry the sap, and the skeleton that supports it might have been worked out by mathematics. Even so, there are many kinds of leaf, and the leaves of any single tree differ slightly among themselves. But if we saw a fig-leaf on a weeping-willow we would have the feeling that all was not well. It would lack coherence. A leaf is beautiful not because it is stylish but because it is natural, created in its exact form by its exact function. A designer tries to make an object as naturally as a tree puts forth a leaf. He does not smother his object with his own personal taste but tries to be objective. He helps the object, if I may so put it, to make itself by its own proper means, so that a ventilator comes to have just the shape of a ventilator, a *fiasco* for wine has the shape that blown glass gives it, as a cat is inevitably covered with cat-fur. Each object takes on its own form. But of course this will not be fixed and final because techniques change, new materials are discovered, and with every innovation the problem arises again and the form of the object may change.

At one time people thought in terms of fine art and commercial art, pure art and applied art. So we used to have sewing-machines built by engineers and then decorated by an artist in gold and mother-of-pearl. Now we no longer have this distinction between fine and not-fine, pure and applied. The definition of art that has caused so much confusion in recent times, and allowed so many fast ones to be pulled, is now losing its prestige. Art is once more becoming a trade, as it was in ancient times when the artist was summoned by society to make certain works of visual communication (called frescoes) to inform the public of a certain religious event. Today the designer (in this case the graphic designer) is called upon to make a communication (called a poster) to inform the public of some new development in a certain field. And why is it the designer who is called upon? Why is the artist not torn from his easel? Because the designer knows about printing, about the techniques used, and he uses forms and colours according to their psychological functions. He does not just make an artistic sketch and leave it up to the printer to reproduce it as best he may. He thinks from the start in terms of printing techniques, and it is with these that he makes his poster.

The designer is therefore the artist of today, not because he is a genius but because he works in such a way as to re-establish contact between art and the public, because he has the humility and ability to respond to whatever demand is made of him by the society in which he lives, because he knows his job, and the ways and means of solving each problem of design. And finally because he responds to the human needs of his time, and helps

Design as Art

Bruno Munari

people to solve certain problems without stylistic preconceptions or false notions of artistic dignity derived from the schism of the arts.

'The form follows the function.' (*Jean-Baptiste Lamarck*)

The designer works in a vast sector of human activity: there is visual design, industrial design, graphic design and research design.

Visual design is concerned with images whose function is to communicate and inform visually: signs, symbols, the meaning of forms and colours and the relations between these.

Industrial design is concerned with functional objects, designed according to economic facts and the study of techniques and materials.

Graphic design works in the world of the Press, of books, of printed advertisements, and everywhere the printed word appears, whether on a sheet of paper or a bottle.

Research design is concerned with experiments of both plastic and visual structures in two or more dimensions. It tries out the possibilities of combining two or more dimensions, attempts to clarify images and methods in the technological field, and carries out research into images on film.

Pure and Applied

Once upon a time there was pure art and applied art (I prefer to use these terms, rather than 'fine' and 'commercial', because 'commercial art' does not really cover enough ground). At all events, forms were born in secret in ivory towers and fathered by divine inspiration, and Artists showed them only to initiates and only in the shape of paintings and pieces of sculpture: for these were the only channels of communication open to the old forms of art.

Around the person of the Artistic Genius there circulated other and lesser geniuses who absorbed the Pure Forms and the Style of the Master and attempted to give these some currency by applying them to objects of everyday use. This led to the making of objects in this style or that style, and even today the question of Style has not been altogether disposed of.

The distinction between pure art, applied art and industrial design is still made in France, a country that at one time was the cradle of living art. What we call design, the French call 'esthétique industrielle', and by this phrase they mean the application to industry of styles invented in the realm of the pure arts.

It therefore comes about that in France they make lamps inspired by abstract forms without bearing in mind that a lamp must give light. They design a Surrealist television set, a Dada table, a piece of 'informal' furniture, forgetting that all objects have their exact uses and well-defined functions, and that they are no longer made by craftsmen modelling a stylish shape in copper according to their whim of the moment but by automatic machines turning out thousands of the things at a time.

What then is this thing called Design if it is neither style nor applied art? It is planning: the planning as objectively as possible of everything that goes to make up the surroundings and atmosphere in which men live today. This atmosphere is created by all the objects produced by industry, from glasses to houses and even cities. It is planning done without preconceived notions of style, attempting only to give each thing its logical structure and proper material, and in consequence its logical form.

So all this talk about sober harmony, beauty and proportions, about the balance between masses and spaces (typical sculpture-talk), about aesthetic perfection (classicism?), about the charm of the materials used and the equilibrium of the forms, all this talk our French friends go in for, is just a lot of old-fashioned claptrap. An object should now be judged by whether it has a form consistent with its use, whether the material fits the construction and the production costs, whether the individual parts are logically fitted together. It is therefore a question of coherence.

Beauty as conceived of in the fine arts, a sense of balance comparable with that of the masterpieces of the past, harmony and all the rest of it, simply

blue, coffee and chocolate, pea-green and violet. Then they would make unexpected leaps from one shade to another, putting red with pale blue (instead of dark) and so on. Can we imagine a 'No Overtaking' sign with a coffee and chocolate car on a violet background? Well, yes. We can imagine it for fun, but we cannot use it for a roadsign in real life.

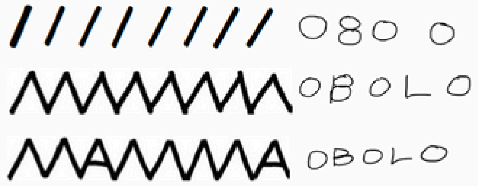
At some times in the past a certain series of colours, let us say all of dark tone, were indiscriminately adapted to all branches of human activity. The colours used for furnishings did not differ much from those for clothes or carriages. But today different colours have different uses. For roadsigns we use only red, blue and yellow (apart from the green light at traffic lights), and each colour has its well-defined meaning. In advertising we use bright brash colours or very refined ones according to our purpose. In printing we use the dull four-colour system which reduces all colours to a norm, while women's fashions make use of all the colours in rotation.

A double-bend sign in the style of Louis XIV. There have always been dangerous double bends, even in the time of Louis XIV, but then there were no roadsigns. They had heraldic arms instead. As the speed and volume of traffic increases, decoration is proportionally reduced, until it reaches the bare essentials of our present-day signals. Visual language changes according to the needs of the day.

In the past, images were nearly all painted, drawn or carved, and they reproduced visible and recognizable reality. Now we can even see the invisible. We have a host of machines exploring for us what we cannot see with the naked eye. We have X-ray photos, the world of the microscope, and the abstract inventions of artists. We have machines that enable us to see music and sounds in the form of luminous waves, machines that show us photo-elasticity in colour by means of polarized light, machines that slow up pictures of motion until we get as it were a blow-up of each instant. Then there are the lights which already form an accepted part of the night-scape,

The Shape of Words

Not only does each letter of a word have a shape of its own, but all its letters taken together give shape to the word. We are of course referring to printed, or at least written, words; for the words we hear in speech or on the radio do not have a visual form. They have what might be called sonic form, but we are not dealing with this at the moment. When you read the word MAMMA you see at once that it has quite a different shape from the word OBOLO. The lines (straight or curved, upright or at an angle) and the blank spaces between one letter and the next all contribute to giving the word its overall shape.



This is especially the case with words we are used to reading — or forced to read — every day: the names of newspapers, of big firms, foreign countries, film stars, the names dinned into us by assiduous advertisers, words that greet us wherever we look, such as 'sport', and the 'in' words of the moment, such as 'pop'. These we seize at a glance, without having to spell out each letter or syllable. That is, we recognize their overall shape, a thing we cannot do with unfamiliar words such as tetradecapodous or tryanlyonnonodont, especially when these are written in the tiniest print on a minute scrap of paper rolled round a medicine bottle, for example.

Some words, such as the names of well-known firms or products, are so familiar to us that if we block out most of the letters we can still read the name correctly at first glance and only notice afterwards that something is slightly unusual. But this can only happen if we preserve the general shape of the word.

An experiment anyone can make is to cut out the letters of a newspaper title, for example, and push these closer together until the upright stroke of one letter also does duty for the next. This gives a clearer idea of the shape of the word. One can go even further, and superimpose one letter on another, as in one of my illustrations I have made an M do duty also as an A in the word DAMO (the trademark of an ancient Roman brick factory).

Knowledge of the shape of words and the possibilities these offer for communication can be very useful to the graphic designer when he comes to make warning signs that have to be taken in quickly, like the ones on motorways, that one cannot stop to decipher.

Understanding the Text

Part 2

My Life in Typefaces

Matthew Carter

Type is something we consume in enormous quantities. In much of the world, it's completely inescapable. But few consumers are concerned to know where a particular typeface came from or when or who designed it, if, indeed, there was any human agency involved in its creation, if it didn't just sort of materialize out of the software ether.

But I do have to be concerned with those things. It's my job. I'm one of the tiny handful of people who gets badly bent out of shape by the bad spacing of the T and the E that you see there. I've got to take that slide off. I can't stand it. Nor can Chris. There. Good.

So my talk is about the connection between technology and design of type. The technology has changed a number of times since I started work: photo, digital, desktop, screen, web. I've had to survive those changes and try to understand their implications for what I do for design. This slide is about the effect of tools on form. The two letters, the two K's, the one on your left, my right, is modern, made on a computer. All straight lines are dead straight. The curves have that kind of mathematical smoothness that the Bézier formula imposes. On the right, ancient Gothic, cut in the resistant material of steel by hand. None of the straight lines are actually straight. The curves are kind of subtle. It has that spark of life from the human hand that the machine or the program can never capture. What a contrast.

Well, I tell a lie. A lie at TED. I'm really sorry. Both of these were made on a computer, same software, same Bézier curves, same font format. The one on your left was made by Zuzana Licko at Emigre, and I did the other one. The tool is the same, yet the letters are different. The letters are different because the designers are different. That's all. Zuzana wanted hers to look like that. I wanted mine to look like that. End of story. Type is very adaptable. Unlike a fine art, such as sculpture or architecture, type hides its methods. I think of myself as an industrial designer. The thing I design is manufactured, and it has a function: to be read, to convey meaning. But there is a bit more to it than that. There's the sort of aesthetic element. What makes these two letters different from different interpretations by different designers? What gives the work of some designers sort of characteristic personal style, as you might find in the work of a fashion designer, an automobile designer, whatever?

There have been some cases, I admit, where I as a designer did feel the influence of technology. This is from the mid-'60s, the change from metal type to photo, hot to cold. This brought some benefits but also one particular drawback: a spacing system that only provided 18 discrete units for letters to be accommodated on. I was asked at this time to design a series of condensed sans serif types with as many different variants as possible within this 18-unit box. Quickly looking at the arithmetic, I realized I could only actually make three of related design. Here you see them. In Helvetica Compressed, Extra Compressed, and Ultra Compressed, this rigid 18-unit system really boxed me in. It kind of determined the proportions of the design. Here are the typefaces, at least the lower cases. So do you look at these and say, "Poor Matthew, he had to submit to a problem, and by God it shows in the results." I hope not. If I were doing this same job today, instead of having 18 spacing units, I would have 1,000. Clearly I could make more variants, but would these three members of the family be better? It's hard to say without actually doing it, but they would not be better in the proportion of 1,000 to 18, I can tell you that. My instinct tells you that any improvement would be rather slight, because they were designed as functions of the system they were designed to fit, and as I said, type is very adaptable. It does hide its methods. All industrial designers work within constraints. This is not fine art.

The question is, does a constraint force a compromise? By accepting a constraint, are you working to a lower standard? I don't believe so, and I've always been encouraged by something that Charles Eames said. He said he was conscious of working within constraints, but not of making compromises. The distinction between a constraint and a compromise is obviously very subtle, but it's very central to my attitude to work.

Remember this reading experience? The phone book. I'll hold the slide so you can enjoy the nostalgia. This is from the mid-'70s early trials of Bell Centennial typeface I designed for the U.S. phone books, and it was my first experience of digital type, and quite a baptism. Designed for the phone books, as I said, to be printed at tiny size on newsprint on very high-speed rotary presses with ink that was kerosene and lampblack. This is not a hospitable environment for a typographic designer. So the challenge for me was to design type that performed as well as possible in these very adverse production conditions. As I say, we were in the infancy of digital type. I had to draw every character by hand on quadrille graph paper -- there were four weights of Bell Centennial — pixel by pixel, then encode them raster line by raster line for the keyboard. It took two years, but I learned a lot. These letters look as though they've been chewed by the dog or something or other, but the missing pixels at the intersections of strokes or in the crotches are the result of my studying the effects of ink spread on cheap paper and reacting, revising the font accordingly. These strange artifacts are designed to compensate for the undesirable effects of scale and production process. At the outset, AT&T had wanted to set the phone books in Helvetica, but as my friend Erik Spiekermann said in the Helvetica movie, if you've seen that, the letters in Helvetica were designed to be as similar to one another as possible. This is not the recipe for legibility at small size. It looks very elegant up on a slide. I had to disambiguate these forms of the figures as much as possible in Bell Centennial by sort of opening the shapes up, as you can see in the bottom part of that slide.

So now we're on to the mid-'80s, the early days of digital outline fonts, vector technology. There was an issue at that time with the size of the fonts, the amount of data that was required to find and store a font in computer memory. It limited the number of fonts you could get on your typesetting system at any one time. I did an analysis of the data, and found that a typical serif face you see on the left needed nearly twice as much data as a sans serif in the middle because of all the points required to define the elegantly curved serif brackets. The numbers at the bottom of the slide, by the way, they represent the amount of data needed to store each of the fonts. So the sans serif, in the middle, sans the serifs, was much more economical, 81 to 151.

"Aha," I thought. "The engineers have a problem. Designer to the rescue."

I made a serif type, you can see it on the right, without curved serifs. I made them polygonal, out of straight line segments, chamfered brackets. And look, as economical in data as a sans serif. We call it Charter, on the right.

So I went to the head of engineering with my numbers, and I said proudly, "I have solved your problem."

"Oh," he said. "What problem?"

And I said, "Well, you know, the problem of the huge data you require for serif fonts and so on."

"Oh," he said. "We solved that problem last week. We wrote a compaction routine that reduces the size of all fonts by an order of magnitude. You can have as many fonts on your system as you like."

"Well, thank you for letting me know," I said.

Foiled again. I was left with a design solution for a nonexistent technical problem.

But here is where the story sort of gets interesting for me. I didn't just throw my design away in a fit of pique. I persevered. What had started as a technical exercise became an aesthetic exercise, really. In other words, I had come to like this typeface. Forget its origins. Screw that. I liked the design for its own sake. The simplified forms of Charter gave it a sort of plain-spoken quality and unfussy spareness that sort of pleased me. You know, at times of technical innovation, designers want to be influenced by what's in the air. We want to respond. We want to be pushed into exploring something new. So Charter is a sort of parable for me, really. In the end, there was no hard and fast causal link between the technology and the design of Charter. I had really misunderstood the technology. The technology did suggest something to me, but it did not force my hand, and I think this happens very often.

You know, engineers are very smart, and despite occasional frustrations because I'm less smart, I've always enjoyed working with them and learning from them. Apropos, in the mid-'90s, I started talking to Microsoft about screen fonts. Up to that point, all the fonts on screen had been adapted from previously existing printing fonts, of course. But Microsoft foresaw correctly the movement, the stampede towards electronic communication, to reading and writing onscreen with the printed output as being sort of secondary in importance.

So the priorities were just tipping at that point. They wanted a small core set of fonts that were not adapted but designed for the screen to face up to the problems of screen, which were their coarse resolution displays. I said to Microsoft, a typeface designed for a particular technology is a self-obsoleting typeface. I've designed too many faces in the past that were intended to mitigate technical problems. Thanks to the engineers, the technical problems went away. So did my typeface. It was only a stopgap. Microsoft came back to say that affordable computer monitors with better resolutions were at least a decade away. So I thought, well, a decade, that's not bad, that's more than a stopgap.

So I was persuaded, I was convinced, and we went to work on what became Verdana and Georgia, for the first time working not on paper but directly onto the screen from the pixel up. At that time, screens were binary. The pixel was either on or it was off. Here you see the outline of a letter, the cap H, which is the thin black line, the contour, which is how it is stored in memory, superimposed on the bitmap, which is the grey area, which is how it's displayed on the screen. The bitmap is rasterized from the outline. Here in a cap H, which is all straight lines, the two are in almost perfect sync on the Cartesian grid. Not so with an O. This looks more like bricklaying than type design, but believe me, this is a good bitmap O, for the simple reason that it's symmetrical in both x and y axes. In a binary bitmap, you actually can't ask for more than that. I would sometimes make, I don't know, three or four different versions of a difficult letter like a lowercase A, and then stand back to choose which was the best. Well, there was no best, so the designer's judgment comes in in trying to decide which is the least bad. Is that a compromise? Not to me, if you are working at the highest standard the technology will allow, although that standard may be well short of the ideal. You may be able to see on this slide two different bitmap fonts there. The "a" in the upper one, I think, is better than the "a" in the lower one, but it still ain't great. You can maybe see the effect better if it's reduced. Well, maybe not.

So I'm a pragmatist, not an idealist, out of necessity. For a certain kind of temperament, there is a certain kind of satisfaction in doing something that cannot be perfect but can still be done to the best of your ability. Here's the lowercase H from Georgia Italic. The bitmap looks jagged and rough. It is jagged and rough. But I discovered, by experiment, that there is an optimum slant for an italic on a screen so the strokes break well at the pixel boundaries. Look in this example how, rough as it is, how the left and right legs actually break at the same level. That's a victory. That's good, right there. And of course, at the lower depths, you don't get much choice. This is an S, in case you were wondering.

Well, it's been 18 years now since Verdana and Georgia were released. Microsoft were absolutely right, it took a good 10 years, but screen displays now do have improved spatial resolution, and very much improved photometric resolution thanks to anti-aliasing and so on. So now that their mission is accomplished, has that meant the demise of the screen fonts that I designed for coarser displays back then? Will they outlive the now-obsolete screens and the flood of new web fonts coming on to the market? Or have they established their own sort of evolutionary niche that is independent of technology? In other words, have they been absorbed into the typographic mainstream? I'm not sure, but they've had a good run so far. Hey, 18 is a good age for anything with present-day rates of attrition, so I'm not complaining.

Thank you.

Concept Development

Ideation

Similarities

Differences

Middle ground

change

skewing for legibility + recognition

visual language

limitations + constraints

function vs. art

structure fits function

clarity over decoration

beauty in function (together)

aesthetics secondary

shapes of words influence recognition + vis com

shapes of letters influence readability

evolution of design

design accessable to everyone

historic vs. new

↓

organic vs. structured

The Discovery

While studying *My Life in Typefaces* and *Design as Art*, I discovered that both texts, though vastly different in focus, revolve around a common tension: the balance between functional needs and artistic expression in design.

Why Does This Matter?

- Design is often seen as either technical or creative; this book shows it is both.
- Understanding design evolution helps creators make intentional, thoughtful work today.
- It reveals how constraints (technological or philosophical) are not limitations, but starting points for creativity.

Specs

Exposed Coptic Stitching

6" x 9"

110 pages
(55 spreads)

The Typefaces

Design as Art

Chapter Head

AltaCalifornia Regular

Major Head

Attic Antique Regular

Sub Head

P22 Franklin Caslon Regular

Body/Headers/Footers/Folios

IM FELL DW Pica Roman Regular

My Life in Typefaces

Chapter Head

Argent Pixel CF Italic

Major Head

Gridlite PE Variable Halfway Bold Circle

Sub Head

Gridlite PE Variable Positive Bold Square

Body/Headers/Footers/Folios

Logic Monospace Regular

Color Palette

Black
CMYK: 0,0,0,100

White
CMYK: 0,0,0,0

Dark Slate Blue
CMYK: 68,43,0,55

Light Steel Blue
CMYK: 30,20,0,9

Royal Blue
CMYK: 80,63,0,22

Midnight Blue
CMYK: 52,69,0,60

Composition

Explorations

The Art of Limits
The Art of Limits
The Art of Limits
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The Art of Limits
My Life In Typefaces Matthew Carter
Design As Art : Bruno Munari
The Art of Limits : Julia Birn
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The Art of Limits
Where function and form intersect
My Life In Typefaces - Matthew Carter
Design As Art - Bruno Munari
The Art of Limits - Julia Birn
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1.
Type Is Life
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Type
In much of the world, it's completely
is something we consume in enormous quantities.
inescapable
Culture today is becoming a mass affair
Design as Art
Pages 17-26, 44-45 from Design as Art
Excerpts from the articles by Bruno Munari exploring the role of design in everyday life, arguing that good design should be functional, accessible, and artistic.
My Life in Typefaces
A transcript of Matthew Carter's TED Talk
Matthew Carter explores the evolution of typography, balancing function and aesthetics within technological constraints. Detailing how these shape the development of typefaces that are both readable and visually compelling.

In the early days of **rationalism** it used to be said that *an object was beautiful in so far as it was functional,* and only the most practical functions were taken into account. Various kinds of tool were used as evidence for this argument, such as surgical instruments. Today we do not think in ~~terms of beauty~~ but of *formal coherence*, and even the *'decorative'* function of the object is thought of as a psychological element. For **beauty in the abstract** may be defined as what is called **style,** with the consequent need to *force everything into a given style because it is new*. Thus in the recent past we have had the aerodynamic style, which has been applied not only to aeroplanes and cars but to electric irons, perambulators and armchairs. On one occasion I even saw an aerodynamic hearse, which is about as far as the aerodynamic style can go (speeding the departing guest?).

We have therefore discarded beauty in the abstract sense,

as something stuck on to the technical part of a thing, like a stylish car body or a decoration tastefully chosen from the work of some great artist. Instead we have formal coherence, rather as we see it in nature.

A
leaf
has the form
it has be-
cause it belongs to a certain
tree and
fulfils a certain function; its struc-
ture is de-
termined by the veins which carry the sap, and the skeleton
that supports it might have been worked out by mathe-
matics. Even so, there are many kinds of leaf, and
the leaves of any single tree differ slightly
among themselves.
But if we saw a fig-leaf on a weep-
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He **helps the object,** if I may so put it, to make itself **by its own proper means,** so that a ventilator comes to have just the shape of a ventilator, a fiasco for wine has the shape that blown glass gives it, as a cat is inevitably covered with cat-fur. Each object takes on its own form. But of course this will not be ~~fixed and final~~ because techniques change, new materials are discovered, and with *every innovation the problem arises again and the form of the object may change.*

At one time people thought in terms of *fine art* and *commercial art,* **pure art** and **applied art.** So we used to have sewing-machines built by engineers and

the demands his neighbours may make of him.

The designer of today re-establishes the long-lost contact between art and the public, between living people and art as a living thing. Instead of pictures for the drawing-room, electric gadgets for the kitchen. **There should be no such thing as art divorced from life, with beautiful things to look at and hideous things to use.** If what we use every day is made with art, and not thrown together by chance or caprice, then we shall have nothing to hide.

Anyone working in the field of design has a hard task ahead of him: to clear his neighbour's mind of all preconceived notions of art and artists, notions picked up at schools where **they condition you to think one way for the whole of your life,** without stopping to think that life changes - and today more rapidly than ever. It is therefore up to us designers to make known our working methods in clear and simple terms, the methods we think are the truest, the most up-to-date, the most likely to resolve our common aesthetic problems. Anyone who uses a properly designed object **feels the presence of an artist** who has worked for him, bettering his living conditions and encouraging him to develop his taste and sense of beauty.

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a place
of honour in the drawing-room
to an ancient Etruscan vase
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probably it was used for
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art and life went hand in
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and just any
old
thing to
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I have therefore very gladly accepted the proposal that I should bring together in a volume the articles I originally published in the Milanese paper Il Giorno. To these I have added other texts, as well as a lot of illustrations

k k

This
slide
is about
the effect
of tools
on form.
The two let-
ters, the two K's,
the one on your left,
my right, is modern,
made on a comput-
er. All straight
lines are
dead straight.
The curves
have that
kind of
mathe- matical
smooth- ness
that the
Bézier for-
mula im-
pos- es.

On
the
right,
ancient
Gothic,
cut in
the re- sis-
tant ma- terial of
steel by hand. None
of the straight
lines are
actually

straight.
The curves are
kind of subtle. It
has that spark
of life from the
human hand
that the machine
or the program
can never capture.
What a con- trast.

Well,

I tell a lie.

A lie at TED.

I'm really sorry. Both of these were made on a computer, *same software, same Bézier curves,* same font format. The one on your left was made by **Zuzana Licko at Emigre,** and I did the other one. *The tool is the same, yet the letters are different.* The letters are different because **the designers are different.** That's all. Zuzana wanted hers to look like that. I wanted mine to look like that.

End of story.

But I do have to be concerned with those things. **It's my job.** I'm one of the tiny handful of people who gets badly bent out of shape by the bad spacing of the **T** and the **E** that you see there. I've got to take that slide off. **I can't stand it.** Nor can Chris. There. Good.

So my talk is about

the connection between **tech-nology** *and* **design of type.**

The **technology** has changed a number of times since I started work: **photo, digital, desktop, screen, web.** I've had to **survive** those changes and try to *understand their implications*

Presentation
Imagery


BEL ,..:''-;
akifujenb
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Z&F
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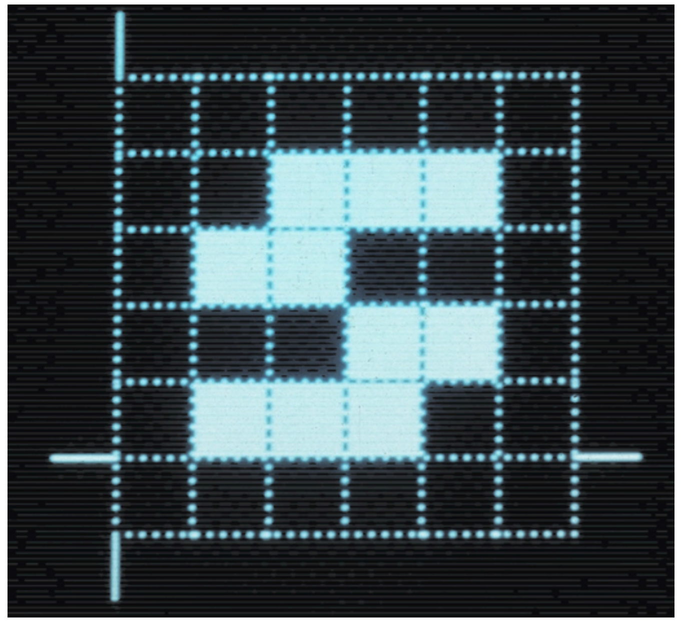

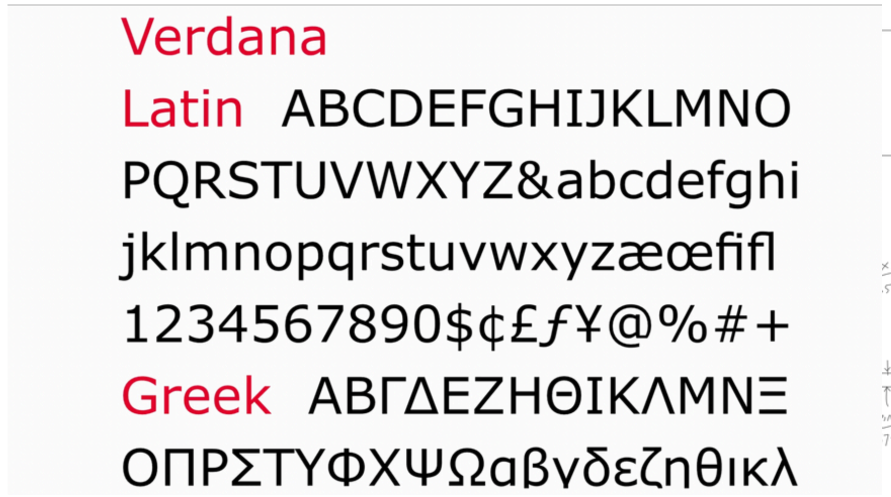
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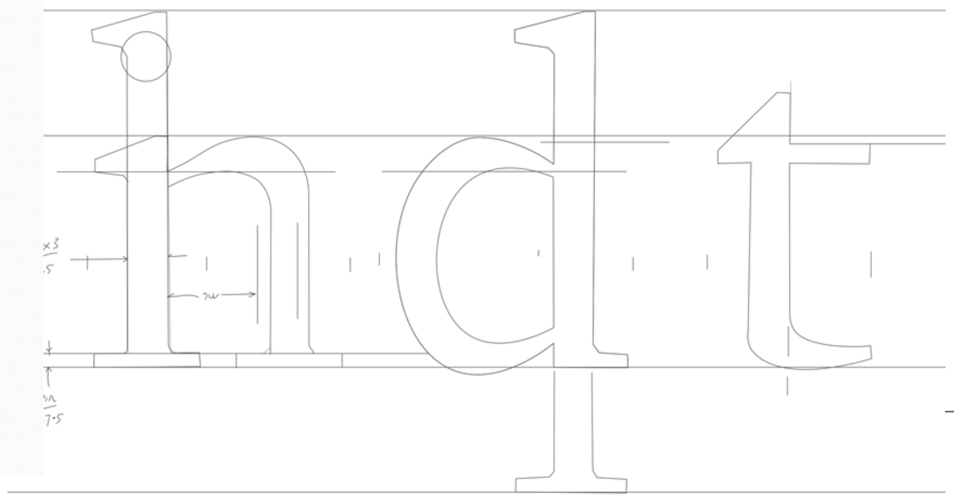
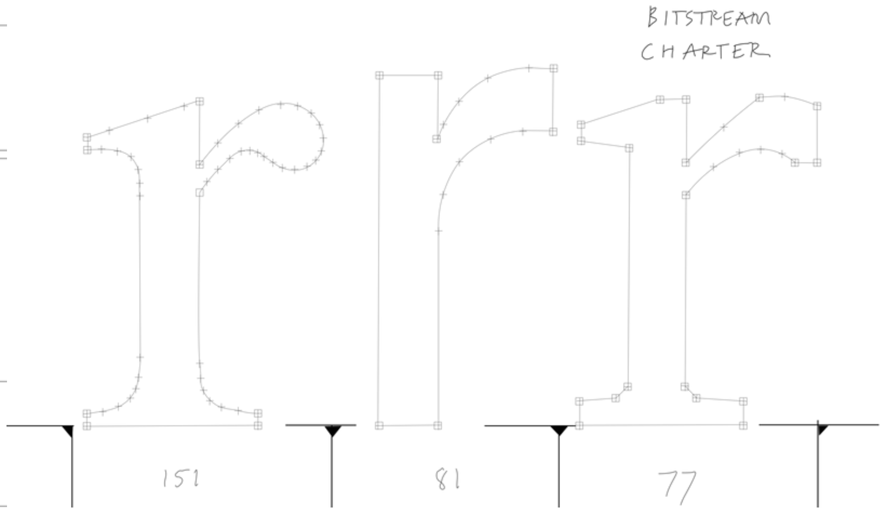
Greek ΑΒΓΔΕΖΗΘΙΚΛΜΝΞ
ΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλ

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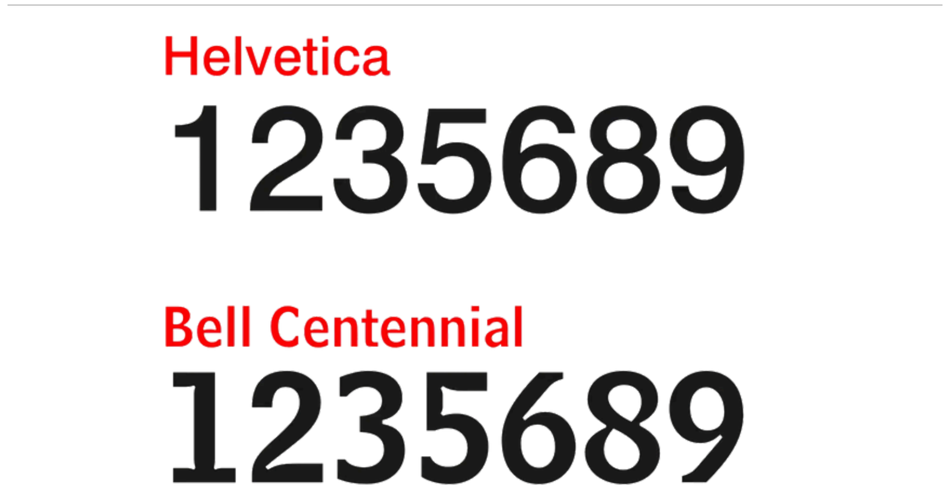
CHARTER
151
81
77


Helvetica
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Bell Centennial
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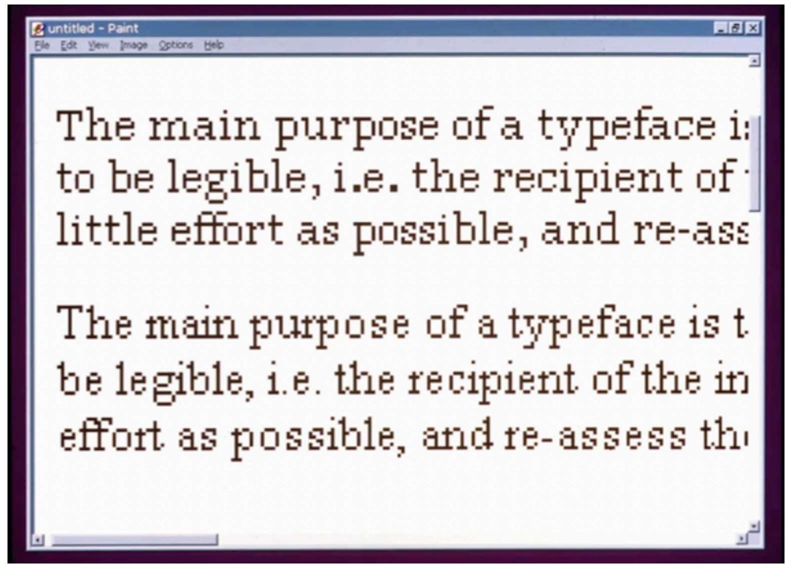
The main purpose of a typeface i
to be legible, i.e. the recipient of
little effort as possible, and re-ass
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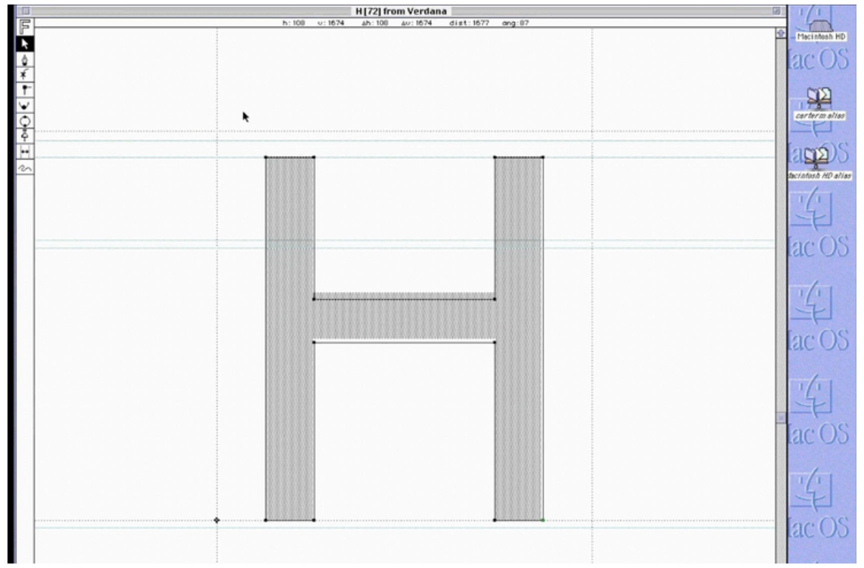
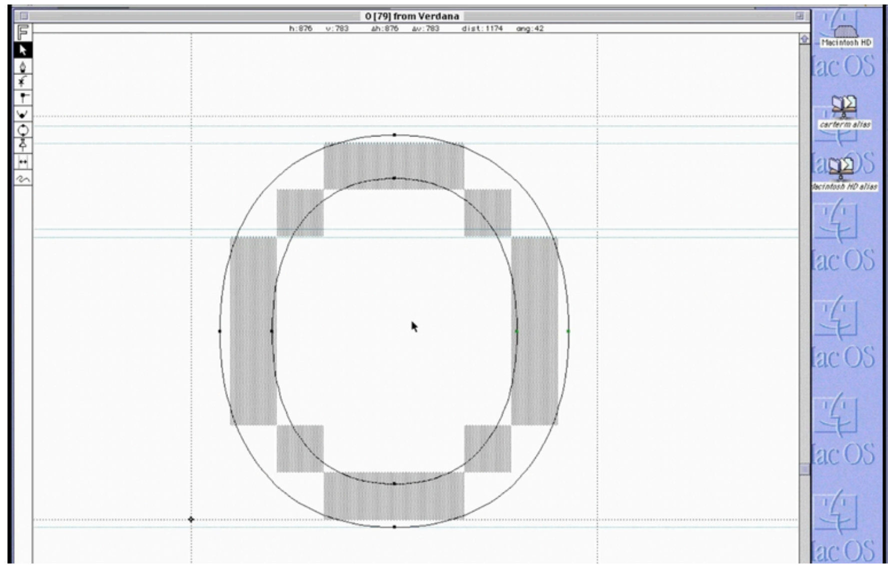
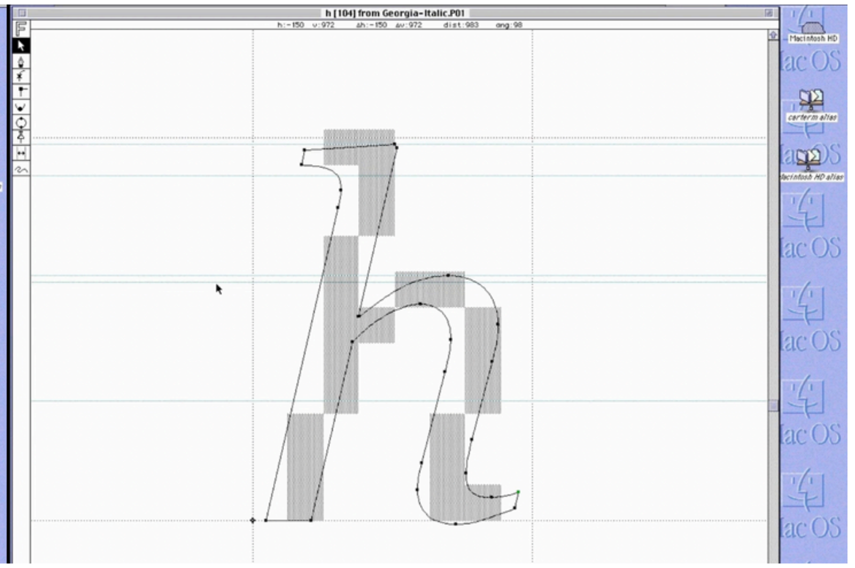
be legible, i.e. the recipient of the in
effort as possible, and re-assess th







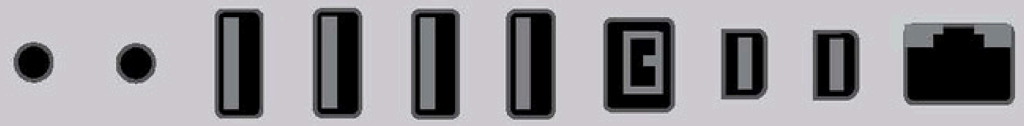
Cover
Concept

Specs

- Mimic a computer
- Front Cover: Screen
- Back Cover: Backside with ports

90 lbs. index paper sandwiched between transparency films

1/4" overhang



The Art of Limits

Centered text

Today it has become necessary to demolish the myth of the 'star' artist who only produces masterpieces for a small group of ultra-intelligent people. It must be understood that as long as art stands aside from the problems of life it will only interest a very few people.

Culture today is becoming a mass affair,

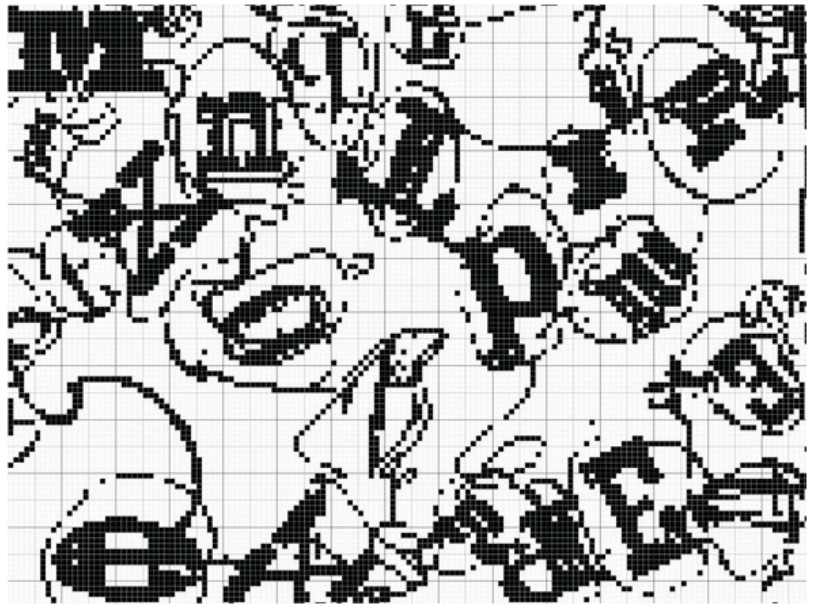
and the artist must step down from his pedestal and be prepared to make a sign for a butcher's shop (if he knows how to do it). The artist must cast off the last rags of romanticism and become active as a man among men, well up in present-day techniques, materials and working methods. Without losing his innate aesthetic sense he must be able to respond with humility and competence to the demands his neighbours may make of him.

Industrial Margins

Final Compositions

The Art of Limits

For my sweet boy – you are gone, but deeply loved and missed. You were wanted for felonious mischief, but never caught.



The Art of Limits

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My Life in Typefaces by Matthew Carter for TED conference
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Created for Savannah College of Art and Design

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CONTENTS

Design as Art

Pages 17-26, 44-45 from Design as Art

Excerpts from the articles by Bruno Munari exploring the role of design in everyday life, arguing that good design should be functional, accessible, and artistic.

Design as Art

Ch. 1

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I have therefore very gladly accepted the proposal that I should bring together in a volume the articles I originally published in the Milanese paper Il Giorno. To these I have added other texts, as well as a lot of

illustrations which it was not possible to publish in the limited space of a daily paper. I have also made a few essential changes for the English edition. I hope that other designers will make similar efforts to spread knowledge of our work, for our methods are daily asserting themselves as the fittest way of gaining the confidence of men at large, and of giving a meaning to our present way of life.

Design came into being in 1919, when Walter Gropius founded the Bauhaus at Weimar. Part of the prospectus of this school reads:

'We know that only the technical means of artistic achievement can be taught, not art itself. The function of art has in the past been given a formal importance which has severed it from our daily life; but art is always present when a people lives sincerely and healthily. 'Our job is therefore to invent a new system of education that may lead -by way of a new kind of specialized teaching of science and technology - to a complete knowledge of human needs and a universal awareness of them. 'Thus our task is to make a new kind of artist, a creator capable of understanding every kind of need: not because he is a prodigy, but because he knows how to approach human needs according to a precise method. We wish to make him conscious of his creative power, not scared of new facts, and independent of formulas in his own work.'

From that time on we have watched an ever more rapid succession of new styles in the world of art: abstract art, Dada, Cubism, Surrealism, NeoAbstract art, Neo-Dada, pop and op. Each one gobbles up its predecessor and we start right back at the beginning again.

When the objects we use every day and the surroundings we live in have become in themselves a work of art, then we s hall be able to say that we have achieved a balanced life.

What Gropius wrote is still valid. This first school of design did tend to make a new kind of artist, an artist useful to society because he helps society to recover its balance, and not to lurch between a false world to live one's material life in and an ideal world to take moral refuge in.

Designers and Stylists

Ch. 2

What is a designer?

He is a planner with an aesthetic sense.

Certain industrial products depend in large measure on him for their success. Nearly always the shape of a thing, be it a typewriter, a pair of binoculars, an armchair, a ventilator, a saucepan or a refrigerator, will have an important effect on sales: the better designed it is, the more it will sell.

The term 'designer' was first used in this sense in America. ~~It does not refer to an industrial designer~~, who designs machines or mechanical parts, workshops or other specialized buildings. *He is in fact a design engineer*, and if he has a motor-scooter on the drawing-board he does not give a great deal of importance to the aesthetic side of things, or at the most he applies a personal idea of what a motor-scooter ought to look like. I once asked an engineer who had designed a motor-scooter why he had chosen a particular colour, and he said:

because it was the cheapest.

The industrial designer therefore thinks of the aesthetic side of the job as simply a matter of *providing a finish*, and although this may be most scrupulously done he avoids ~~aesthetic problems that are bound up with contemporary culture~~ because such things are not considered useful. An engineer must never be caught writing poetry. The designer works differently. He *gives the right weight to each part* of the project in hand, and he knows that the *ultimate form of the object is psychologically vital* when the potential buyer is making up his mind. He therefore tries to give it *a form as appropriate as possible to its function, a form that one might say arises spontaneously from the function,* from the mechanical part (when there is one), from the most appropriate material, from the most up-to-date production techniques, from a calculation of costs, and from other psychological and aesthetic factors.

