Typography with the IBM Selectric Composer

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The place of the IBM Selectric Composer in the evolution of bookmaking processes is outlined: it provides a return to directness and simplicity, combined with the speed of mechanization. Some restrictions and problems which the new machine poses for the type designer are described. The article was originally presented as a lecture at Gallery 303 in New York City last fall. It has been composed on the IBM Selectric Composer in the Univers face which the author adapted to the machine.

Reproducing Our Letterforms

To explain the place that the IBM Selectric Composer has assumed in our trade, I have drawn up the plan shown in Figure 1.

(1) In the Middle Ages a calligrapher prepares by pen one copy of a book: this is the most direct progress from the idea to the graphic "imprisonment." The author can make his book by himself.

(2) The need for a greater diffusion of ideas encourages book workers in the Middle Ages to invent wood-engraving and printing on a press: the result is faster duplication of copies but the necessity of cooperation of two specialists, the engraver and the printer. Already the author can no longer make his book by himself.

(3) The process becomes more complicated: founding of movable letters, composing, paging, printing require the cooperative skills of several trades.

(4) Mechanical composition further multiplies the bookmaking processes, including punching tape, founding, paging, and printing.

(5) At last, photocomposition becomes really the faster way to compose: we speak in terms of a million letters per second. But the process is most complex and involves many more specialists--

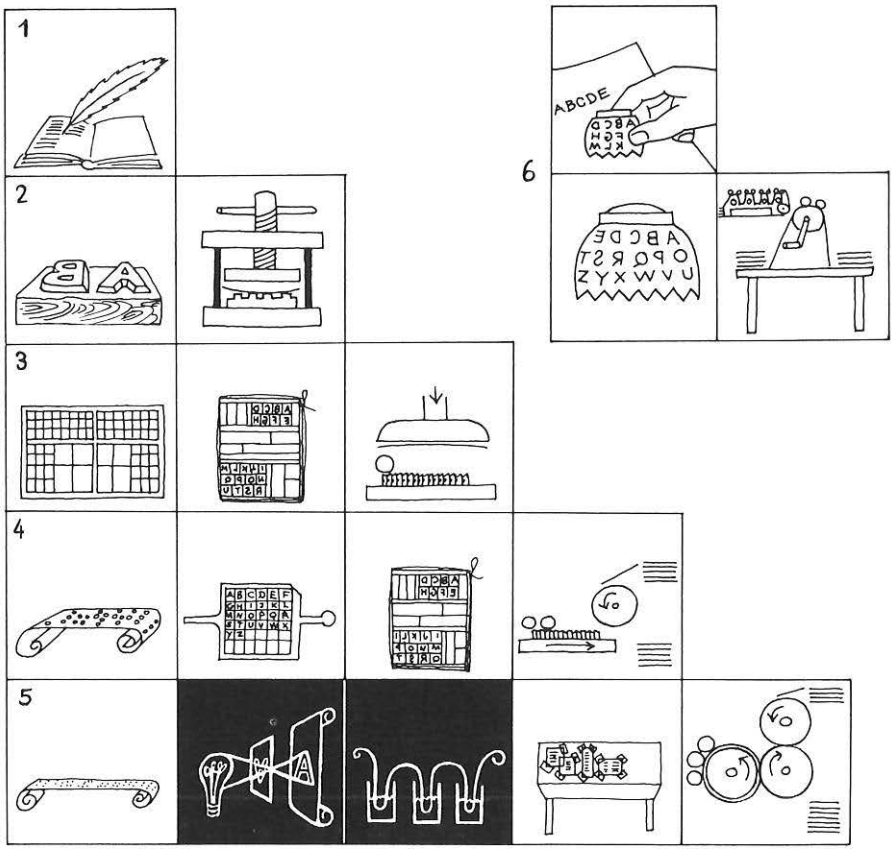

Figure 1. Methods used to reproduce our letterforms.

typographers, photographers, chemists, etc. Moreover, an important part of the work takes place without any direct view of composition: the compositor is engaged in a purely theoretical process; he does not see the letters he is composing; he sends codes and the photograph is made in darkness. We can observe that the more time is reduced the more complicated the operations become.

