Paul Gredinger:

Pro-Programmatic

Do you know what the title of the book means? The title of the book can be explained by reference to the book title. A programme can be designed for naming the book. For this, one must know what the book is about. The subject, at any rate, is: creative arrangement. But that is too general. As the author sees it, there are two separate aspects to creative arrangement: the design, to design, the designer, etc. and the programme, to programme, programmatic, etc. Well then, Design and Programme? No. The "and" is too weak. The two ideas are more closely linked than that. Programme Design? Design Programme? No. Both are dependent on each other. Which on which? Each on each. Design of the Programme? Programme of the Design? No. To be sure, the meaning of both is clear. But what is essential lies in between. It lies in the designation of the two ideas. The principal question, then, is the connection between the two words. It can be expressed through any kind of linguistic link. For the reciprocal action of programme and design should be as complete as possible. The solution: to enumerate all the possible ways in which these concepts can be connected. And to consider all these variants as a book title. The best solution would be to list them all together on the cover: Design of Programmes, Programme for Design. Design = Programme. Programming. Designing. Programming Designs. Designing Programmes. And so forth. The book would have to feature a whole list of titles. Since that is not possible, the title reads as it is now. But means an entire programme.

The title can be explained in different terms. Designing programmes can also mean: inventing rules of arrangement. Taking a chemical reaction as a parallel, the designer must try to find a group of new combinations by reference to a kind of formula. The formula is paramount. The formula creates the form. Creates a group of forms. Thus, for instance, there is a formula in poetry corresponding to this conception. The traditional structure of language is dissolved. No grammar. No syntax. The elements are single words. They stand loose in the line with all their valencies free. The rule of the game is permutation. The poems arising are called constellations. Constellations are a poetic programme. There is an example in this book.

Another example of a programme (and as usual the programme comprises certain elements and certain rules for combining them): four pictorial signs each having nine values are printed on cards: Swiss jass cards. The rules for their combination are the rules of jass. The rule of the game = programme. And, considered in these terms, every other game is nothing more than the carrying out of a programme.

More self-evident still, and hence all the less consciously present in one's mind: the formula of the recipe. First the elements are enumerated: take . . . potatoes, milk, water, salt, and butter. Then the preparation: peeling, cutting up, boiling, straining, stirring . . . Result: creamed potatoes. The recipe is the programme. Simple enough. But interpreting many of these programmes is more difficult. And when it comes to designing them, then the difficulties really begin. That is why it is called an art. The culinary art. And then there is still the whole menu to cook: one programme superimposed on another. The full score is a cookery book.

And then a surprisingly obvious example is provided by another of the housewife's occupations: making something linear into something two-dimensional or even something with a complicated spatial form. And to make it by simple means. What is topologically complicated is simply called: knitting. Programme: in – round – through – off. Result: knitting. Another variant of the programme produces purling. More complicated rules produce more complicated patterns. The programme is contained in any instructions for a knitting pattern. In machine knitting the programme is a punched tape. Example: Jacquard pattern.

Example of a programme that has become a picture: the ornament. For instance: a scissor-cut. Or: kaleidoscope. Two pictures harking back to childhood? Yet there is more behind them than meets the eye. There is a whole world behind them. The simplest elements (form) fitted together in the simplest way (repetition, symmetry) give expression to the spirit of an entire culture. China, South America, Asia Minor, Africa, Greece, Rome. And the geometrical art of today?

Closest to the typical idea of a structural programme come structures in electronic music. Here the structural unity of the mental vision is realized by projection into the musical experience. The elements of the composition are sound units (impulses). Composing with these units consists in regulating a single parameter: time. And the music is a structure of programmed impulses. Structure in the sense of the organization of growth.