In the early days of rationalism it used to be said that *an object was beautiful in so far as it was functional,* and only the most practical functions were taken into account. Various kinds of tool were used as evidence for this argument, such as surgical instruments. Today we do not think in ~~terms of beauty~~ but of *formal coherence*, and even the 'decorative' function of the object is thought of as a psychological element. For beauty in the abstract may be defined as what is called style, with the consequent need to *force everything into a given style because it is new*. Thus in the recent past we have had the aerodynamic style, which has been applied not only to aeroplanes and cars but to electric irons, perambulators and armchairs. On one occasion I even saw an aerodynamic hearse, which is about as far as the aerodynamic style can go (speeding the departing guest?).

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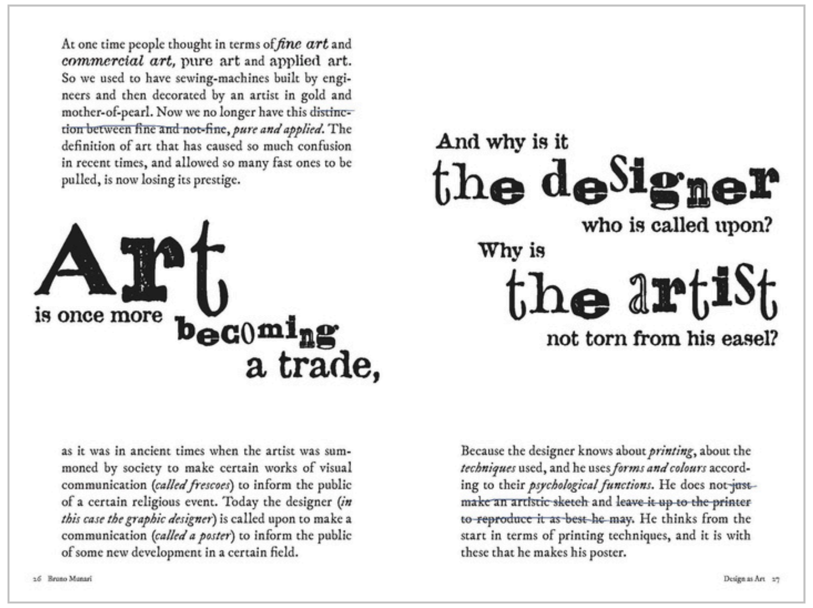
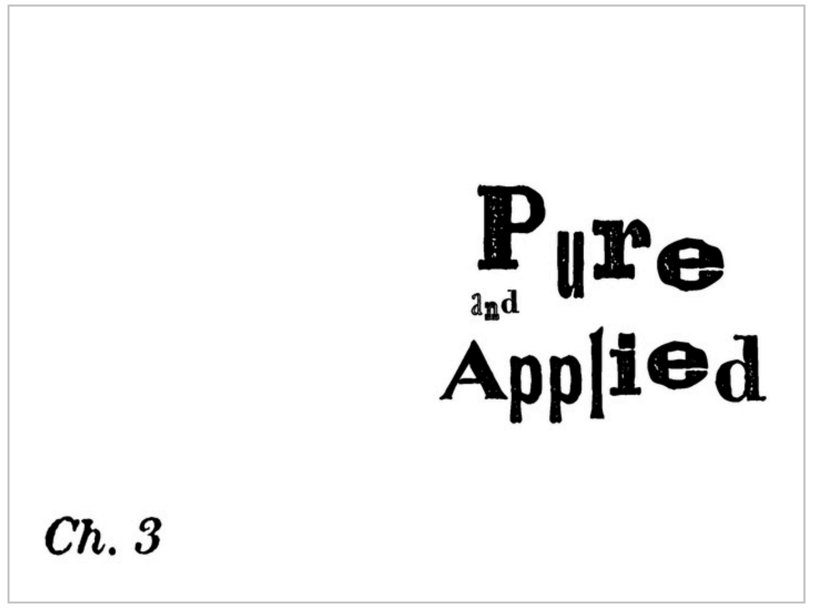
A leaf has the form it has because it belongs to a certain tree and fulfils a certain function; its structure is determined by the veins which carry the sap, and the skeleton that supports it might have been worked out by mathematics. Even so, there are many kinds of leaf, and the leaves of any single tree differ slightly among themselves. But if we saw a fig-leaf on a weeping-willow we would have the feeling that all was not well. It would lack coherence. A leaf is beautiful not because it is stylish but because it is natural, created in its exact form by its exact function. A designer tries to make an object as naturally as a tree puts forth a leaf. He does not smother his object with his own personal taste but tries to be objective.

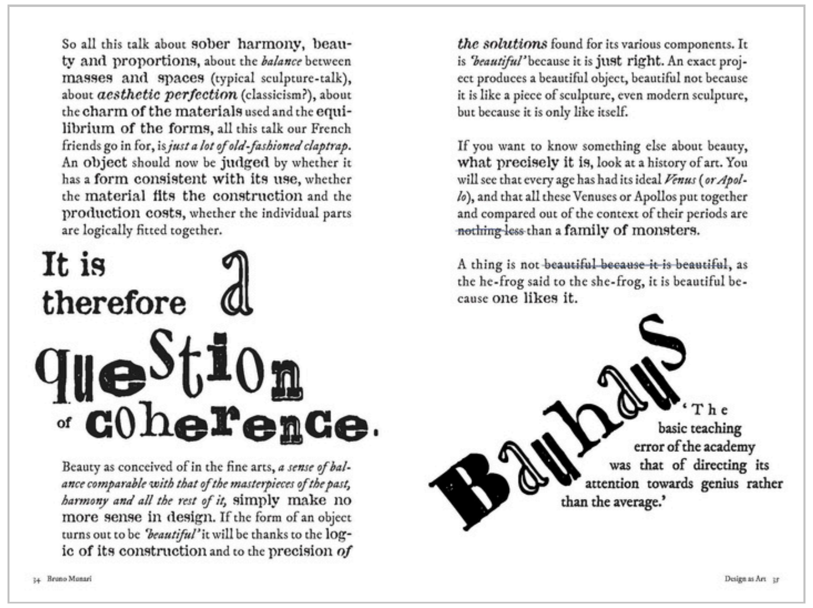
He helps the object, if I may so put it, to make itself by its own proper means, so that a ventilator comes to have just the shape of a ventilator, a fiasco for wine has the shape that blown glass gives it, as a cat is inevitably covered with cat-fur. Each object takes on its own form. But of course this will not be ~~fixed and final~~ because techniques change, new materials are discovered, and with *every innovation the problem arises again* and the form of the object may change.

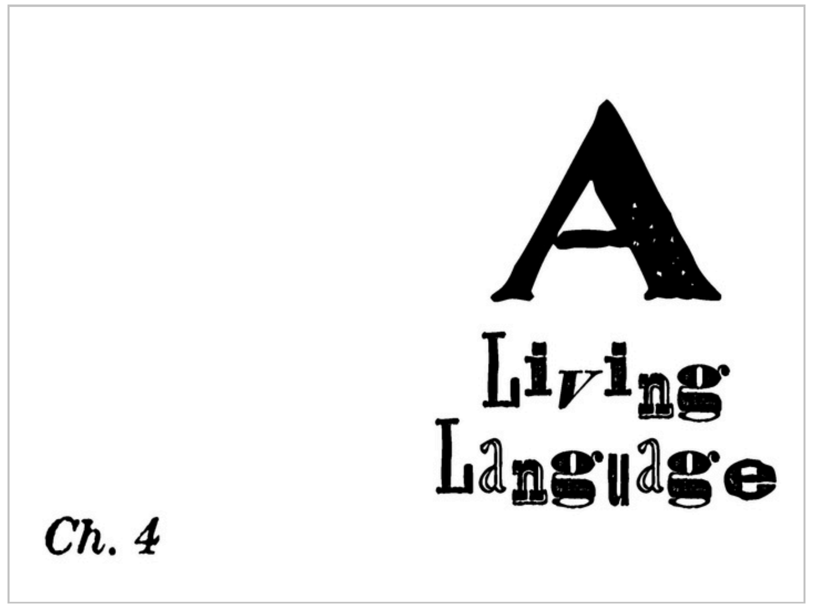

And why is it
the designer
who is called upon?
Why is
the artist
not torn from his easel?
Art
is once more
becoming
a trade,

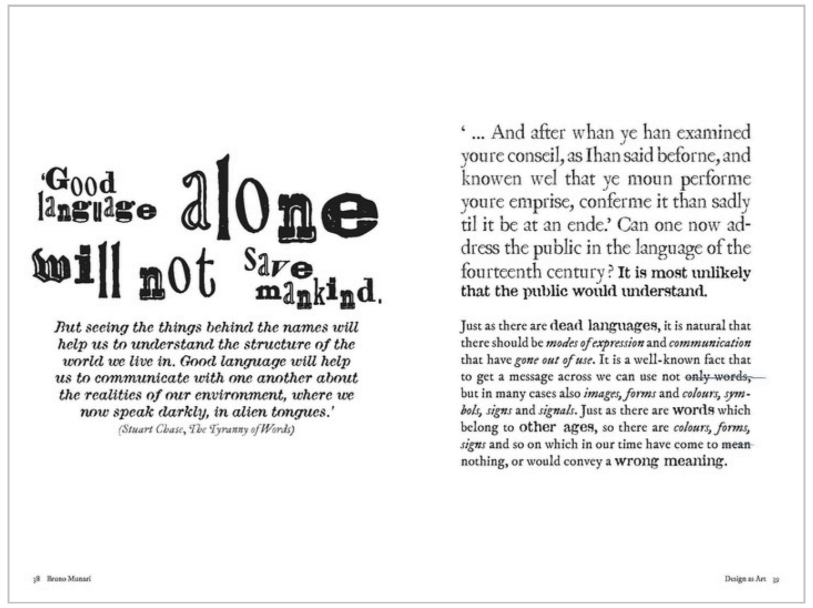

The designer
Visual design
Industrial design
Graphic design
Research design
'The form follows the function.'
(Jean-Baptiste Lamarck)

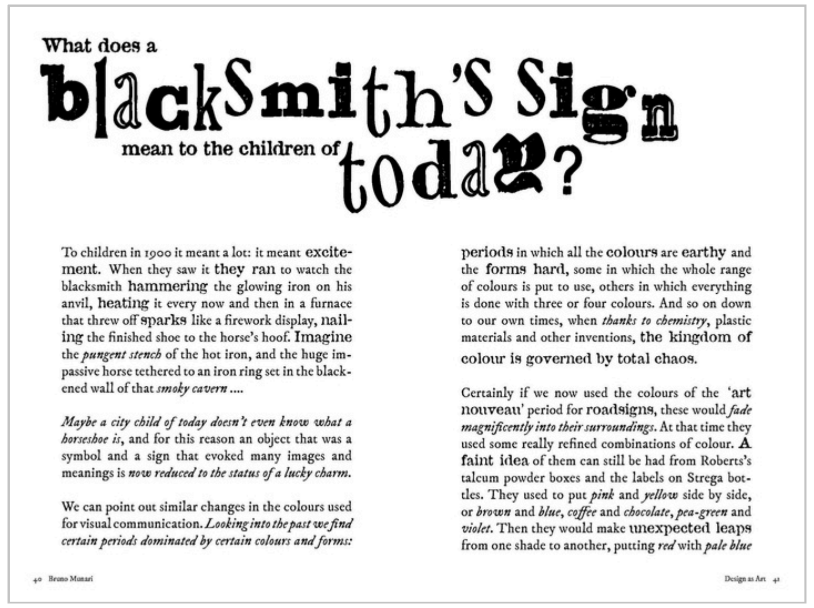

Pure
and
Applied
Ch. 3

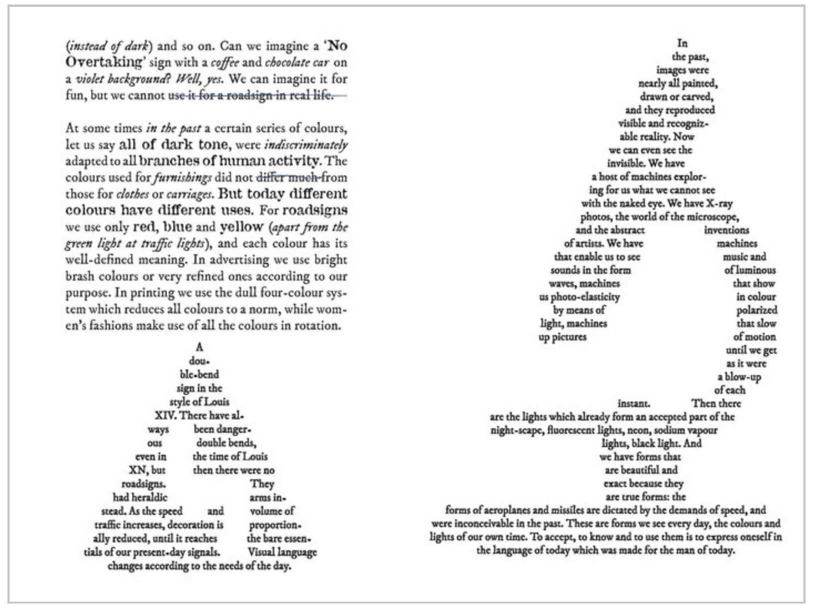

Once upon a time
What then is this thing called Design if it is neither style nor applied art?

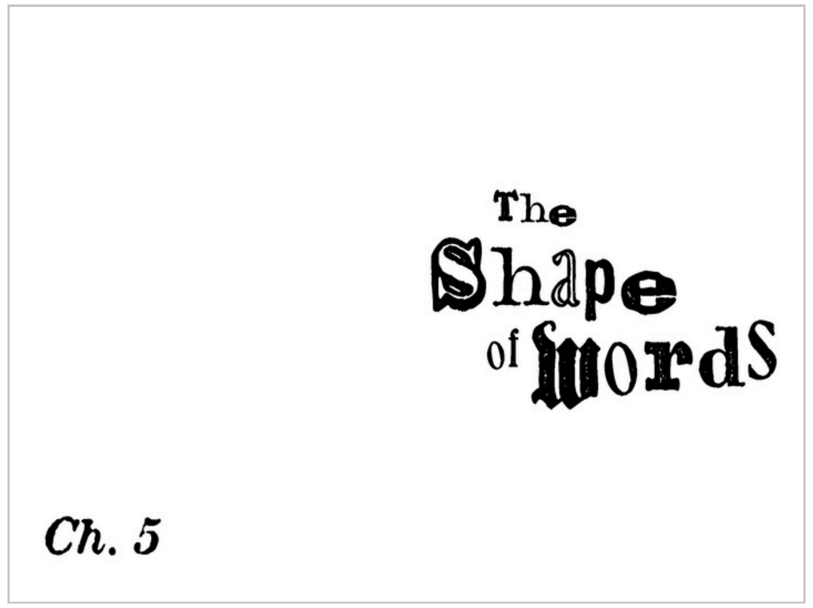

It is therefore a question of coherence.
Bauhaus

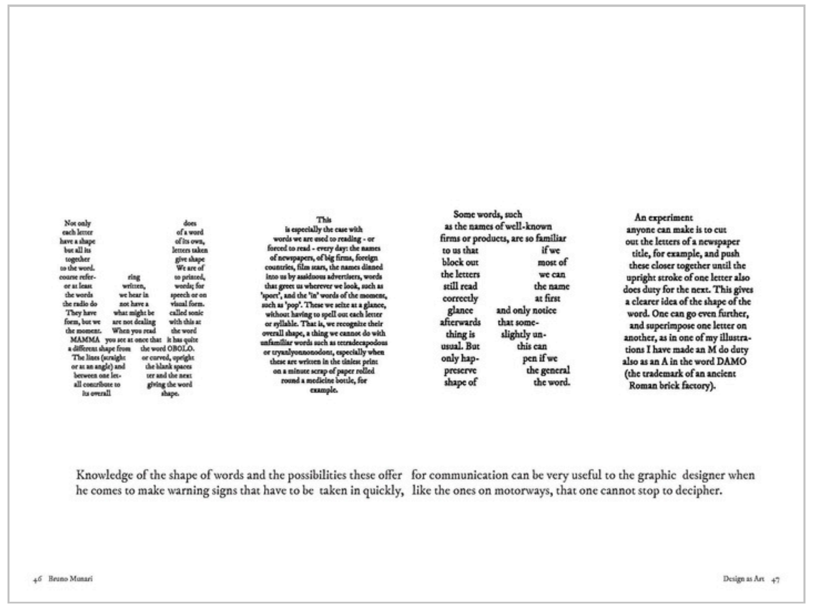

A
Living
Language
Ch. 4

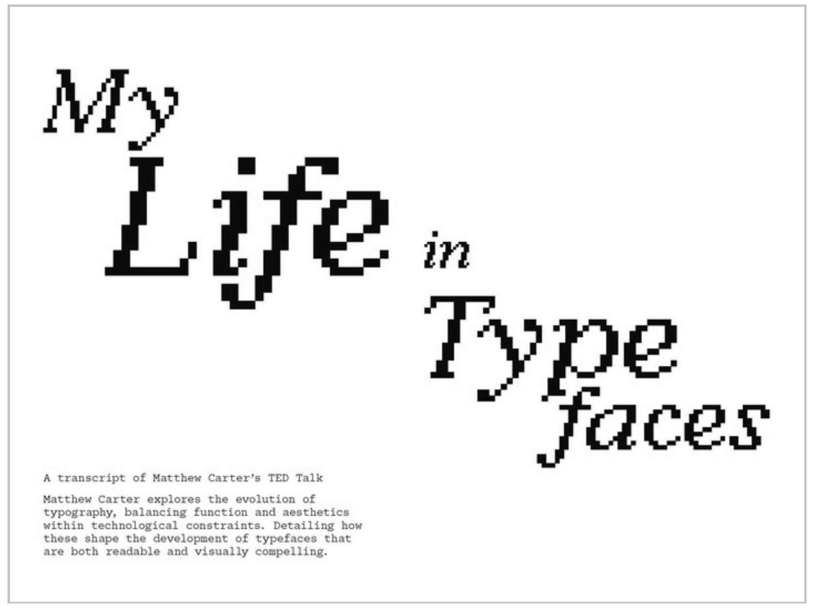

'Good language alone will not save mankind.


What does a
blacksmith's Sign
mean to the children of
today?




The
Shape
of Words
Ch. 5




My
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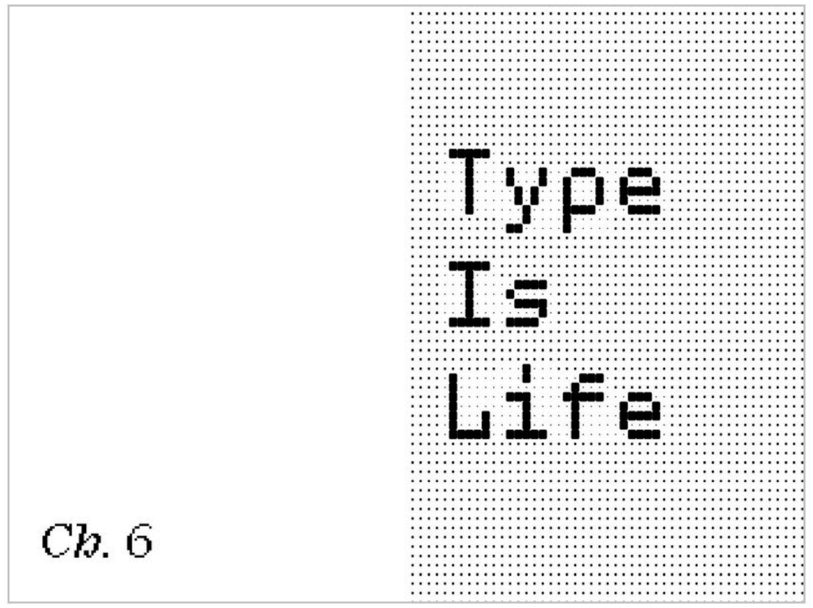
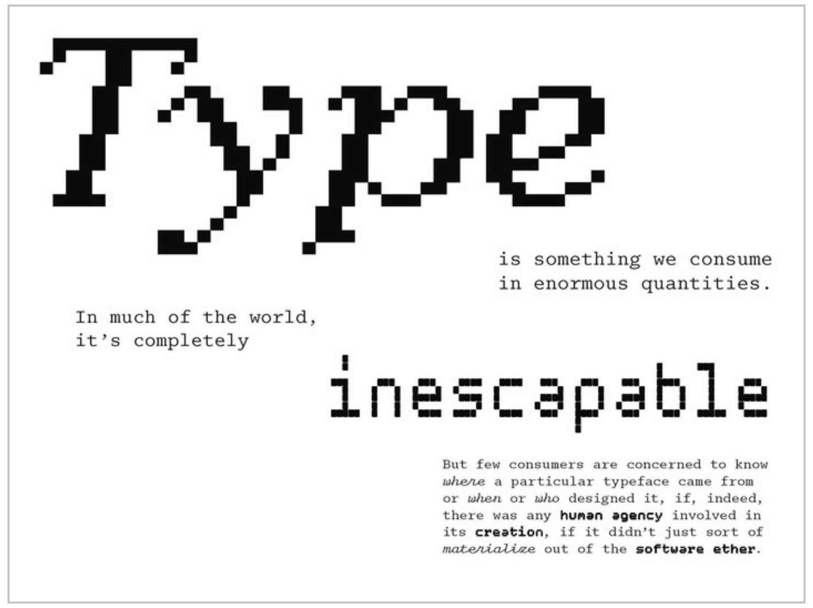

Type
Is
Life

Ch. 6

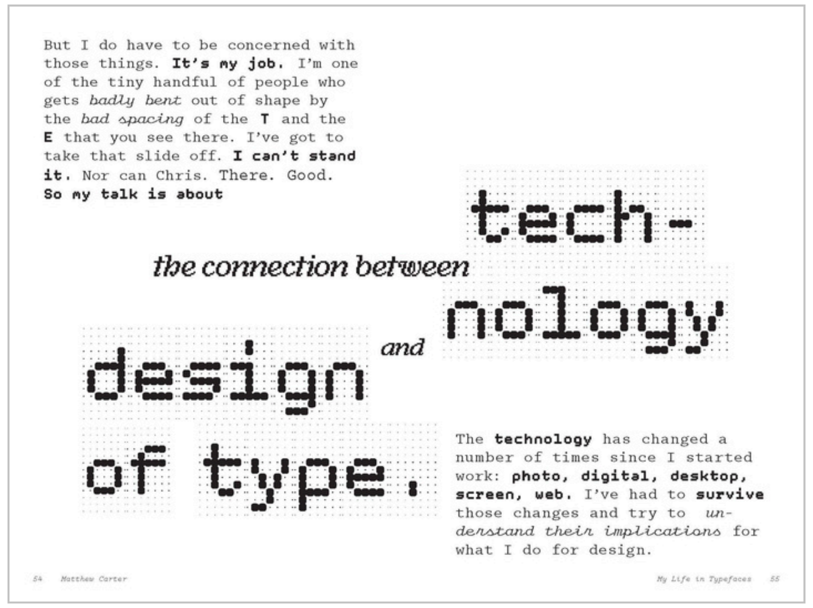

Type

is something we consume
in enormous quantities.

In much of the world,
it's completely

inescapable

But few consumers are concerned to know *where* a particular typeface came from or *when* or *who* designed it, if, indeed, there was any **human agency** involved in its **creation**, if it didn't just sort of *materialize* out of the **software ether**.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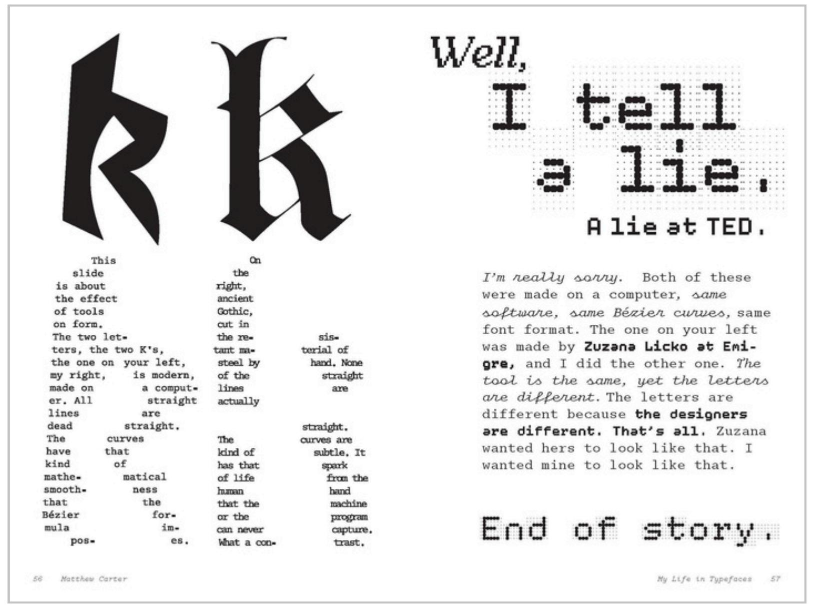
The **technology** has changed a number of times since I started work: **photo, digital, desktop, screen, web.** I've had to **survive** those changes and try to *understand their implications* for what I do for design.

54 Matthew Carter

My Life in Typefaces 55


This
slide
is about
the effect
of tools
on form.
The two let-
ters, the two K's,
the one on your left,
my right, is modern,
made on a comput-
er. All straight
lines are
dead straight.
The curves
have that
kind of
mathe- matical
smooth- ness
that the
Bézier for-
mula im-
pos- es.

On
the
right,
ancient
Gothic,
cut in
the re- sis-
tant ma- terial of
steel by hand. None
of the straight
lines are
actually
straight.
The curves are
kind of subtle. It
has that spark
of life from the
human hand
that the machine
or the program
can never capture.
What a con- trast.

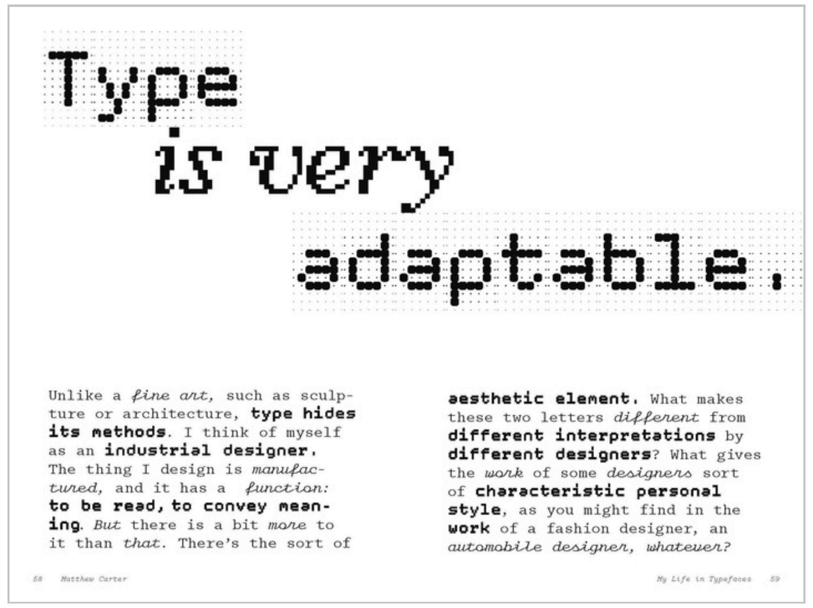
Well,
I tell
a lie.
A lie at TED.

I'm really sorry. Both of these were made on a computer, *same software, same Bézier curves,* same font format. The one on your left was made by **Zuzana Licko at Emigre,** and I did the other one. *The tool is the same, yet the letters are different.* The letters are different because **the designers are different. That's all.** Zuzana wanted hers to look like that. I wanted mine to look like that.

End of story.

56 Matthew Carter

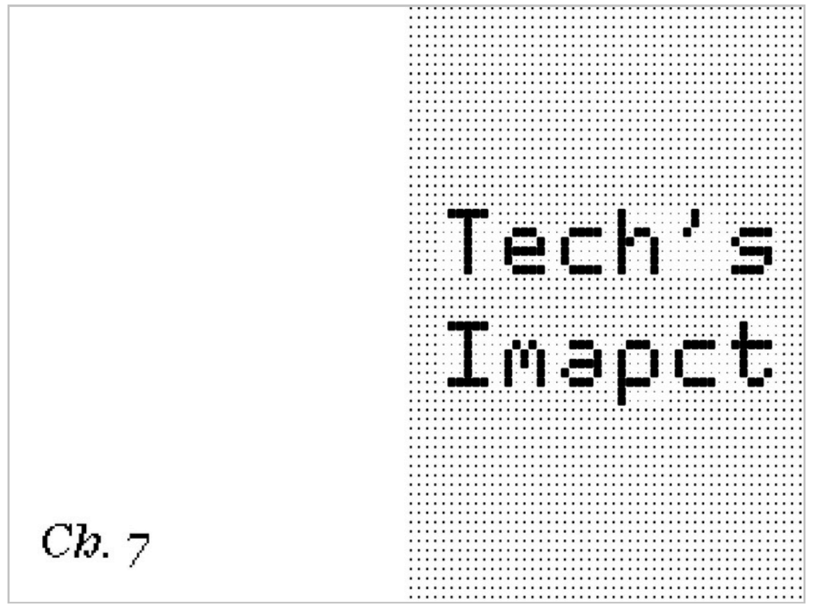
My Life in Typefaces 57


Type
is very
adaptable.

Unlike a *fine art,* such as sculpture or architecture, **type hides its methods**. I think of myself as an **industrial designer**. The thing I design is *manufactured,* and it has a *function:* **to be read, to convey meaning**. *But* there is a bit *more* to it than *that*. There's the sort of **aesthetic element**. What makes these two letters *different* from **different interpretations** by **different designers**? What gives the *work* of some *designers* sort of **characteristic personal style**, as you might find in the **work** of a fashion designer, an *automobile designer, whatever?*

58 Matthew Carter

My Life in Typefaces 59


Tech's
Imapct

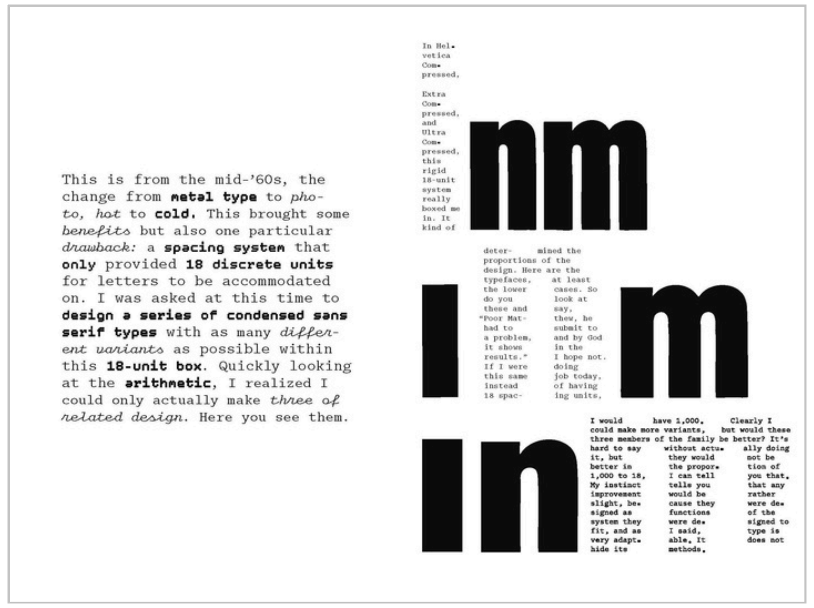
Ch. 7


There *have been* some cases, **I admit,**
where *I as a designer* **did**

Feel
the influence of
technology

62 Matthew Carter

My Life in Typefaces 63


This is from the mid-'60s, the change from **metal type** to *photo, hot* to **cold.** This brought some *benefits* but also one particular *drawback:* a **spacing system** that **only** provided **18 discrete units** for letters to be accommodated on. I was asked at this time to **design a series of condensed sans serif types** with as many *different variants* as possible within this **18-unit box**. Quickly looking at the **arithmetic**, I realized I could only actually make *three of related design*. Here you see them.

In Helvetica Compressed, Extra Compressed, and Ultra Compressed, this rigid 18-unit system really boxed me in. It kind of

nm

deter- mined the
proportions of the
design. Here are the
typefaces, at least
the lower cases. So
do you look at
these and say,
"Poor Mat- thew, he
had to submit to
a problem, and by God
it shows in the
results." I hope not.
If I were doing
this same job today,
instead of having
18 spac- ing units,

I m

In

I would have 1,000. Clearly I
could make more variants, but would these
three members of the family be better? It's
hard to say without actu- ally doing
it, but they would not be
better in the propor- tion of
1,000 to 18. I can tell you that.
My instinct tells you that any
improvement would be rather
slight, be- cause they were de-
signed as functions of the
system they were de- signed to
fit, and as I said, type is
very adapt- able. It does not
hide its methods.

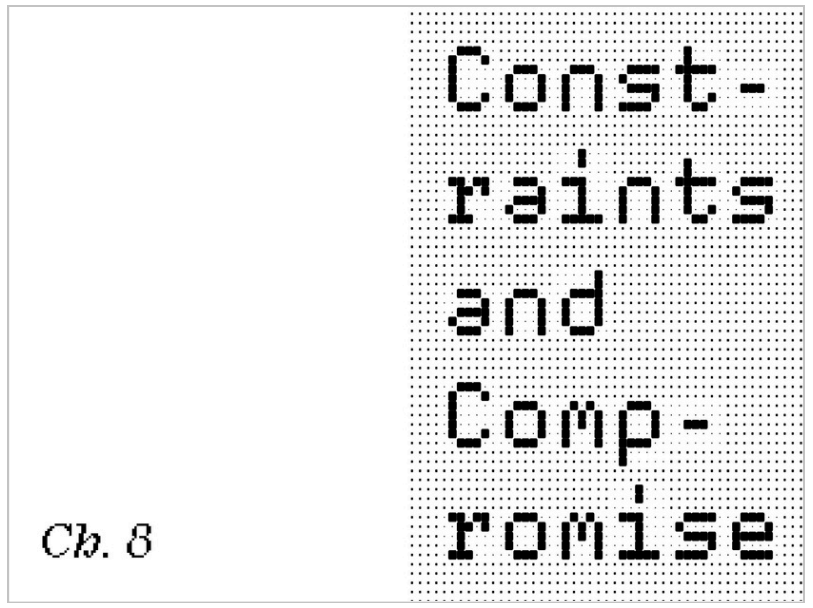

All industrial designers work
within constraints.

This
is not
fine art.

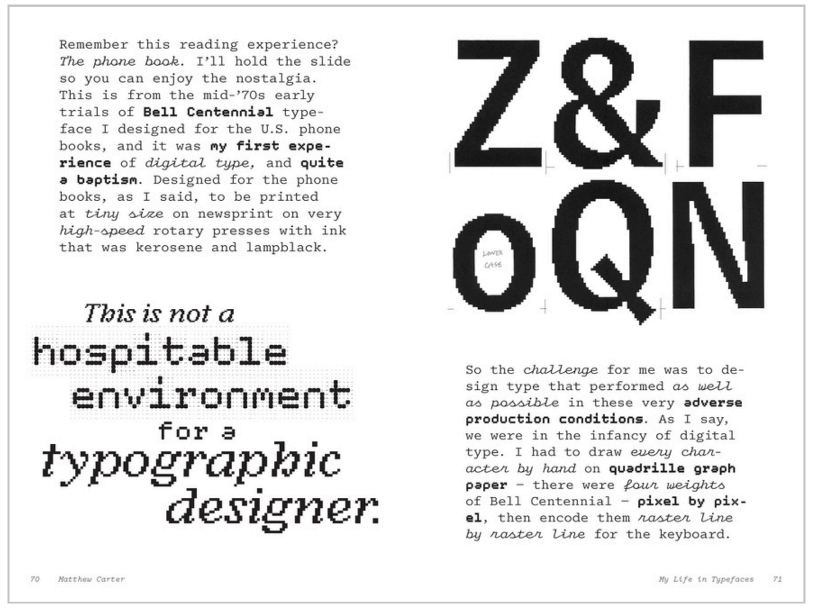
The question is, does a **constraint** force a *compromise?* By *accepting* a constraint, are you working to a *lower standard?* **I don't believe so**, and I've always been encouraged by something that *Charles Eames* said. He said he was **conscious of working** *within constraints,* but **not** *of making compromises.* The **distinction** between a *constraint* and a *compromise* is obviously *very subtle,* but it's **very central** to my attitude to work.

66 Matthew Carter

My Life in Typefaces 67


Const-
raints
and
Comp-
romise

Ch. 8


Remember this reading experience? *The phone book.* I'll hold the slide so you can enjoy the nostalgia. This is from the mid-'70s early trials of **Bell Centennial** typeface I designed for the U.S. phone books, and it was **my first experience** of *digital type,* and **quite a baptism**. Designed for the phone books, as I said, to be printed at *tiny size* on newsprint on very *high-speed* rotary presses with ink that was kerosene and lampblack.

This is not a
hospitable
environment
for a
typographic
designer.

Z&F
oQN

So the *challenge* for me was to design type that performed *as well as possible* in these very **adverse production conditions**. As I say, we were in the infancy of digital type. I had to draw *every character by hand* on **quadrille graph paper** – there were *four weights* of Bell Centennial – **pixel by pixel**, then encode them *raster line by raster line* for the keyboard.

70 Matthew Carter

My Life in Typefaces 71


BEL,.:''-;
akifujenb
12543608

It took two years, but I learned a lot. These letters look as though they've been **chewed by the dog** or *something or other,* but the **missing pixels** at the *intersections of strokes* or in the crotches are the result of my *studying* the *effects* of **ink spread** on **cheap paper** and **reacting**, revising the font accordingly. These *strange artifacts* are designed to **compensate** for the **undesirable effects** of *scale and production process.*

72 Matthew Carter

My Life in Typefaces 73

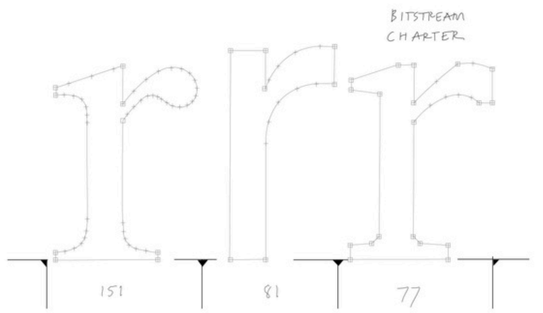
At the outset, AT&T had wanted to set the phone books in **Helvetica**, but as my friend Erik Spiekermann said in the Helvetica movie, if you've seen that, the letters in Helvetica were *designed to be as similar to one another as possible*. **This is not** the recipe for *legibility at small size*. It looks very elegant up on a slide. I had to **disambiguate** these *forms* of the *figures* as much as possible in **Bell Centennial** by sort of opening the shapes up, as you can see in the bottom part of that slide.

Helvetica

1235689

Bell Centennial

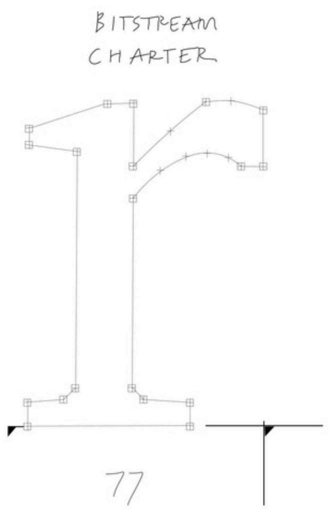
1235689



So now we're on to the *mid-'80s*, the early days of **digital outline fonts**, *vector technology*. There was an issue at that time with the **size** of the fonts, the amount of *data* that was **required** to find and *store* a font in **computer memory**. It **limited** the number of fonts you could get on your **typesetting system** at any one time. I did an *analysis* of the data, and found that a typical *serif face* you see on the left needed nearly **twice** as much data as a *sans serif* in the middle because of all the **points** required to **define** the *elegantly curved serif brackets*. The **numbers** at the bottom of the slide, by the way, they represent the amount of **data needed** to store each of the fonts. So the *sans serif, in the middle, sans the serifs,* was much more economical, **81 to 151**.

"Aha,"
I thought.
"The engineers
have a problem,
Designer
to the
rescue."

I made a *serif type*, you can see it on the right, **without curved serifs**. I made them **polygonal**, out of straight line segments, *chamfered brackets*. And look, as **economical** in data as a *sans serif*. We call it **Charter**, on the right.



So I went to the head of engineering with my numbers, and I said proudly,

File Edit Insert People

the designer: I have solved your problem

the engineer: Oh. What problem?

the designer: Well, you know, the problem of the huge data you require for serif fonts ad so on.

the engineer: Oh. We solved that problem last week. We wrote a compaction routine that reduces the size of all fonts by an order of magnitude. You can have as many fonts on your system as you like.

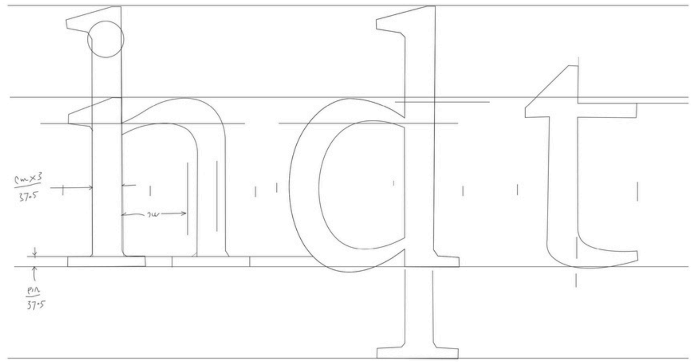
the designer: Well, thank you for letting me know.

A A ^v A ^A B I U link

Foiled again. I was left with a design solution for a nonexistent technical problem.

Ch. 9

From Print to Screen



You know, engineers are *very smart*, and despite **occasional frustrations** because I'm less smart, I've always enjoyed working with them and learning from them. Apropos, in the *mid-'90s*, I started talking to Microsoft about **screen fonts.** Up to that point, all the fonts on screen had been **adapted** from previously *existing printing fonts*, of course. But Microsoft foresaw correctly the movement, the **stampede** towards *electronic communication*, to reading and writing **on screen** with the **printed output** as being sort of *secondary in importance*.

So the **priorities** were just tipping at that point. They wanted a **small core set of fonts** that *were not adapted* but **designed** for the screen to face up to the problems of screen, which were their **coarse resolution displays.** I said to Microsoft,

a typeface
for a particular
technology
is a self-
obsoleting
typeface.

I've designed **too many faces** in the past that were intended to *mitigate technical problems*. Thanks to the **engineers**, the technical problems *went away*. **So did my typeface.**

It was only a **stopgap.** Microsoft came back to say that *affordable computer* monitors with **better resolutions** were **at least** a decade away. So I thought, well, *a decade,* that's *not bad,* that's more than a **stopgap.**

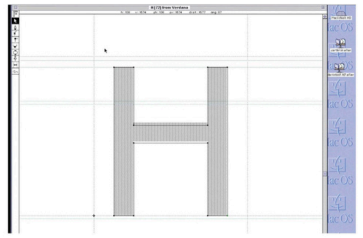
Verdana
Latin ABCDEFGHIJKLMNO
PQRSTUVWXYZ&abcdefghi
jklmnopqrstuvwxyzæœfifl
1234567890$¢£ƒ¥@%#+
Greek ΑΒΓΔΕΖΗΘΙΚΛΜΝΞ
ΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλ

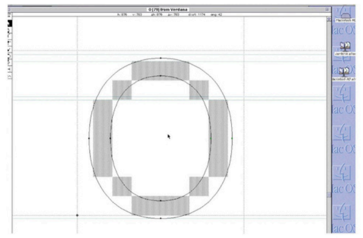
So I was *persuaded*, I was **convinced**, and we went to work on what became **Verdana** and **Georgia**, for the first time working *not on paper* but **directly** onto the screen from **the pixel up.**

Ch. 10

The Future of Type-Faces

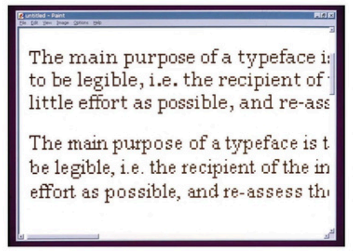
At that time, screens were **binary.** The pixel was either **on** or it was **off.** Here you see the outline of a letter, *the cap H*, which is the thin black line, **the contour**, which is how it is stored in memory, *superimposed on the bitmap*, which is the grey area, which is how it's displayed on the screen. The bitmap is **rasterized** from the outline. Here in a cap H, which is all straight lines, the two are in *almost perfect sync* on the **Cartesian grid.**



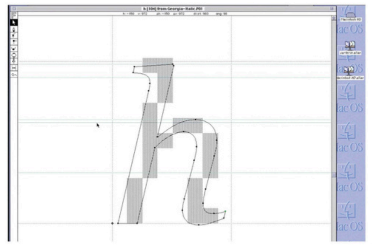


Not so with *an O*. This looks more like **bricklaying** than type design, but believe me, this is a *good bitmap O*, for the simple reason that it's **symmetrical** in both **x and y axes**. In a binary bitmap, you actually can't ask for more than that. I would sometimes make, I don't know, *three or four different versions* of a difficult letter like a **lowercase A**, and then stand back to choose which was the best. Well, **there was no best,** so the

designer's *judgment* comes in trying to decide which is **the least bad**. Is that a *compromise?* **Not to me**, if you are working at the highest standard the technology will allow, although that standard may be well short of the ideal. You may be able to see on this slide two different bitmap fonts there. *The "a"* in the **upper one,** I think, is better than *the "a"* in the **lower one,** but it still ain't great. You can maybe see the effect better if it's *reduced*. Well, maybe not.