(6) The Selectric Composer takes a new place in this evolution. With it the author can, should he wish to, write his book by himself again, without any specialist's help. We can speak of a modern calligrapher: the rolling Selectric head which bears the alphabet is almost like an extension of the individual hand, replacing the pen and also the art of writing. Composing becomes extremely simple and direct.

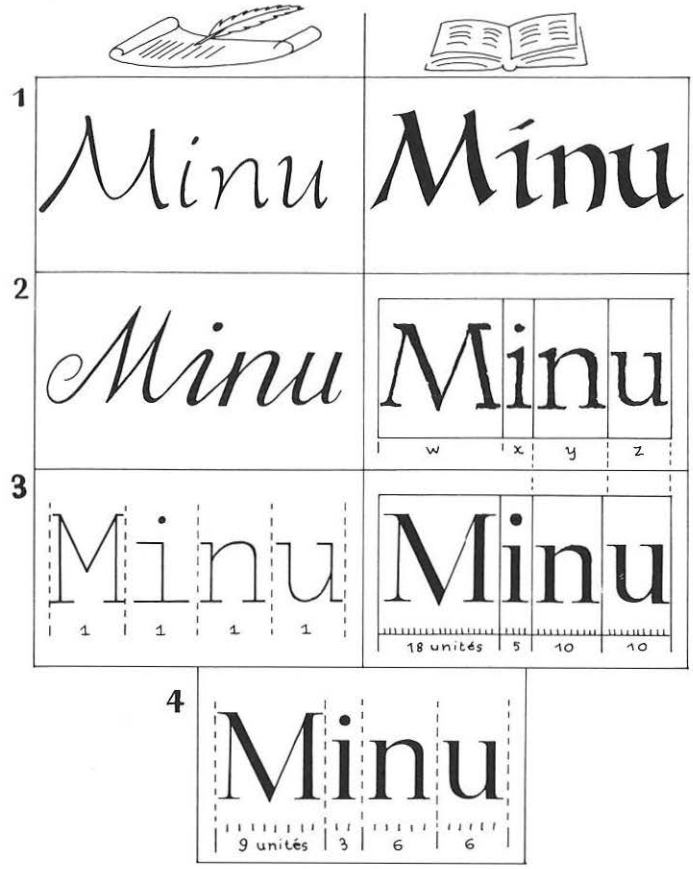

Figure 2. Personal and impersonal letterforms.

Personal and Impersonal Graphics

This return to simplicity attracts me and makes me believe in the future of this way of composing. But what is the typographic quality of this composition? In Figure 2 we discern two major kinds of graphics: to the left, handwriting, the personal, direct, immediate expression of my ideas; and to the right, impersonal, indirect, distant graphics, printing characters.

(1) At the top we see two examples of script: to the left, the free script of a burgher; to the right, the script of a medieval calligrapher.

(2) The following line shows to the left the evolution of script as a succession of characters tied together. To the right we see the first

form of a graphics founded, composed, and printed. The appearance of the two graphics is more and more differentiated. On the lead block are relief characters. All blocks have the same height, but their widths vary with every letter. For every letter the type-founder fixes a new width. This is still true today.

(3) The following line shows, to the left, what more and more replaces handwriting: the typewriter. Until a few years ago, such typewriters were of severely restricted use, owing to the very poor aesthetics of typing, which conceives of all letters in terms of the same width. To the right is the mechanical composing system. Letter widths are restricted, most manufacturers taking eighteen units as the basis for the widest letter. On this number of units all the letters have to be designed. Niceties are no longer allowed: the example shows that the n and the u in line 2 are of different widths, but here a difference of one unit is unacceptable and the two letters must be designed on the same width. This does not prevent the quality of our mechanical composers from being very good.

The place of the Selectric Composer is between the two groups: it is still a typewriter, but it is also a composer. The number of units is reduced by one half, to nine.

Restrictions on Letterforms

What is the influence of that restriction in the number of units on the letterforms?

If we take forty classical alphabets, add the relative widths, and divide by forty, we obtain an average width for every letter (Fig. 3).

The graphic representation of these widths (Fig. 4), arranged in an ascending order, gives that scale: at the top, the lower-case i, the narrowest one; at the bottom, the capital W, the widest one.

Applying the nine available units on this schema (Fig. 5), we note that only a minimum distortion is necessary to enclose the various letters in these width groups. Yet a real difficulty exists. Problems are raised not by the fact that there are only nine units at our disposal but by the fact that every letter has always, and in all faces, to be on the same relative width.