Another example of a programme as a formulated predetermination is provided by any musical score. Particular interest attaches to written instructions which make disorder (the most random arrangement) and not order their governing principle. The following example is explained in the book. A composer lets random features of the surface of the paper determine frequency, duration, timbre, volume and entry. The sounds are not predetermined as usual. All the same, the score is a score, a designed programme: that and that are the elements. And I can do that with them. Result: a whole series of solutions. It is not important that the result should be this or that; what is important is that the form should and must take its shape in obedience to an order or formula. It is in the design of the formula (image: a tulip bulb) and not in the design of the form (image: tulip) that the creative pleasure resides. And thus the aim of the creative work.

Programme from the Far East

The idea for this book came from Japan, from Naomi Asakura. He wrote that he was a designer and teacher in Fukushima-shi. He wanted (he said) to publish my first book – "Cold Art" – in Tokyo. He thought the analyses it contained of concrete pictures were of educational use and worth translating. The chapter that was of most personal interest to him was the last one entitled "Prospects of the Future". This chapter (he said) had been written in 1957. Thus the future was now behind us. What were the prospects now?

He wondered if I had written something more topical on the subject in the meantime. If topicality is to be measured in terms of dates, – well, there are these essays. A testament in advance? I should prefer the reader to interpret this collection with the same open mind as that with which they were conceived: as an interim balance, the result of experience which can be supplemented or rejected at will in each part.

This story really leads up to the point: as I wanted to see to the typography of the Far Eastern edition, Asakura sent me a selection of Japanese typefaces.

It was not easy for me to find criteria and make my choice. I do not understand what the signs mean and the feeling for design they embody is foreign to me. But the picture below fascinates me. One thing I did understand: the Japanese have evolved a programme from a typeface; they have achieved something which will still keep us busy for a long time to come. (The reader will understand this after reading the first essay "A new Basis for the Old Display Sans-Serif".

1

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Programme from the Far Middle Ages

I pass the Cathedral every day on my way to work. The building contains some typical Gothic specialities. An example is provided by the pointed arches of the 15th century cloisters reproduced below: a perfect example of the joyful (and artful) way the Gothic designers went to work.

Joyful, because it gave them pleasure to create complicated patterns in profusion. Artful, because they tempered the complicacy to the beholder and concealed the profusion. That is: none of the 16 windows (one is missing in the picture) is identical with another; simply because somebody wanted to have fun (a whim, perhaps, of the head artisan?) Each window is a design in itself based on an exact programme of constants and variants.

The Programme:
The material and execution are prescribed; the dimensions, outlines, including the vertical tripartition up to the springing line of the arch.

There are 16 different ornamental patterns to be designed in the triangle of the arch and they must be related from the following points of view:

the profiles of the lines and the joining together of the bundles of lines are in principle all alike –
the tracing of the lines must be adapted organically to the outline and also to the vertical tripartition –
the lines meet either at right angles to each other (or to the periphery) or run into each other at O degrees –
there must be no residual forms; that is, each line must form a self-contained pattern on two sides.