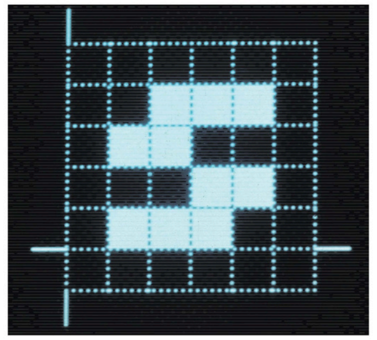


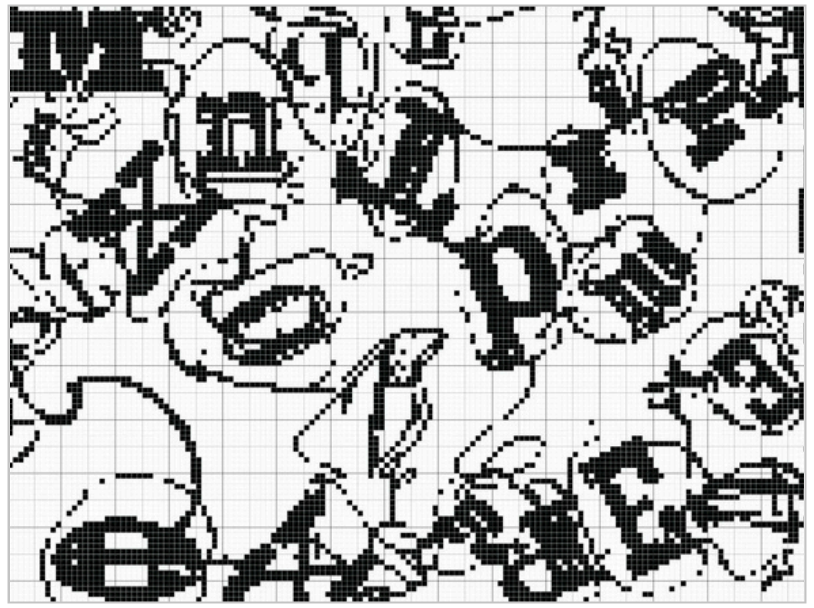
So I'm a pragmatist, not an idealist, out of necessity.



For a certain kind of *temperament*, there is a certain kind of **satisfaction** in doing something that *cannot be perfect* but can still be done to the **best of your ability.** Here's the *lowercase H* from Georgia Italic. The bitmap looks **jagged** and **rough**. It is jagged and rough. But I discovered, *by experiment*, that there is an **optimum slant** for an italic on a screen so the strokes break well at the **pixel boundaries.** Look in this example how, rough as it is, how the left and right legs actually break at the same level. **That's a victory.** *That's good,* right there. And of course, at the lower depths, you don't get much choice.

This is *an S*, in case you were wondering. Well, it's **been 18 years** now since Verdana and Georgia were released. Microsoft were *absolutely right*, it took a good 10 years, but screen displays now do have **improved spatial resolution,** and very much improved *photometric resolution* thanks to anti-aliasing and so on. So now that their **mission is accomplished**, has that meant the *demise of the screen fonts* that I designed for **coarser displays** back then? Will they outlive the **now-obsolete** screens and the flood of new web fonts coming on to the market? Or have they established *their own* sort of *evolutionary niche* that is independent of technology? In other words, have they been absorbed into the **typographic mainstream**? I'm not sure, but they've had a good run so far. Hey, 18 is a good age for anything with present-day rates of attrition, **so I'm not complaining.**





References Used in Part 1

Munari, Bruno. "Design as Art, Designers and Stylists : What Is a Designer?; Pure and Applied ; A Living Language, The Shape of Words." Design as Art, Penguin Global, 2009.

References Used in Part 2

Carter, Matthew. "My Life in Typefaces." TED, www.ted.com/talks/matthew_carter_my_life_in_typefaces. Accessed 21 Apr. 2025. Video Transcript and presentation images

Concept, design, printing, and binding by Julia Birn.

Text from Design as Art by Bruno Munari is typeset in the following typefaces:

Altacalifornia Regular
Attic Antique Regular
P22 Franklin Caslon Regular
IM Fell DW Pica Roman Regular and Italic

Text from My Life in Typefaces by Matthew Carter is typeset in the following typefaces:

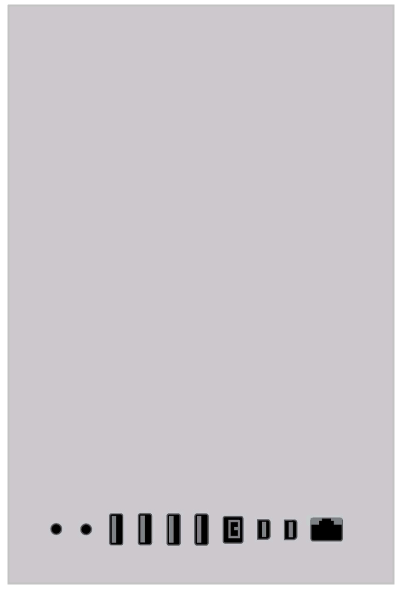
Argent Pixel CF Italic
Gridlite PE Variable Halfway Bold Square
Logic Monospace Regular and Italic

Body text is 14pt with 16.8pt leading. Display text, headings, and subheading appears in various sizes.

Printed and bound by hand in Guam, April 2025.

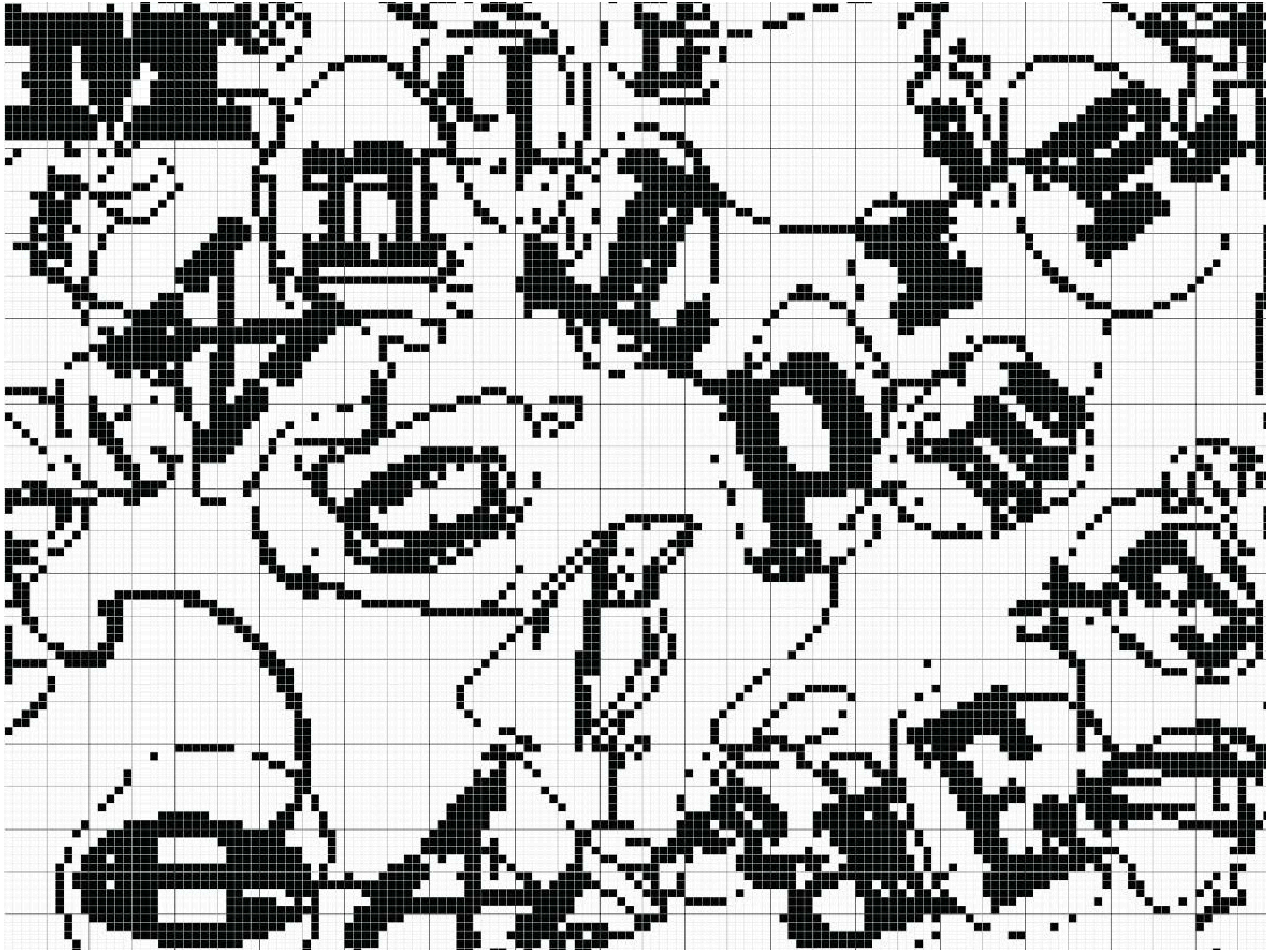
Paper: 90 lbs. 160 gsm index.
Cover: 90 lbs. 160 gsm index and transparency film.
Coptic bound with exposed spine stitching.

Designed using Adobe InDesign and Illustrator.
Used for educational and non-commercial purposes.



The Art of Limits

For my sweet boy – you are gone, but deeply loved and missed. You were wanted for felonious mischief, but never caught.



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My Life in Typefaces by Matthew Carter for TED conference
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Created for Savannah College of Art and Design

The Art of Limits

My life in Typefaces - Matthew Carter
Design as Art - Bruno Munari
The Art of Limits - Julia Birn

CONTENTS

Design as Art

Pages 17-26, 44-45 from Design as Art

Excerpts from the articles by Bruno Munari exploring the role of design in everyday life, arguing that good design should be functional, accessible, and artistic.

Design as Art

Ch. 1

Today it has become necessary to demolish the myth of the 'star' artist who only produces masterpieces for a small group of ultra-intelligent people. It must be understood that as long as art stands aside from the problems of life it will only interest a very few people.

Culture today is becoming

a mass affair,

and the artist must step down from his pedestal and be prepared to make a sign for a butcher's shop (if he knows how to do it). The artist must cast off the last rags of romanticism and become active as a man among men, well up in present-day techniques, materials and working methods. Without losing his innate aesthetic sense he must be able to respond with humility and competence to the demands his neighbours may make of him.

The designer of today re-establishes the long-lost contact between art and the public, between living people and art as a living thing. Instead of pictures for the drawing-room, electric gadgets for the kitchen. There should be no such thing as art divorced from life, with beautiful things to look at and hideous things to use. If what we use every day is made with art, and not thrown together by chance or caprice, then we shall have nothing to hide.

Anyone working in the field of design has a hard task ahead of him: to clear his neighbour's mind of all preconceived notions of art and artists, notions picked up at schools where they condition you to think one way for the whole of your life, without stopping to think that life changes - and today more rapidly than ever. It is therefore up to us designers to make known our working methods in clear and simple terms, the methods we think are the truest, the most up-to-date, the most likely to resolve our common aesthetic problems. Anyone who uses a properly designed object feels the presence of an artist who has worked for him, bettering his living conditions and encouraging him to develop his taste and sense of beauty.

When we give
a place
of honour in the drawing-room
to an ancient Etruscan vase
which we consider beautiful,
well proportioned and made
with precision and economy,
we must also remember that
the vase once had an
extremely common use. Most
probably it was used for
cooking-oil. It was made by a
designer of those times, when
art and life went hand in
hand and there was no
such thing as a work
of art to look at
and just any
old
thing to
use.

I have therefore very gladly accepted the proposal that I should bring together in a volume the articles I originally published in the Milanese paper Il Giorno. To these I have added other texts, as well as a lot of illustrations which it was not possible to publish in the limited space of a daily paper. I have also made a few essential changes for the English edition. I hope that other designers will make similar efforts to spread knowledge of our work, for our methods are daily asserting themselves as the fittest way of gaining the confidence of men at large, and of giving a meaning to our present way of life.

Design came into being in 1919, when Walter Gropius founded the Bauhaus at Weimar. Part of the prospectus of this school reads:

'We know that only the technical means of artistic achievement can be taught, not art itself. The function of art has in the past been given a formal importance which has severed it from our daily life; but art is always present when a people lives sincerely and healthily. 'Our job is therefore to invent a new system of education that may lead -by way of a new kind of specialized teaching of science and technology - to a complete knowledge of human needs and a universal awareness of them.

'Thus our task is to make a new kind of artist, a creator capable of understanding every kind of need: not because he is a prodigy, but because he knows how to approach human needs according to a precise method. We wish to make him conscious of his creative power, not scared of new facts, and independent of formulas in his own work.'

From that time on we have watched an ever more rapid succession of new styles in the world of art: abstract art, Dada, Cubism, Surrealism, NeoAbstract art, Neo-Dada, pop and op. Each one gobbles up its predecessor and we start right back at the beginning again.

What Gropius wrote is still valid. This first school of design did tend to make a new kind of artist, an artist useful to society because he helps society to recover its balance, and not to lurch between a false world to live one's material life in and an ideal world to take moral refuge in.

When the objects we use every day and the surroundings we live in have become in themselves a work of art, then we s hall be able to say that we have achieved a balanced life.

Designers and Stylists

Ch. 2

What is a designer?

He is a planner with an aesthetic sense.

Certain industrial products depend in large measure on him for their success. Nearly always the shape of a thing, be it a typewriter, a pair of binoculars, an armchair, a ventilator, a saucepan or a refrigerator, will have an important effect on sales: the better designed it is, the more it will sell.

The term '**designer**' was first used in this sense in America. ~~It does not refer to an industrial designer~~, who designs machines or mechanical parts, workshops or other specialized buildings. *He is in fact a design engineer*, and if he has a motor-scooter on the drawing-board he does not give a great deal of importance to the aesthetic side of things, or at the most he applies a personal idea of what a motor-scooter ought to look like. I once asked an engineer who had designed a motor-scooter why he had chosen a particular colour, and he said:

because it was the cheapest.

The **industrial designer** therefore thinks of the aesthetic side of the job as simply a matter of *providing a finish*, and although this may be most scrupulously done he avoids ~~aesthetic problems that are bound up with contemporary culture~~ because such things are not considered useful. An **engineer** must never be caught writing poetry. The **designer** works differently. He *gives the right weight to each part* of the project in hand, and he knows that the *ultimate form of the object is psychologically vital* when the potential buyer is making up his mind. He therefore tries to give it *a form as appropriate as possible to its function, a form that one might say arises spontaneously from the function,* from the mechanical part (when there is one), from the most appropriate material, from the most up-to-date production techniques, from a calculation of costs, and from other psychological and aesthetic factors.

In the early days of rationalism it used to be said that *an object was beautiful in so far as it was functional,* and only the most practical functions were taken into account. Various kinds of tool were used as evidence for this argument, such as surgical instruments. Today we do not think in ~~terms of beauty~~ but of *formal coherence*, and even the 'decorative' function of the object is thought of as a psychological element. For beauty in the abstract may be defined as what is called style, with the consequent need to *force everything into a given style because it is new*. Thus in the recent past we have had the aerodynamic style, which has been applied not only to aeroplanes and cars but to electric irons, perambulators and armchairs. On one occasion I even saw an aerodynamic hearse, which is about as far as the aerodynamic style can go (speeding the departing guest?).

We have therefore discarded beauty in the abstract sense,

as something stuck on to the technical part of a thing, like a stylish car body or a decoration tastefully chosen from the work of some great artist. Instead we have formal coherence, rather as we see it in nature.

A leaf has the form it has because it belongs to a certain tree and fulfils a certain function; its structure is determined by the veins which carry the sap, and the skeleton that supports it might have been worked out by mathematics. Even so, there are many kinds of leaf, and the leaves of any single tree differ slightly among themselves.

But if we saw a fig-leaf on a weeping-willow we would have the feeling that all was not well. It would lack coherence. A leaf is beautiful not because it is stylish but because it is natural, created in its exact form by its exact function. A designer tries to make an object as naturally as a tree puts forth a leaf. He does not smother his object with his own personal taste but tries to be objective.

He helps the object, if I may so put it, to make itself by its own proper means, so that a ventilator comes to have just the shape of a ventilator, a fiasco for wine has the shape that blown glass gives it, as a cat is inevitably covered with cat-fur. Each object takes on its own form. But of course this will not be ~~fixed and final~~ because techniques change, new materials are discovered, and with *every innovation the problem arises again* and the form of the object may change.

At one time people thought in terms of *fine art* and *commercial art*, pure art and applied art. So we used to have sewing-machines built by engineers and then decorated by an artist in gold and mother-of-pearl. Now we no longer have this ~~distinction between fine and not-fine~~, *pure and applied*. The definition of art that has caused so much confusion in recent times, and allowed so many fast ones to be pulled, is now losing its prestige.

Art
is once more becoming a trade,

as it was in ancient times when the artist was summoned by society to make certain works of visual communication (*called frescoes*) to inform the public of a certain religious event. Today the designer (*in this case the graphic designer*) is called upon to make a communication (*called a poster*) to inform the public of some new development in a certain field.

And why is it
the designer
who is called upon?
Why is
the artist
not torn from his easel?

Because the designer knows about *printing*, about the *techniques* used, and he uses *forms and colours* according to their *psychological functions*. He does not ~~just make an artistic sketch~~ and ~~leave it up to the printer to reproduce it as best he may~~. He thinks from the start in terms of printing techniques, and it is with these that he makes his poster.

The designer is therefore the artist of today, not ~~because he is a genius~~ but because he works in such a way as to *re-establish contact between art and the public*, because he has the *humility and ability* to *respond to whatever demand is made of him by the society* in which he lives, because he knows his job, and the ways and means of solving each problem of design. And finally because he responds to the human needs of his time, and helps people to solve certain problems without stylistic preconceptions or false notions of artistic dignity derived from the schism of the arts.

'The form follows the function.'

(Jean-Baptiste Lamarck)

The designer

works in a vast sector of human activity:
there is visual design, industrial design, graphic design and research design.

Visual design

is concerned with images whose function is to communicate and inform visually:
signs, symbols, the meaning of forms and colours and the relations between these.

Industrial design

is concerned with functional objects, designed according to economic facts and the study of techniques and materials.

Graphic design

works in the world of the Press, of books, of printed advertisements, and everywhere the printed word appears, whether on a sheet of paper or a bottle.

Research design

is concerned with experiments of both plastic and visual structures in two or more dimensions. It tries out the possibilities of combining two or more dimensions, attempts to clarify images and methods in the technological field, and carries out research into images on film.

Pure and Applied

Ch. 3

Once upon a time

there was pure art and applied art (I prefer to use these terms, rather than ~~*'fine'*~~ and ~~*'commercial'*~~, because ~~'commercial art' does not really cover enough ground~~). At all events, forms were born in secret in ivory towers and fathered by divine inspiration, and Artists showed them only to initiates and only in the shape of paintings and pieces of sculpture: *for these were the only channels of communication open to the old forms of art.*

Around the person of the Artistic Genius there circulated other and lesser geniuses who absorbed the Pure Forms and the Style of the Master and attempted to give these some *currency by applying them to objects of everyday use.* This led to the making of *objects in this style or that style*, and even today the question of ~~Style has not been altogether disposed of.~~

The distinction between *pure art, applied art* and *industrial design* is still made in France, a country that at one time was the cradle of living art. What we call design, the French call 'esthetique industrielle', and by this phrase they mean *the application to industry of styles invented in the realm of the pure arts.*

It therefore comes about that in France they make *lamps inspired by abstract forms without bearing in mind that a lamp must give light.* They design a Surrealist television set, a Dada table, a piece of 'informal' furniture, forgetting that ~~all objects have their exact uses and well-defined functions~~, and that they are no longer ~~made by craftsmen modelling a stylish~~ shape in copper according to their whim of the moment but by automatic machines turning out thousands of the things at a time.

What then is this thing called Design if it is neither style nor applied art?

It is planning: the planning as objectively as possible of everything that goes to make up the surroundings and atmosphere in which men live today. *This atmosphere is created by all the objects produced by industry,* from glasses to houses and even cities. It is planning done without preconceived notions of style, attempting only to give each thing its *logical structure* and *proper material,* and in consequence *its logical form.*

So all this talk about sober harmony, beauty and proportions, about the *balance* between masses and spaces (typical sculpture-talk), about *aesthetic perfection* (classicism?), about the charm of the materials used and the equilibrium of the forms, all this talk our French friends go in for, is *just a lot of old-fashioned claptrap*. An object should now be judged by whether it has a form consistent with its use, whether the material fits the construction and the production costs, whether the individual parts are logically fitted together.

It is therefore a question of coherence.

Beauty as conceived of in the fine arts, *a sense of balance comparable with that of the masterpieces of the past, harmony and all the rest of it,* simply make no more sense in design. If the form of an object turns out to be *'beautiful'* it will be thanks to the logic of its construction and to the precision *of the solutions* found for its various components. It is *'beautiful'* because it is just right. An exact project produces a beautiful object, beautiful not because it is like a piece of sculpture, even modern sculpture, but because it is only like itself.

If you want to know something else about beauty, what precisely it is, look at a history of art. You will see that every age has had its ideal *Venus* (*or Apollo*), and that all these Venuses or Apollos put together and compared out of the context of their periods are ~~nothing less~~ than a family of monsters.

A thing is not ~~beautiful because it is beautiful~~, as the he-frog said to the she-frog, it is beautiful because one likes it.

Bauhaus

'The basic teaching error of the academy was that of directing its attention towards genius rather than the average.'

A Living Language

Ch. 4

'Good language alone will not save mankind.

But seeing the things behind the names will help us to understand the structure of the world we live in. Good language will help us to communicate with one another about the realities of our environment, where we now speak darkly, in alien tongues.'

(Stuart Chase, The Tyranny of Words)

' ... And after whan ye han examined youre conseil, as I han said beforne, and knowen wel that ye moun performe youre emprise, conferme it than sadly til it be at an ende.' Can one now address the public in the language of the fourteenth century? **It is most unlikely that the public would understand.**

Just as there are **dead languages**, it is natural that there should be *modes of expression* and *communication* that have *gone out of use*. It is a well-known fact that to get a message across we can use not ~~only words,~~ but in many cases also *images, forms* and *colours, symbols, signs* and *signals*. Just as there are **words** which belong to **other ages**, so there are *colours, forms, signs* and so on which in our time have come to ~~mean~~ nothing, or would convey a **wrong meaning**.

What does a blacksmith's sign mean to the children of today?

To children in 1900 it meant a lot: it meant excitement. When they saw it they ran to watch the blacksmith hammering the glowing iron on his anvil, heating it every now and then in a furnace that threw off sparks like a firework display, nailing the finished shoe to the horse's hoof. Imagine the *pungent stench* of the hot iron, and the huge impassive horse tethered to an iron ring set in the blackened wall of that *smoky cavern ....*

Maybe a city child of today doesn't even know what a horseshoe is, and for this reason an object that was a symbol and a sign that evoked many images and meanings is *now reduced to the status of a lucky charm.*

We can point out similar changes in the colours used for visual communication. *Looking into the past we find certain periods dominated by certain colours and forms:* periods in which all the colours are earthy and the forms hard, some in which the whole range of colours is put to use, others in which everything is done with three or four colours. And so on down to our own times, when *thanks to chemistry*, plastic materials and other inventions, the kingdom of colour is governed by total chaos.

Certainly if we now used the colours of the 'art nouveau' period for roadsigns, these would *fade magnificently into their surroundings*. At that time they used some really refined combinations of colour. A faint idea of them can still be had from Roberts's talcum powder boxes and the labels on Strega bottles. They used to put *pink* and *yellow* side by side, or *brown* and *blue*, *coffee* and *chocolate*, *pea-green* and *violet*. Then they would make unexpected leaps from one shade to another, putting *red* with *pale blue* (*instead of dark*) and so on. Can we imagine a '**No Overtaking**' sign with a *coffee* and *chocolate car* on a *violet background*? *Well, yes.* We can imagine it for fun, but we cannot ~~use it for a roadsign in real life.~~

At some times *in the past* a certain series of colours, let us say **all of dark tone**, were *indiscriminately* adapted to all **branches of human activity**. The colours used for *furnishings* did not ~~differ much~~ from those for *clothes* or *carriages*. **But today different colours have different uses.** For **roadsigns** we use only **red**, **blue** and **yellow** (*apart from the green light at traffic lights*), and each colour has its well-defined meaning. In advertising we use bright brash colours or very refined ones according to our purpose. In printing we use the dull four-colour system which reduces all colours to a norm, while women's fashions make use of all the colours in rotation.

A double-bend sign in the style of Louis XIV. There have always been dangerous double bends, even in the time of Louis XN, but then there were no roadsigns. They had heraldic arms instead. As the speed and volume of traffic increases, decoration is proportionally reduced, until it reaches the bare essentials of our present-day signals. Visual language changes according to the needs of the day.

In the past, images were nearly all painted, drawn or carved, and they reproduced visible and recognizable reality. Now we can even see the invisible. We have a host of machines exploring for us what we cannot see with the naked eye. We have X-ray photos, the world of the microscope, and the abstract inventions of artists. We have machines that enable us to see music and sounds in the form of luminous waves, machines that show us photo-elasticity in colour by means of polarized light, machines that slow up pictures of motion until we get as it were a blow-up of each instant. Then there are the lights which already form an accepted part of the night-scape, fluorescent lights, neon, sodium vapour lights, black light. And we have forms that are beautiful and exact because they are true forms: the forms of aeroplanes and missiles are dictated by the demands of speed, and were inconceivable in the past. These are forms we see every day, the colours and lights of our own time. To accept, to know and to use them is to express oneself in the language of today which was made for the man of today.

The Shape of Words

Ch. 5

Not only does each letter of a word have a shape of its own, but all its letters taken together give shape to the word. We are of course referring to printed, or at least written, words; for the words we hear in speech or on the radio do not have a visual form. They have what might be called sonic form, but we are not dealing with this at the moment. When you read the word MAMMA you see at once that it has quite a different shape from the word OBOLO. The lines (straight or curved, upright or at an angle) and the blank spaces between one letter and the next all contribute to giving the word its overall shape.

This is especially the case with words we are used to reading - or forced to read - every day: the names of newspapers, of big firms, foreign countries, film stars, the names dinned into us by assiduous advertisers, words that greet us wherever we look, such as 'sport', and the 'in' words of the moment, such as 'pop'. These we seize at a glance, without having to spell out each letter or syllable. That is, we recognize their overall shape, a thing we cannot do with unfamiliar words such as tetradecapodous or tryanlyonnonodont, especially when these are written in the tiniest print on a minute scrap of paper rolled round a medicine bottle, for example.

Some words, such as the names of well-known firms or products, are so familiar to us that if we block out most of the letters we can still read the name correctly at first glance and only notice afterwards that something is slightly unusual. But this can only happen if we preserve the general shape of the word.

An experiment anyone can make is to cut out the letters of a newspaper title, for example, and push these closer together until the upright stroke of one letter also does duty for the next. This gives a clearer idea of the shape of the word. One can go even further, and superimpose one letter on another, as in one of my illustrations I have made an M do duty also as an A in the word DAMO (the trademark of an ancient Roman brick factory).

Knowledge of the shape of words and the possibilities these offer for communication can be very useful to the graphic designer when he comes to make warning signs that have to be taken in quickly, like the ones on motorways, that one cannot stop to decipher.

My Life in Typefaces

A transcript of Matthew Carter's TED Talk

Matthew Carter explores the evolution of typography, balancing function and aesthetics within technological constraints. Detailing how these shape the development of typefaces that are both readable and visually compelling.

Ch. 6

Type
Is
Life

Type

is something we consume in enormous quantities.

In much of the world, it's completely

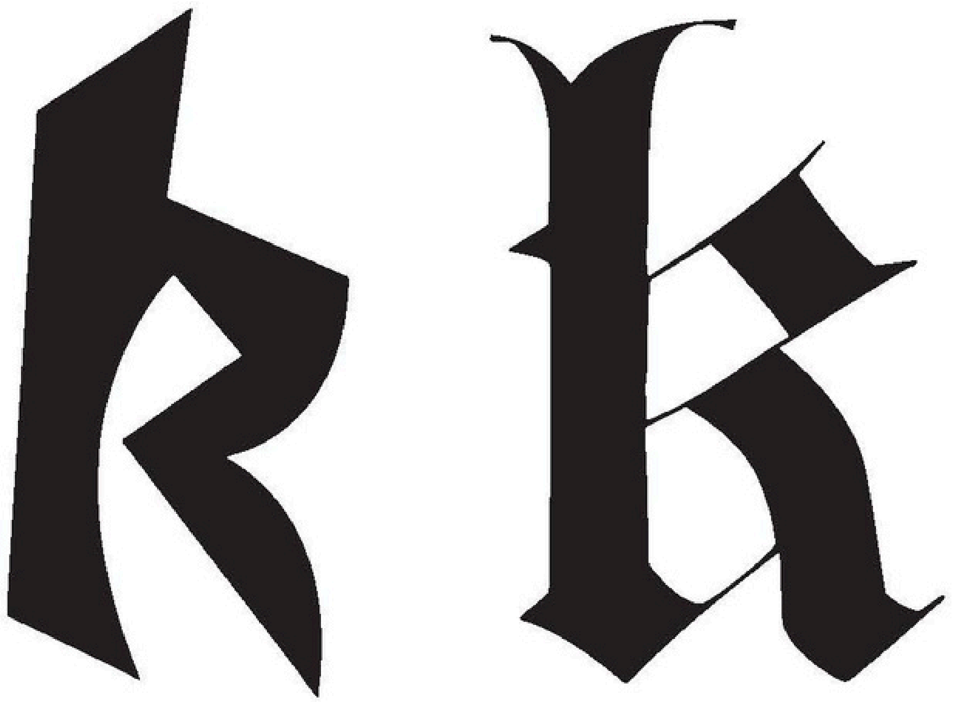
inescapable

But few consumers are concerned to know *where* a particular typeface came from or *when* or *who* designed it, if, indeed, there was any **human agency** involved in its **creation**, if it didn't just sort of *materialize* out of the **software ether**.

But I do have to be concerned with those things. **It's my job.** I'm one of the tiny handful of people who gets *badly bent* out of shape by the *bad spacing* of the **T** and the **E** that you see there. I've got to take that slide off. **I can't stand it.** Nor can Chris. There. Good. **So my talk is about**

the connection between **tech-nology** and **design of type.**

The **technology** has changed a number of times since I started work: **photo, digital, desktop, screen, web.** I've had to **survive** those changes and try to *understand their implications* for what I do for design.



This slide is about the effect of tools on form. The two letters, the two K's, the one on your left, my right, is modern, made on a computer. All straight lines are dead straight. The curves have that kind of mathematical smoothness that the Bézier formula imposes.

On the right, ancient Gothic, cut in the resistant material of steel by hand. None of the straight lines are actually straight. The curves are subtle. It has that kind of spark of life from the human hand that the machine or the program can never capture. What a contrast.

Well, I tell a lie.

A lie at TED.

I'm really sorry. Both of these were made on a computer, *same software, same Bézier curves,* same font format. The one on your left was made by **Zuzana Licko at Emigre,** and I did the other one. *The tool is the same, yet the letters are different.* The letters are different because **the designers are different. That's all.** Zuzana wanted hers to look like that. I wanted mine to look like that.

End of story.

Type is very adaptable.

Unlike a *fine art,* such as sculpture or architecture, **type hides its methods**. I think of myself as an **industrial designer.** The thing I design is *manufactured,* and it has a *function:* **to be read, to convey meaning**. *But* there is a bit *more* to it than *that*. There's the sort of **aesthetic element.** What makes these two letters *different* from **different interpretations** by **different designers**? What gives the *work* of some *designers* sort of **characteristic personal style**, as you might find in the **work** of a fashion designer, an *automobile designer, whatever?*

Ch. 7

Tech's Imapct

There *have been* some cases, **I admit,**
where *I as a designer* **did**

Feel

the influence of

technology

This is from the mid-'60s, the change from **metal type** to *photo, hot* to **cold.** This brought some *benefits* but also one particular *drawback:* a **spacing system** that **only** provided **18 discrete units** for letters to be accommodated on. I was asked at this time to **design a series of condensed sans serif types** with as many *different variants* as possible within this **18-unit box**. Quickly looking at the **arithmetic**, I realized I could only actually make *three of related design*. Here you see them.

In Helvetica Compressed, Extra Compressed, and Ultra Compressed, this rigid 18-unit system really boxed me in. It kind of determined the proportions of the design. Here are the typefaces, at least the lower cases. So do you look at these and say, "Poor Matthew, he had to submit to a problem, and by God it shows in the results." I hope not. If I were doing this same job today, instead of having 18 spacing units, I would have 1,000. Clearly I could make more variants, but would these three members of the family be better? It's hard to say without actually doing it, but they would not be better in the proportion of 1,000 to 18, I can tell you that. My instinct tells you that any improvement would be rather slight, because they were designed as functions of the system they were designed to fit, and as I said, type is very adaptable. It does not hide its methods.

nm

l m

ln

All industrial designers work within constraints.

This is not fine art.

The question is, does a **constraint** force a *compromise?* By *accepting* a constraint, are you working to a *lower standard*? **I don't believe so**, and I've always been encouraged by something that *Charles Eames* said. He said he was **conscious of working** *within constraints,* but **not** *of making compromises.* The **distinction** between a *constraint* and a *compromise* is obviously *very subtle,* but it's **very central** to my attitude to work.

Ch. 8

Const-
raints
and
Comp-
romise

Remember this reading experience? *The phone book.* I'll hold the slide so you can enjoy the nostalgia. This is from the mid-'70s early trials of **Bell Centennial** typeface I designed for the U.S. phone books, and it was **my first experience** of *digital type,* and **quite a baptism**. Designed for the phone books, as I said, to be printed at *tiny size* on newsprint on very *high-speed* rotary presses with ink that was kerosene and lampblack.

This is not a **hospitable environment for a** *typographic designer.*

So the *challenge* for me was to design type that performed *as well as possible* in these very **adverse production conditions**. As I say, we were in the infancy of digital type. I had to draw *every character by hand* on **quadrille graph paper** – there were *four weights* of Bell Centennial – **pixel by pixel**, then encode them *raster line by raster line* for the keyboard.

BEL,..:‘’-;

akifujenb

12543608

It took two years, but I learned a lot. These letters look as though they’ve been **chewed by the dog** or *something or other,* but the **missing pixels** at the *intersections of strokes* or in the crotches are the result of my *studying* the *effects* of **ink spread** on **cheap paper** and **reacting,** revising the font accordingly. These *strange artifacts* are designed to **compensate** for the **undesirable effects** of *scale and production process.*

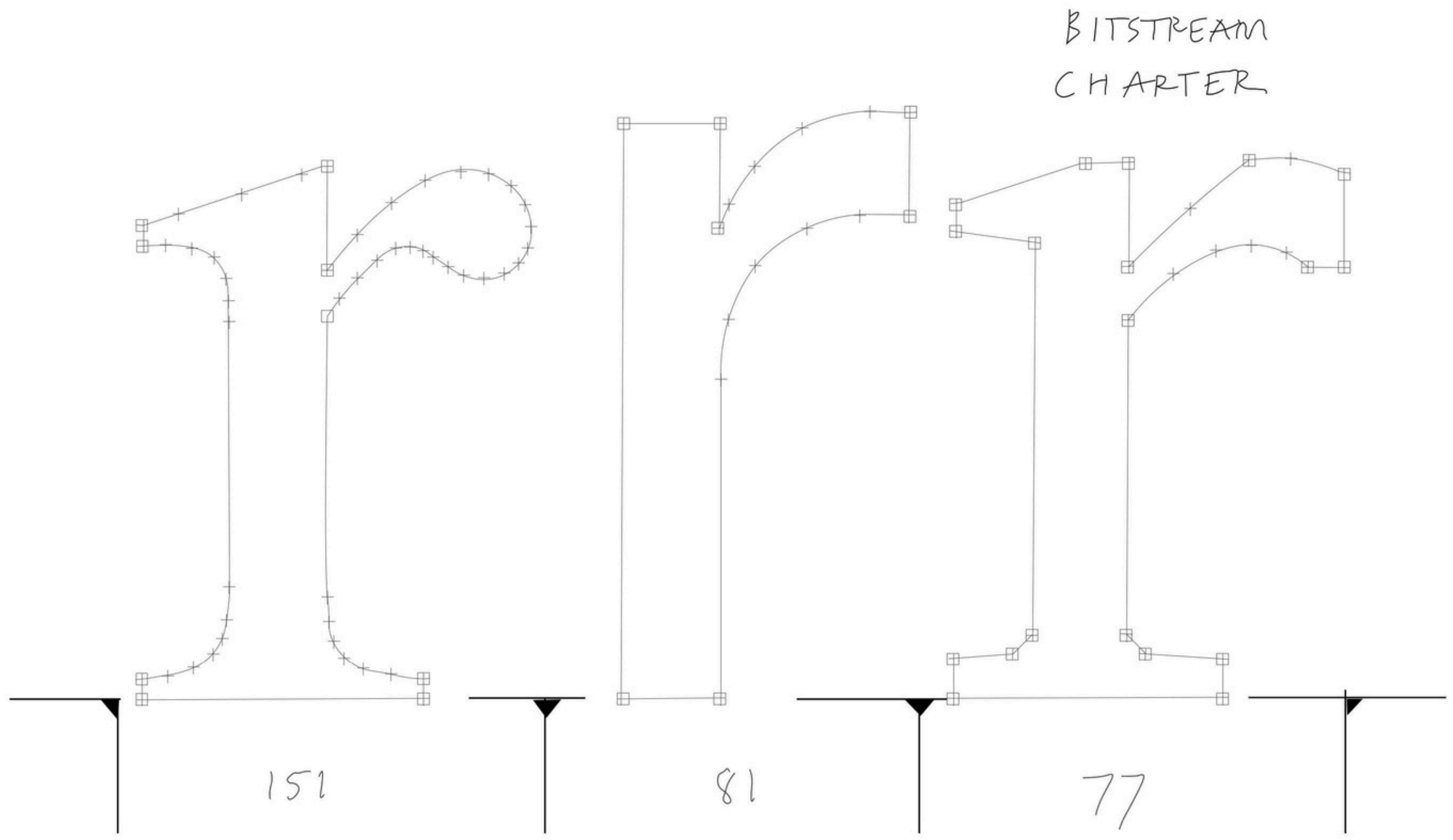
At the outset, AT&T had wanted to set the phone books in **Helvetica**, but as my friend Erik Spiekermann said in the Helvetica movie, if you've seen that, the letters in Helvetica were *designed to be as similar to one another as possible*. **This is not** the recipe for *legibility at small size*. It looks very elegant up on a slide. I had to **disambiguate** these *forms* of the *figures* as much as possible in **Bell Centennial** by sort of opening the shapes up, as you can see in the bottom part of that slide.

Helvetica

1235689

Bell Centennial

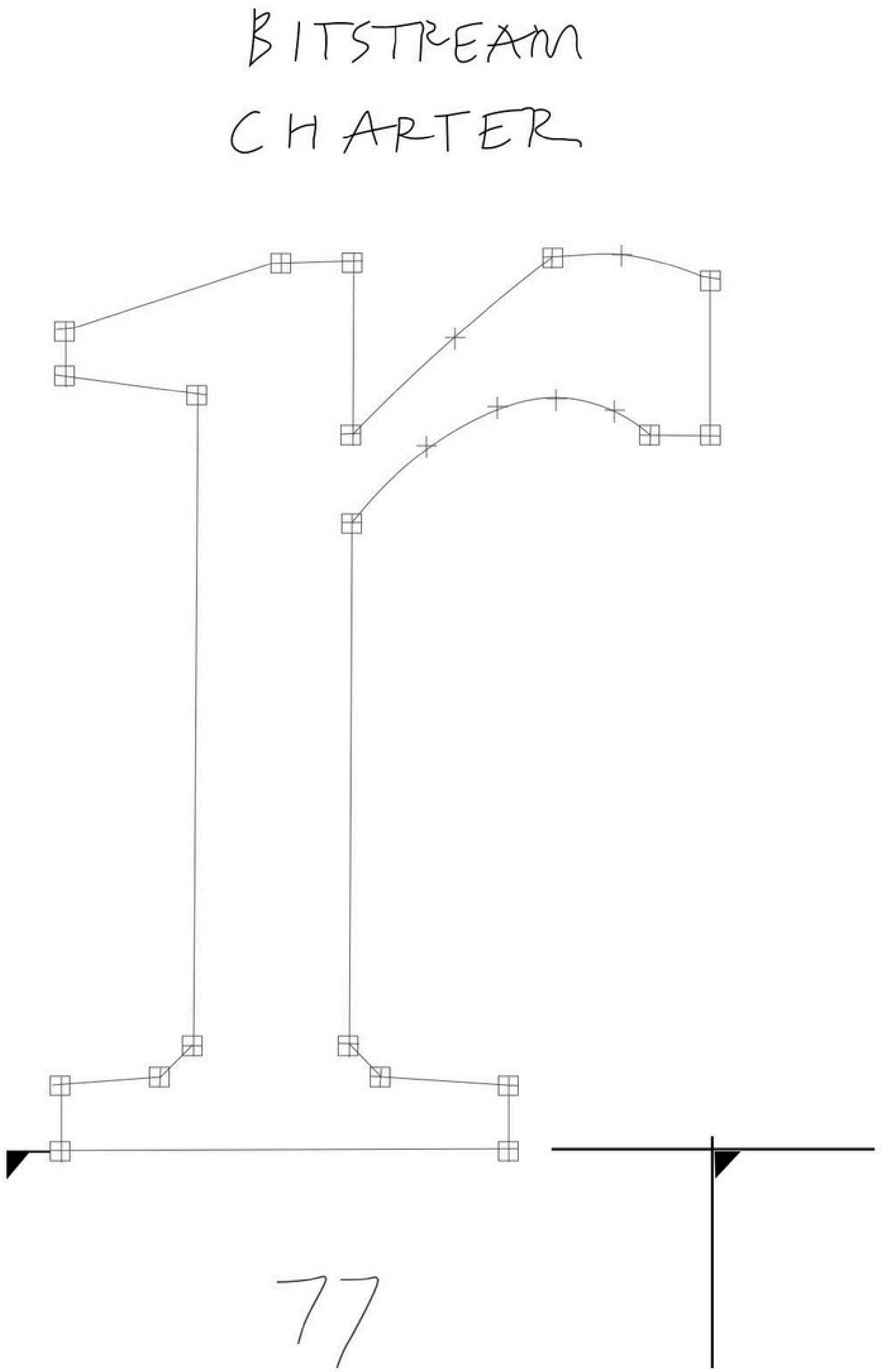
1235689



So now we're on to the *mid-'80s,* the early days of **digital outline fonts**, *vector technology.* There was an issue at that time with the **size** of the fonts, the amount of *data* that was **required** to find and *store* a font in **computer memory**. It **limited** the number of fonts you could get on your **typesetting system** at any one time. I did an *analysis* of the data, and found that a typical *serif face* you see on the left needed nearly **twice** as much data as a *sans serif* in the middle because of all the **points** required to **define** the *elegantly curved serif brackets.* The **numbers** at the bottom of the slide, by the way, they represent the amount of **data needed** to store each of the fonts. So the *sans serif, in the middle, sans the serifs,* was much more economical, **81 to 151**.

"Aha,"
I thought.
"The engineers
have a problem,
Designer
to the
rescue."

I made a *serif type*, you can see it on the right, **without curved serifs**. I made them **polygonal**, out of straight line segments, *chamfered brackets*. And look, as **economical** in data as a *sans serif*. We call it **Charter**, on the right.



So I went to the head of engineering with my numbers, and I said proudly,

File Edit Insert People

the designer: I have solved your problem

the engineer: Oh. What problem?

the designer: Well, you know, the problem of the huge data you require for serif fonts ad so on.

the engineer: Oh. We solved that problem last week. We wrote a compaction routine that reduces the size of all fonts by an order of magnitude. You can have as many fonts on your system as you like.

the designer: Well, thank you for letting me know.

Foiled again. I was left with a design solution for a nonexistent technical problem.