	ALPHABETS LUMITYPE - PHOTON																							
	1 BASKER. ROM.	2 BASKER. ITAL.	3 BODONI ROM.	4 BODONI ITAL.	5 BODONI SEMIB	6 BODONI BOLD	7 GARAMOND ROM.	8 GARAMOND ITAL.	9 CASLON ROM.	10 CASLON ITAL.	11 CASLON BOLD	12 JANSON ROM.	13 JANSON ITAL.	14 JANSON BOLD	15 MERIDIEN ROM.	16 MERIDIEN ITAL.	17 MERIDIEN SEMIB	18 MERIDIEN BOLD	19 UNIVERS 47	20 UNIVERS 57	21 UNIVERS 67	22 UNIVERS 45	23 UNIVERS 55	24 UNIVERS 65
a	8,5	8	8	9	8,5	8,5	7	7,5	8	8	8,5	7,5	8	8,5	8,5	8	8,5	9,5	8,5	9	9	8,5	8,5	9
b	10	7,5	9	8,5	9,5	9,5	8	6,5	9,5	7,5	9,5	9	7,5	9	9	7,5	10	11	9	9	9,5	9	9	9,5
c	7,5	6	7,5	7	7,5	8	6,5	5	7,5	6	7,5	7	5,5	7,5	7,5	6	8	8,5	8,5	8	8,5	8	8	8,5
d	10	9	9	9,5	9,5	9,5	8,5	8	9,5	8	10	9	8	9,5	9,5	7,5	10	11	9	9	9,5	9	9	9,5
e	8	6,5	8	7,5	8	8,5	6,5	5	8	6	8	7,5	6	8	8	6	8	9,5	8,5	8,5	9	8,5	8,5	9
f	5,5	5	5	5,5	5,5	5,5	5	5	5,5	5,5	6	5	4,5	5,5	5	4,5	5,5	6,5	5,5	6	6	4,5	5	5,5
g	9	7,5	8,5	8,5	9	9,5	8	6	9	7	9,5	8,5	7,5	8,5	8,5	7,5	9	9,5	9	9	9,5	9	9	9,5
h	10	8	9	9	9,5	9,5	8	8	10	8	10	9	8,5	9,5	10	8,5	11	12	9	9	9,5	9	9	9,5
i	5	4,5	4,5	5	5	5	4	4,5	5	5	5	4,5	4,5	5	5	4	5	6	4	4,5	4,5	4	4	4,5
j	5	4,5	4,5	4,5	5	5,5	4	4,5	5	4,5	5	4	4,5	4,5	4,5	4	5	6	4	4,5	4,5	4	4	4,5
k	9	7,5	8,5	8,5	9,5	10	8	7,5	9	7,5	9,5	8,5	7	9	9,5	8	10	11	8	8,5	9	7,5	8	9
l	5	4,5	4,5	5	5	5	4	4,5	5	4,5	5	4,5	4	5	5	4	5	6	4	4,5	4,5	4	4	4,5
m	15	12	14	13	14	14	12	11	14	11,5	14	14	14	14	15	13	16	17	14	14	15	14	14	15
n	10	8,5	9	9	9,5	9,5	8	7,5	9,5	8,5	10	9	9	9,5	10	8,5	11	12	9	9	9,5	9	9	9,5
o	10	7	8,5	8	9	9,5	8	6,5	9,5	6,5	10	9	7	9,5	9	7	9,5	10,5	9	9	9,5	9	9	9,5
p	10,5	8,5	9	9	9,5	9,5	8	6,5	9,5	7,5	10	9	8	9,5	9,5	7,5	10	11	9	9	9,5	9	9	9,5
q	10	7,5	9	8,5	9,5	9,5	8	7	9,5	8	9,5	9	8	9	9,5	7,5	9,5	10,5	9	9	9,5	9	9	9,5
r	7	6	7	7	7,5	8	5,5	5,5	6,5	6,5	7	6	7	6,5	6,5	6,5	7	8	5,5	6	6,5	5,5	5,5	6
s	6,5	5,5	7	7	7,5	7,5	5,5	4,5	6,5	5,5	7	6	5	6,5	6,5	5,5	7	7,5	8	8	8	7,5	7,5	8
t	5,5	5	6	5,5	6	6,5	5	4,5	5,5	5	6	5,5	5	6	5,5	4,5	5,5	7	5,5	6	6	5	5,5	6
u	10	9	9	9	9,5	9,5	7,5	7,5	9,5	8	10	9	9	9,5	9,5	8,5	10	11	9	9	9,5	9	9	9,5
v	8	8,5	8	8	8	9	8	6,5	8	8,5	8,5	8	8	8	9	7,5	9	10,5	7,5	8	8,5	7	8	8,5
w	12	11,5	11,5	12,5	12	13	12	9,5	12,5	11,5	12,5	13	12	12,5	14	11	14	16	12,5	13	14	12	13	14
x	9	8	8	10	8,5	9	7,5	7,5	8,5	8,5	9	7,5	8	7,5	9	8	9,5	10	6,5	7,5	8,5	7	7,5	8,5
y	8	6,5	8	9	8,5	8,5	8	6	8,5	6,5	9	8,5	7	8,5	8,5	7,5	9	10	7,5	8	8,5	7	8	8,5
z	6,5	7	7,5	8	8	8	6,5	6,5	8	8,5	8	7	7,5	7,5	7	6,5	7,5	8	6	6,5	7,5	6,5	7	7,5