2

3

4

Programme as morphology

Unbounded surfaces

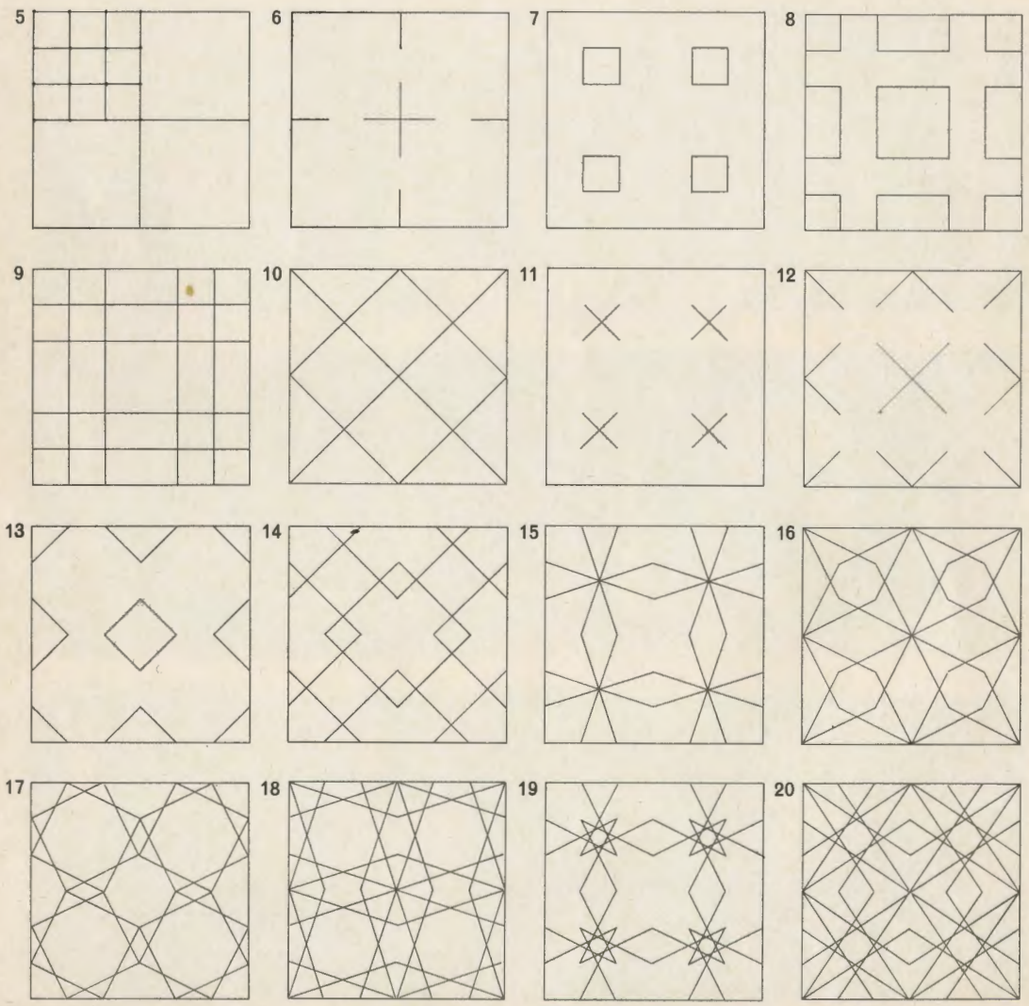
Example.
To give at least one instance of the astonishing richness and beauty of such geometrical patterns, Fig. 5 to 20 show forms which can be obtained in a latticework from a square consisting of $3^2 = 9$ part squares by drawing a straight line between any two nodes. The number of nodes here is 16, which happens to be the same as the number of connecting lines between them and therefore also the number of patterns of the first order. Each total square 3^2 is repeated four times in juxtaposition so as to show the connection thus established between the single patterns (Fig. 5).

In patterns 5 to 8 the "theme", i.e. the line being multiplied in conformity to a rule (here the fourfold reflection of the square is being used), lies either minus a side of a square or in an axis of reflection, so that there are only four repetitions at a time. They make the simpler, more familiar forms. The other patterns are developed from lines in another position, each of which yields eight repetitions. The forms thus arising are largely unknown.

Each of the 16 forms can be combined with every other one in a pattern of the second order. They can be easily drawn if first one pattern is introduced into the latticework and then the other is drawn over it.

If three are drawn over one another, a pattern of the third order is obtained, of which there are 560.

From: "Harmonie der Formen" by Wilhelm Ostwald. Verlag Unesma, Leipzig 1927



Programme as Logic

Instead of solutions for problems, programmes for solutions – the subtitle can also be understood in these terms: for no problem (so to speak) is there an absolute solution. Reason: the possibilities cannot be delimited absolutely. There is always a group of solutions, one of which is the best under certain conditions.