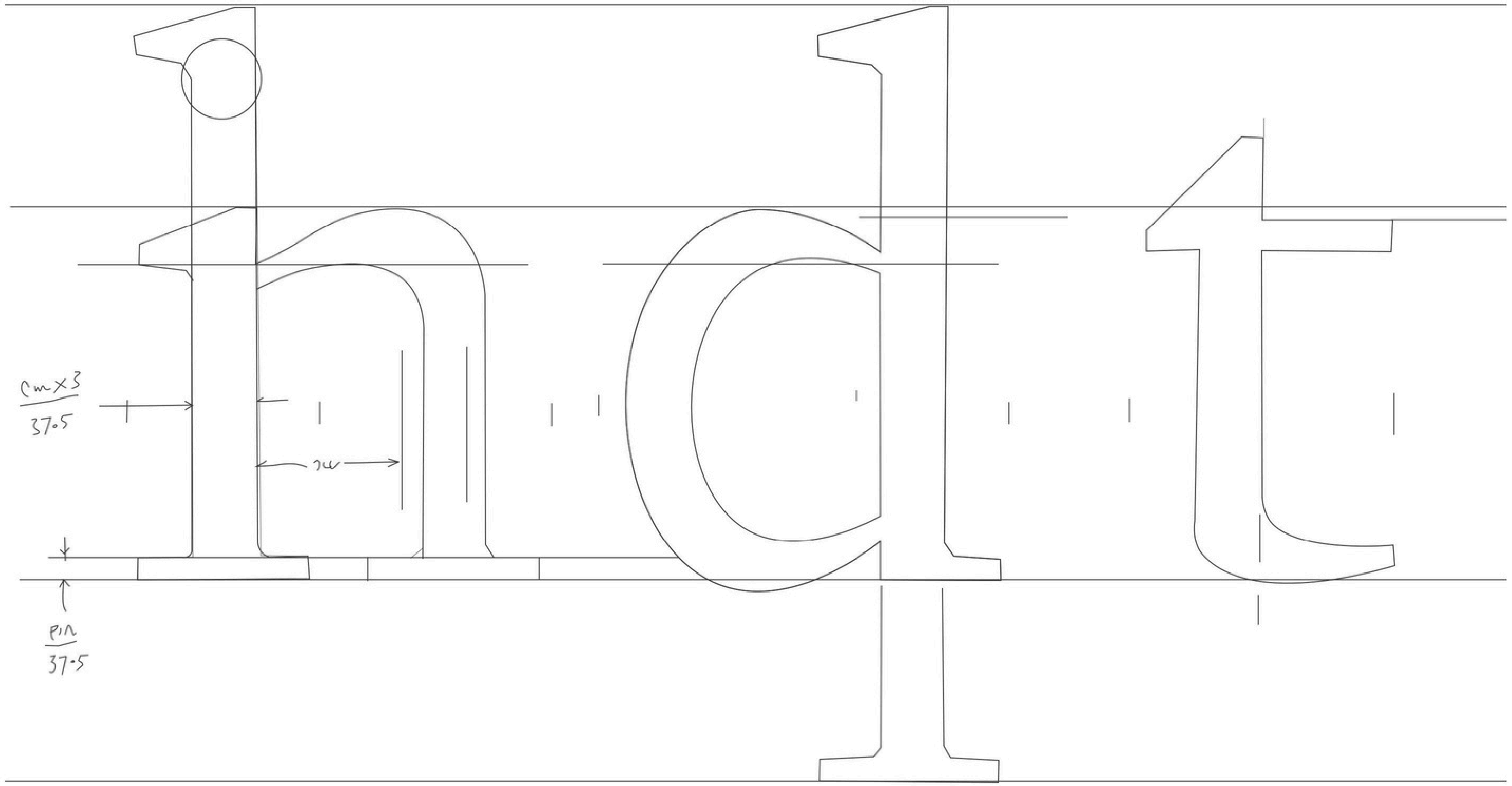
Ch. 9

From Print to Screen

But here is where the *story* sort of gets **interesting** for me. I didn't just *throw my design away in a fit* of **pique**. **I persevered**. What had started as a **technical exercise** became an *aesthetic exercise,* really. *In other words,* **I had come to like this typeface.**

Forget. *its orgins.* **Screw** **that.**

I *liked* the design **for its own sake**. The **simplified forms** of Charter gave it a sort of *plain-spoken quality* and **unfussy spareness** that sort of pleased me. You know, at times of **technical innovation**, designers want to be *influenced* by what's in the air. **We want to respond.** *We want to be pushed* into exploring something new. So Charter is a sort of **parable** for me, really. In the end, there was no hard and fast causal link between the technology and the design of Charter. **I had really misunderstood the technology. The technology did suggest something to me, but it did not force my hand**, *and I think this happens very* **often.**



You know, engineers are *very smart*, and despite **occasional frustrations** because I'm less smart, I've always enjoyed working with them and learning from them. Apropos, in the *mid-'90s*, I started talking to Microsoft about **screen fonts.** Up to that point, all the fonts on screen had been **adapted** from previously *existing printing fonts*, of course. But Microsoft foresaw correctly the movement, the **stampede** towards *electronic communication*, to reading and writing **on screen** with the **printed output** as being sort of *secondary in importance*.

So the **priorities** were just tipping at that point. They wanted a **small core set of fonts** that *were not adapted* but **designed** for the screen to face up to the problems of screen, which were their **coarse resolution displays**. I said to Microsoft,

a typeface *for a particular* **technology** *is a* **self-obsoleting** *typeface.*

I've designed **too many faces** in the past that were intended to *mitigate technical problems*. Thanks to the **engineers**, the technical problems *went away*. **So did my typeface.**

It was only a **stopgap**. Microsoft came back to say that *affordable computer* monitors with **better resolutions** were **at least** a decade away. So I thought, well, *a decade,* that's *not bad,* that's more than a **stopgap**.

Verdana

Latin ABCDEFGHIJKLMNO
PQRSTUVWXYZ&abcdefghi
jklmnopqrstuvwxyzæœfifl
1234567890$¢£ƒ¥@%#+

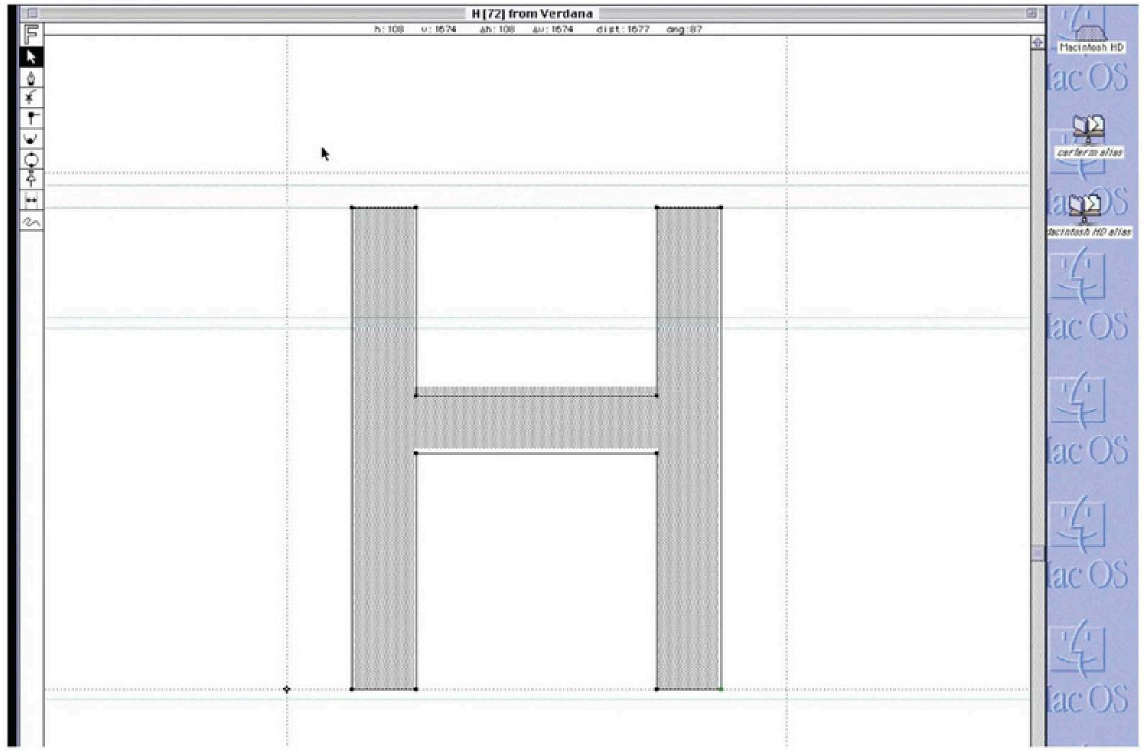
Greek ΑΒΓΔΕΖΗΘΙΚΛΜΝΞ
ΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλ

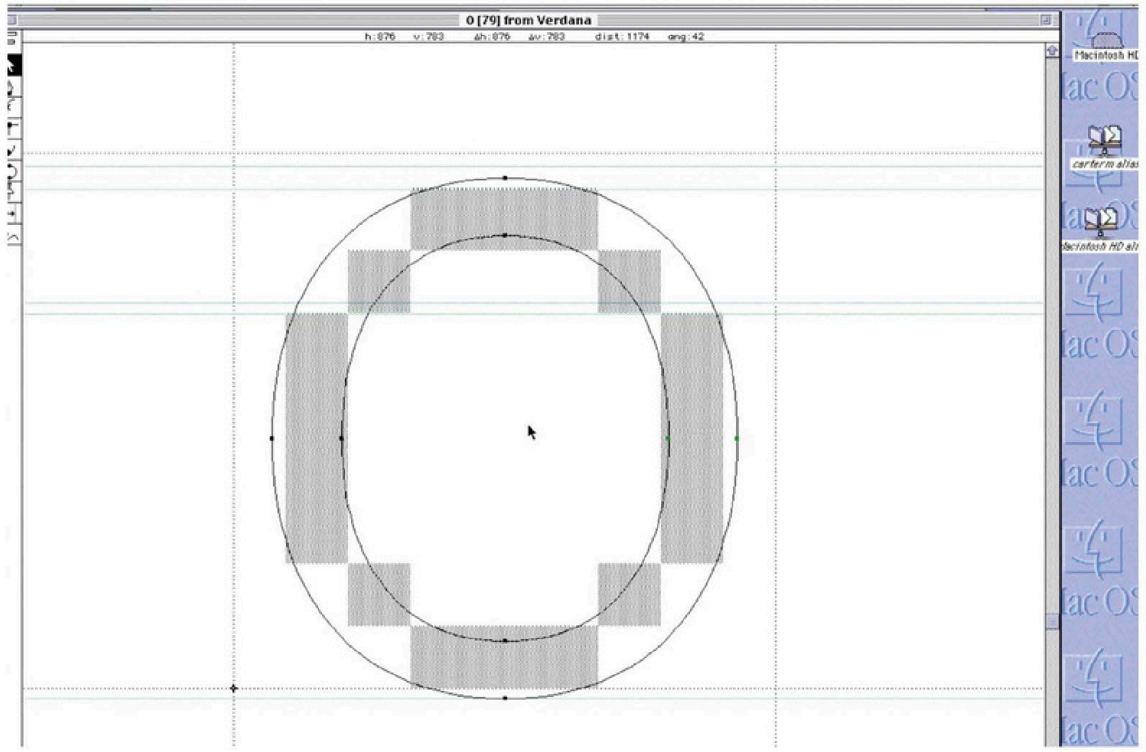
So I was *persuaded*, I was **convinced**, and we went to work on what became **Verdana** and **Georgia**, for the first time working *not on paper* but **directly** onto the screen from **the pixel up.**

Ch. 10

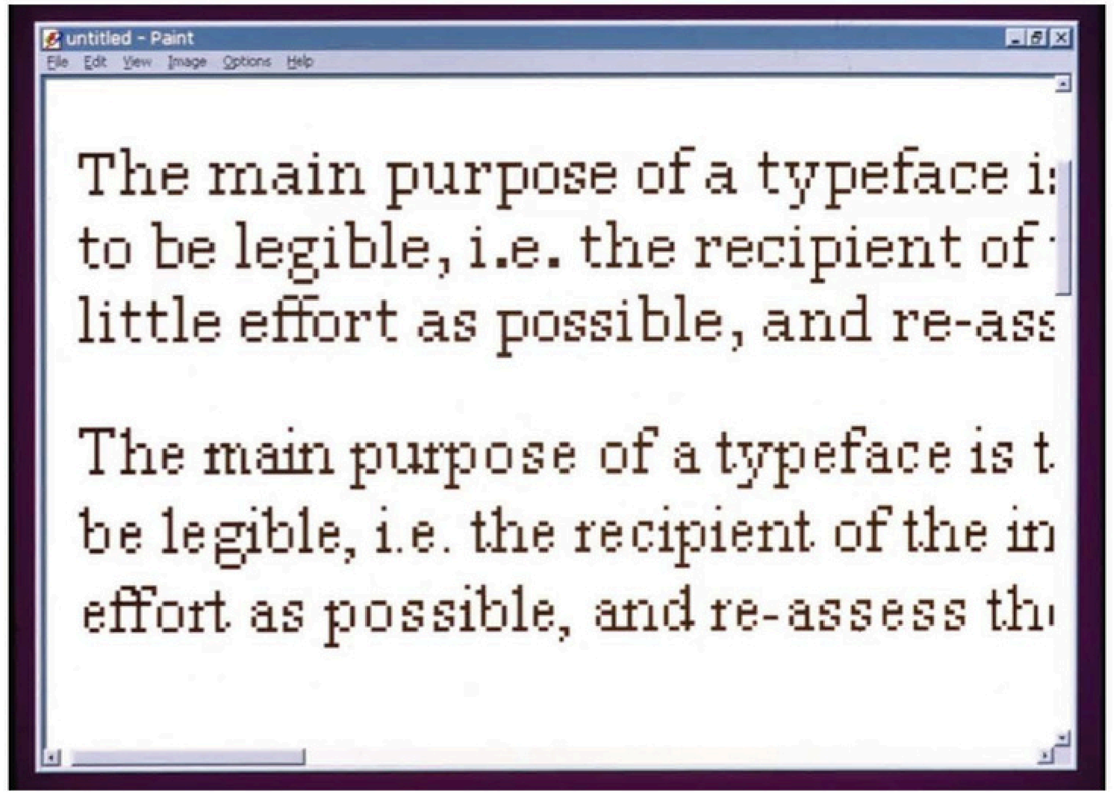
The Future of Type-Faces

At that time, screens were **binary.** The pixel was either **on** or it was **off.** Here you see the outline of a letter, *the cap H*, which is the thin black line, **the contour**, which is how it is stored in memory, *superimposed on the bitmap*, which is the grey area, which is how it's displayed on the screen. The bitmap is **rasterized** from the outline. Here in a cap H, which is all straight lines, the two are in *almost perfect sync* on the **Cartesian grid.**

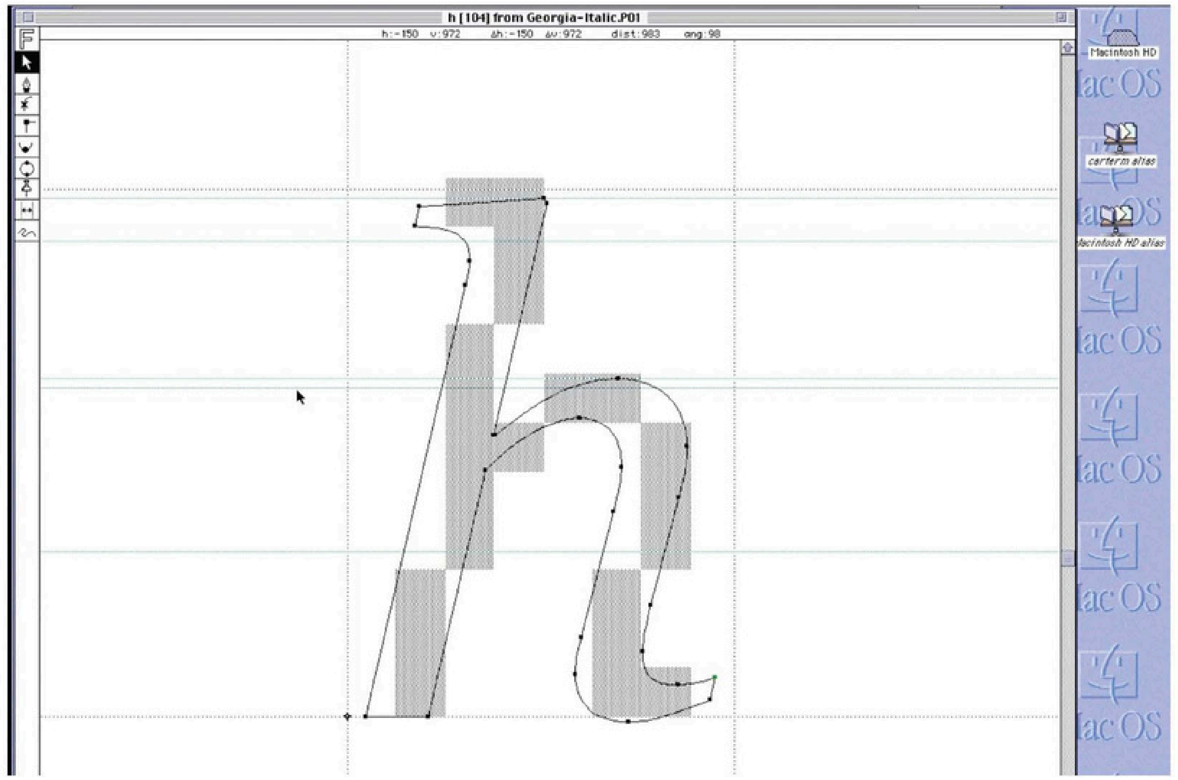




Not so with *an O*. This looks more like **bricklaying** than type design, but believe me, this is a *good bitmap O*, for the simple reason that it's **symmetrical** in both **x and y axes**. In a binary bitmap, you actually can't ask for more than that. I would sometimes make, I don't know, *three or four different versions* of a difficult letter like a **lowercase A**, and then stand back to choose which was the best. Well, **there was no best,** so the designer's *judgment* comes in trying to decide which is **the least bad**. Is that a *compromise?* **Not to me**, if you are working at the highest standard the technology will allow, although that standard may be well short of the ideal. You may be able to see on this slide two different bitmap fonts there. *The "a"* in the **upper one,** I think, is better than *the "a"* in the **lower one,** but it still ain't great. You can maybe see the effect better if it's *reduced*. Well, maybe not.

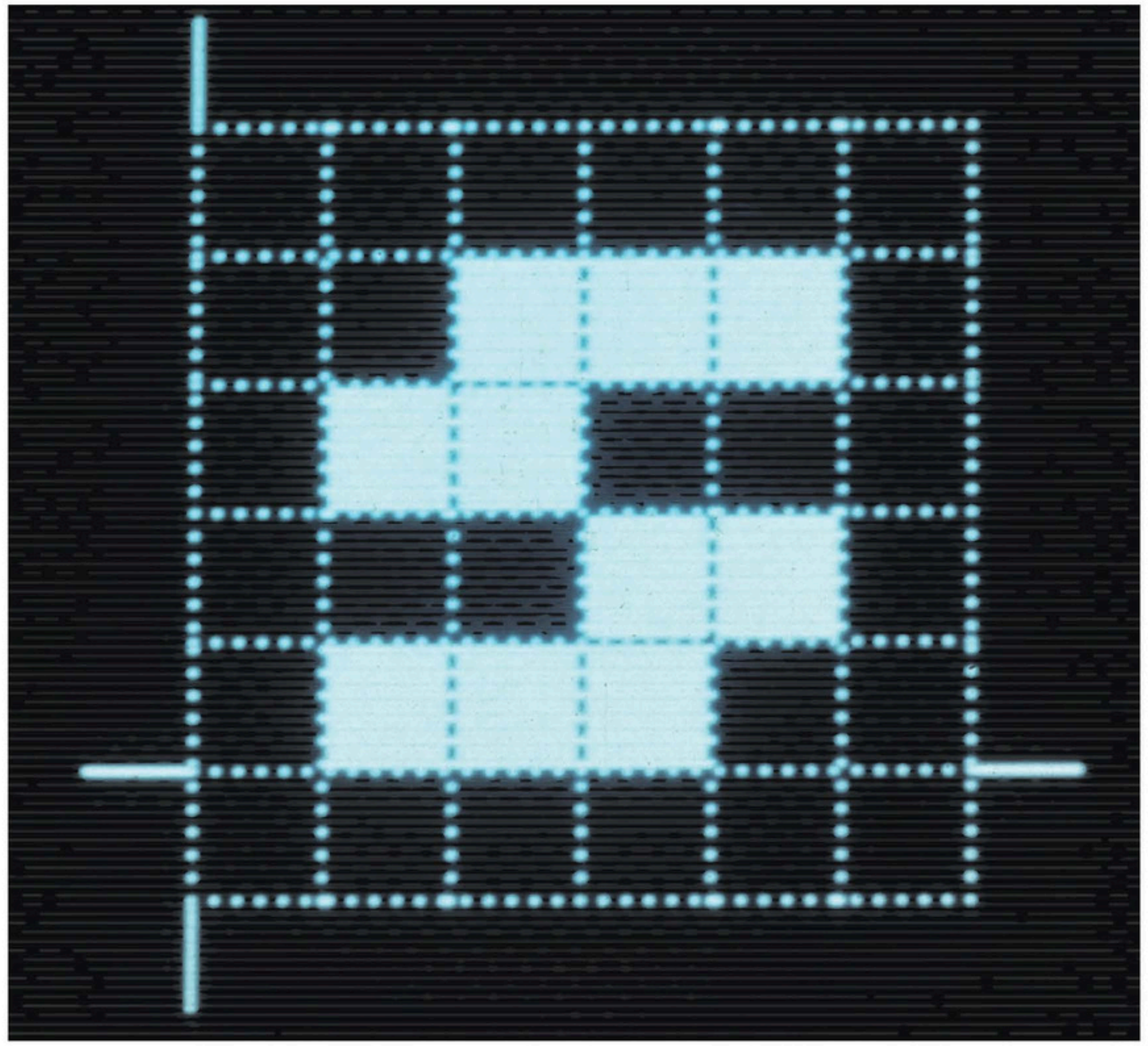


So *I'm a* pragmatist, *not an* idealist, *out of* necessity.



For a certain kind of *temperament,* there is a certain kind of **satisfaction** in doing something that *cannot be perfect* but can still be done to the **best of your ability.** Here's the *lowercase H* from Georgia Italic. The bitmap looks **jagged** and **rough**. It is jagged and rough. But I discovered, *by experiment*, that there is an **optimum slant** for an italic on a screen so the strokes break well at the **pixel boundaries.** Look in this example how, rough as it is, how the left and right legs actually break at the same level. **That's a victory.** *That's good,* right there. And of course, at the lower depths, you don't get much choice.

This is *an S*, in case you were wondering. Well, it's **been 18 years** now since Verdana and Georgia were released. Microsoft were *absolutely right*, it took a good 10 years, but screen displays now do have **improved spatial resolution**, and very much improved *photometric resolution* thanks to anti-aliasing and so on. So now that their **mission is accomplished**, has that meant the *demise of the screen fonts* that I designed for **coarser displays** back then? Will they outlive the **now-obsolete** screens and the flood of new web fonts coming on to the market? Or have they established *their own* sort of *evolutionary niche* that is independent of technology? In other words, have they been absorbed into the **typographic mainstream**? I'm not sure, but they've had a good run so far. Hey, 18 is a good age for anything with present-day rates of attrition, **so I'm not complaining.**



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Munari, Bruno. "Design as Art, Designers and Stylists : What Is a Designer?; Pure and Applied ; A Living Language, The Shape of Words." Design as Art, Penguin Global, 2009.

References
Used in Part 2

Carter, Matthew. "My Life in Typefaces." TED, www.ted.com/talks/matthew_carter_my_life_in_typefaces. Accessed 21 Apr. 2025. Video Transcript and presentation images

Concept, design, printing, and binding by Julia Birn.

Text from Design as Art by Bruno Munari is typeset in the following typefaces:

Altacalifornia Regular
Attic Antique Regular
P22 Franklin Caslon Regular
IM Fell DW Pica Roman Regular and Italic

Text from My Life in Typefaces by Matthew Carter is typeset in the following typefaces:

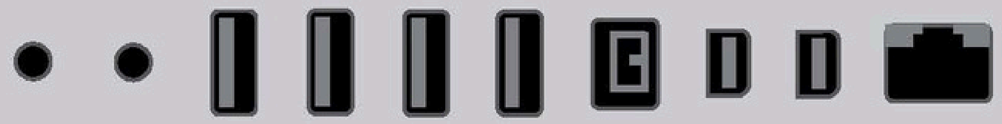
Argent Pixel CF Italic
Gridlite PE Variable Halfway Bold Square
Logic Monospace Regular and Italic

Body text is 14pt with 16.8pt leading. Display text, headings, and subheading appears in various sizes.

Printed and bound by hand in Guam, April 2025.

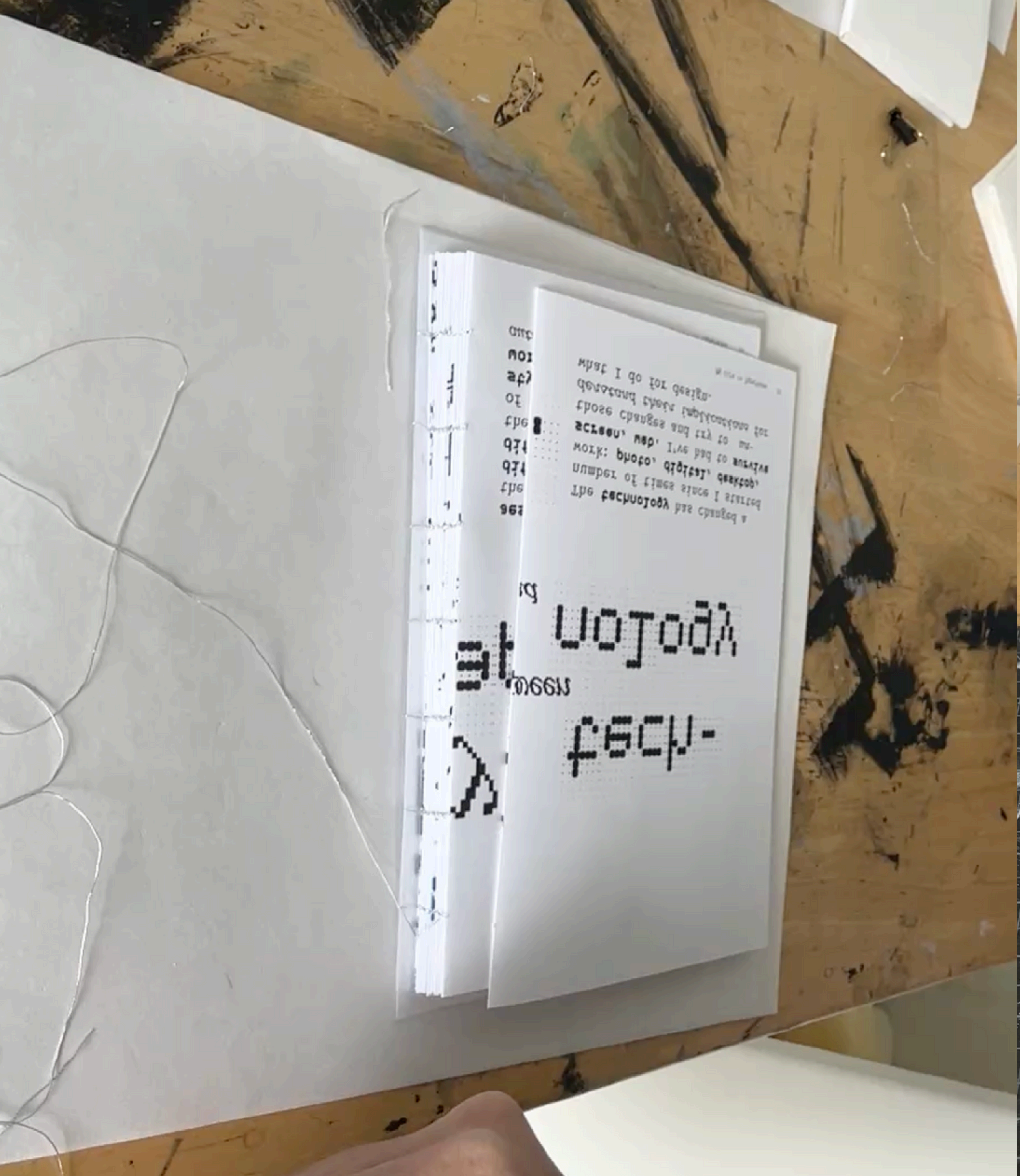
Paper: 90 lbs. 160 gsm index.
Cover: 90 lbs. 160 gsm index and transparency film.
Coptic bound with exposed spine stitching.

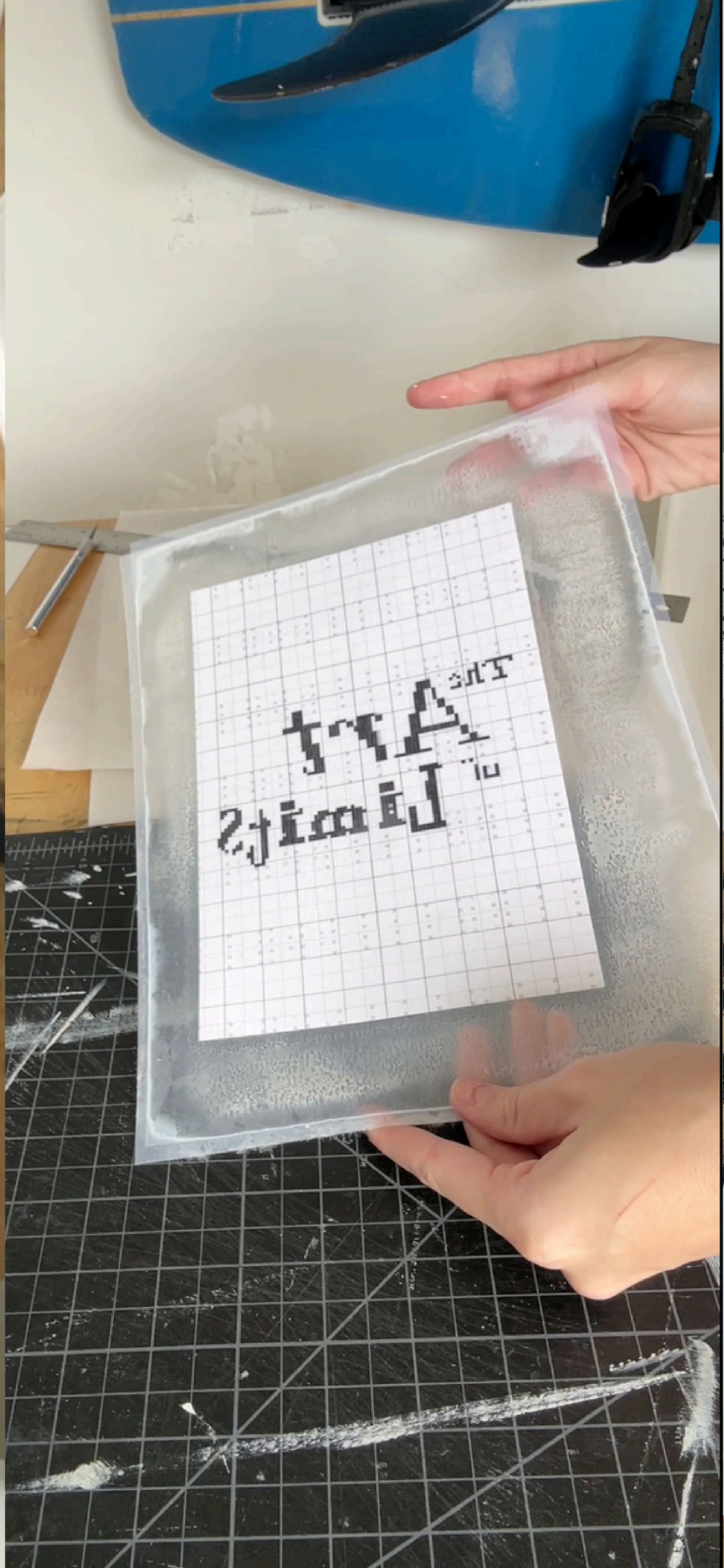
Designed using Adobe InDesign and Illustrator.
Used for educational and non-commercial purposes.