	ALPHABETS MONOTYPE																	
	25 BEMBO ROM. 270	26 BEMBO ITAL. 270	27 BEMBO BOLD 428	28 CENTAUR RO. 252	29 CENTAUR IT. 252	30 ROCKWELL RO. 371	31 ROCKWELL B. 391	32 GILL ROM. 262	33 GILL ITAL. 262	34 GILL BOLD 275	35 PERPETUA R. 239	36 PERPETUA I. 239	37 CLARENDON R. 12	38 TIMES ROM. 327	39 TIMES ITAL. 327	40 TIMES BOLD 334	TOTAL : 40	= MOYENNE
a	8	8	9	7	7	9	10	8	9	10	7	8	9	9	9	9	336,50	8,41
b	10	8	11	9	7	11	11	10	10	11	9	8	9	10	9	9	365,00	9,12
c	8	6	9	7	5	9	10	8	8	9	8	6	8	9	8	8	301,50	7,53
d	10	8	11	9	7	11	11	10	10	11	9	8	9	10	9	9	372,00	9,30
e	8	7	9	7	5	10	10	9	9	10	8	6	8	8	8	8	315,00	7,87
f	6	5	7	6	5	5	6	5	5	6	5	5	6	6	6	6	218,00	5,45
g	10	8	11	8	6	11	11	9	9	10	8	8	9	9	9	9	350,50	8,76
h	10	9	11	9	7	10	11	10	10	11	9	8	10	10	9	9	375,50	9,38
i	5	5	6	5	5	5	6	5	5	6	5	5	5	5	5	5	195,00	4,87
j	5	5	6	5	5	5	6	5	5	6	5	5	6	5	5	5	198,00	4,95
k	10	9	11	9	6	10	11	10	10	11	9	7	10	10	10	10	360,50	9,01
l	5	5	6	5	5	5	6	5	5	6	5	5	5	5	5	5	194,00	4,85
m	16	13	18	14	11	15	18	15	15	18	14	11	15	15	14	14	569,50	14,23
n	10	9	11	9	8	10	11	10	10	11	9	8	10	10	9	9	377,00	9,42
o	10	8	11	8	6	10	10	10	10	11	9	7	9	10	9	9	356,00	8,90
p	10	9	11	9	7	11	11	10	10	11	9	8	9	10	9	9	370,00	9,25
q	10	8	11	9	6	11	11	10	10	11	9	8	9	10	9	9	365,00	9,12
r	7	6	8	6	6	8	8	8	8	9	7	6	7	7	7	7	271,00	6,77
s	6	6	7	6	5	8	9	7	7	8	6	5	7	7	7	7	268,00	6,70
t	6	5	7	6	5	5	6	7	7	8	6	5	6	6	7	6	231,50	5,78
u	10	9	11	9	8	10	11	10	10	11	9	8	10	10	9	9	374,00	9,35
v	10	9	11	8	7	10	11	9	9	10	8	7	9	9	8	8	339,50	8,48
w	15	13	16	12	11	14	15	14	14	15	13	10	13	13	12	12	513,50	12,83
x	10	10	11	8	9	10	10	10	10	11	9	7	9	9	10	10	351,50	8,78
y	10	9	11	8	7	10	11	9	9	10	8	7	9	9	9	9	340,00	8,20
z	8	10	10	8	8	8	9	8	8	10	7	7	8	8	8	8	307,50	7,68

Figure 3. The average width within 40 classical alphabets for each of the 26 letters.