To describe the problem is part of the solution. This implies: not to make creative decisions as prompted by feeling but by intellectual criteria. The more exact and complete these criteria are, the more creative the work becomes. The creative process is to be reduced to an act of selection. Designing means: to pick out determining elements and combine them. Seen in these terms, designing calls for method. The most suitable I know is the one Fritz Zwicky has developed, although actually his is intended for scientists rather than designers. (*Die morphologische Forschung*, 1953, Kommissionsverlag, Winterthur) I have produced the diagram below in accordance with his instructions and, following his terminology, I have called it the morphological box of the typogram. It contains the criteria – the parameters on the left, the relative components on the right – following which marks and signs are to be designed from letters.

The criteria are rough. As the work proceeds, of course, they are to be refined as desired. The components are to be made into parameters and new components are to be specified, etc. Moreover, they are not only rough, they are also not self-contained. The component "something else" is the parcel in which the left-overs are packed if the parameter does not break down neatly. The designations are imprecise in some cases. There are many imperfections. But it is precisely in drawing up the scheme, in striving for perfection, that the work really lies. The work is not diminished; it is merely transferred to another plane.

The inadequacy of this box is my own and not inherent in the method. Even so: it contains thousands of solutions which – as could be shown by checking an example – are arrived at by the blind concatenation of components. It is a kind of designing automatic.

21

a Basis

1. Components	11. Word	12. Abbreviation	13. Word group	14. Combined	
2. Typeface	21. Sans-serif	22. Roman	23. German	24. Some other	25. Combined
3. Technique	31. Written	32. Drawn	33. Composed	34. Some other	35. Combined

b Colour

1. Shade	11. Light	12. Medium	13. Dark	14. Combined	
2. Value	21. Chromatic	22. Achromatic	23. Mixed	24. Combined	

c Appearance

1. Size	11. Small	12. Medium	13. Large	14. Combined	
2. Proportion	21. Narrow	22. Usual	23. Broad	24. Combined	
3. Boldness	31. Lean	32. Normal	33. Fat	34. Combined	
4. Inclination	41. Upright	42. Oblique	43. Combined		

d Expression

1. Reading direction	11. From left to right	12. From top to bottom	13. From bottom to top	14. Otherwise	15. Combined
2. Spacing	21. Narrow	22. Normal	23. Wide	24. Combined	
3. Form	31. Unmodified	32. Mutilated	33. Projected	34. Something else	35. Combined
4. Design	41. Unmodified	42. Something omitted	43. Something replaced	44. Something added	45. Combined

Solutions from the programme

(Not all the solutions were found with the aid of the morphological box. But all those found can be assigned to a place in it and analyzed.)

If all the components contained in the trademark *intermöbel* are added we obtain the following chain:

a 11. (word) – 21. (sans-serif) – 33. (composed)
b 14. (shades combined, viz. light and dark) – 12. (achromatic)
c 12. (size immaterial, therefore medium) – 22. (proportion usual) – 33. (fat) – 41. (roman)
d 11. (from left to right) – 22. (normal spacing) – 31. (form unmodified) – 43. (something replaced, viz. the face of the letter r by superimposition of the two parts of the word).

Not all the components are of equal importance; only two are actually decisive: b 14 + d 43.

The importance of "combined" is shown in example b 14: the components light-medium-dark are not very expressive in themselves because they do not represent an assessable value (apart from black always being dark). But if letters of varying degrees of darkness are combined (as here) the parameter of shade may be the point at which the solution crystallizes out.

Parameters as points of crystallization: I will illustrate all those in the section "Expression" by the following examples:

"Reading direction" determines the expression of the typograms *Krupp* and *National Zeitung*. In both instances the component d 15 (combined) forms the basis. In *Krupp* d 11 (from left to right) is combined with d 14 (otherwise, i. e. from right to left).
In the case of *National Zeitung* the components are d 12 and 13. Incidentally, the typogram for Bech Electronic Centre belongs here, see page 44.