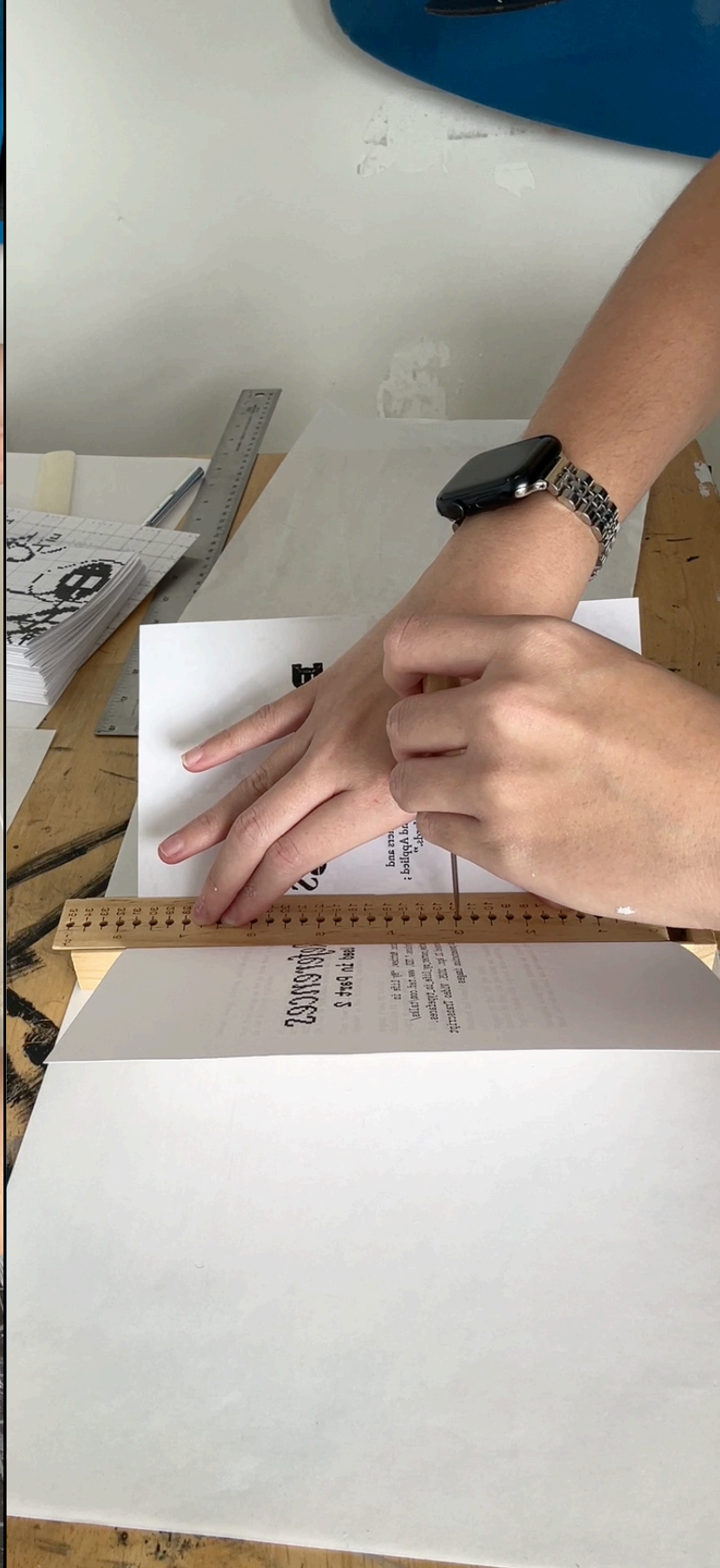


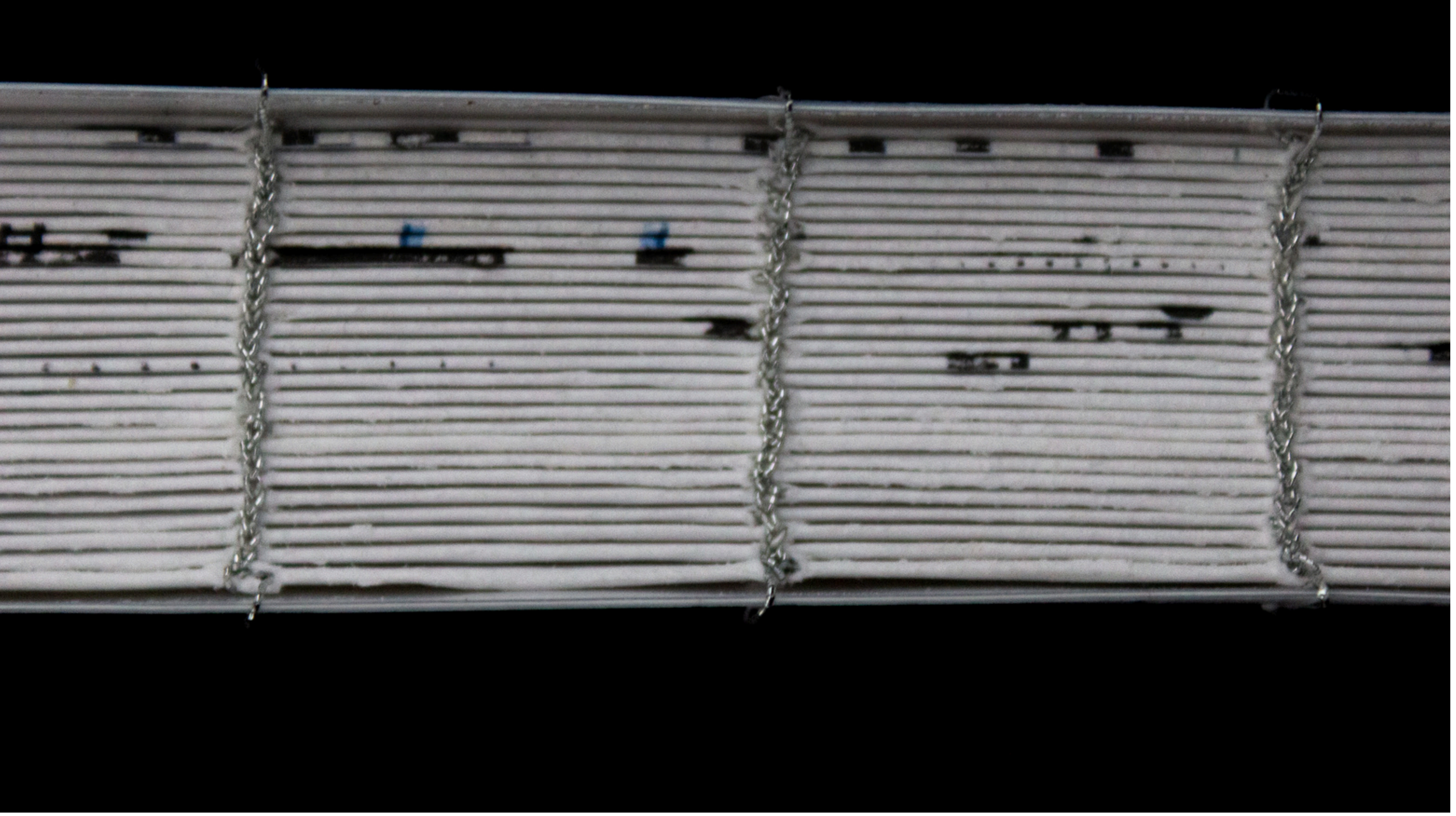
The Art of Limits

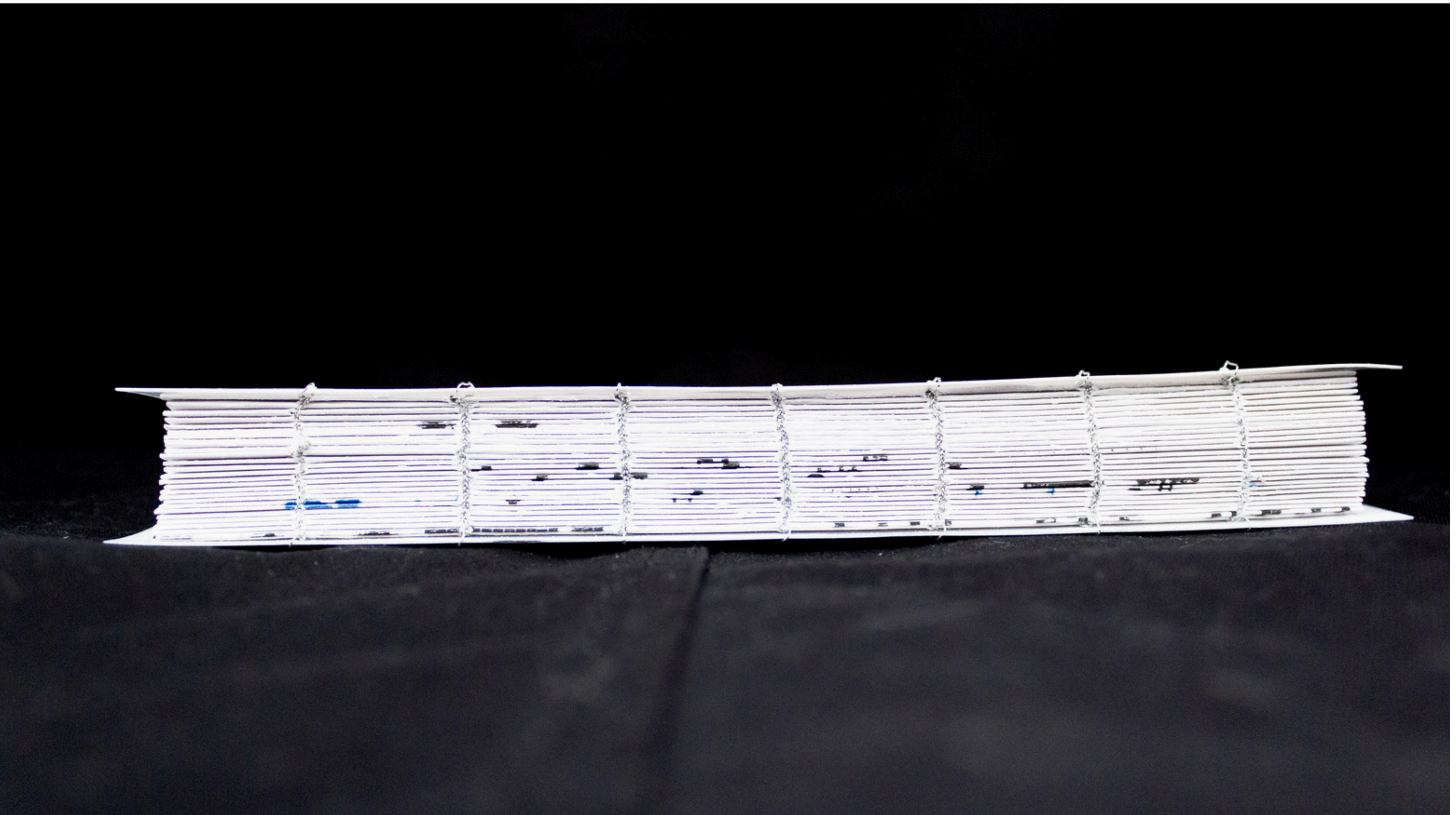
Physical Book

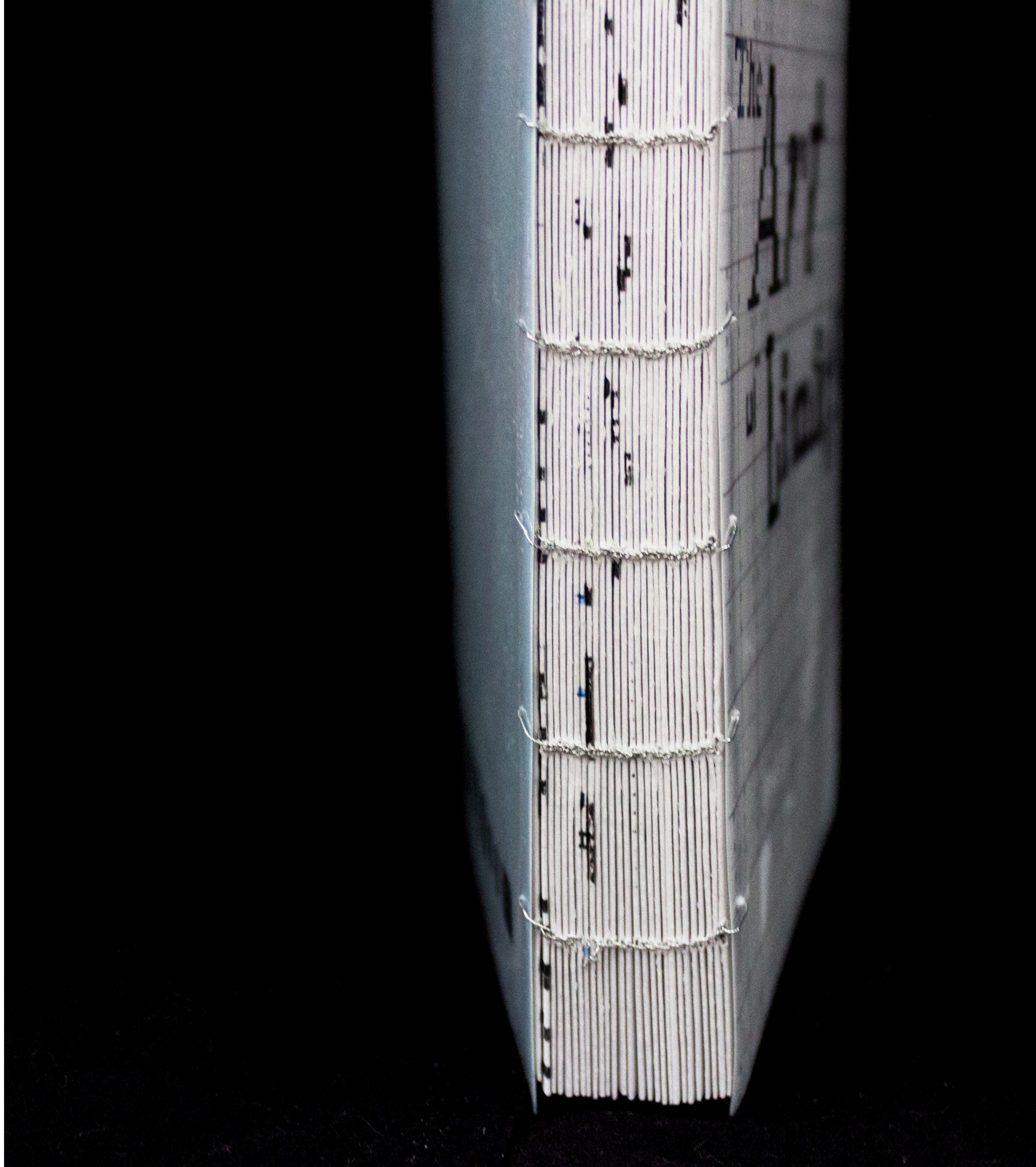


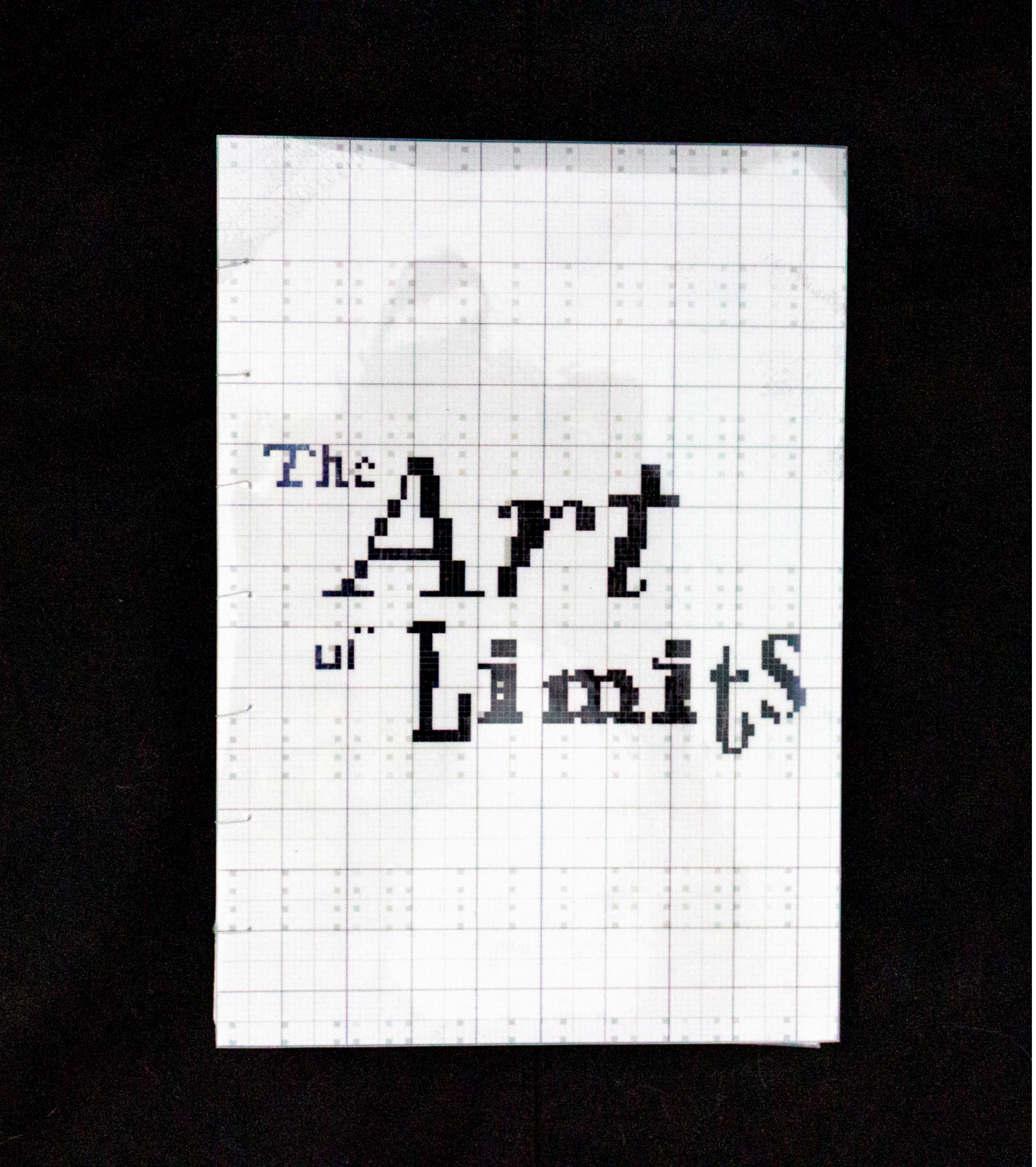


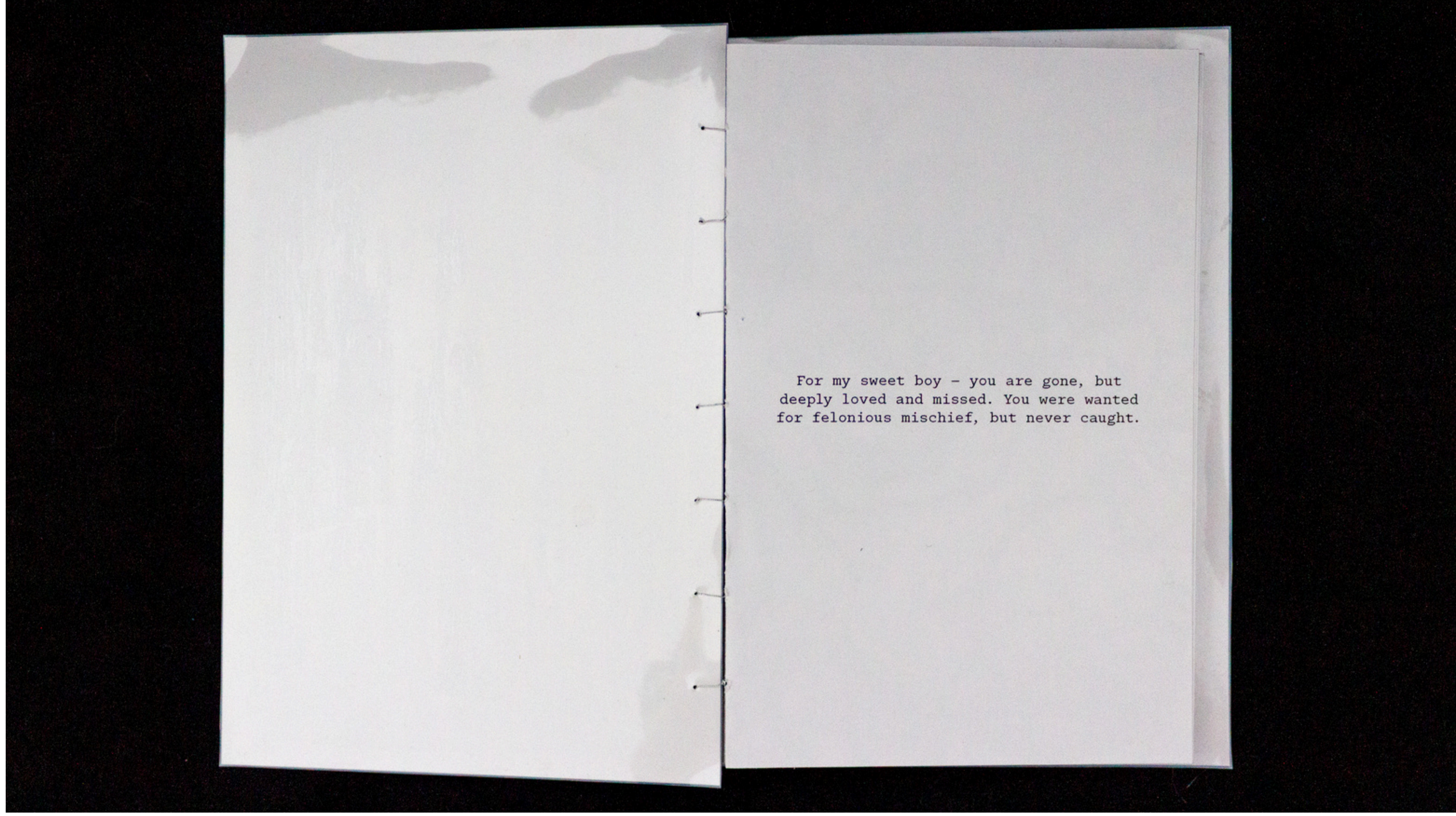


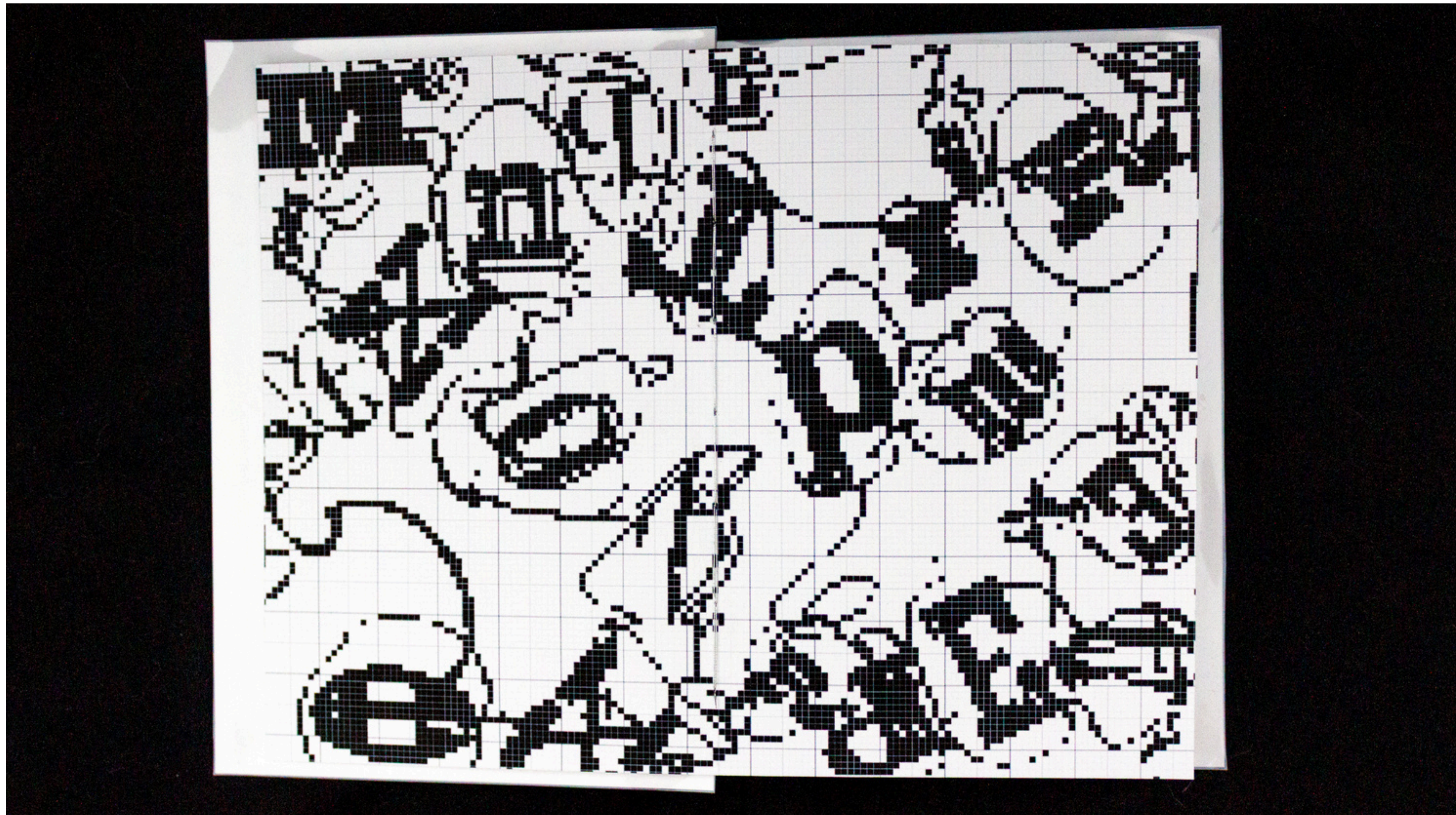


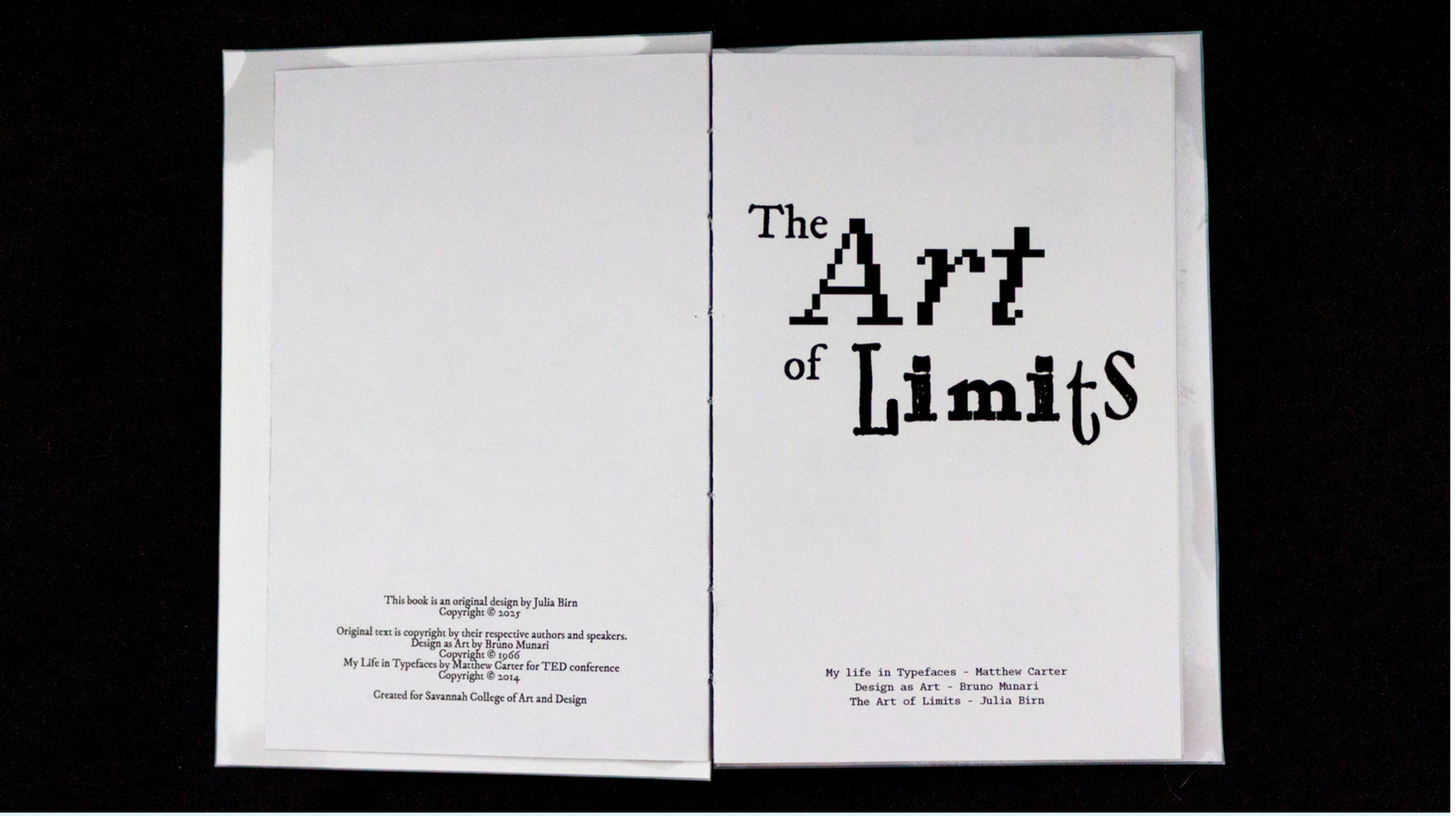





The
Art
of
Limits


For my sweet boy – you are gone, but
deeply loved and missed. You were wanted
for felonious mischief, but never caught.

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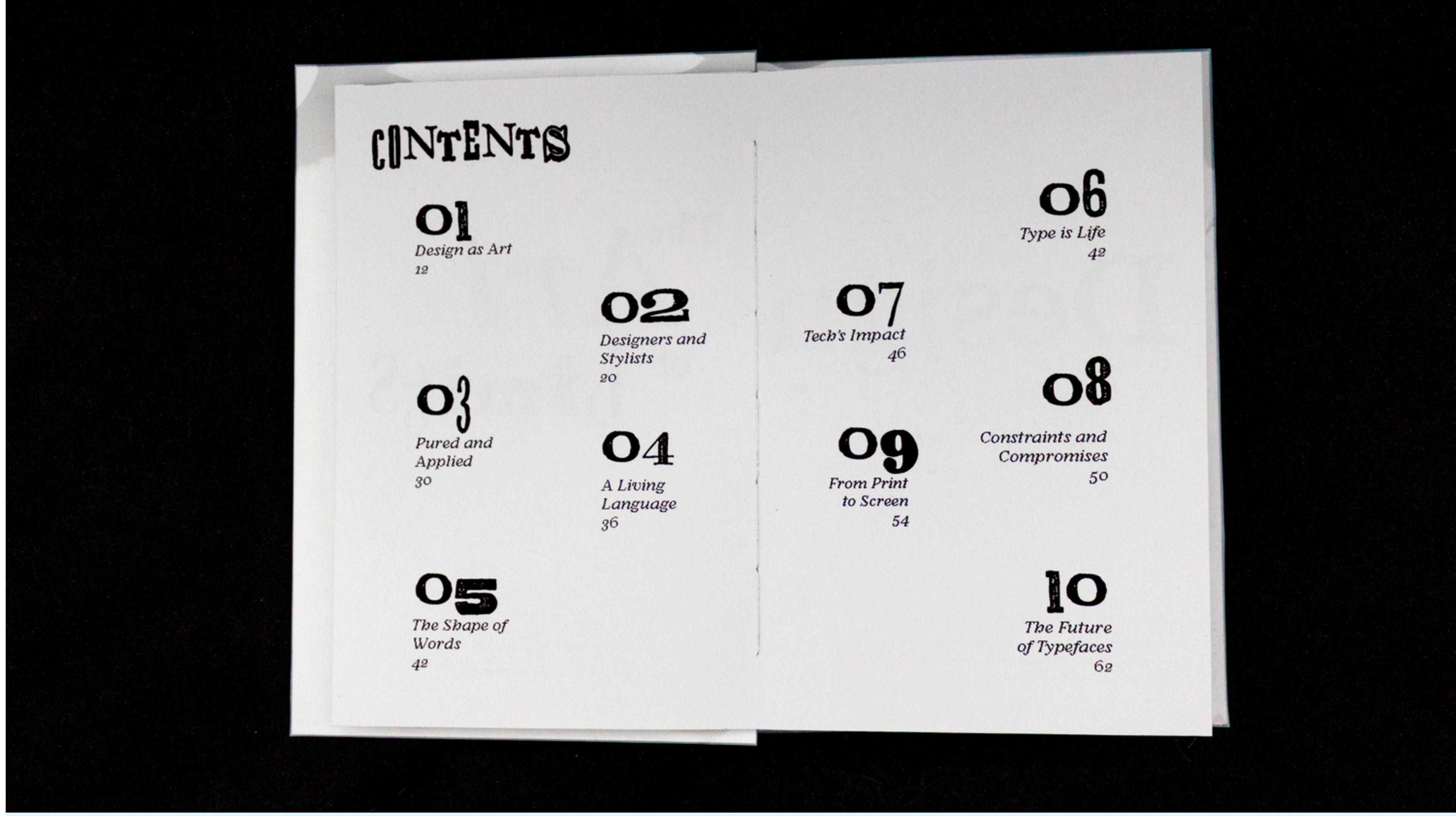
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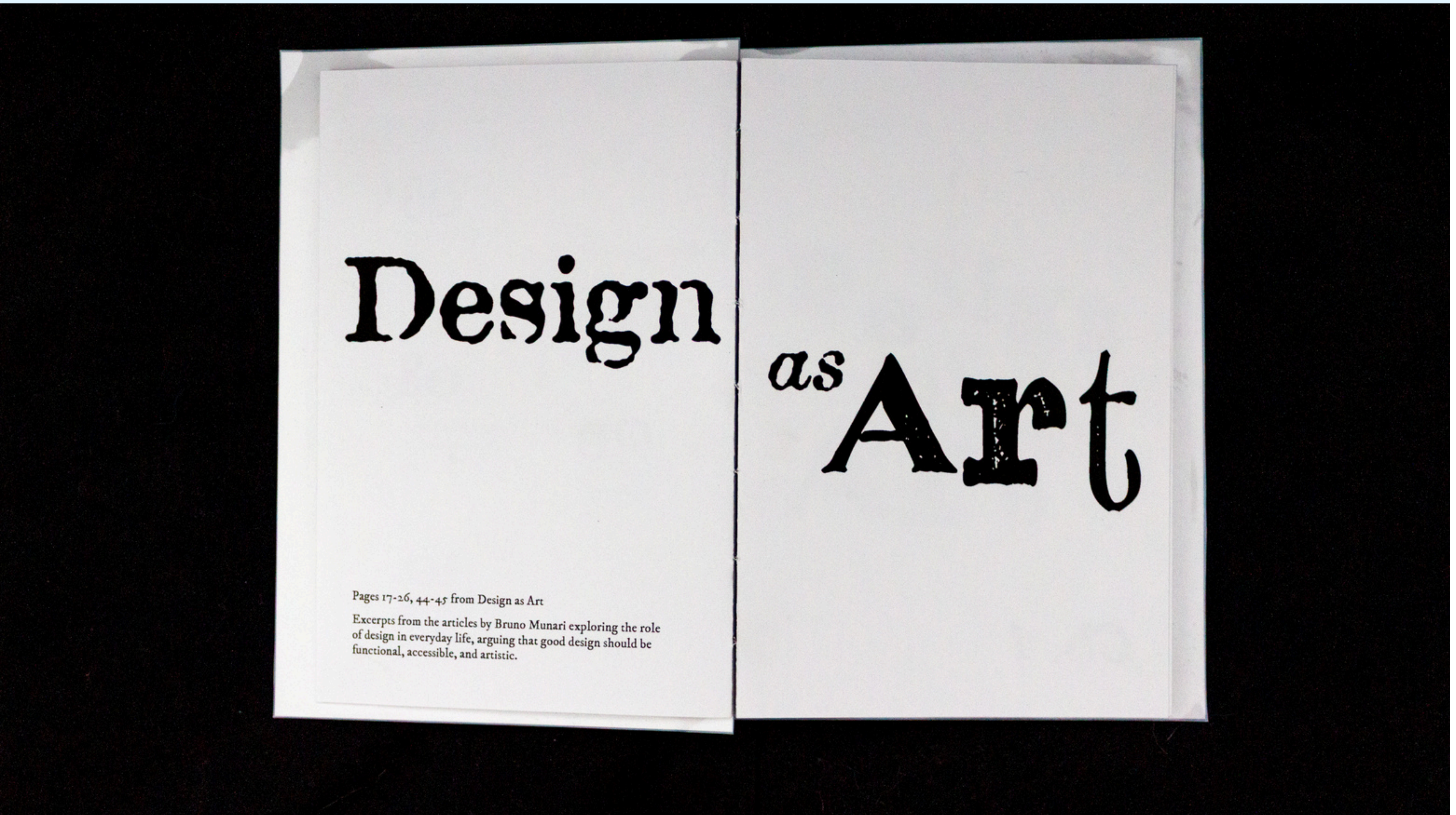
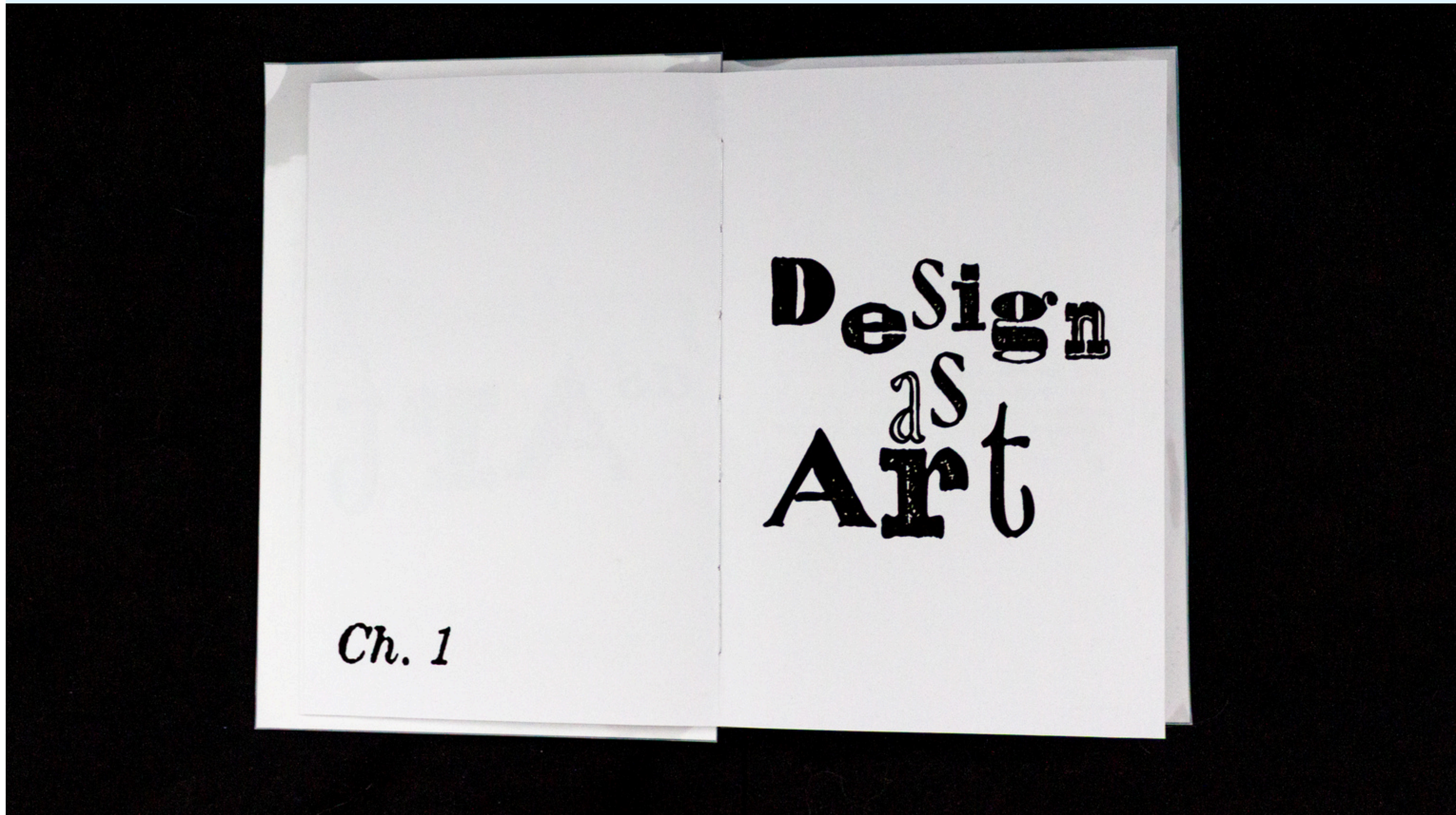
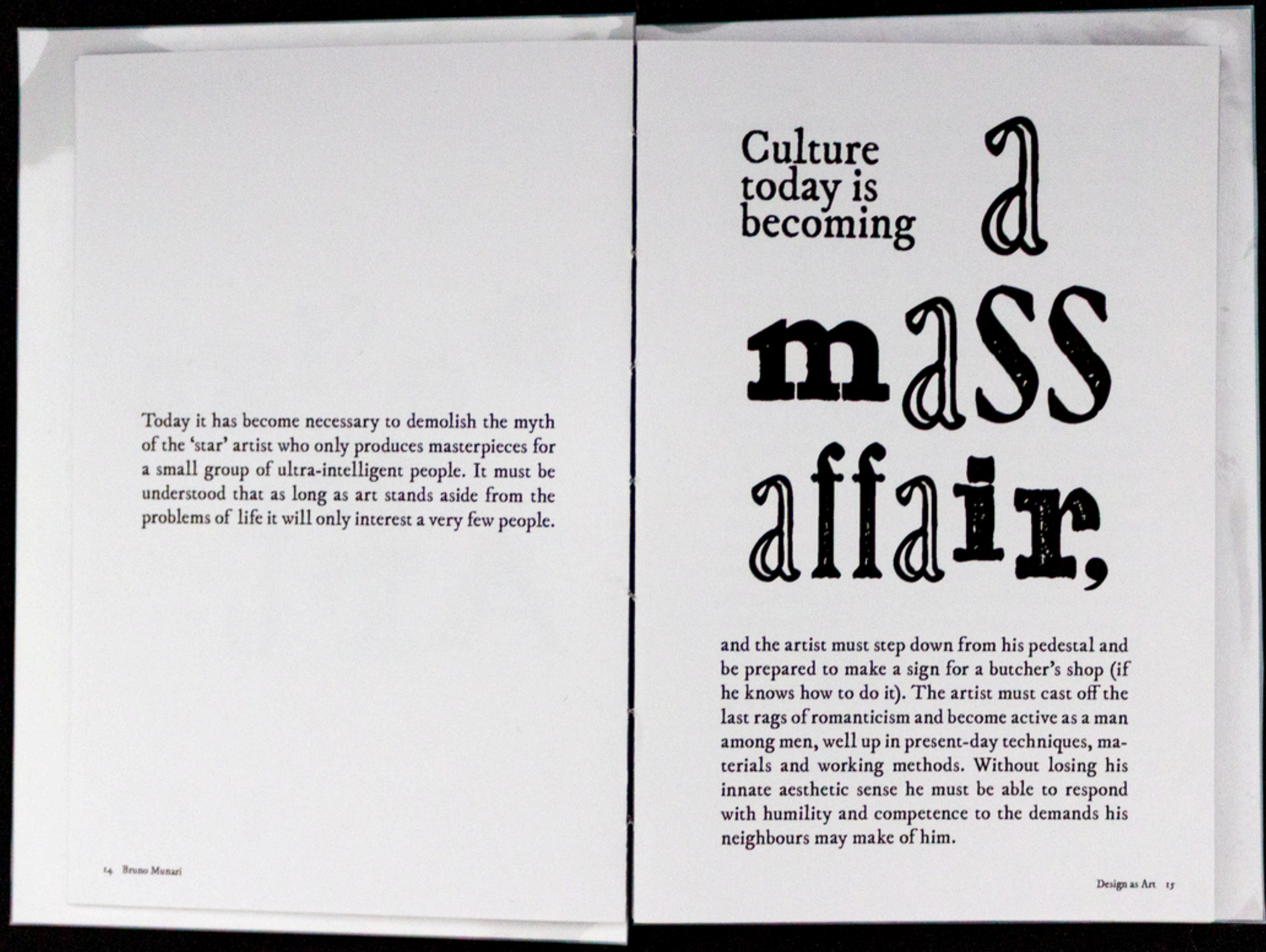
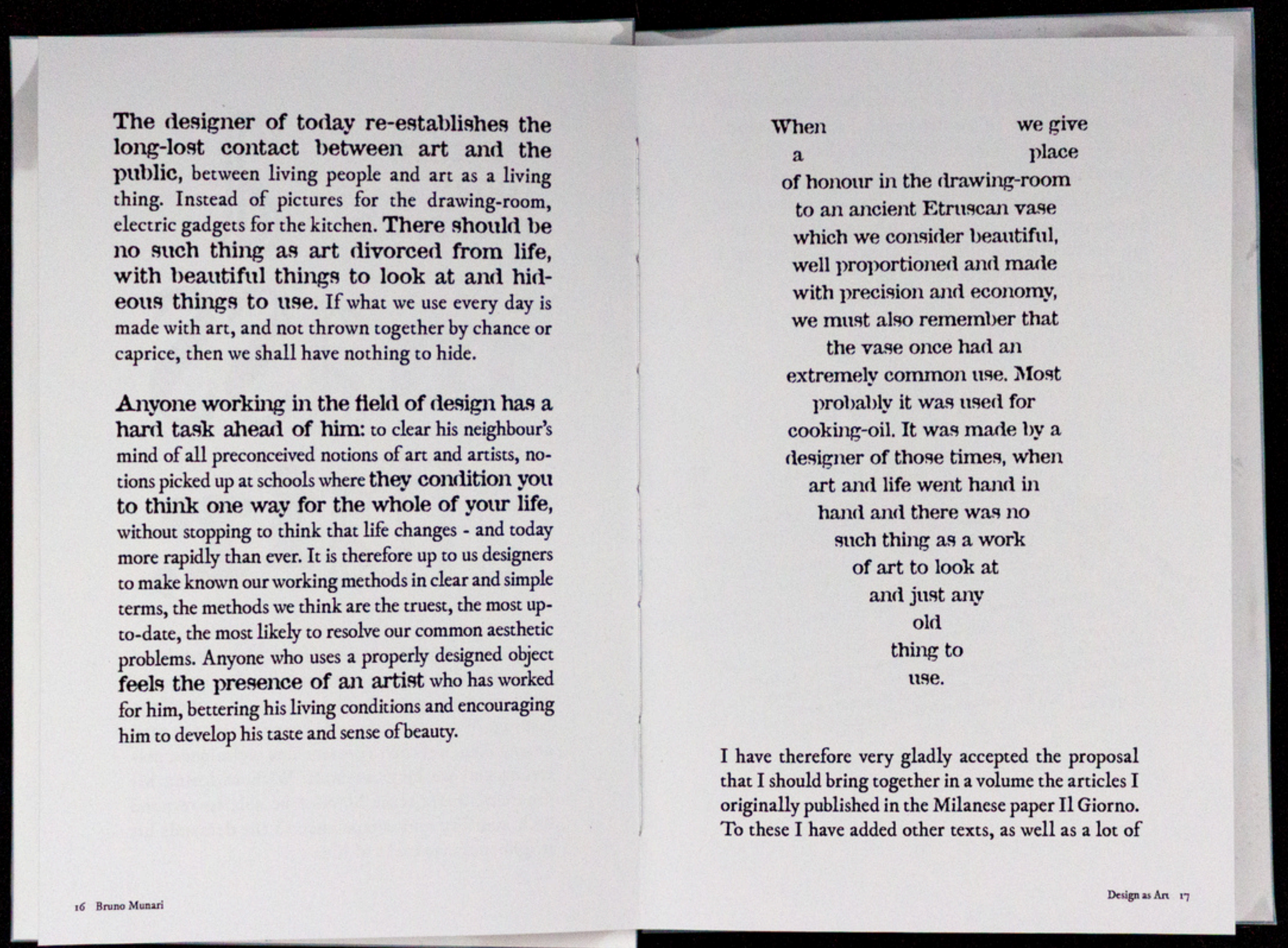

Design as Art
Pages 17-26, 44-45 from Design as Art
Excerpts from the articles by Bruno Munari exploring the role of design in everyday life, arguing that good design should be functional, accessible, and artistic.


Ch. 1
Design as Art


Today it has become necessary to demolish the myth of the 'star' artist who only produces masterpieces for a small group of ultra-intelligent people. It must be understood that as long as art stands aside from the problems of life it will only interest a very few people.

Culture today is becoming a mass affair,

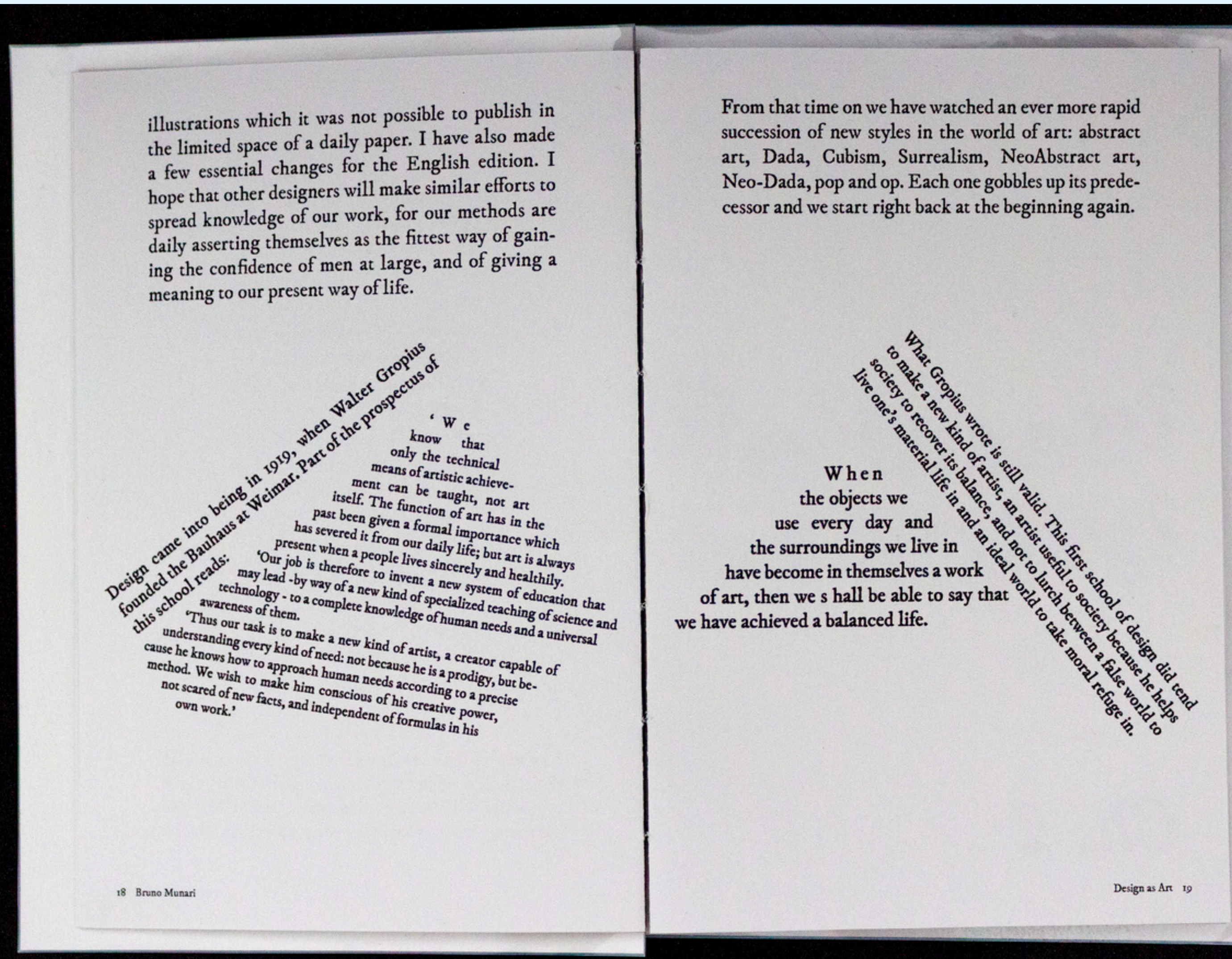
and the artist must step down from his pedestal and be prepared to make a sign for a butcher's shop (if he knows how to do it). The artist must cast off the last rags of romanticism and become active as a man among men, well up in present-day techniques, materials and working methods. Without losing his innate aesthetic sense he must be able to respond with humility and competence to the demands his neighbours may make of him.


The designer of today re-establishes the long-lost contact between art and the public, between living people and art as a living thing. Instead of pictures for the drawing-room, electric gadgets for the kitchen. **There should be no such thing as art divorced from life, with beautiful things to look at and hideous things to use.** If what we use every day is made with art, and not thrown together by chance or caprice, then we shall have nothing to hide.

Anyone working in the field of design has a hard task ahead of him: to clear his neighbour's mind of all preconceived notions of art and artists, notions picked up at schools where **they condition you to think one way for the whole of your life,** without stopping to think that life changes - and today more rapidly than ever. It is therefore up to us designers to make known our working methods in clear and simple terms, the methods we think are the truest, the most up-to-date, the most likely to resolve our common aesthetic problems. Anyone who uses a properly designed object **feels the presence of an artist** who has worked for him, bettering his living conditions and encouraging him to develop his taste and sense of beauty.

When we give a place of honour in the drawing-room to an ancient Etruscan vase which we consider beautiful, well proportioned and made with precision and economy, we must also remember that the vase once had an extremely common use. Most probably it was used for cooking-oil. It was made by a designer of those times, when art and life went hand in hand and there was no such thing as a work of art to look at and just any old thing to use.

I have therefore very gladly accepted the proposal that I should bring together in a volume the articles I originally published in the Milanese paper Il Giorno. To these I have added other texts, as well as a lot of


illustrations which it was not possible to publish in the limited space of a daily paper. I have also made a few essential changes for the English edition. I hope that other designers will make similar efforts to spread knowledge of our work, for our methods are daily asserting themselves as the fittest way of gaining the confidence of men at large, and of giving a meaning to our present way of life.

Design came into being in 1919, when Walter Gropius founded the Bauhaus at Weimar. Part of the prospectus of this school reads:

'We know that only the technical means of artistic achievement can be taught, not art itself. The function of art has in the past been given a formal importance which has severed it from our daily life; but art is always present when a people lives sincerely and healthily.

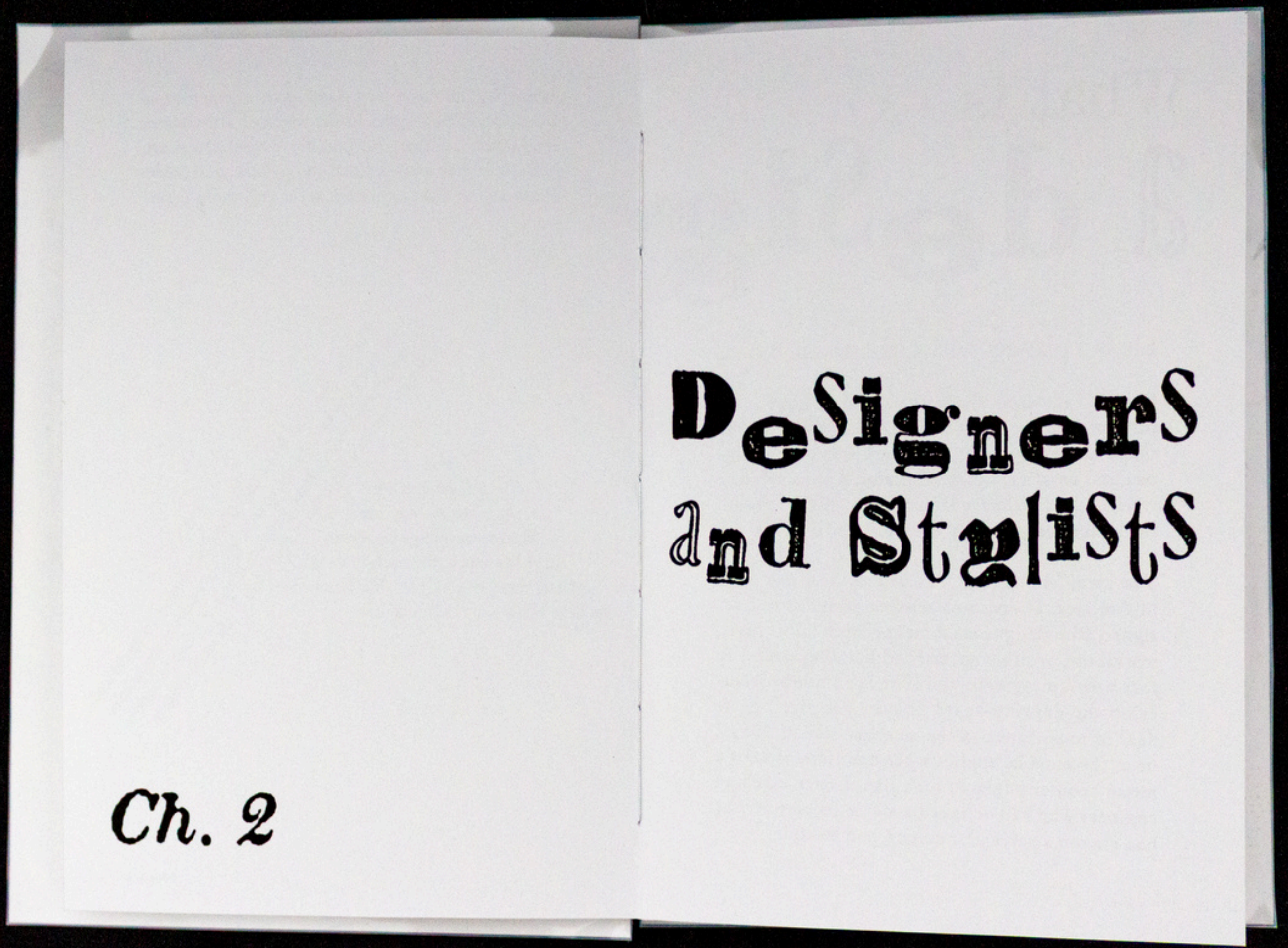
'Our job is therefore to invent a new system of education that may lead -by way of a new kind of specialized teaching of science and technology - to a complete knowledge of human needs and a universal awareness of them.