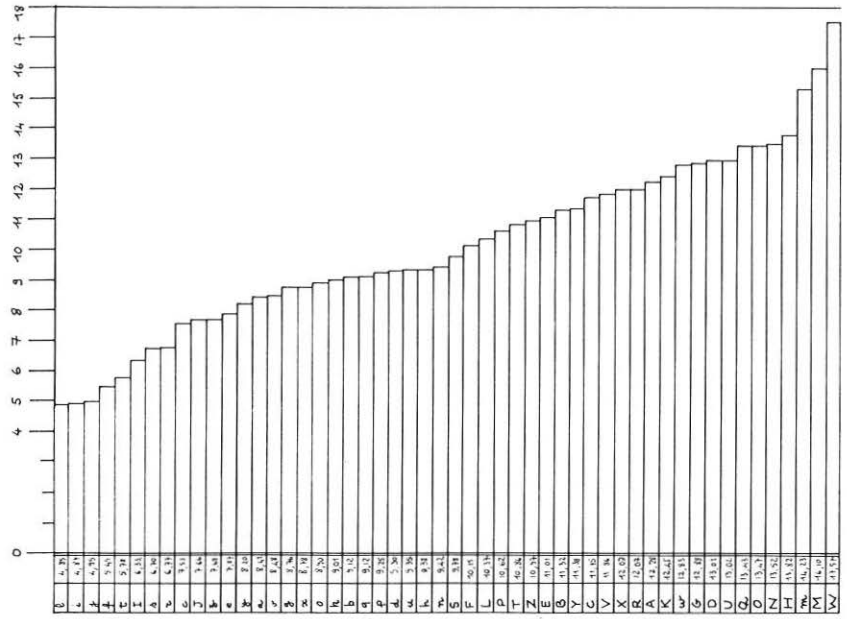

Figure 4. The graphic representation of the average widths of letters shown in Figure 3.

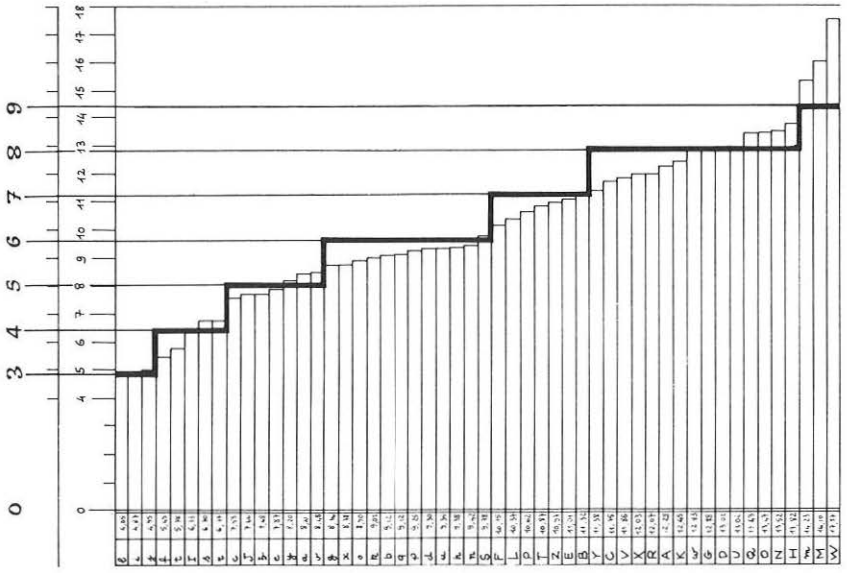

Figure 5. Application of a nine-unit scale to Figure 4.