"Spacing", once again combined in the component, is determining in *Braun Electric* and *Autokredit A.G.*

22

intermöbel

23

KRUPP 1871
KRUPP 1961

24

National Zeitung

25

B r a u n Electric International SA

26

AU T O K R E D I T

10.11

Again: Solutions from the programme

"Form" is relevant in *Abfälle*, *Globotyper*, *wievoll?*. In *Abfälle* the component d 32 (mutilated, here fragmented); in *Globotyper* d 33 (projected, here on a sphere), in *wievoll?* d 34 (something else, the form is neither unmodified, nor is it mutilated or projected, but "something else": partly silhouetted).

The idea of "design" means something more than is conveyed by "form". To take an example: in *Auto AG*, the dropping of the crossbar of the A's cannot be called a mutilation nor a form operation either. If the form is mutilated, the components are preserved. That is not the case in this instance. The form as such is Berthold sans-serif but "something is omitted". The reverse applies to the case of *FH* (Fédération Horlogère Suisse): here "something is added": namely, the Swiss cross within the letters. In the case of *Rheinbrücke* there is "something replaced": the part of the word "brücke" (bridge) by the sign.

The reader will have noticed that there is a criterion running right through the examples below: the relationship between form and content.

Basically, every typogram can be produced in two ways: firstly, through the word sense (to interpret the meaning) and secondly, through the word picture (to take the formal data as the point of departure). It would need a second, a semantic box, to bring this within a system. Its components can be found in the examples given here.

Say: the solution for *National Zeitung* is the perception of a formal rotation, *Krupp* is a literary interpretation (Look back to the past, look forward to the future). In *Autokredit* the word credit (payment over a long term) is represented. In *Globotyper* the typeface suggests the typewriter and the projection suggests the sphere (it was originally a name for the IBM spherical head typewriter). "*Abfälle*" and "*wievoll?*" symbolize the idea, etc.

27

Abfälle

28

globotyper

29

wievoll?

30

AUTO AG

31

FH

32

RHEIN

Programme as Grid

Is the grid a programme? Let me put it more specifically: if the grid is considered as a proportional regulator, a system, it is a programme par excellence. Squared paper is a (arithmetic) grid, but not a programme. Unlike, say, the (geometric) module of Le Corbusier, which can, of course, be used as a grid but is primarily a programme. Albert Einstein said of the module: "It is a scale of proportions that makes the bad difficult and the good easy". That is a programmatic statement of what I take to be the aim of "Designing Programmes".