'Thus our task is to make a new kind of artist, a creator capable of understanding every kind of need: not because he is a prodigy, but because he knows how to approach human needs according to a precise method. We wish to make him conscious of his creative power, not scared of new facts, and independent of formulas in his own work.'

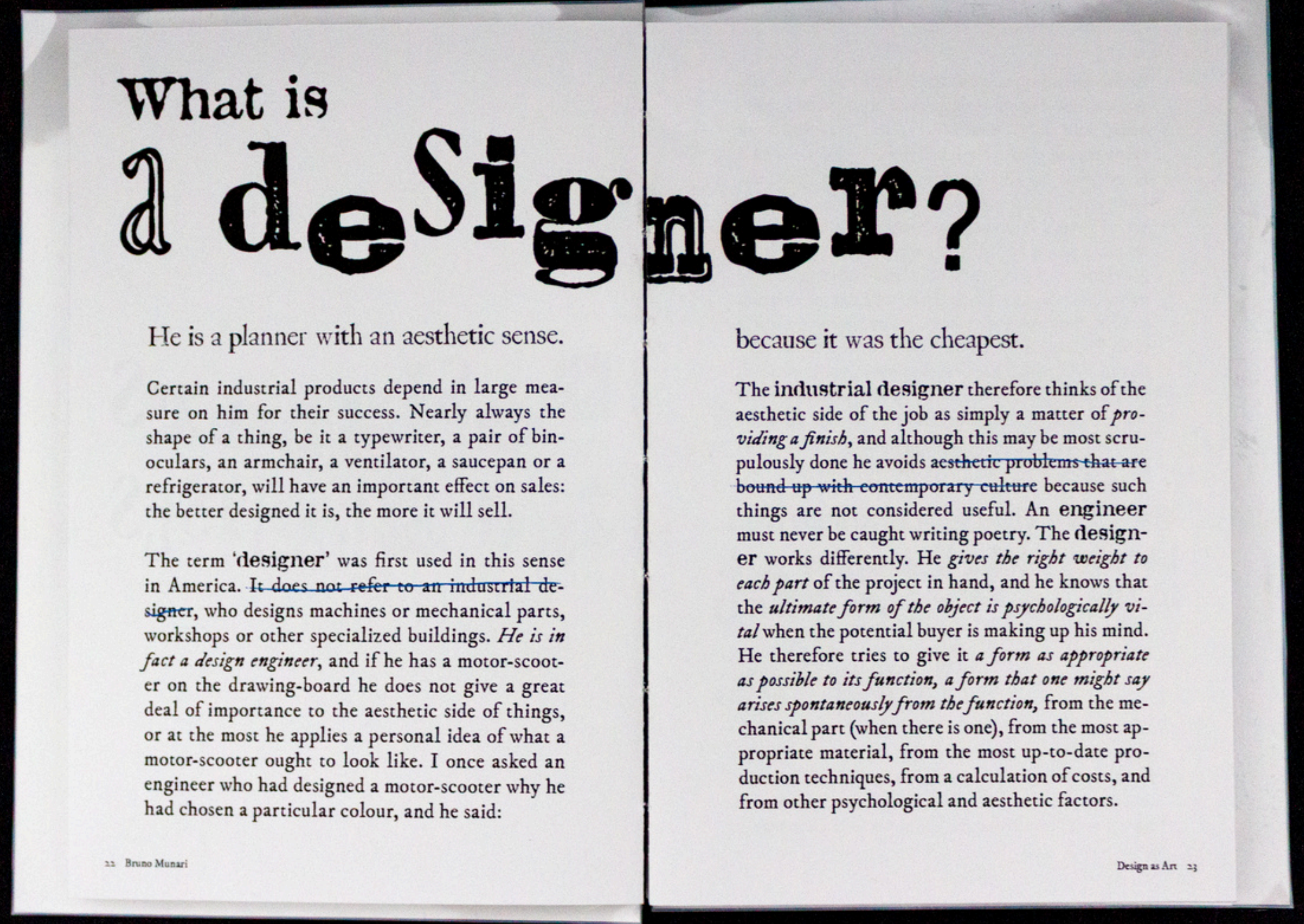
From that time on we have watched an ever more rapid succession of new styles in the world of art: abstract art, Dada, Cubism, Surrealism, NeoAbstract art, Neo-Dada, pop and op. Each one gobbles up its predecessor and we start right back at the beginning again.

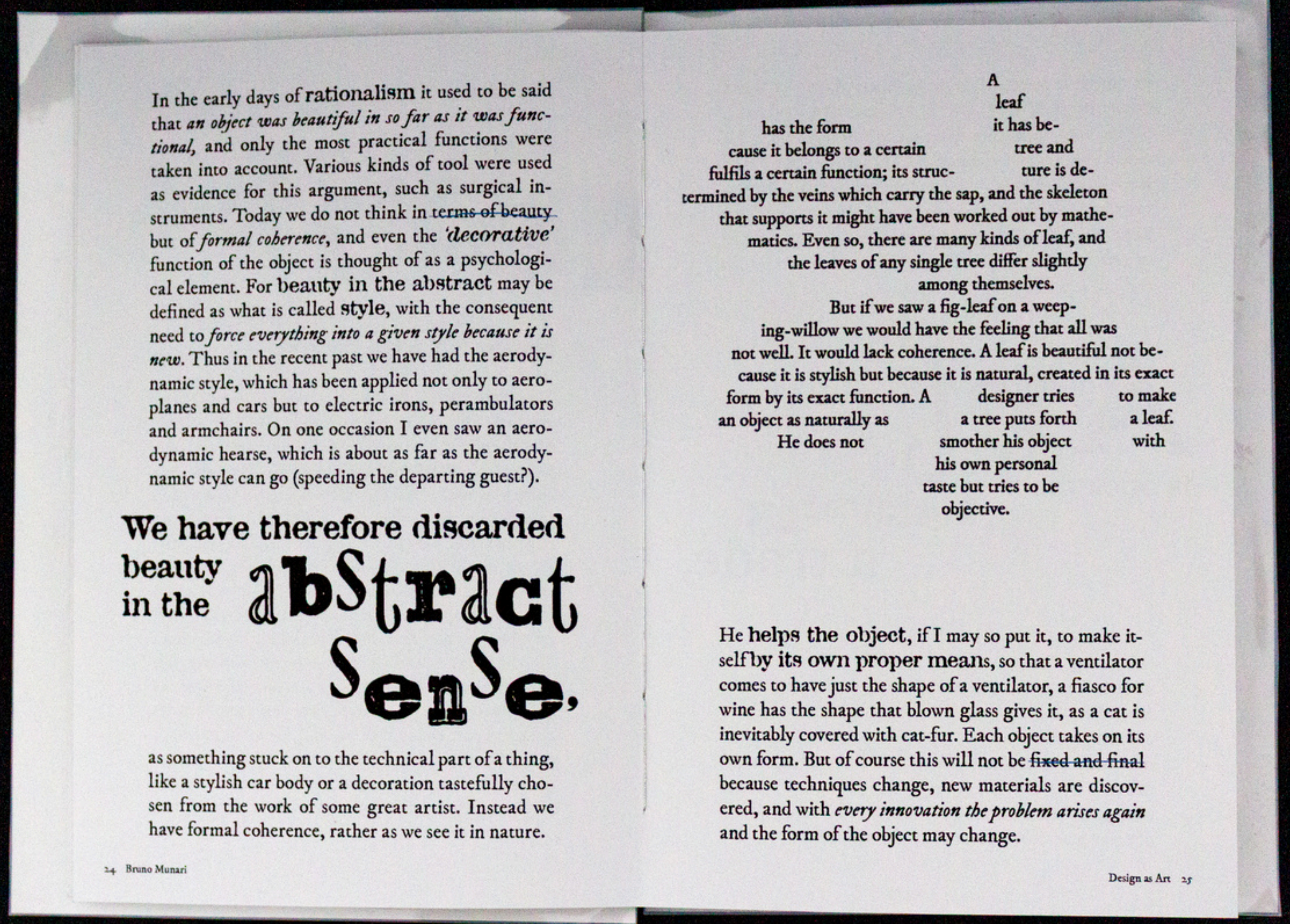
What Gropius wrote is still valid. This first school of design did tend to make a new kind of artist, an artist useful to society because he helps society to recover its balance, and not to lurch between a false world to live one's material life in and an ideal world to take moral refuge in.

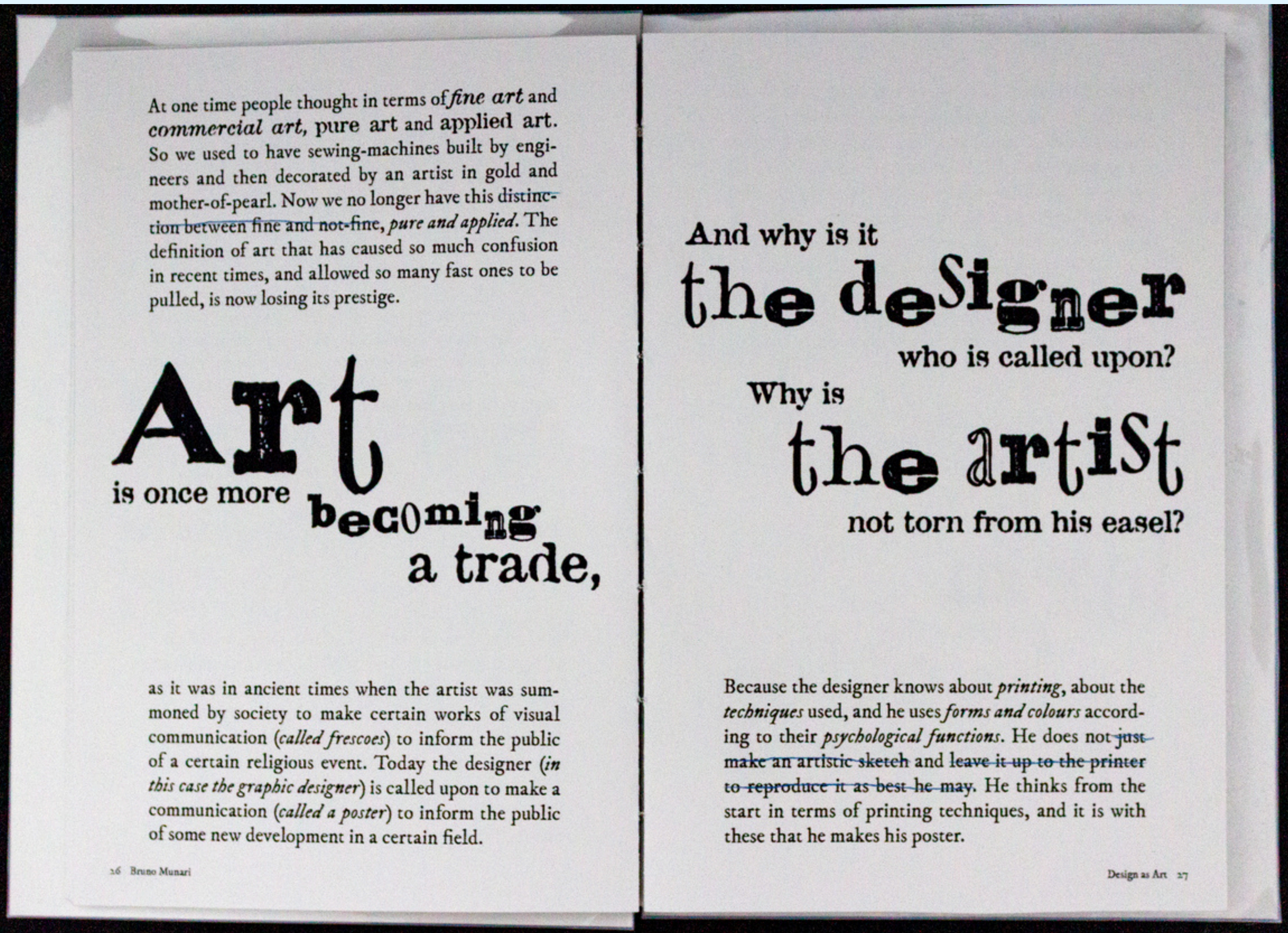
When the objects we use every day and the surroundings we live in have become in themselves a work of art, then we s hall be able to say that we have achieved a balanced life.

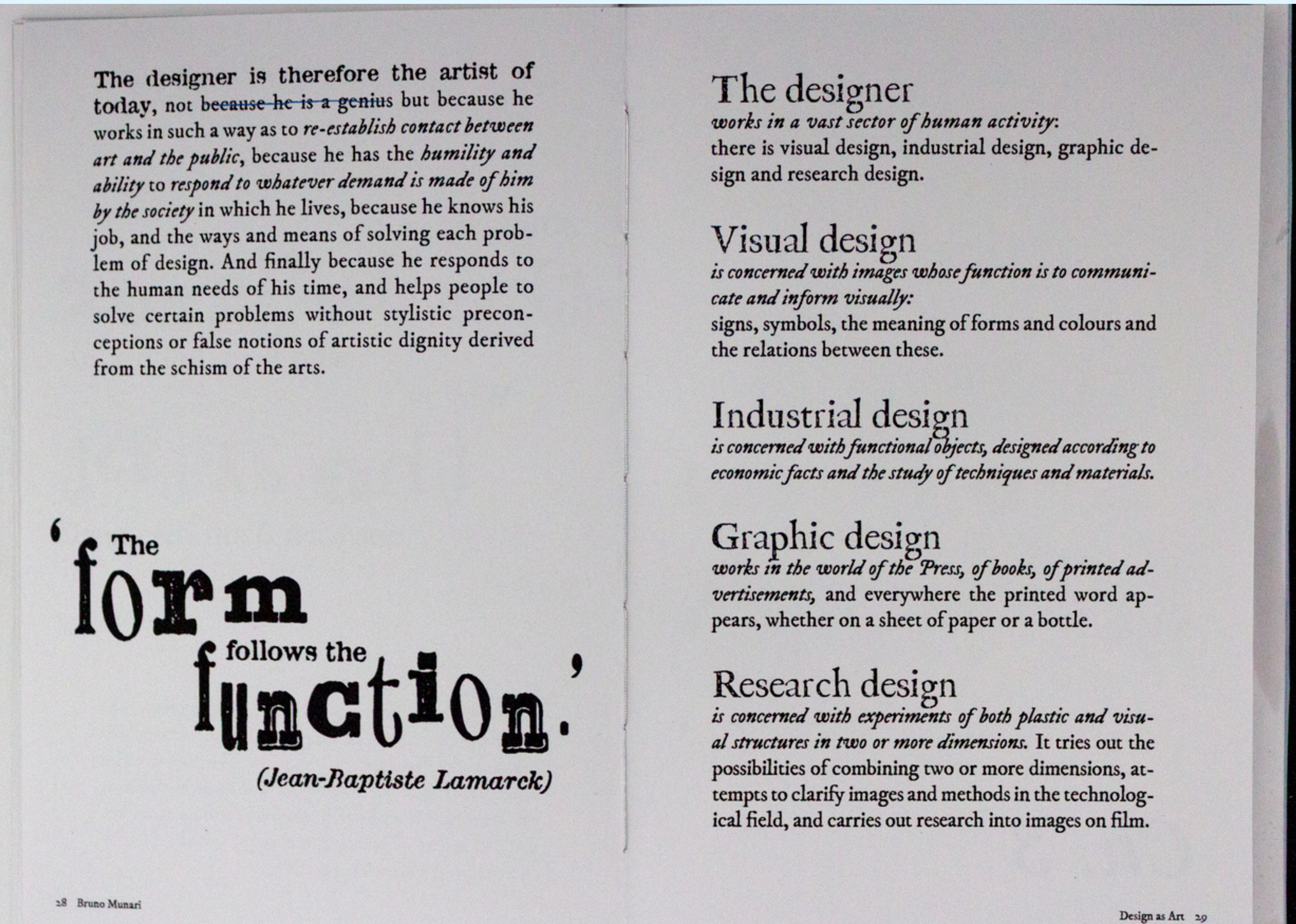

Ch. 2

Designers and Stylists


What is a designer?
He is a planner with an aesthetic sense.
Certain industrial products depend in large measure on him for their success. Nearly always the shape of a thing, be it a typewriter, a pair of binoculars, an armchair, a ventilator, a saucepan or a refrigerator, will have an important effect on sales: the better designed it is, the more it will sell.
The term 'designer' was first used in this sense in America. ~~It does not refer to an industrial designer~~, who designs machines or mechanical parts, workshops or other specialized buildings. He is in fact a design engineer, and if he has a motor-scooter on the drawing-board he does not give a great deal of importance to the aesthetic side of things, or at the most he applies a personal idea of what a motor-scooter ought to look like. I once asked an engineer who had designed a motor-scooter why he had chosen a particular colour, and he said:
22 Bruno Munari
because it was the cheapest.
The industrial designer therefore thinks of the aesthetic side of the job as simply a matter of providing a finish, and although this may be most scrupulously done he avoids ~~aesthetic problems that are bound up with contemporary culture~~ because such things are not considered useful. An engineer must never be caught writing poetry. The designer works differently. He gives the right weight to each part of the project in hand, and he knows that the ultimate form of the object is psychologically vital when the potential buyer is making up his mind. He therefore tries to give it a form as appropriate as possible to its function, a form that one might say arises spontaneously from the function, from the mechanical part (when there is one), from the most appropriate material, from the most up-to-date production techniques, from a calculation of costs, and from other psychological and aesthetic factors.
Design as Art 23


In the early days of rationalism it used to be said that an object was beautiful in so far as it was functional, and only the most practical functions were taken into account. Various kinds of tool were used as evidence for this argument, such as surgical instruments. Today we do not think in ~~terms of beauty~~ but of formal coherence, and even the 'decorative' function of the object is thought of as a psychological element. For beauty in the abstract may be defined as what is called style, with the consequent need to force everything into a given style because it is new. Thus in the recent past we have had the aerodynamic style, which has been applied not only to aeroplanes and cars but to electric irons, perambulators and armchairs. On one occasion I even saw an aerodynamic hearse, which is about as far as the aerodynamic style can go (speeding the departing guest?).
We have therefore discarded beauty in the abstract sense,
as something stuck on to the technical part of a thing, like a stylish car body or a decoration tastefully chosen from the work of some great artist. Instead we have formal coherence, rather as we see it in nature.
24 Bruno Munari
A leaf has the form it has because it belongs to a certain tree and fulfils a certain function; its structure is determined by the veins which carry the sap, and the skeleton that supports it might have been worked out by mathematics. Even so, there are many kinds of leaf, and the leaves of any single tree differ slightly among themselves.
But if we saw a fig-leaf on a weeping-willow we would have the feeling that all was not well. It would lack coherence. A leaf is beautiful not because it is stylish but because it is natural, created in its exact form by its exact function. A designer tries to make an object as naturally as a tree puts forth a leaf. He does not smother his object with his own personal taste but tries to be objective.
He helps the object, if I may so put it, to make itself by its own proper means, so that a ventilator comes to have just the shape of a ventilator, a fiasco for wine has the shape that blown glass gives it, as a cat is inevitably covered with cat-fur. Each object takes on its own form. But of course this will not be ~~fixed and final~~ because techniques change, new materials are discovered, and with every innovation the problem arises again and the form of the object may change.
Design as Art 25


At one time people thought in terms of fine art and commercial art, pure art and applied art. So we used to have sewing-machines built by engineers and then decorated by an artist in gold and mother-of-pearl. Now we no longer have this ~~distinction between fine and not-fine~~, pure and applied. The definition of art that has caused so much confusion in recent times, and allowed so many fast ones to be pulled, is now losing its prestige.
Art is once more becoming a trade,
as it was in ancient times when the artist was summoned by society to make certain works of visual communication (called frescoes) to inform the public of a certain religious event. Today the designer (in this case the graphic designer) is called upon to make a communication (called a poster) to inform the public of some new development in a certain field.
26 Bruno Munari
And why is it the designer who is called upon?
Why is the artist not torn from his easel?
Because the designer knows about printing, about the techniques used, and he uses forms and colours according to their psychological functions. He does not ~~just make an artistic sketch~~ and ~~leave it up to the printer to reproduce it as best he may~~. He thinks from the start in terms of printing techniques, and it is with these that he makes his poster.
Design as Art 27


The designer is therefore the artist of today, not ~~because he is a genius~~ but because he works in such a way as to re-establish contact between art and the public, because he has the humility and ability to respond to whatever demand is made of him by the society in which he lives, because he knows his job, and the ways and means of solving each problem of design. And finally because he responds to the human needs of his time, and helps people to solve certain problems without stylistic preconceptions or false notions of artistic dignity derived from the schism of the arts.
'The form follows the function.'
(Jean-Baptiste Lamarck)
28 Bruno Munari
The designer
works in a vast sector of human activity:
there is visual design, industrial design, graphic design and research design.
Visual design
is concerned with images whose function is to communicate and inform visually:
signs, symbols, the meaning of forms and colours and the relations between these.
Industrial design
is concerned with functional objects, designed according to economic facts and the study of techniques and materials.
Graphic design
works in the world of the Press, of books, of printed advertisements, and everywhere the printed word appears, whether on a sheet of paper or a bottle.
Research design
is concerned with experiments of both plastic and visual structures in two or more dimensions. It tries out the possibilities of combining two or more dimensions, attempts to clarify images and methods in the technological field, and carries out research into images on film.
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Ch. 3

Pure and Applied

Once upon a time

there was pure art and applied art (I prefer to use these terms, rather than ~~*'fine'*~~ and ~~*'commercial'*~~, because ~~'commercial art' does not really cover enough ground~~). At all events, forms were born in secret in ivory towers and fathered by divine inspiration, and Artists showed them only to initiates and only in the shape of paintings and pieces of sculpture: *for these were the only channels of communication open to the old forms of art.*

Around the person of the Artistic Genius there circulated other and lesser geniuses who absorbed the Pure Forms and the Style of the Master and attempted to give these some *currency by applying them to objects of everyday use.* This led to the making of *objects in this style or that style*, and even today the question of S~~tyle has not been altogether disposed of.~~

The distinction between *pure art, applied art* and *industrial design* is still made in France, a country that at one time was the cradle of living art. What we call design, the French call 'esthetique industrielle', and by this phrase they mean *the application to industry of styles invented in the realm of the pure arts.*

It therefore comes about that in France they make *lamps inspired by abstract forms without bearing in mind that a lamp must give light.* They design a Surrealist television set, a Dada table, a piece of 'informal' furniture, forgetting that ~~all objects have their exact uses and well-defined functions~~, and that they are no longer ~~made by craftsmen modelling a stylish~~ shape in copper according to their whim of the moment but by automatic machines turning out thousands of the things at a time.

What then is this thing called Design if it is neither style nor applied art?

It is planning: the planning as objectively as possible of everything that goes to make up the surroundings and atmosphere in which men live today. *This atmosphere is created by all the objects produced by industry,* from glasses to houses and even cities. It is planning done without preconceived notions of style, attempting only to give each thing its *logical structure* and *proper material,* and in consequence *its logical form.*

So all this talk about sober harmony, beauty and proportions, about the *balance* between masses and spaces (typical sculpture-talk), about *aesthetic perfection* (classicism?), about the charm of the materials used and the equilibrium of the forms, all this talk our French friends go in for, is *just a lot of old-fashioned claptrap.* An object should now be judged by whether it has a form consistent with its use, whether the material fits the construction and the production costs, whether the individual parts are logically fitted together.

It is therefore a question of coherence.

Beauty as conceived of in the fine arts, *a sense of balance comparable with that of the masterpieces of the past, harmony and all the rest of it,* simply make no more sense in design. If the form of an object turns out to be *'beautiful'* it will be thanks to the logic of its construction and to the precision *of*

the solutions found for its various components. It is *'beautiful'* because it is just right. An exact project produces a beautiful object, beautiful not because it is like a piece of sculpture, even modern sculpture, but because it is only like itself.

If you want to know something else about beauty, what precisely it is, look at a history of art. You will see that every age has had its ideal *Venus* (*or Apollo*), and that all these Venuses or Apollos put together and compared out of the context of their periods are ~~nothing less~~ than a family of monsters.

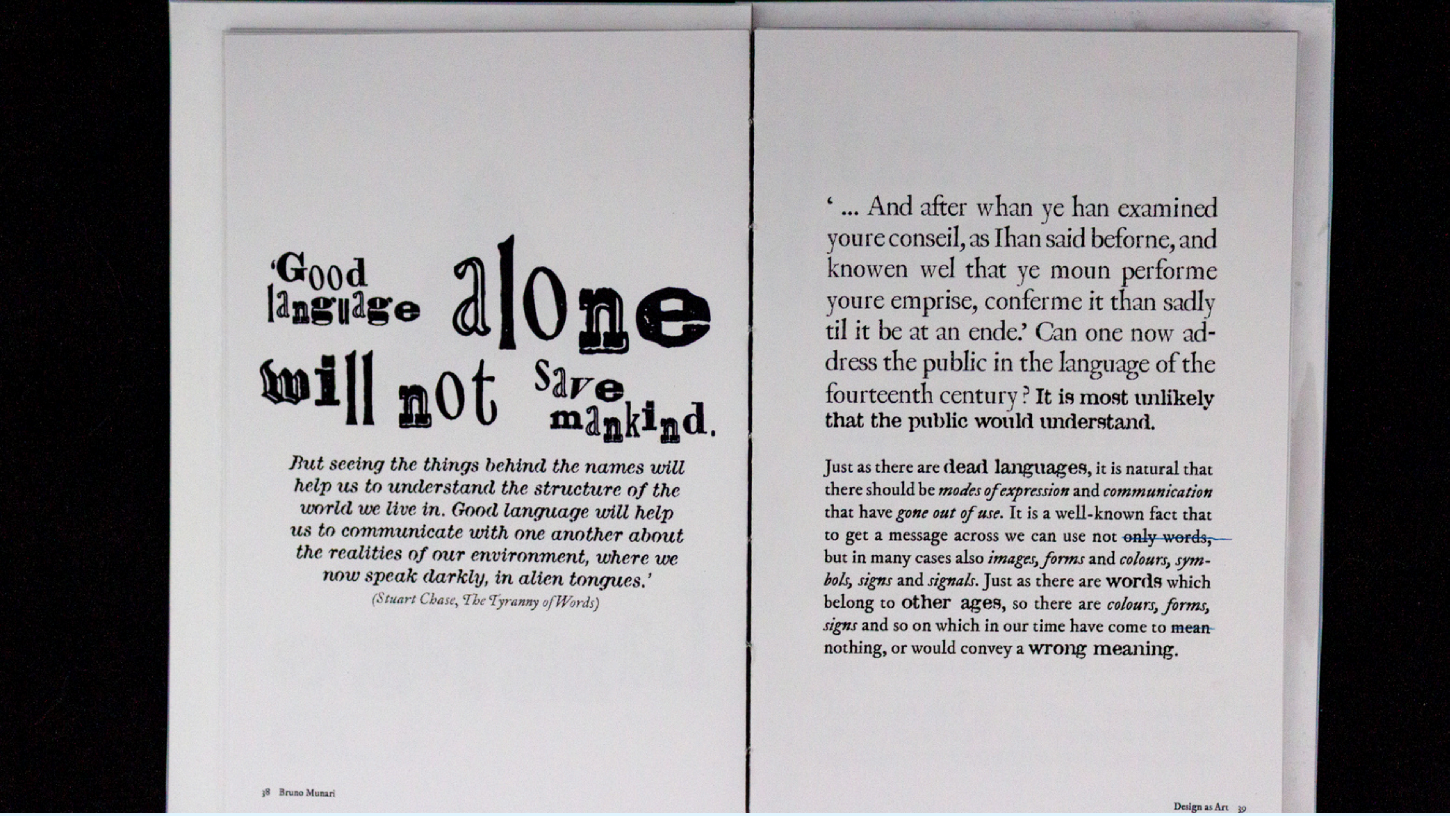
A thing is not ~~beautiful because it is beautiful~~, as the he-frog said to the she-frog, it is beautiful because one likes it.

Bauhaus

'The basic teaching error of the academy was that of directing its attention towards genius rather than the average.'

Ch. 4

A Living Language



'Good language alone will not save mankind.

But seeing the things behind the names will help us to understand the structure of the world we live in. Good language will help us to communicate with one another about the realities of our environment, where we now speak darkly, in alien tongues.'

(Stuart Chase, *The Tyranny of Words*)

38 Bruno Munari

'... And after whan ye han examined youre conseil, as Ihan said beforne, and knowen wel that ye moun performe youre emprise, conferme it than sadly til it be at an ende.' Can one now address the public in the language of the fourteenth century? **It is most unlikely that the public would understand.**

Just as there are **dead languages**, it is natural that there should be *modes of expression* and *communication* that have *gone out of use*. It is a well-known fact that to get a message across we can use not ~~only words,~~ but in many cases also *images, forms* and *colours, symbols, signs* and *signals*. Just as there are **words** which belong to **other ages**, so there are *colours, forms, signs* and so on which in our time have come to ~~mean~~ nothing, or would convey a **wrong meaning.**

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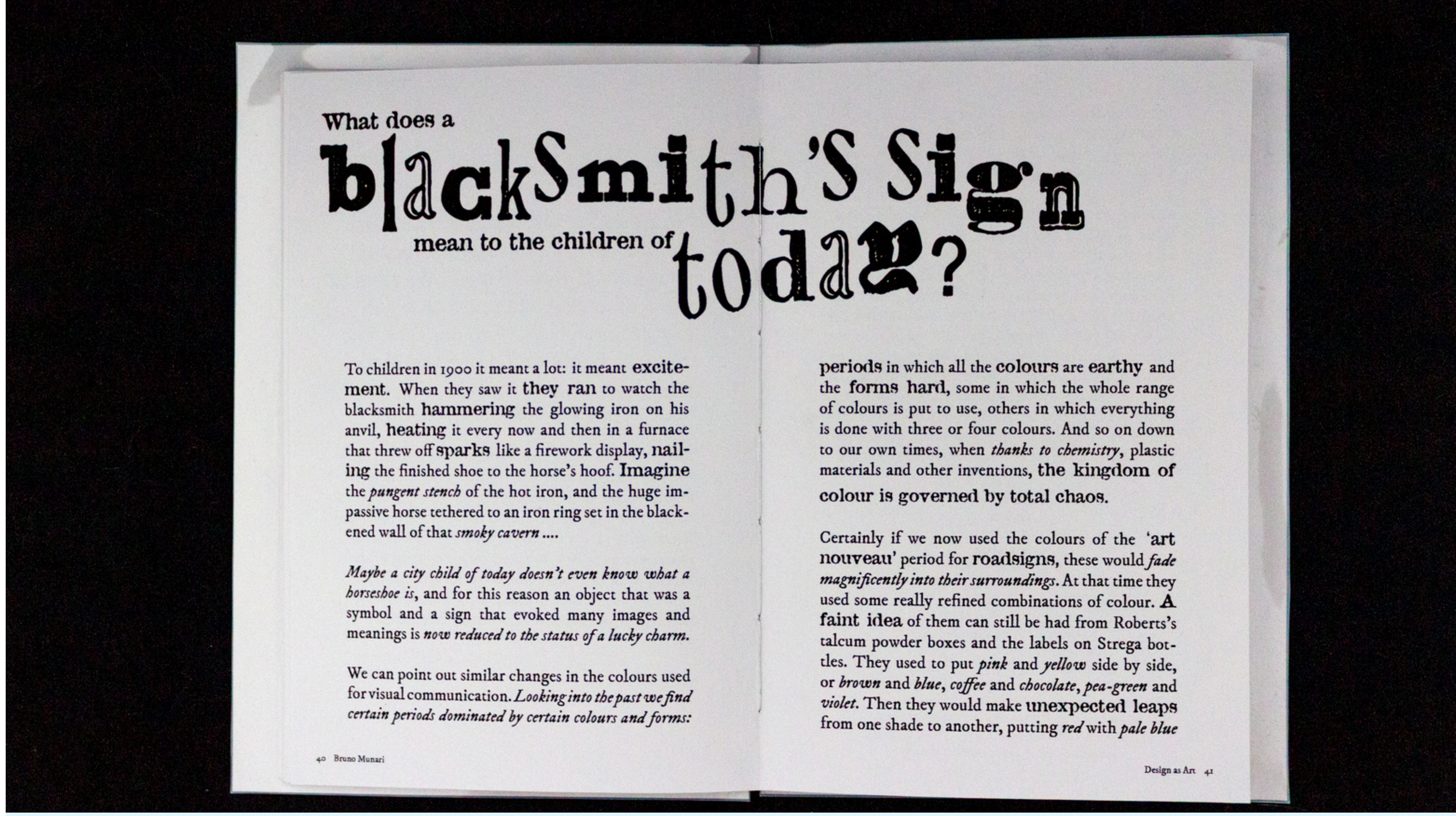

What does a blackSmith's Sign mean to the children of today?

To children in 1900 it meant a lot: it meant **excitement.** When they saw it **they ran** to watch the blacksmith **hammering** the glowing iron on his anvil, **heating** it every now and then in a furnace that threw off **sparks** like a firework display, **nailing** the finished shoe to the horse's hoof. **Imagine** the *pungent stench* of the hot iron, and the huge impassive horse tethered to an iron ring set in the blackened wall of that *smoky cavern ....*

Maybe a city child of today doesn't even know what a horseshoe is, and for this reason an object that was a symbol and a sign that evoked many images and meanings is *now reduced to the status of a lucky charm.*

We can point out similar changes in the colours used for visual communication. *Looking into the past we find certain periods dominated by certain colours and forms:* **periods** in which all the **colours** are **earthy** and the **forms hard,** some in which the whole range of colours is put to use, others in which everything is done with three or four colours. And so on down to our own times, when *thanks to chemistry*, plastic materials and other inventions, **the kingdom of colour is governed by total chaos.**

Certainly if we now used the colours of the **'art nouveau'** period for **roadsigns,** these would *fade magnificently into their surroundings*. At that time they used some really refined combinations of colour. **A faint idea** of them can still be had from Roberts's talcum powder boxes and the labels on Strega bottles. They used to put *pink* and *yellow* side by side, or *brown* and *blue*, *coffee* and *chocolate*, *pea-green* and *violet*. Then they would make **unexpected leaps** from one shade to another, putting *red* with *pale blue*

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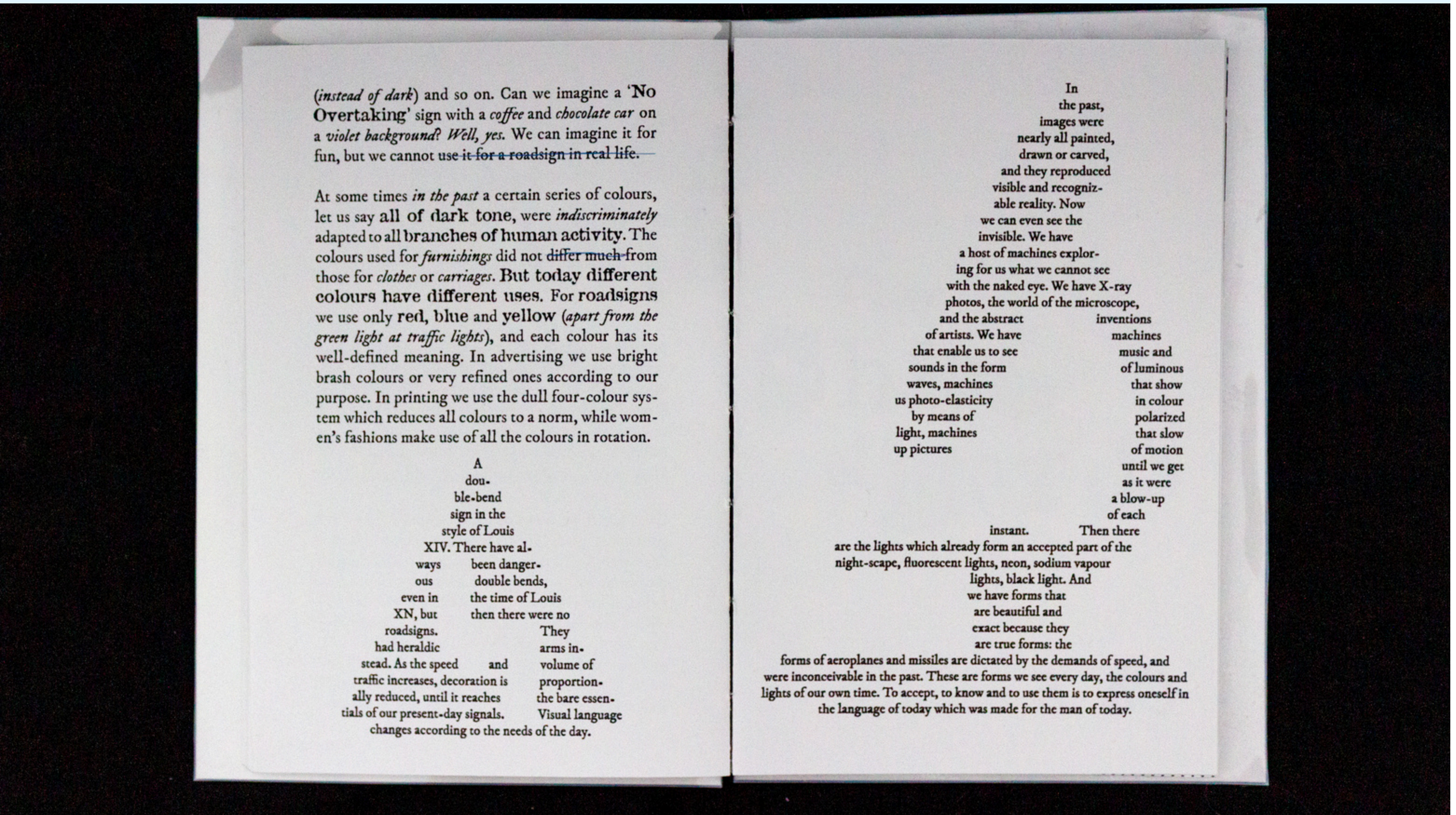
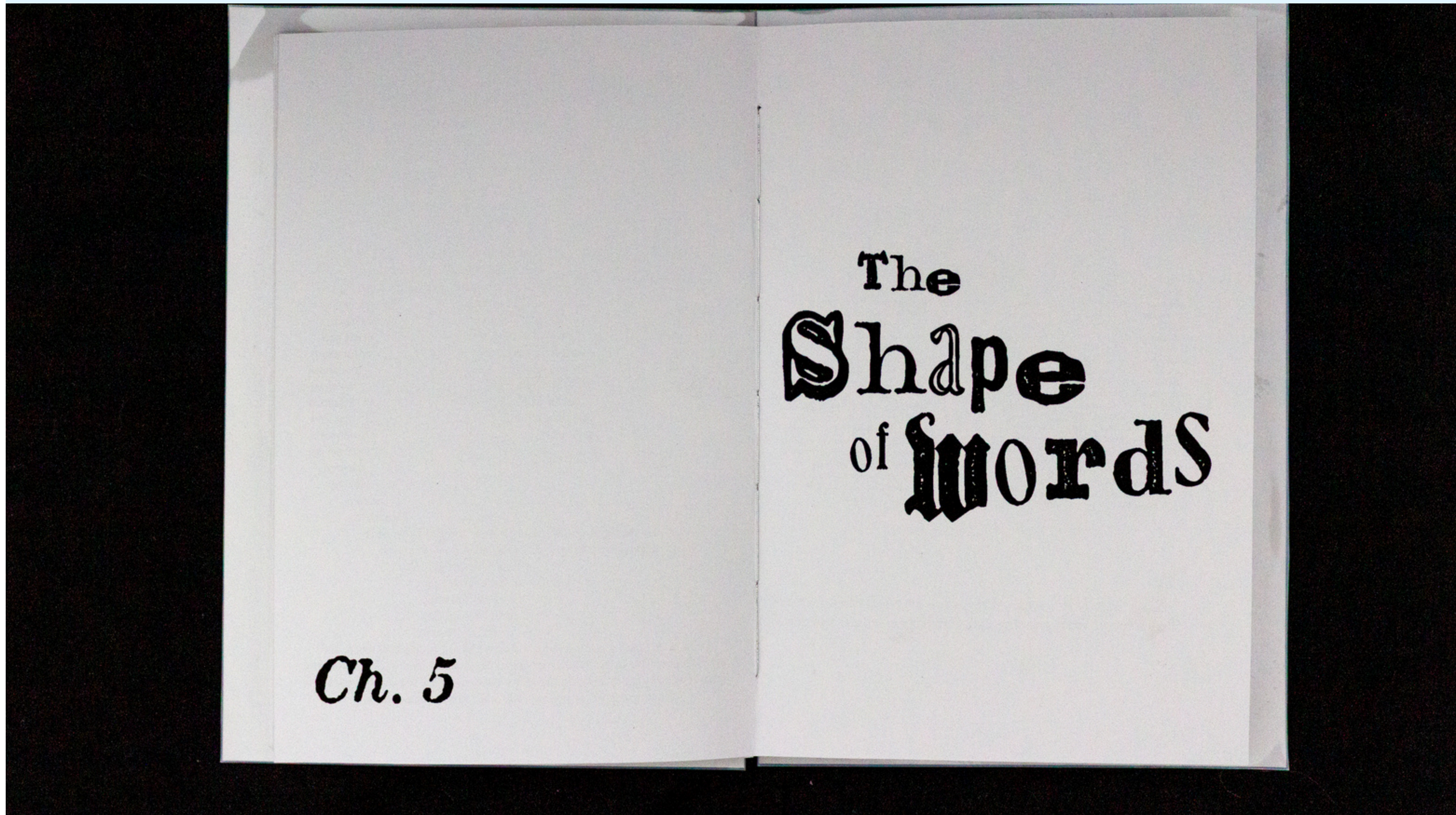


(*instead of dark*) and so on. Can we imagine a **'No Overtaking'** sign with a *coffee* and *chocolate car* on a *violet background? Well, yes.* We can imagine it for fun, but we cannot use ~~it for a roadsign in real life.~~

At some times *in the past* a certain series of colours, let us say **all of dark tone,** were *indiscriminately* adapted to all **branches of human activity.** The colours used for *furnishings* did not ~~differ much~~ from those for *clothes* or *carriages*. **But today different colours have different uses.** For **roadsigns** we use only **red, blue** and **yellow** (*apart from the green light at traffic lights*), and each colour has its well-defined meaning. In advertising we use bright brash colours or very refined ones according to our purpose. In printing we use the dull four-colour system which reduces all colours to a norm, while women's fashions make use of all the colours in rotation.

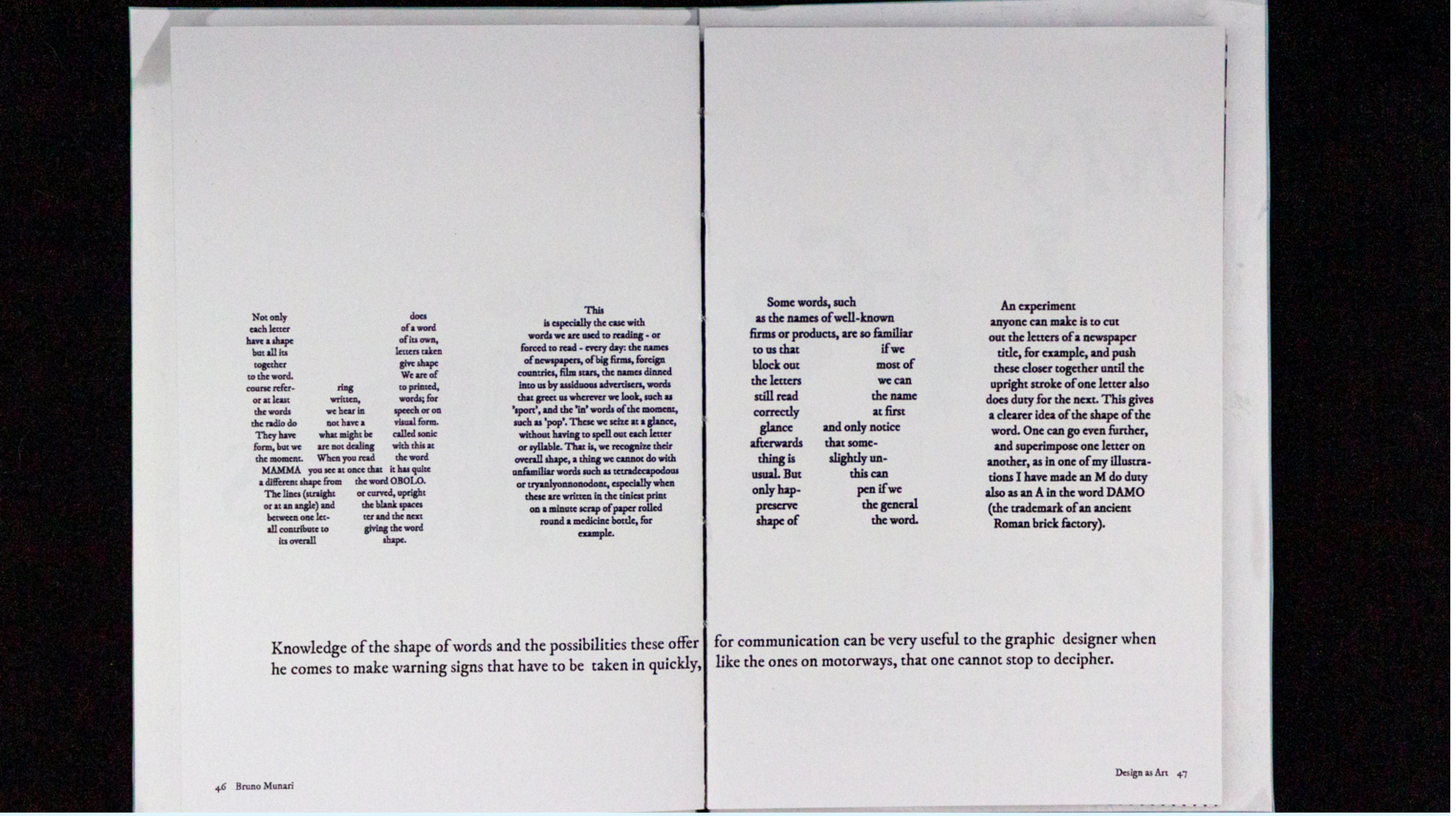
A
dou-
ble-bend
sign in the
style of Louis
XIV. There have al-
ways been danger-
ous double bends,
even in the time of Louis
XN, but then there were no
roadsigns. They
had heraldic arms in-
stead. As the speed and volume of
traffic increases, decoration is proportion-
ally reduced, until it reaches the bare essen-
tials of our present-day signals. Visual language
changes according to the needs of the day.