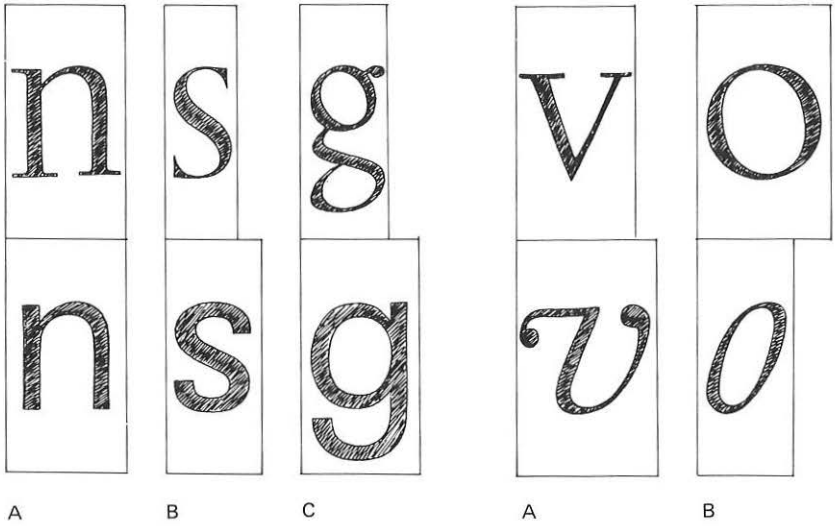

Figure 6. Comparison of old-style and sans-serif letter widths: n, s, and g.

Figure 7. Comparison of old-style and sans-serif letter widths: v and o.

For example, if we easily manage to design the lower-case s of an old style on its defined width, in a sans serif we have much more concern (Fig. 6), for closed endings give to this letter a much more significant volume. The lower-case g shows the same difficulties.

If we take an old-style roman with its italic (Fig. 7), we see that, for example, lower-case italic *v* is in that even larger than roman; on the other hand, the italic *o* is narrower than the roman.

Problems for the Designer

For the designer other problems are raised by the new technique of the Selectric Composer--Figure 8.

A few years ago, when we had to adapt the letters to the photocomposition system, the elements of reduced surfaces had to be increased proportionally, since light going through a small hole is not proportional to light going through a large one. Diagram 1A shows the theoretical drawing of an i; 1B, the distortion produced by photography with a very short flash; 1C, the necessary adaptation of the drawing for a photocomposition system.

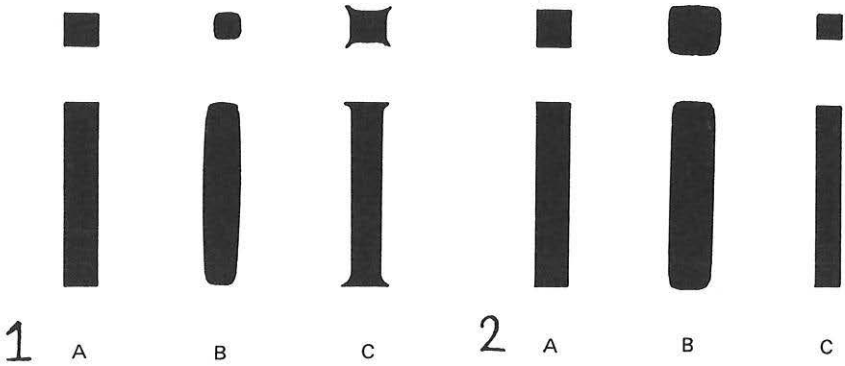

Figure 8. Distortion and adaptation of letterforms for (1) photocomposition and (2) the Selectric Composer.

With the typewriter system, the opposite happens: small-surface characters tend to imprint the paper more heavily--i.e., to increase in weight--while large letters like M or W may print lightly or imperfectly. The Selectric Composer can vary the force of its impression for three classes of signs (with small, medium, and large surfaces), but the designer has to take into account differences of surface *within* every one of these classes. For instance i, which in the same class as many other lower-case letters, has to be designed proportionally lighter. Diagram 2A shows the theoretical design of i; 2B, the result of a typed i without modification; 2C, the necessary adaptation for a typed face.

It is obvious that we can't have everything: an ingeniously simple machine sold at such a low price does not give the same performance as a machine costing five times as much. What must be the aesthete's position in view of these restrictions? I accept them. Technology needs us designers, and, in my opinion, if we don't cooperate willingly with the engineers, we will run the risk of being bypassed by technology. I, for one, am proud to live in these fascinating times and to know that they stand in need of the contributions of designers and scholars, who still know how to see with our human eyes.