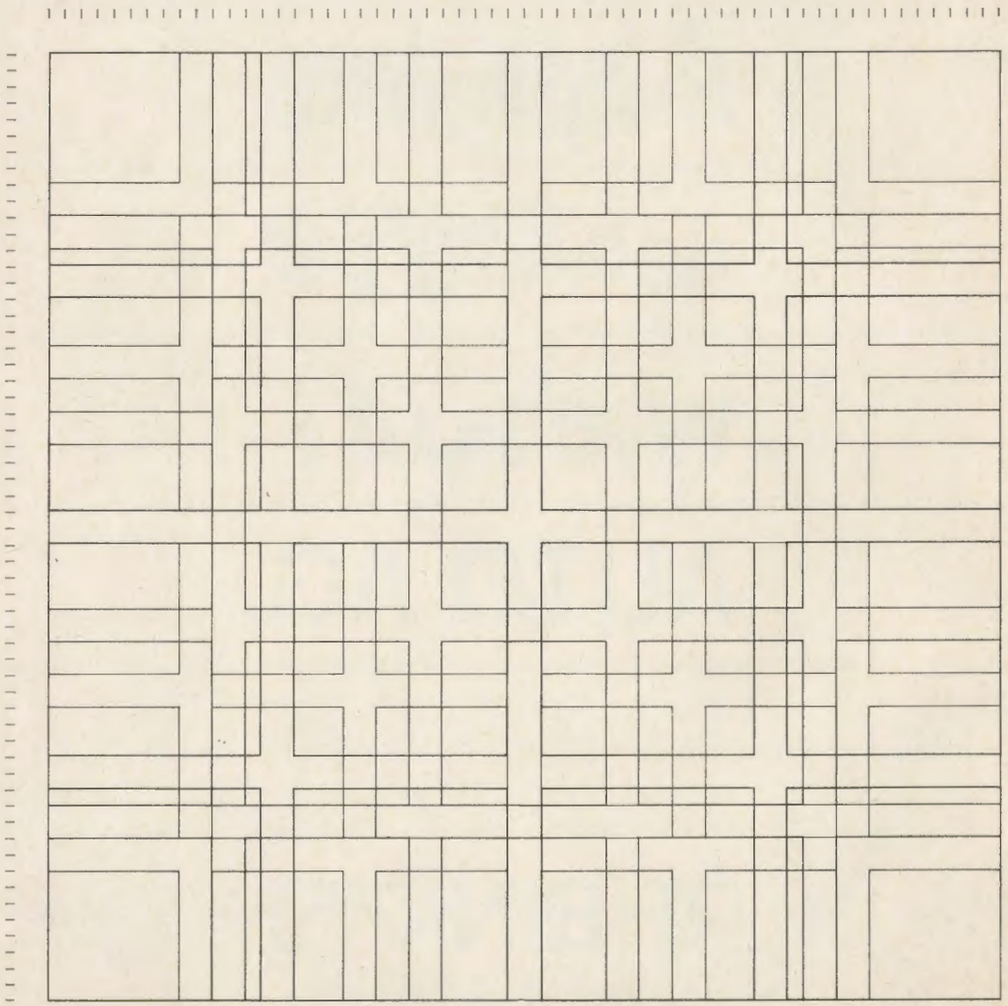
The typographic grid is a proportional regulator for composition, tables, pictures, etc. It is a formal programme to accommodate x unknown items. The difficulty is: to find the balance, the maximum of conformity to a rule with the maximum of freedom. Or: the maximum of constants with the greatest possible variability.

In our agency we have evolved the "mobile grid". An example is the arrangement below: the grid for the periodical *Capital*.

The basic unit is 10 points; the size of the basic typeface including the lead. The text and picture area are divided at the same time into one, two, three, four, five and six columns. There are 58 units along the whole width. This number is a logical one when there are always two units between the columns. That is: it divides in every case without a remainder: with two columns the 58 units are composed of 2 x 28 + 2 (space between columns); with 3 columns 3 x 18 + 2 x 2; with 4 columns 4 x 13 + 3 x 2; with 5 columns 5 x 10 + 4 x 2; with 6 columns 6 x 8 + 5 x 2 10-point units.

The grid looks complicated to anyone not knowing the key. For the initiate it is easy to use and (almost) inexhaustible as a programme.

33



12.13

Again: Programme as Grid

The grid meant here is the screen of a printing block. A good example for understanding an essential factor.

Designing programmes means finding a generally valid principle of integrated arrangement. This applies not only to typography (a predestined application in any case) or – going farther afield – to the realm of geometry. It applies without any restriction to the realm of the visual. Without restriction because all the elements are programmable periodically, i. e. at will. There is no dimension, proportion, form; no colour, which cannot be constantly led over into another. All the elements occur in series, or better, in groups.