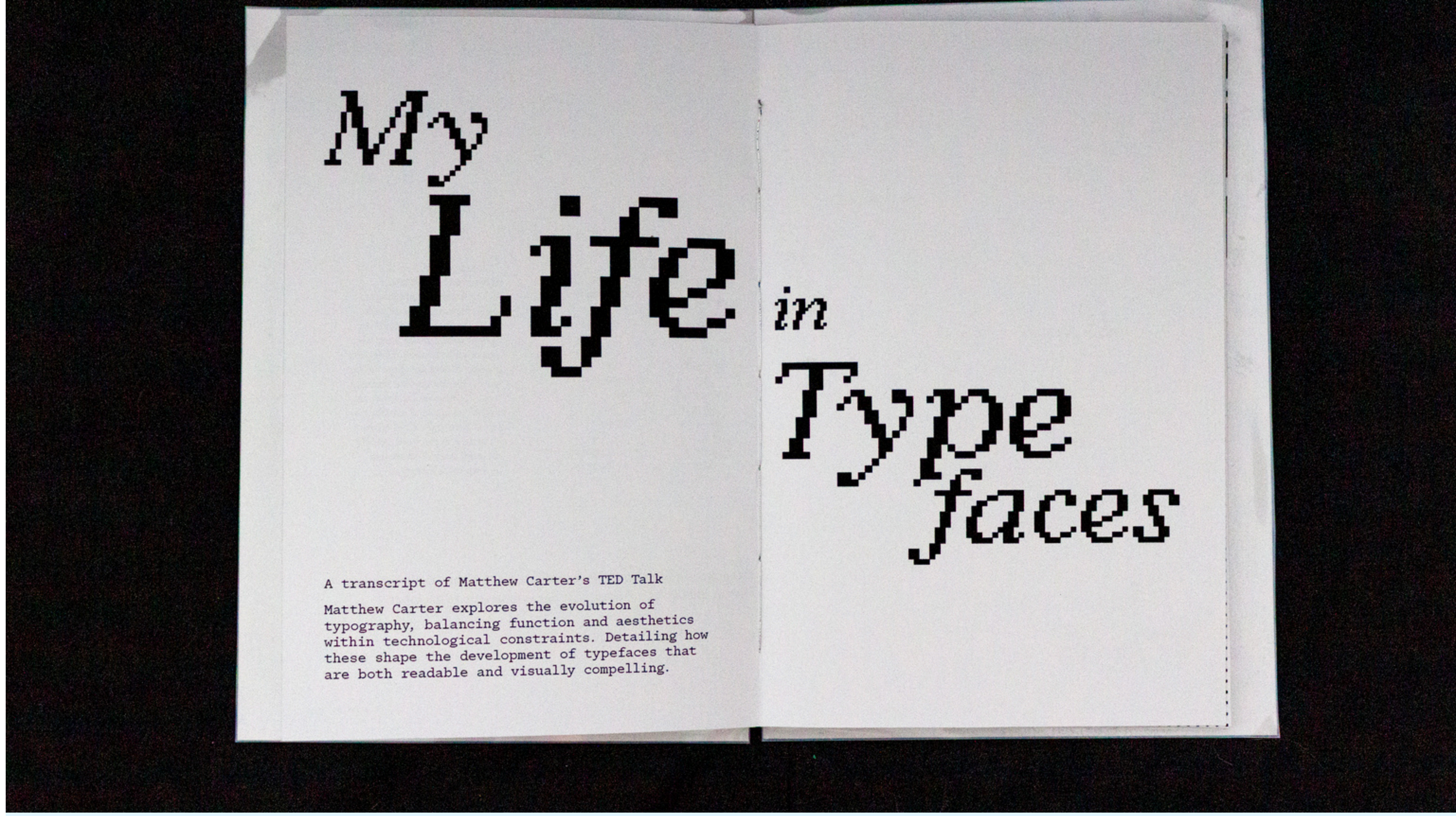
In
the past,
images were
nearly all painted,
drawn or carved,
and they reproduced
visible and recogniz-
able reality. Now
we can even see the
invisible. We have
a host of machines explor-
ing for us what we cannot see
with the naked eye. We have X-ray
photos, the world of the microscope,
and the abstract inventions
of artists. We have machines
that enable us to see music and
sounds in the form of luminous
waves, machines that show
us photo-elasticity in colour
by means of polarized
light, machines that slow
up pictures of motion
until we get
as it were
a blow-up
of each
instant. Then there
are the lights which already form an accepted part of the
night-scape, fluorescent lights, neon, sodium vapour
lights, black light. And
we have forms that
are beautiful and
exact because they
are true forms: the
forms of aeroplanes and missiles are dictated by the demands of speed, and
were inconceivable in the past. These are forms we see every day, the colours and
lights of our own time. To accept, to know and to use them is to express oneself in
the language of today which was made for the man of today.

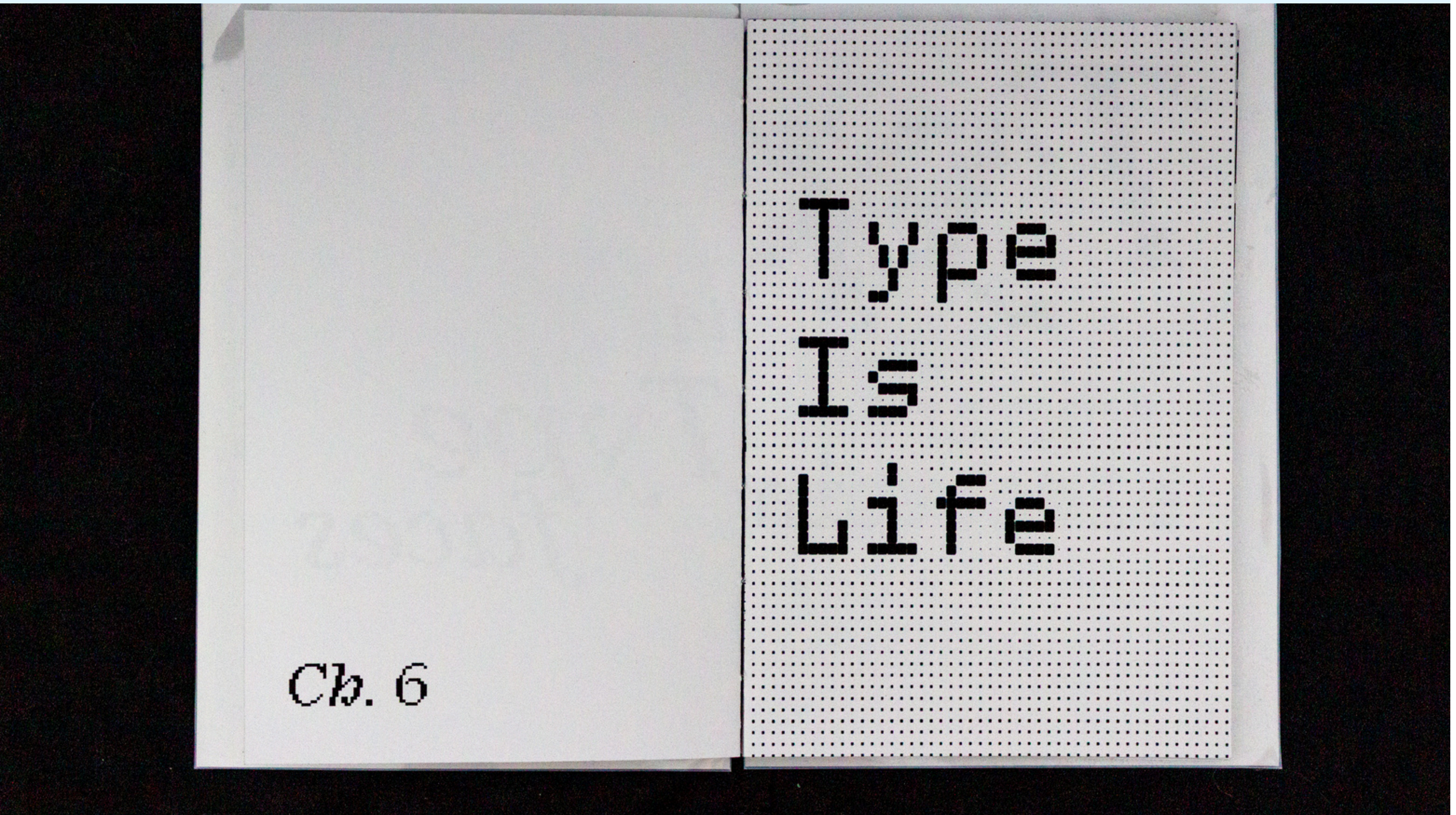


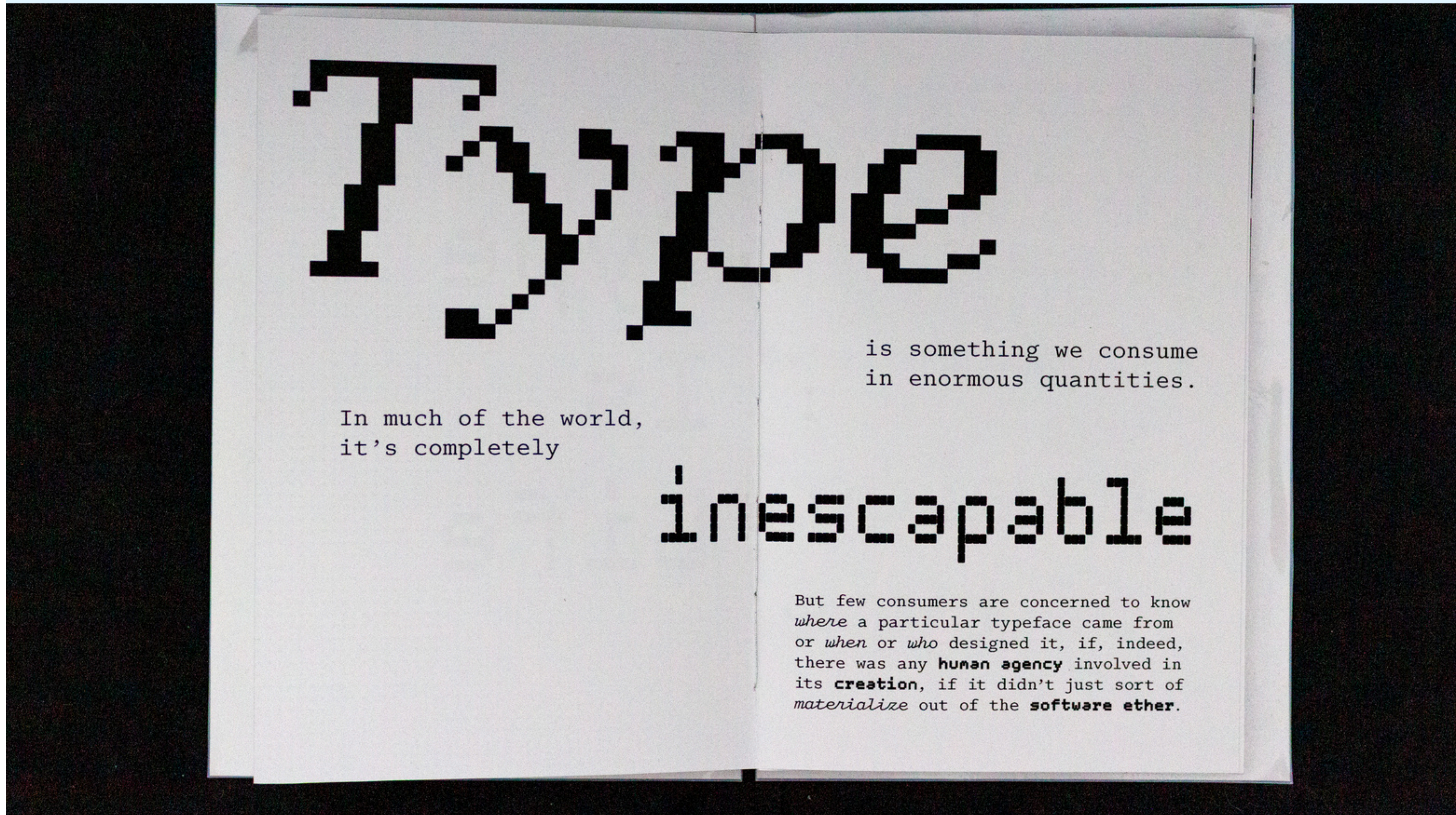
The Shape of Words

Ch. 5


Knowledge of the shape of words and the possibilities these offer for communication can be very useful to the graphic designer when he comes to make warning signs that have to be taken in quickly, like the ones on motorways, that one cannot stop to decipher.
46 Bruno Munari
Design as Art 47


My Life in Typefaces
A transcript of Matthew Carter's TED Talk
Matthew Carter explores the evolution of typography, balancing function and aesthetics within technological constraints. Detailing how these shape the development of typefaces that are both readable and visually compelling.


Ch. 6
Type
Is
Life


Type
is something we consume
in enormous quantities.
In much of the world,
it's completely
inescapable
But few consumers are concerned to know where a particular typeface came from or when or who designed it, if, indeed, there was any human agency involved in its creation, if it didn't just sort of materialize out of the software ether.

But I do have to be concerned with those things. **It's my job.** I'm one of the tiny handful of people who gets *badly bent* out of shape by the *bad spacing* of the **T** and the **E** that you see there. I've got to take that slide off. **I can't stand it.** Nor can Chris. There. Good. **So my talk is about**

the connection between **tech-nology** *and* **design of type.**

The **technology** has changed a number of times since I started work: **photo, digital, desktop, screen, web.** I've had to **survive** those changes and try to *understand their implications* for what I do for design.

k k

This slide is about the effect of tools on form. The two letters, the two K's, the one on your left, my right, is modern, made on a computer. All straight lines are dead straight. The curves have that kind of mathematical smoothness that the Bézier formula imposes.

On the right, ancient Gothic, cut in the resistant material of steel by hand. None of the straight lines are actually straight. The curves are subtle. It has that kind of spark of life from the human hand that the machine or the program can never capture. What a contrast.

Well, **I tell a lie.**

A lie at TED.

I'm really sorry. Both of these were made on a computer, *same software, same Bézier curves,* same font format. The one on your left was made by **Zuzana Licko at Emigre,** and I did the other one. *The tool is the same, yet the letters are different.* The letters are different because **the designers are different. That's all.** Zuzana wanted hers to look like that. I wanted mine to look like that.

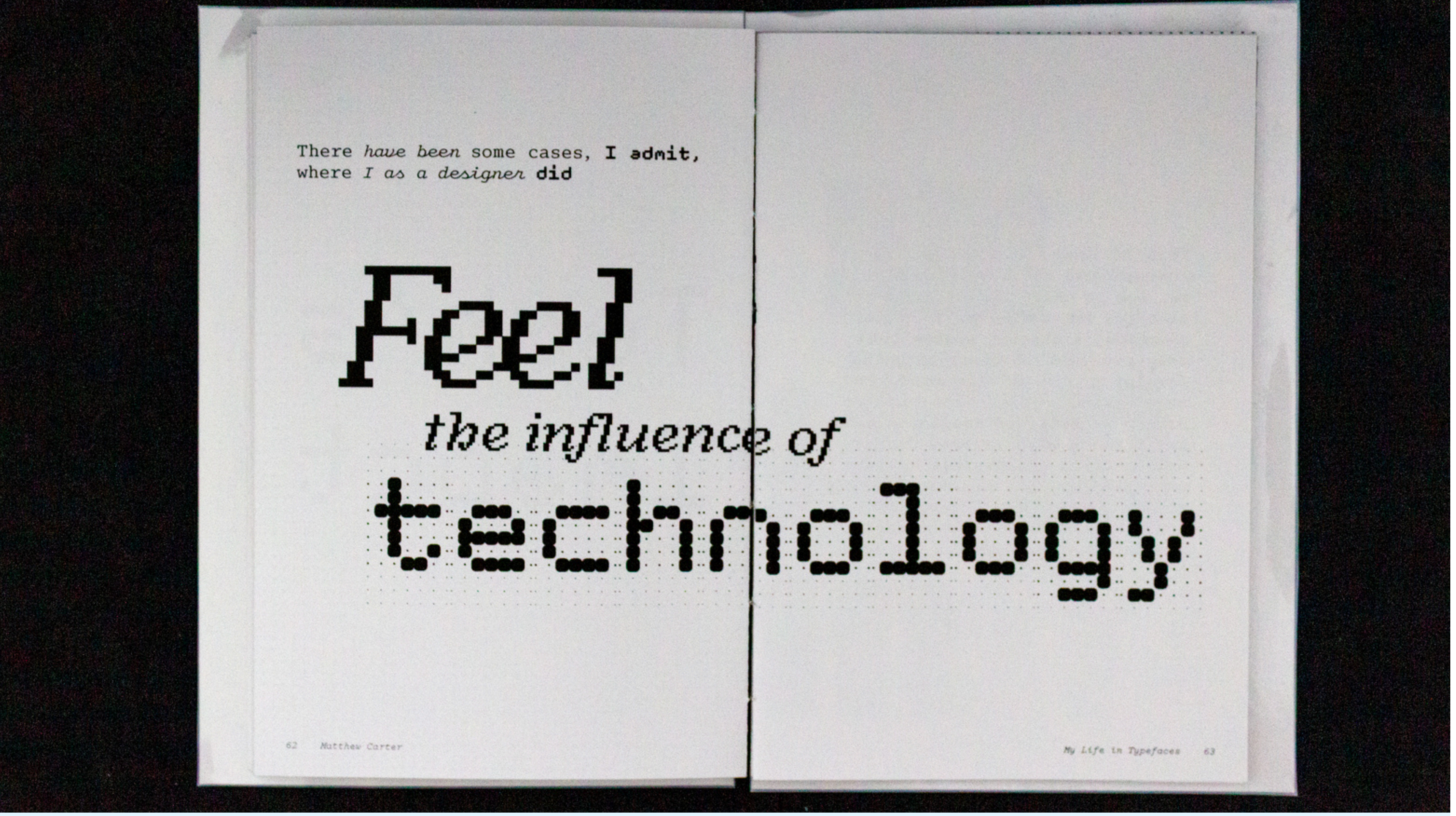
End of story.

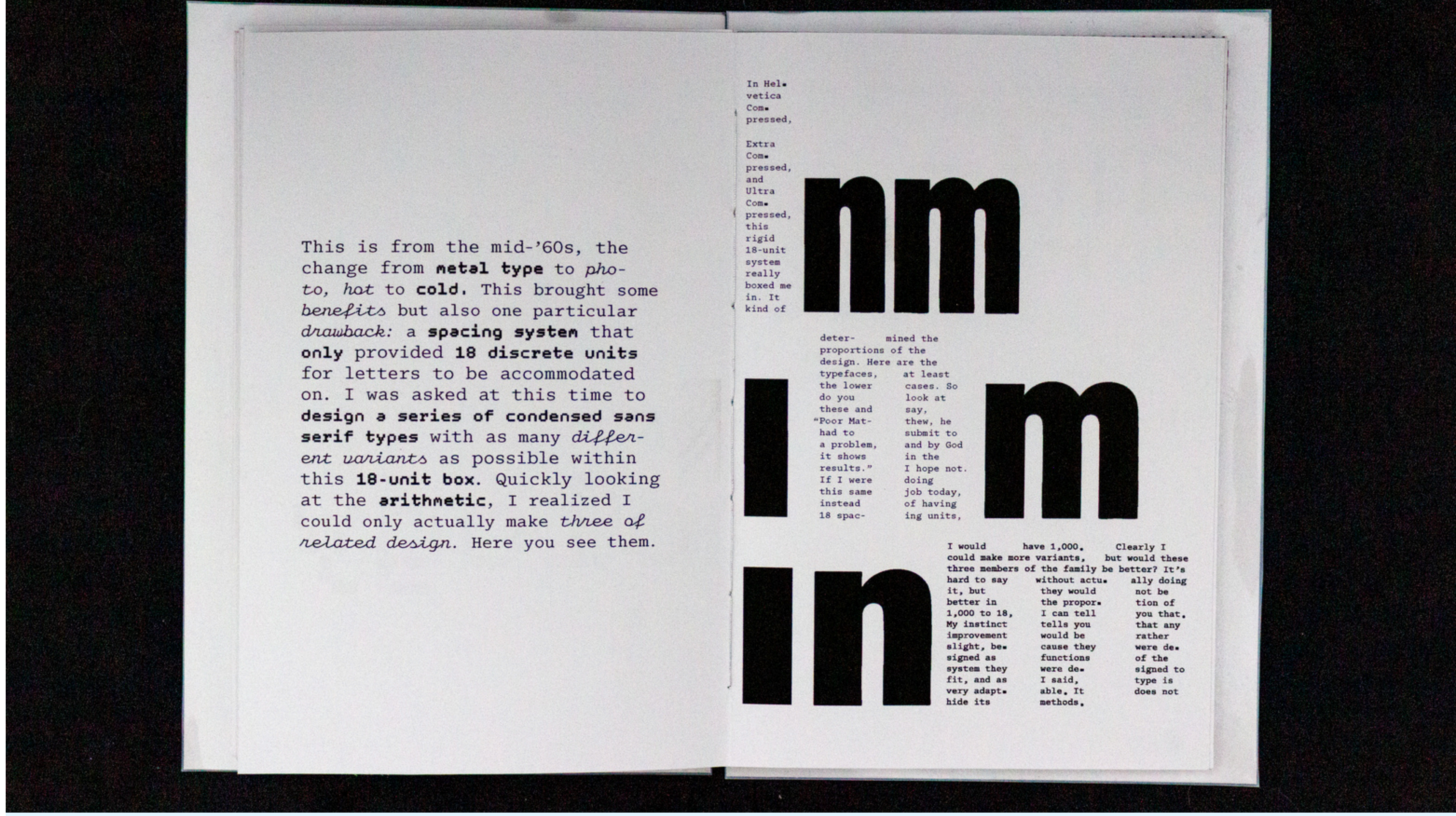
Type *is very* **adaptable.**

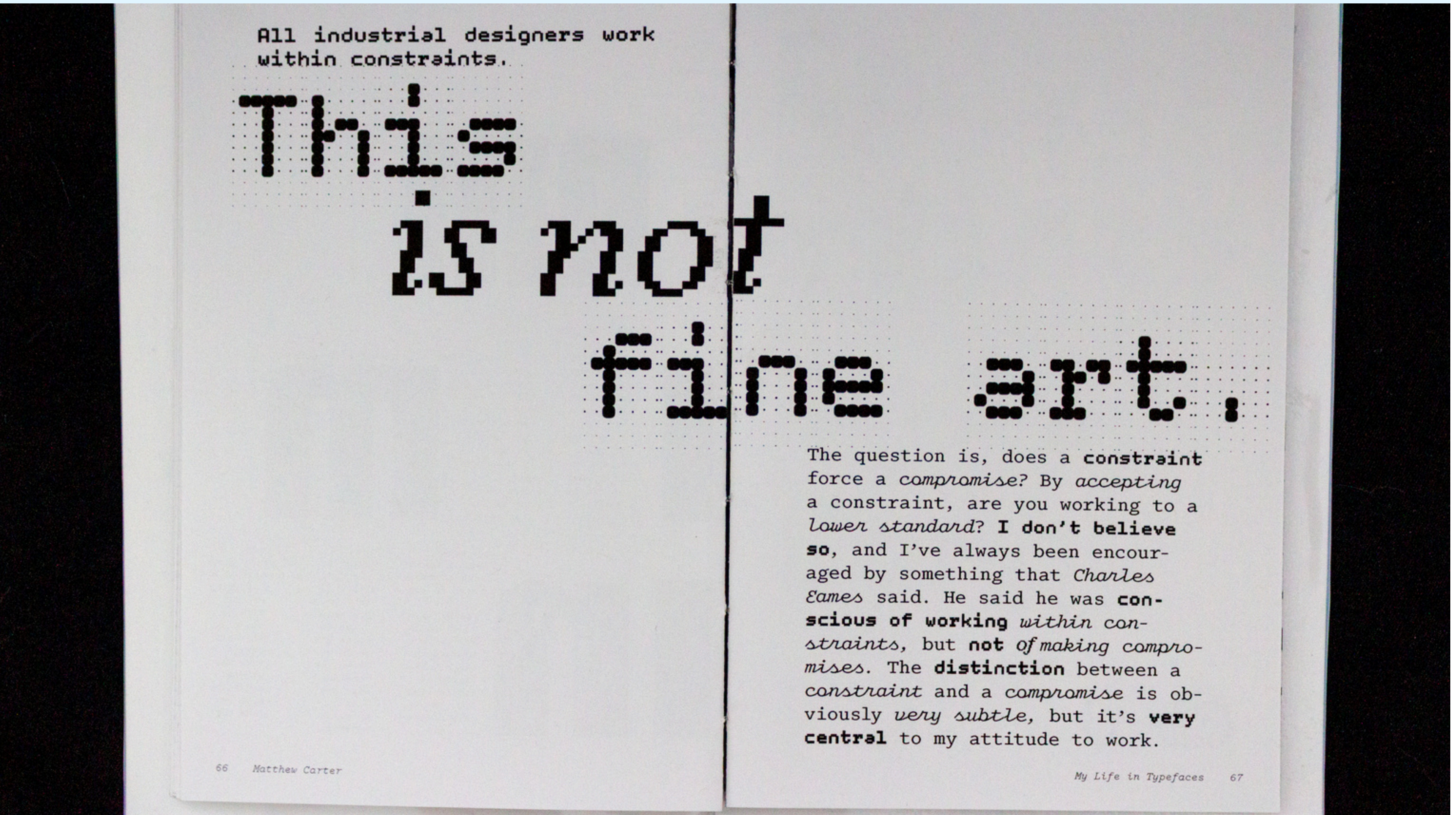
Unlike a *fine art,* such as sculpture or architecture, **type hides its methods.** I think of myself as an **industrial designer.** The thing I design is *manufactured,* and it has a *function:* **to be read, to convey meaning.** *But* there is a bit *more* to it than *that.* There's the sort of **aesthetic element.** What makes these two letters *different* from **different interpretations** by **different designers**? What gives the *work* of some *designers* sort of **characteristic personal style,** as you might find in the **work** of a fashion designer, an *automobile designer, whatever?*

Ch. 7

Tech's Imapct


There have been some cases, I admit, where I as a designer did
Feel
the influence of
technology
62 Matthew Carter
My Life in Typefaces 63


This is from the mid-'60s, the change from metal type to photo, hot to cold. This brought some benefits but also one particular drawback: a spacing system that only provided 18 discrete units for letters to be accommodated on. I was asked at this time to design a series of condensed sans serif types with as many different variants as possible within this 18-unit box. Quickly looking at the arithmetic, I realized I could only actually make three of related design. Here you see them.
nm
l m
in


All industrial designers work within constraints.
This
is not
fine art.
The question is, does a constraint force a compromise? By accepting a constraint, are you working to a lower standard? I don't believe so, and I've always been encouraged by something that Charles Eames said. He said he was conscious of working within constraints, but not of making compromises. The distinction between a constraint and a compromise is obviously very subtle, but it's very central to my attitude to work.
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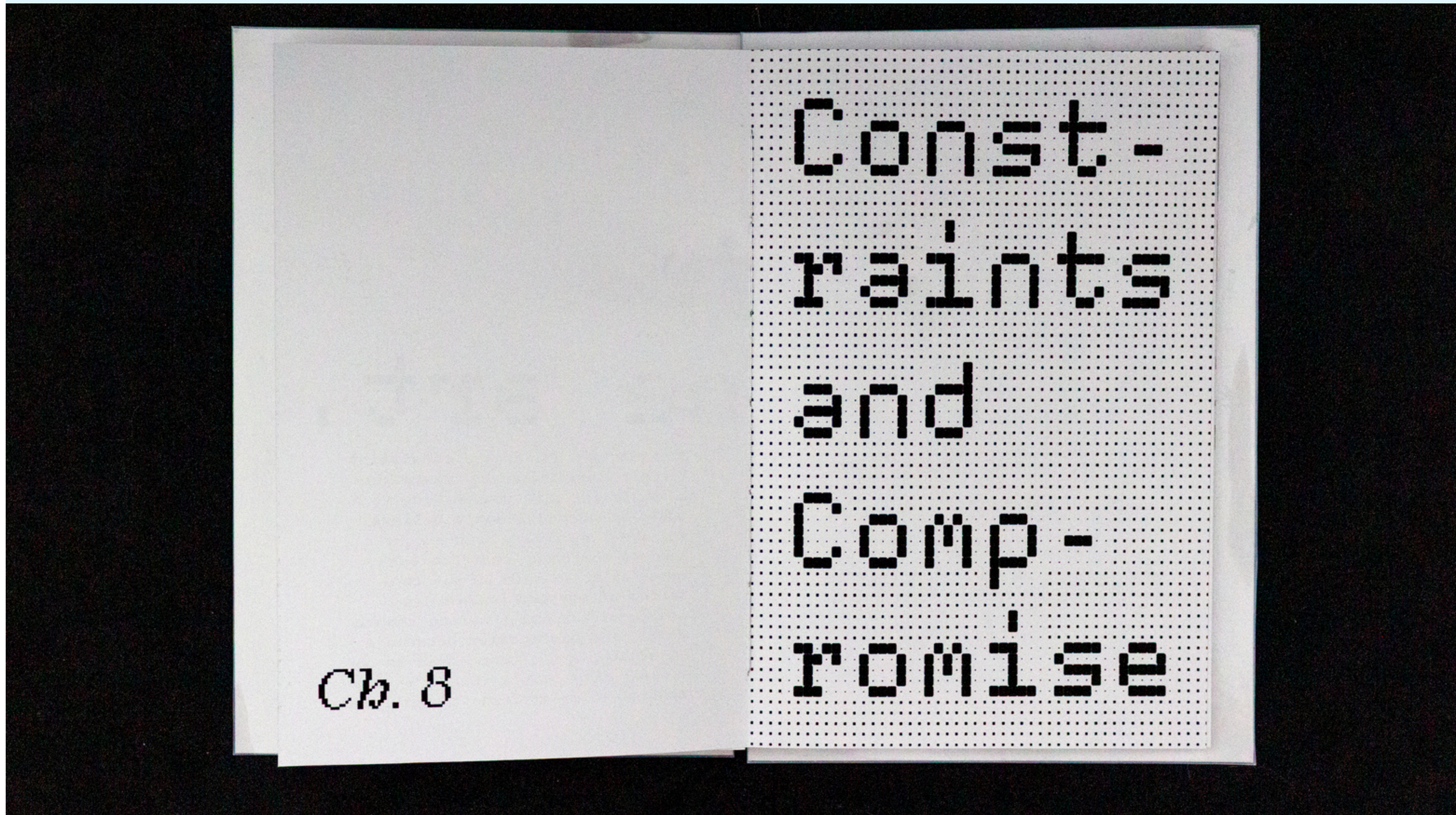
My Life in Typefaces 67


Ch. 8
Const-
raints
and
Comp-
romise

Remember this reading experience? *The phone book*. I'll hold the slide so you can enjoy the nostalgia. This is from the mid-'70s early trials of **Bell Centennial** typeface I designed for the U.S. phone books, and it was **my first experience** of *digital type*, and **quite a baptism**. Designed for the phone books, as I said, to be printed at *tiny size* on newsprint on very *high-speed* rotary presses with ink that was kerosene and lampblack.

This is not a
hospitable
environment
for a
typographic
designer.

Z&F
oQN

So the *challenge* for me was to design type that performed *as well as possible* in these very **adverse production conditions**. As I say, we were in the infancy of digital type. I had to draw *every character by hand* on **quadrille graph paper** – there were *four weights* of Bell Centennial – **pixel by pixel**, then encode them *raster line by raster line* for the keyboard.

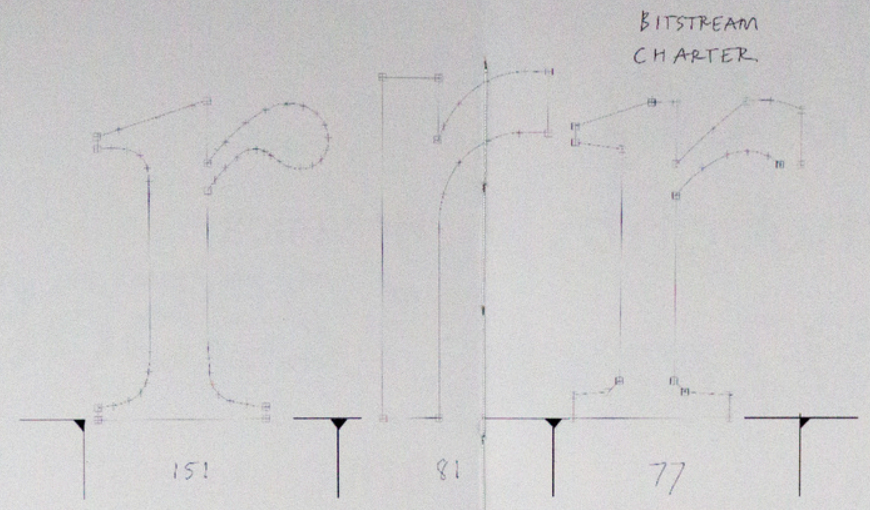
BEL ,.:''-;
akifujenb
12543608

It took two years, but I learned a lot. These letters look as though they've been **chewed by the dog** or *something or other*, but the **missing pixels** at the *intersections of strokes* or in the crotches are the result of my *studying the effects* of **ink spread** on **cheap paper** and **reacting**, revising the font accordingly. These *strange artifacts* are designed to **compensate** for the **undesirable effects** of *scale and production process*.

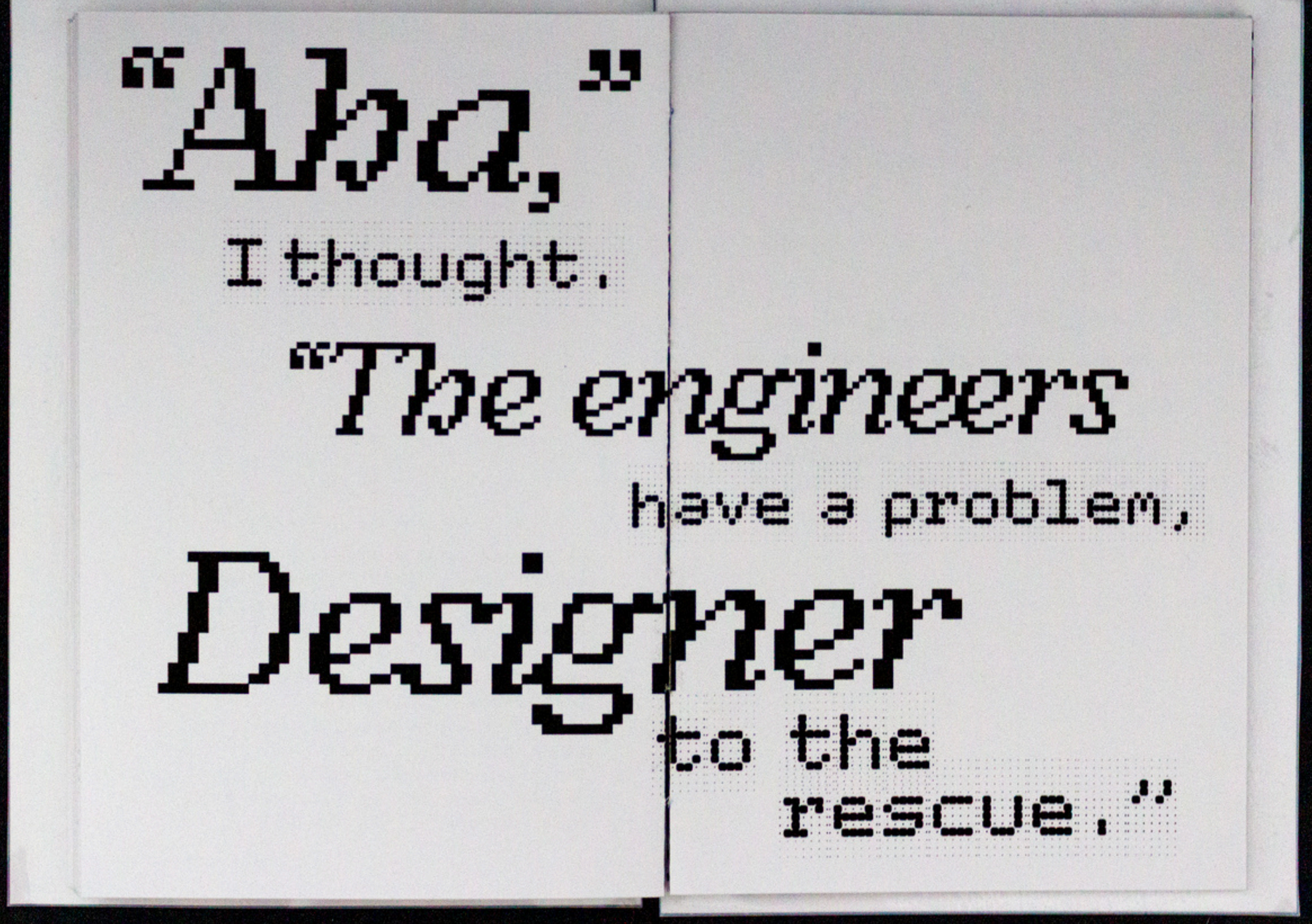
At the outset, AT&T had wanted to set the phone books in **Helvetica**, but as my friend Erik Spiekermann said in the Helvetica movie, if you've seen that, the letters in Helvetica were *designed to be as similar to one another as possible*. **This is not** the recipe for *legibility at small size*. It looks very elegant up on a slide. I had to **disambiguate** these *forms* of the *figures* as much as possible in **Bell Centennial** by sort of opening the shapes up, as you can see in the bottom part of that slide.

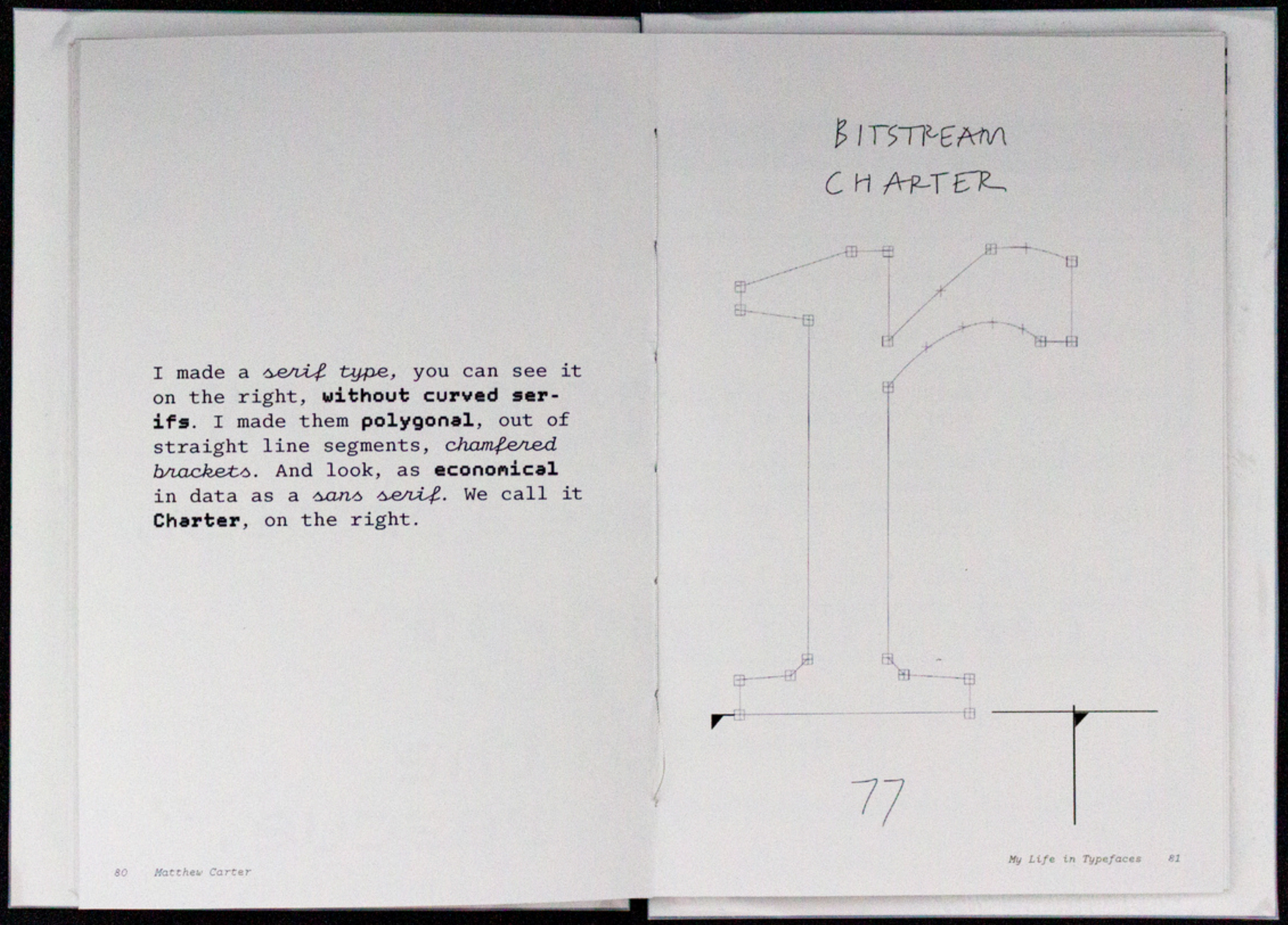
Helvetica
1235689

Bell Centennial
1235689



So now we're on to the *mid-'80s*, the early days of **digital outline fonts**, *vector technology*. There was an issue at that time with the **size** of the fonts, the amount of *data* that was **required** to find and *store* a font in **computer memory**. It **limited** the number of fonts you could get on your **typesetting system** at any one time. I did an *analysis* of the data, and found that a typical *serif face* you see on the left needed nearly **twice** as much data as a *sans serif* in the middle because of all the **points** required to **define** the *elegantly curved serif brackets*. The **numbers** at the bottom of the slide, by the way, they represent the amount of **data needed** to store each of the fonts. So the *sans serif, in the middle, sans the serifs*, was much more economical, **81 to 151**.


"Aha,"
I thought.
"The engineers
have a problem,
Designer
to the
rescue."