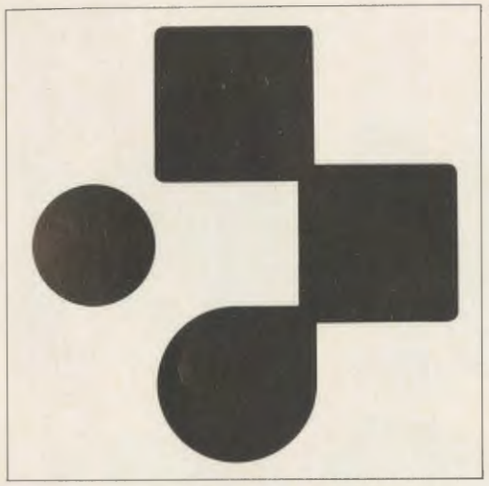
The same applies in the realm of the acoustic, in music. Language is different, because the elements have not been produced naturally but artificially. Even if programming in literature is subject to restricted laws, it is still quite possible, as is shown by Kutter's Programme for Berio.

The periodic demonstrated by the block screen: a light tone consists of small, black dots on a white surface; a dark tone is the reverse. Between them is the arithmetically exact grey tone: a checkerwork of black and white squares of equal size. Thus, from light to dark, the screen undergoes a transformation from circle to square to circle, in which process the form changes as steadily as the tone.

In the colour block there is the added fascination of the colour mixture: out of 4 colours (yellow-purple-cyan-black) all the colours can be produced periodically simply by manipulating the size of the half-tone screen dots.

What could have been more logical than to take the screen itself as a sign programme for a block-making factory? Fig. 34: the minimum form declared to be a form is integrated into a larger whole in the other three examples (advertisement subjects).

34



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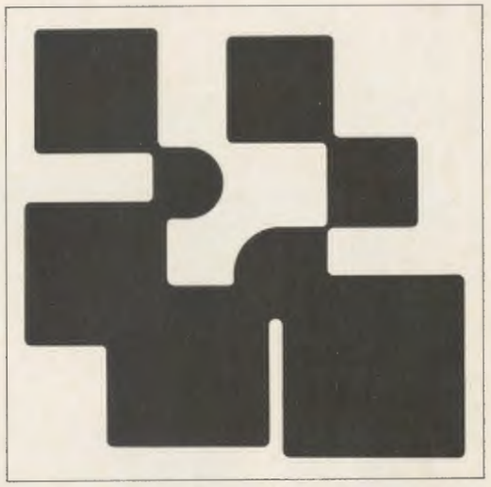

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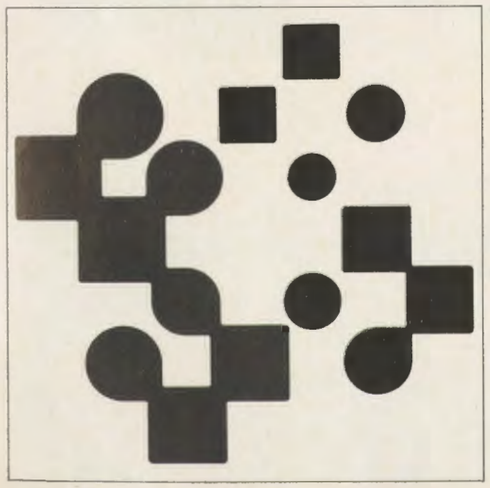

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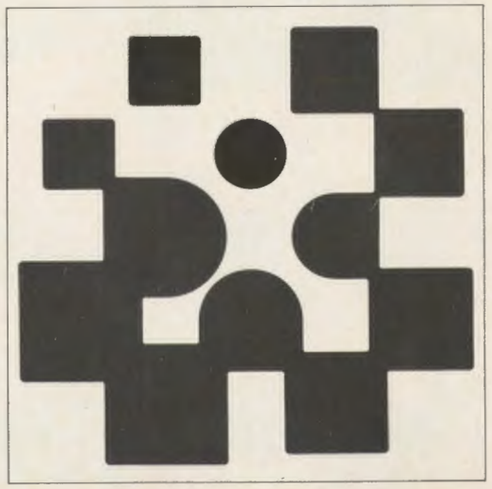


Programme as Photography

The fact that the elements of the visual are periodic, and that the periodic is an essential part of programming, finds its confirmation here: a photograph put together from photographs. The car is photographed from different angles, the positions of the camera being fixed periodically in accordance with a certain programme. The effect is an imaginary movement in two dimensions at the same time.