I made a serif type, you can see it on the right, without curved serifs. I made them polygonal, out of straight line segments, chamfered brackets. And look, as economical in data as a sans serif. We call it Charter, on the right.
BITSTREAM
CHARTER
77
80 Matthew Carter
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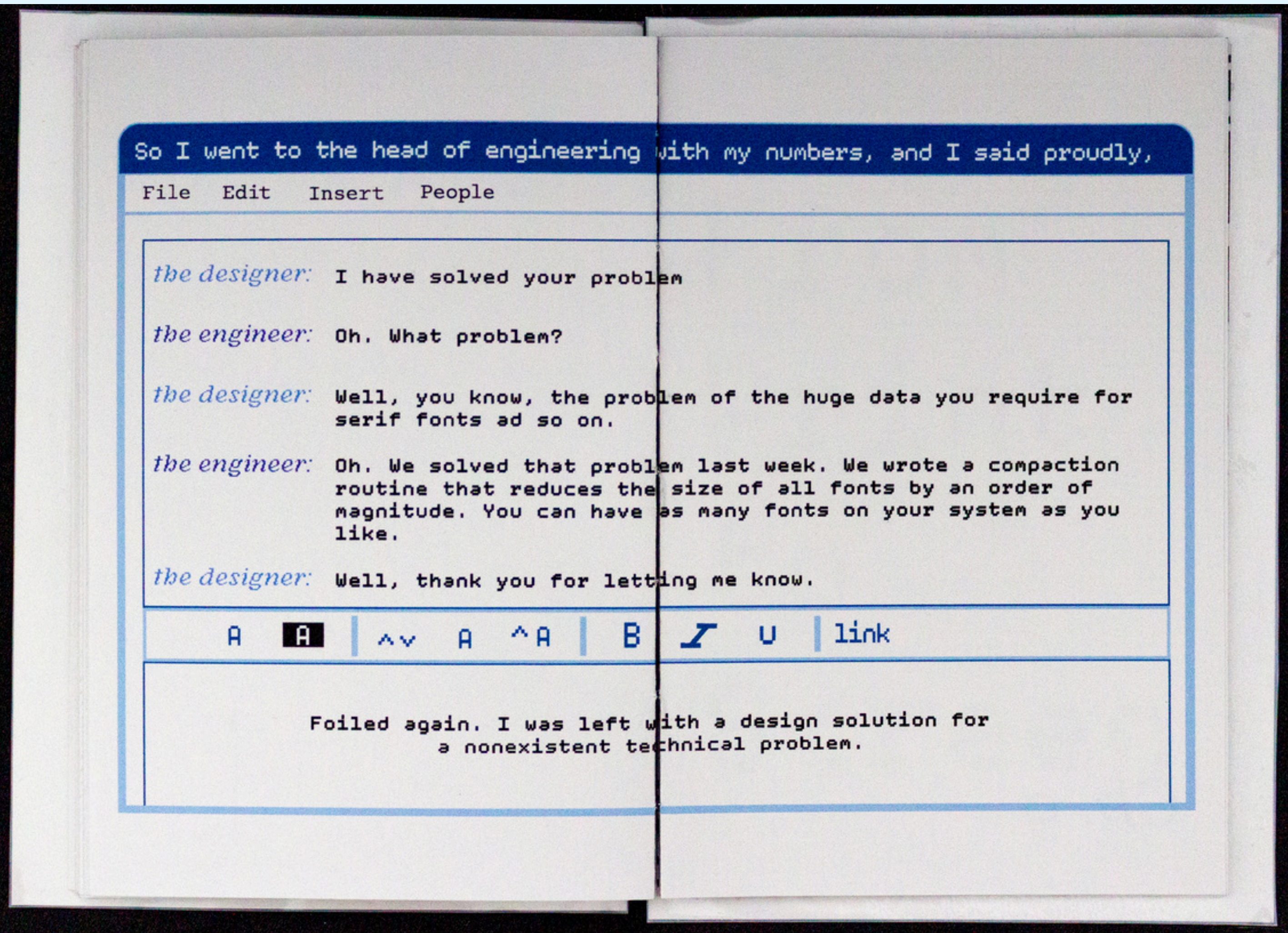
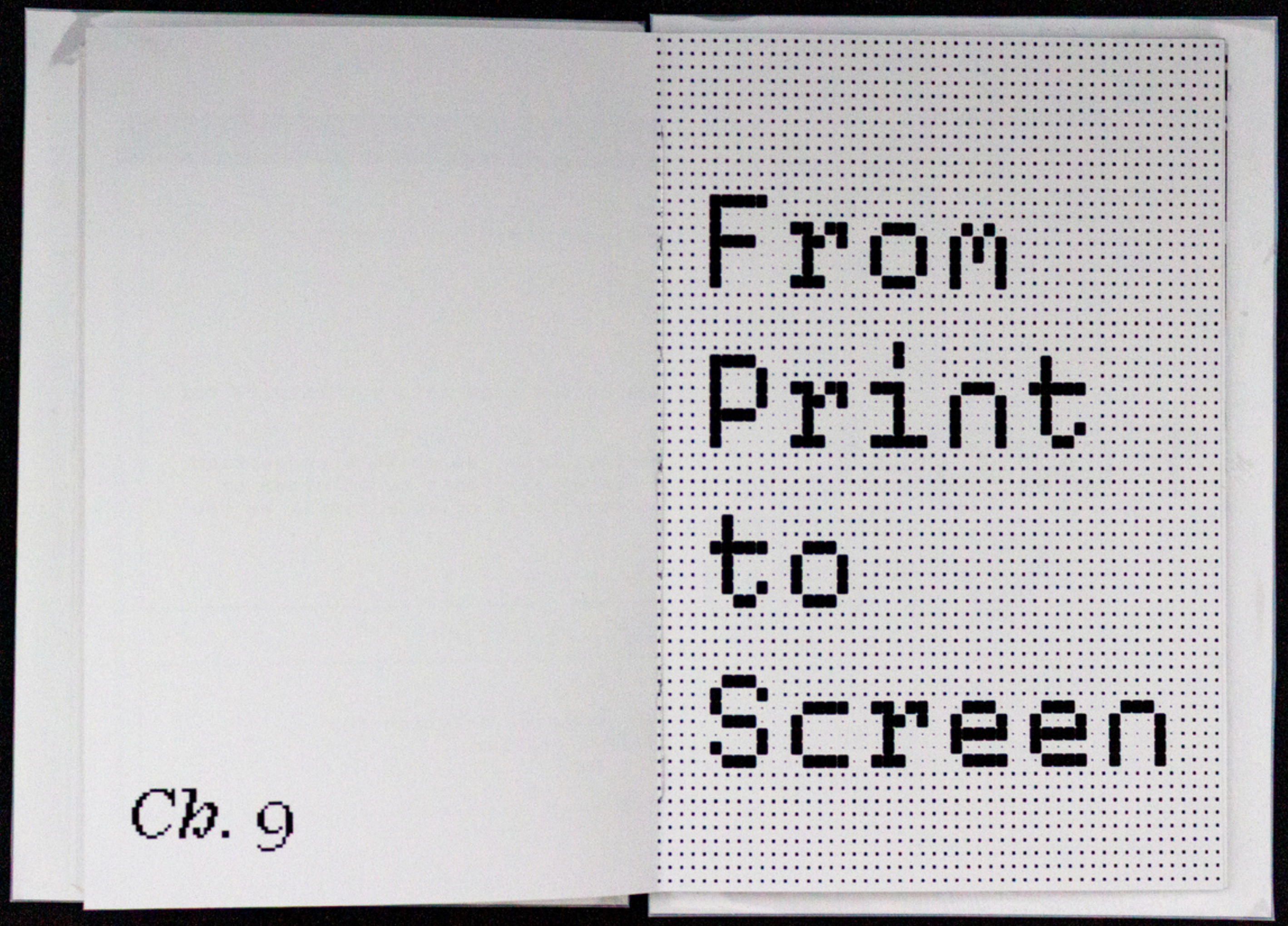
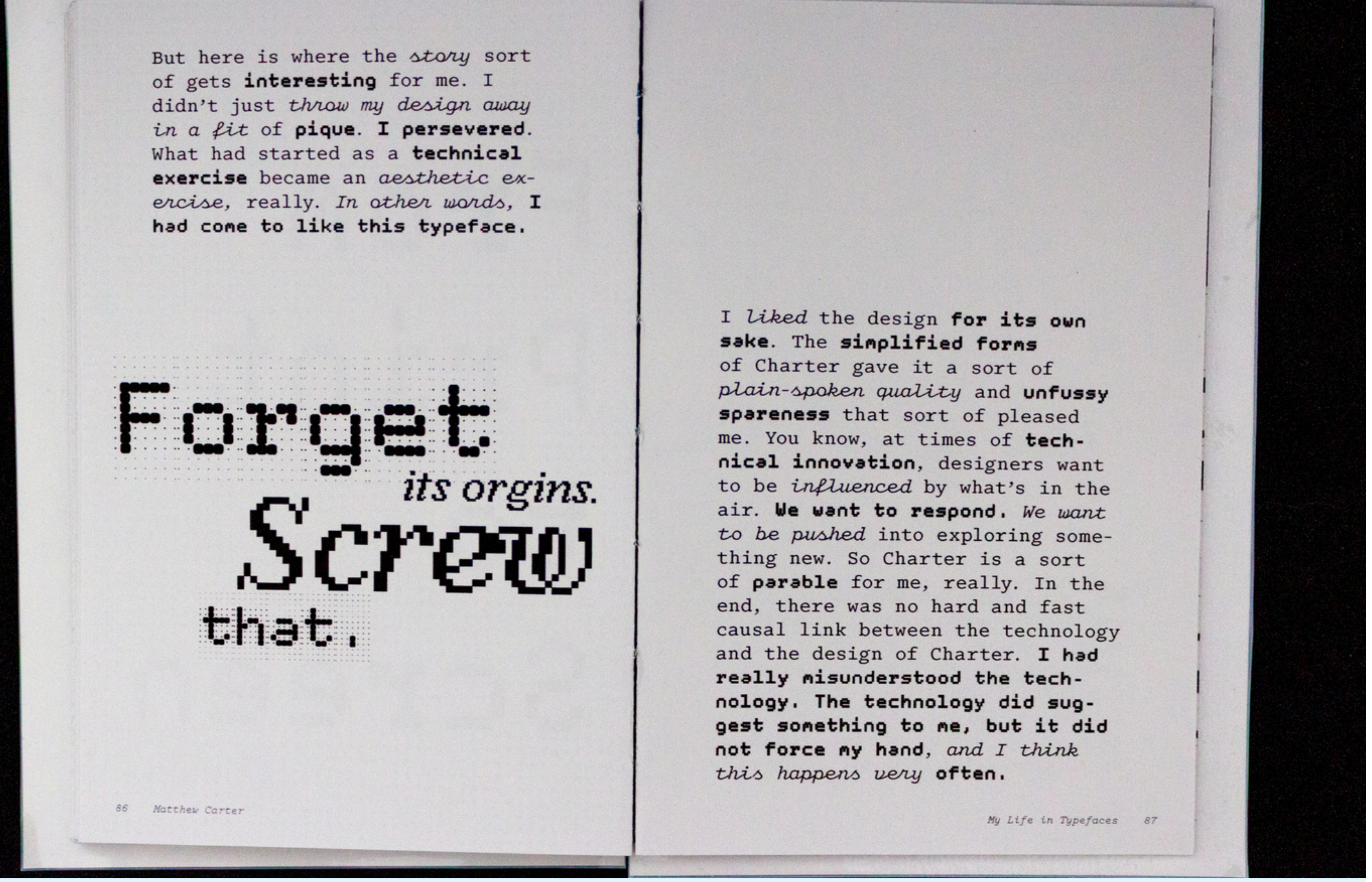
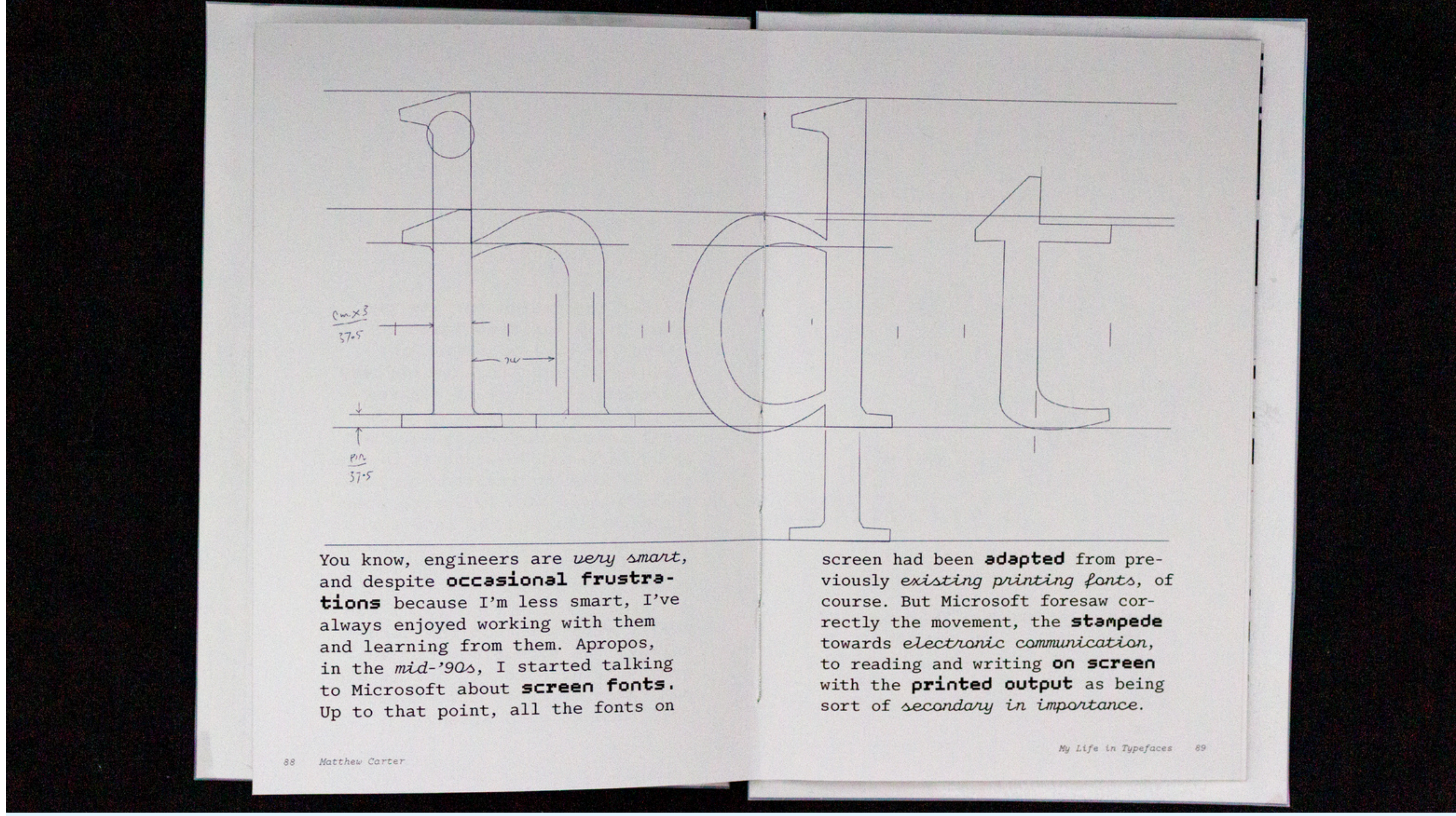
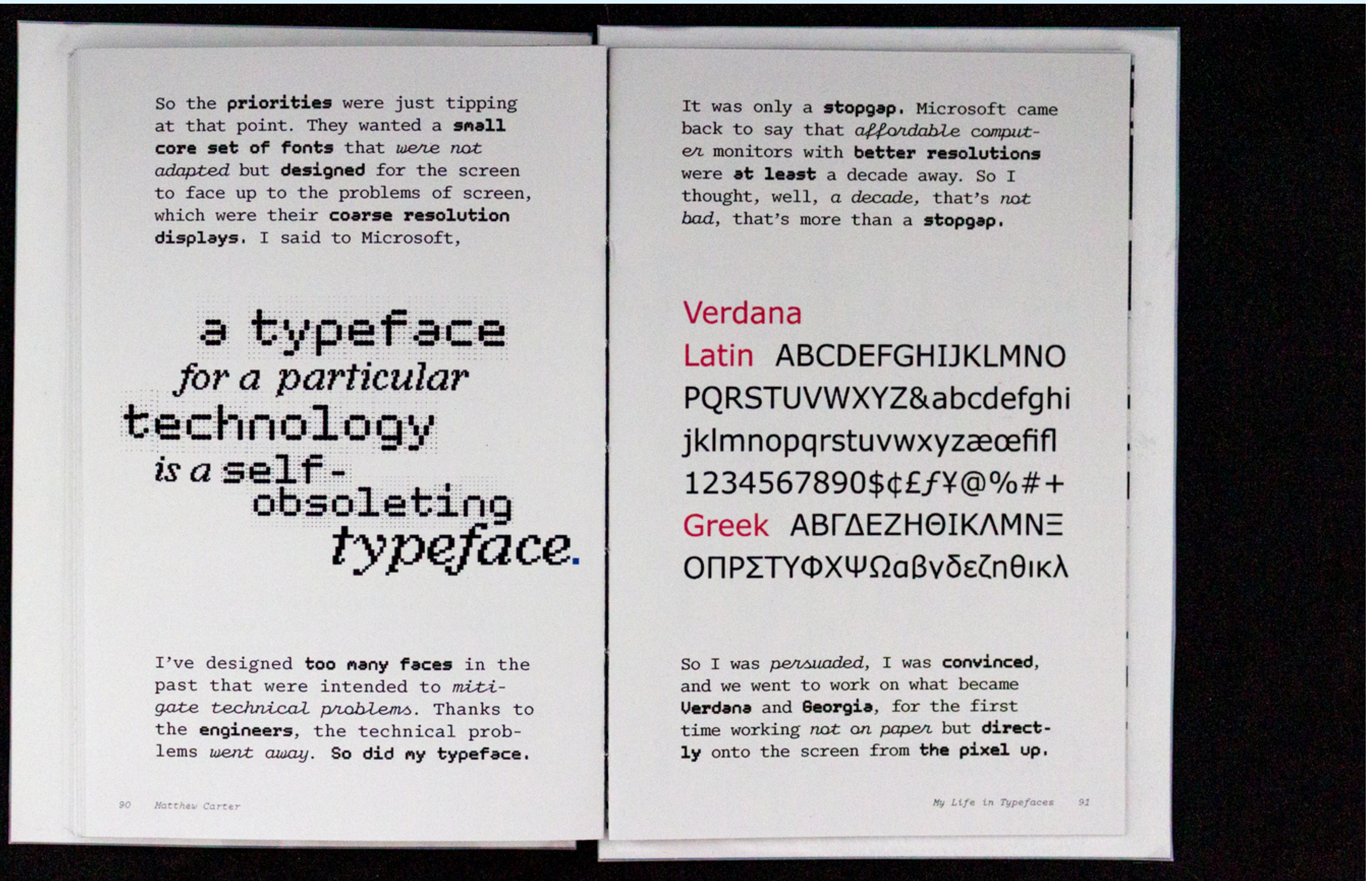

So I went to the head of engineering with my numbers, and I said proudly,
File Edit Insert People
the designer: I have solved your problem
the engineer: Oh. What problem?
the designer: Well, you know, the problem of the huge data you require for serif fonts ad so on.
the engineer: Oh. We solved that problem last week. We wrote a compaction routine that reduces the size of all fonts by an order of magnitude. You can have as many fonts on your system as you like.
the designer: Well, thank you for letting me know.
link
Foiled again. I was left with a design solution for a nonexistent technical problem.


Ch. 9
From
Print
to
Screen


But here is where the *story* sort of gets **interesting** for me. I didn't just *throw my design away in a fit* of **pique**. **I persevered**. What had started as a **technical exercise** became an *aesthetic exercise*, really. *In other words*, **I had come to like this typeface.**

I *liked* the design **for its own sake**. The **simplified forms** of Charter gave it a sort of *plain-spoken quality* and **unfussy spareness** that sort of pleased me. You know, at times of **technical innovation**, designers want to be *influenced* by what's in the air. **We want to respond.** *We want to be pushed* into exploring something new. So Charter is a sort of **parable** for me, really. In the end, there was no hard and fast causal link between the technology and the design of Charter. **I had really misunderstood the technology. The technology did suggest something to me, but it did not force my hand**, *and I think this happens very* **often.**


You know, engineers are *very smart*, and despite **occasional frustrations** because I'm less smart, I've always enjoyed working with them and learning from them. Apropos, in the *mid-'90s*, I started talking to Microsoft about **screen fonts.** Up to that point, all the fonts on screen had been **adapted** from previously *existing printing fonts*, of course. But Microsoft foresaw correctly the movement, the **stampede** towards *electronic communication*, to reading and writing **on screen** with the **printed output** as being sort of *secondary in importance*.

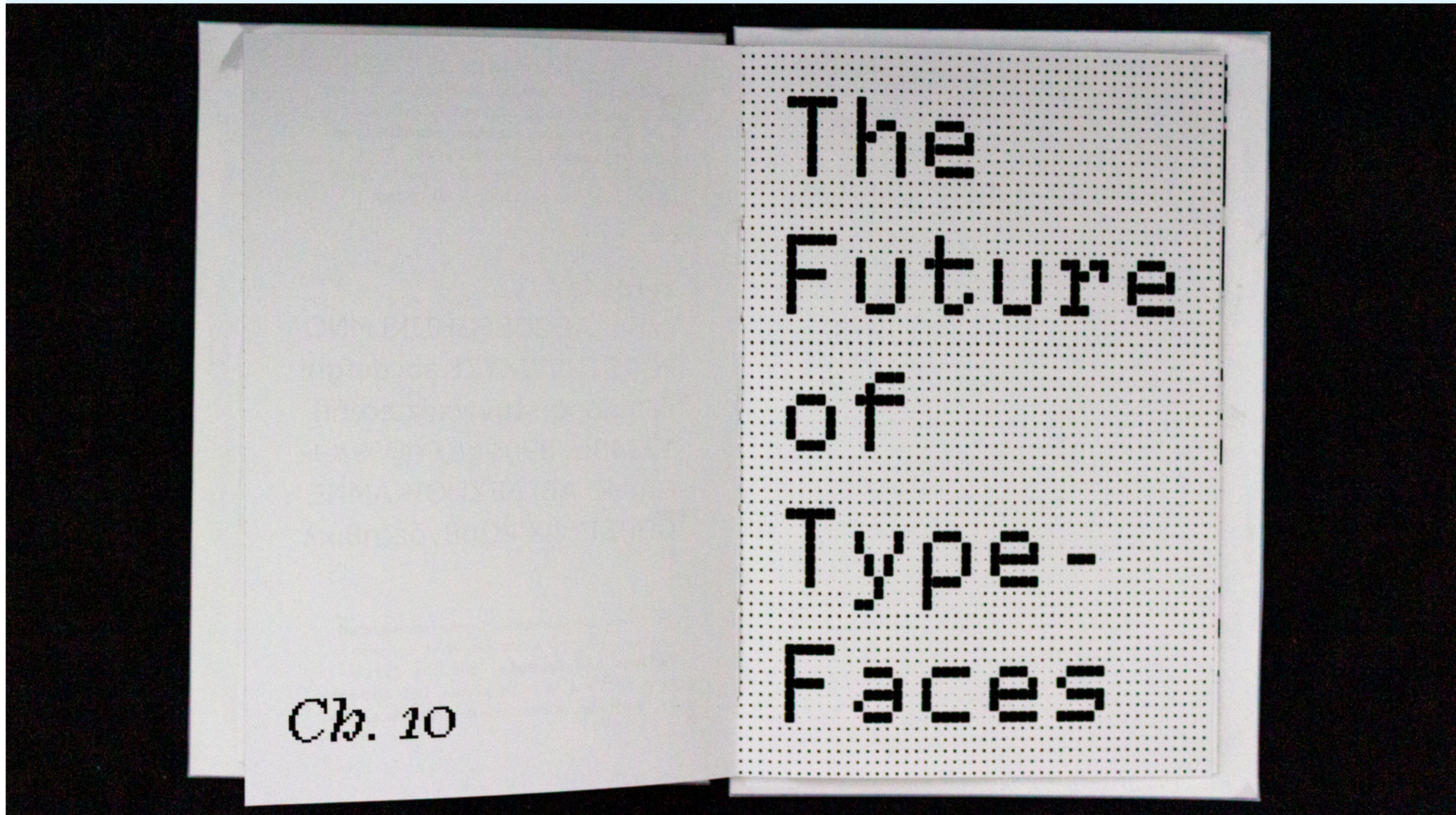

So the **priorities** were just tipping at that point. They wanted a **small core set of fonts** that *were not adapted* but **designed** for the screen to face up to the problems of screen, which were their **coarse resolution displays.** I said to Microsoft,

I've designed **too many faces** in the past that were intended to *mitigate technical problems*. Thanks to the **engineers**, the technical problems *went away*. **So did my typeface.**

It was only a **stopgap.** Microsoft came back to say that *affordable computer* monitors with **better resolutions** were **at least** a decade away. So I thought, well, *a decade*, that's *not bad*, that's more than a **stopgap.**

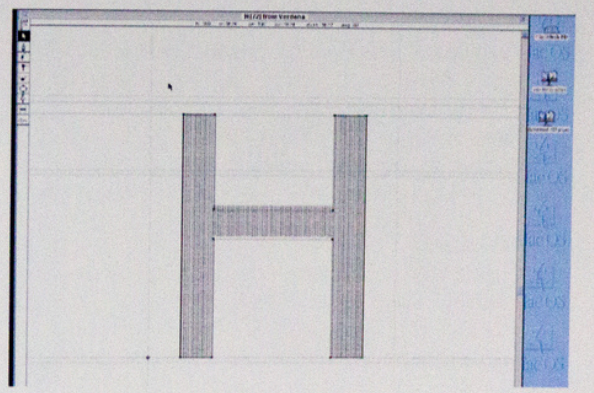
Verdana
Latin ABCDEFGHIJKLMNO
PQRSTUVWXYZ&abcdefghi
jklmnopqrstuvwxyzæœfifl
1234567890$¢£ƒ¥@%#+
Greek ΑΒΓΔΕΖΗΘΙΚΛΜΝΞ
ΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλ

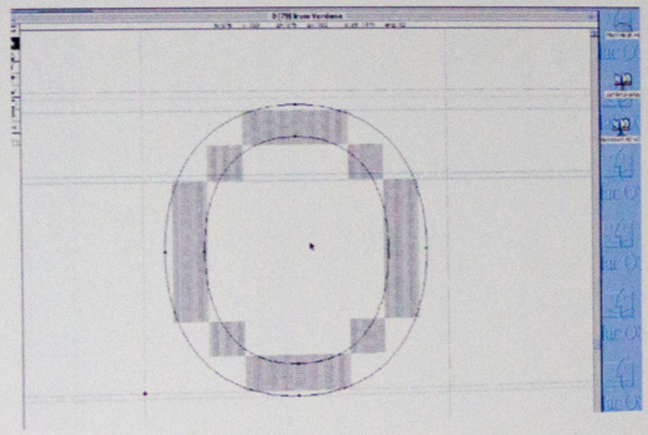
So I was *persuaded*, I was **convinced**, and we went to work on what became **Verdana** and **Georgia**, for the first time working *not on paper* but **directly** onto the screen from **the pixel up.**


Ch. 10

The Future of Type-Faces

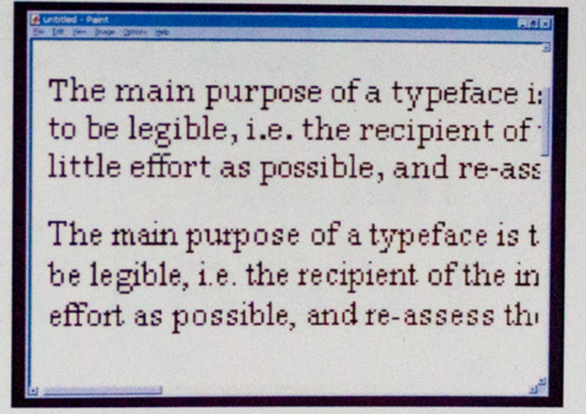
At that time, screens were **binary.** The pixel was either **on** or it was **off.** Here you see the outline of a letter, *the cap H,* which is the thin black line, **the contour,** which is how it is stored in memory, *superimposed on the bitmap,* which is the grey area, which is how it's displayed on the screen. The bitmap is **rasterized** from the outline. Here in a cap H, which is all straight lines, the two are in *almost perfect sync* on the **Cartesian grid.**





Not so with *an O.* This looks more like **bricklaying** than type design, but believe me, this is a *good bitmap O,* for the simple reason that it's **symmetrical** in both **x and y axes.** In a binary bitmap, you actually can't ask for more than that. I would sometimes make, I don't know, *three or four different versions* of a difficult letter like a **lowercase A,** and then stand back to choose which was the best. Well, **there was no best,** so the

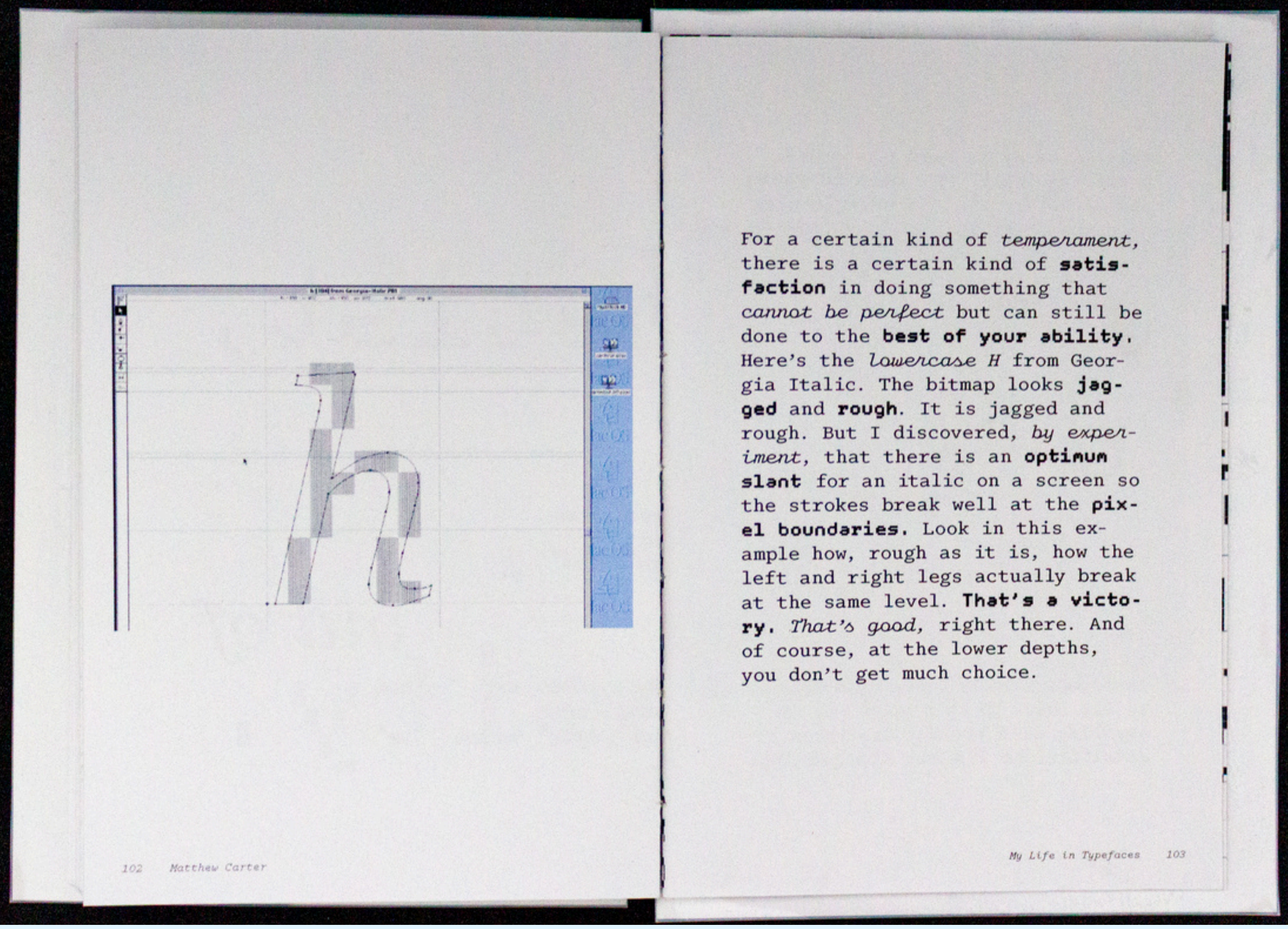
designer's *judgment* comes in trying to decide which is **the least bad.** Is that a *compromise?* **Not to me,** if you are working at the highest standard the technology will allow, although that standard may be well short of the ideal. You may be able to see on this slide two different bitmap fonts there. *The "a"* in the **upper one,** I think, is better than *the "a"* in the **lower one,** but it still ain't great. You can maybe see the effect better if it's *reduced.* Well, maybe not.

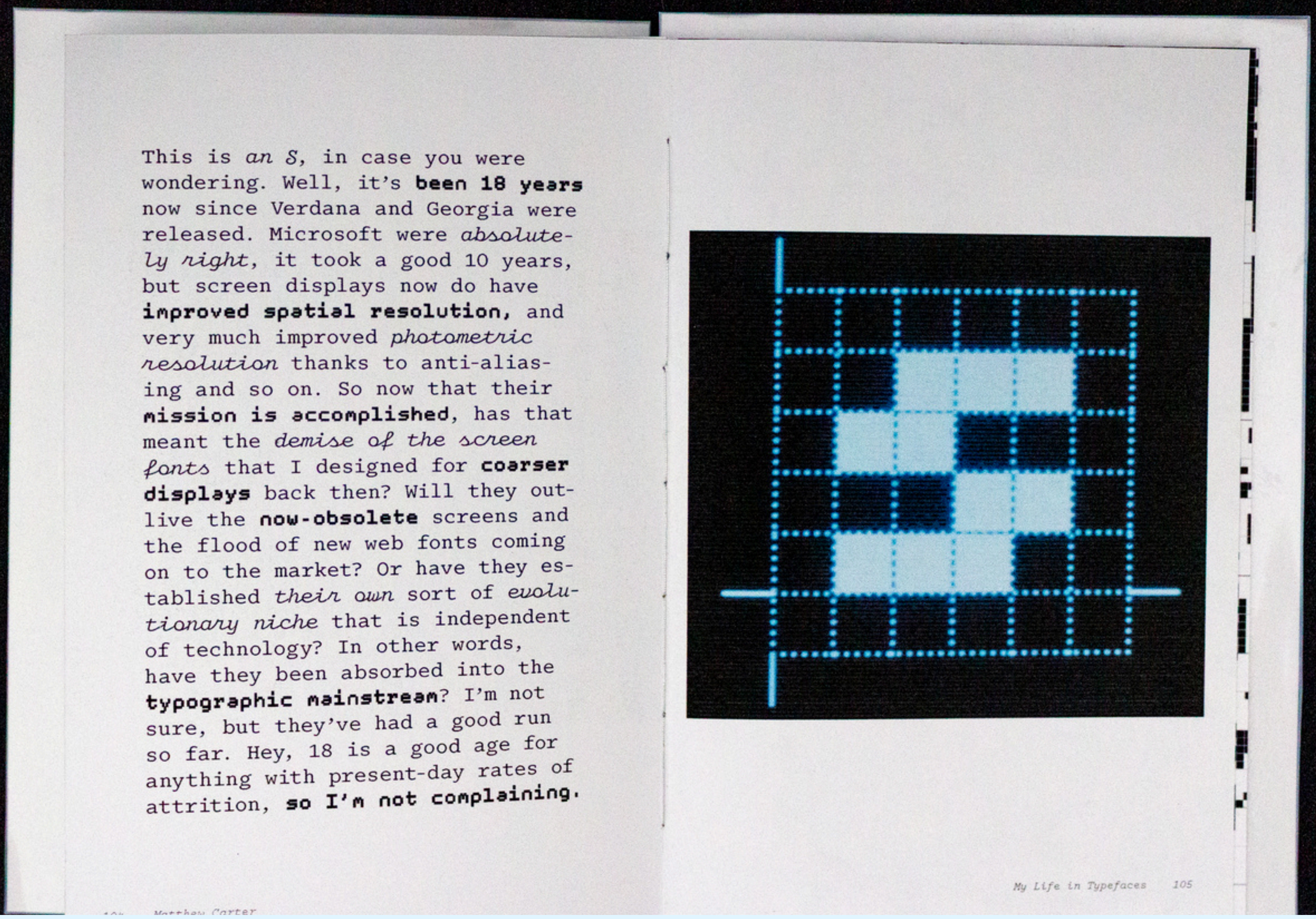


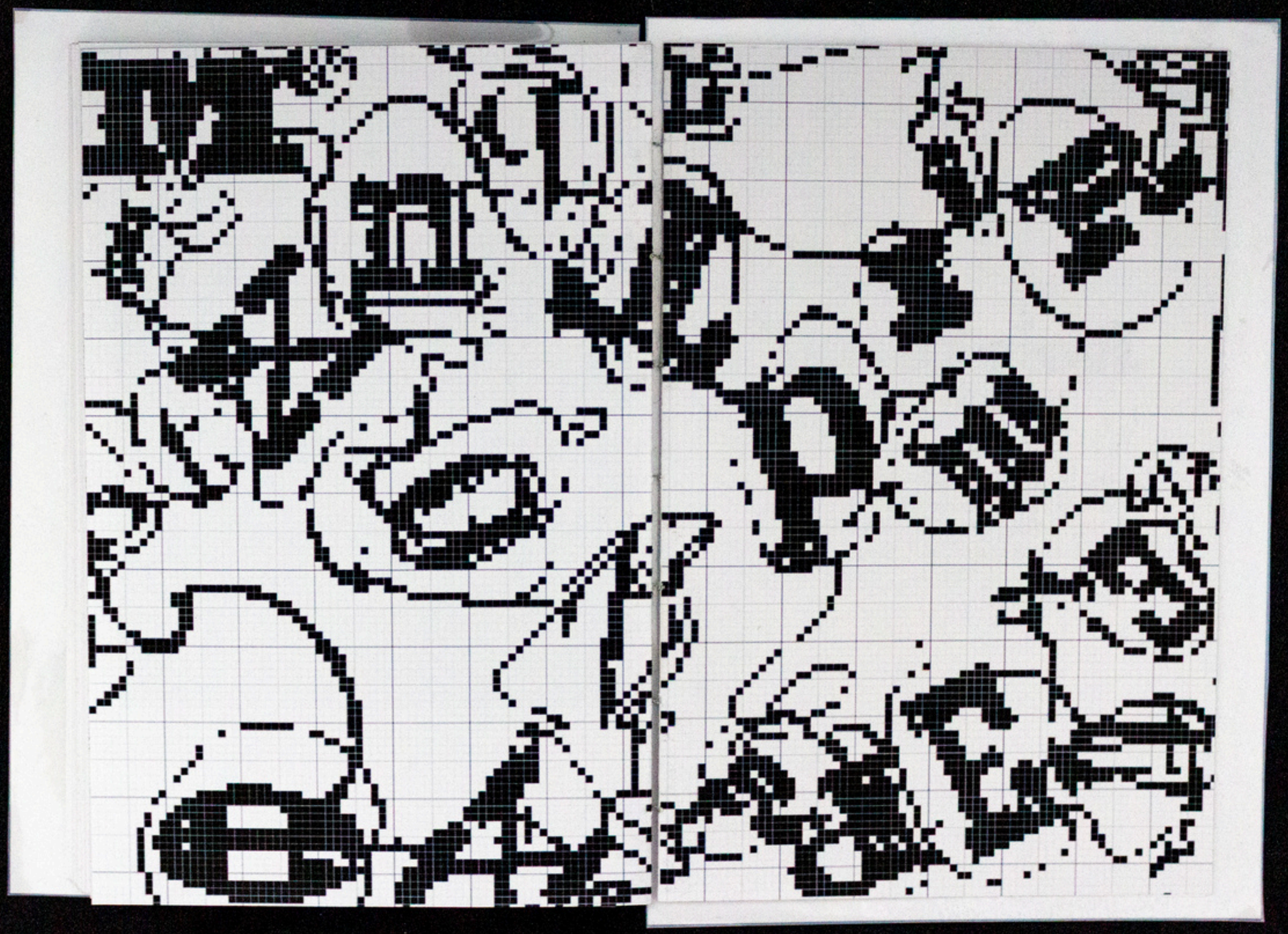
So *I'm a* pragmatist,

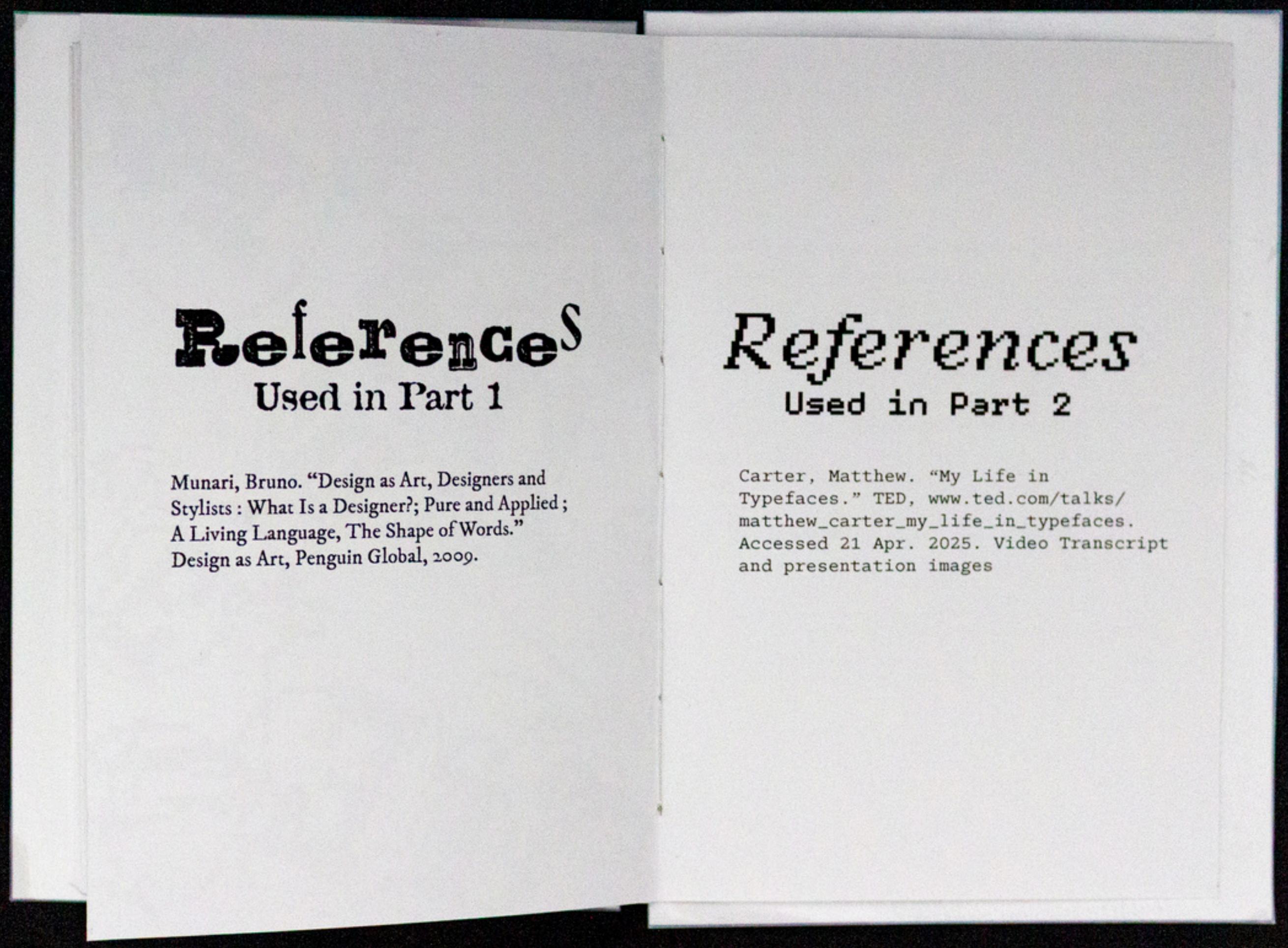
not an idealist,

out of necessity.


For a certain kind of temperament,
there is a certain kind of satis-
faction in doing something that
cannot be perfect but can still be
done to the best of your ability.
Here's the lowercase H from Geor-
gia Italic. The bitmap looks jag-
ged and rough. It is jagged and
rough. But I discovered, by exper-
iment, that there is an optimum
slant for an italic on a screen so
the strokes break well at the pix-
el boundaries. Look in this ex-
ample how, rough as it is, how the
left and right legs actually break
at the same level. That's a victo-
ry. That's good, right there. And
of course, at the lower depths,
you don't get much choice.


This is an S, in case you were
wondering. Well, it's been 18 years
now since Verdana and Georgia were
released. Microsoft were absolute-
ly right, it took a good 10 years,
but screen displays now do have
improved spatial resolution, and
very much improved photometric
resolution thanks to anti-alias-
ing and so on. So now that their
mission is accomplished, has that
meant the demise of the screen
fonts that I designed for coarser
displays back then? Will they out-
live the now-obsolete screens and
the flood of new web fonts coming
on to the market? Or have they es-
tablished their own sort of evolu-
tionary niche that is independent
of technology? In other words,
have they been absorbed into the
typographic mainstream? I'm not
sure, but they've had a good run
so far. Hey, 18 is a good age for
anything with present-day rates of
attrition, so I'm not complaining.

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Used in Part 2
Carter, Matthew. "My Life in
Typefaces." TED, www.ted.com/talks/
matthew_carter_my_life_in_typefaces.
Accessed 21 Apr. 2025. Video Transcript
and presentation images

Concept, design, printing, and binding by Julia Birn.

Text from Design as Art by Bruno Munari is typeset in the following typefaces:

Altacalifornia Regular
Attic Antique Regular
P22 Franklin Caslon Regular
IM Fell DW Pica Roman Regular and Italic

Text from My Life in Typefaces by Matthew Carter is typeset in the following typefaces:

Argent Pixel CF Italic
Gridlite PE Variable Halfway Bold Square
Logic Monospace Regular and Italic

Body text is 14pt with 16.8pt leading. Display text, headings, and subheading appears in various sizes.

Printed and bound by hand in Guam, April 2025.

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Cover: 90 lbs. 160 gsm index and transparency film.
Coptic bound with exposed spine stitching.

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