The periodic applies not only to the perceptible but also to perception itself, to sensory experience. True, our experience of the world is mediated to us through only two eyes, but our eyes are constantly moving in our head, with our head and with our body. That is the experience of space and time which (mortals that we are) we apprehend as being continuous.

Which is another point I wanted to make: the picture is a good illustration of the problems raised in this book. To see a thing in various perspectives; to select the viewpoints so that the views (cumulatively) produce a new whole. In the illustration below a programme has been made out of this approach, and as far as the book is concerned, a virtue has been made out of necessity.

Designing programmes: why is it so difficult to define what is meant in a nutshell. The subtitle: instead of solutions for problems programmes for solutions is more exact, certainly, but scarcely more graphic. The position is probably this: there can be no clear concept of something which, while not new, is not yet firmly fixed in the conscious mind; that is to say, which is still unclear in itself. This introduction, Gredinger's introduction, the whole book is nothing but a definition in different perspectives. Perhaps the title will take on substance as the reader goes through the text. Perhaps the words will become a concept? That would be ideal.

Again: Programme as Photography

The photograph below shows what might be termed a metaphysical view of the same object, viz. a car. It is an extract from a "pastework picture" by Vera Spoerri.

"No one has yet seen a table as it really is", says the mathematician Andreas Speiser, "but always only a part view relative to the point from which it is viewed. The table itself is an unalterable object which constantly appears in a variety of aspects. It is therefore an invariant, an unalterable, in an infinite number of pictures. Let us remember this law: in the apparently unordered sequence of our visual ideas appear invariant structures, these very objects in space; these ideas are by no means voluntary but linked through the operation of a law with existing objects, they are conditioned by something absolute and therefore relative to this. Mathematics can create such relations a priori, and the theory of relativity is born, but it is actually an invariant theory."

However much this picture may differ from the picture on the left, the differences between the two underlying programmes are small. Thus: on the left is the full view of the car, here are parts of the car photographed from periodically fixed viewpoints and pieced together. In both cases the points from which the car is viewed are virtually the same; the distances away are different: farther away on the left, closer here. In both cases the beholder sees different views of the body – from in front, from the side, from above – in the flat. That is to say, what is in reality perceived spatially only at different points of time is here experienced simultaneously.

(Perhaps it may even be possible to bring off the trick of not only showing a full view of the car from outside but also doing away with the contrast of inside and outside. The camera would not merely wander round the object but through it. It is the same principle as the Möbius band. It is a question of programming.)

Programme as commercial design

Problem: to design packs for three washing powders. It must be remembered that each of them has its own "brand personality" and yet they all belong to the same family. That is to say, a basic form must be found which allows the three variants to be sufficiently distinctive and at the same time sufficiently alike.

Programme: waves with a different pattern of crests and troughs and overlaps in each pack.

In addition a cumulative effect was wanted. Packets of washing powder are bought chiefly in self-service shops and must therefore make their own impact. Hence the poster-like "presence" had to be maximized: the three packs together had to add up to something more than just the sum of three packs.

Solution: The waves form a continuous pattern over the different packs. This occurs irrespective of whether the packs standing side by side are identical or different. It also occurs when the ends and faces of packs are placed side by side.

To say what goes without saying: this programme deals only with formal problems, the solution of which (in this instance) is without any intrinsic significance. What is crucial, of course, is that the formal programme should square with the psychological one. But that raises questions which we have not space enough to go into here.

Programme as computer graphics

The illustrations below show pictures from the series 201. They came into being in 1966 and are the work of Frieder Nake, who is per se a programmer at the computing centre of the Stuttgart Institute of Technology.

He writes:

Visual objects generated by computers and drawn by automatic drawing machines are solutions of aesthetic programmes which are written by human beings and implemented by machines.

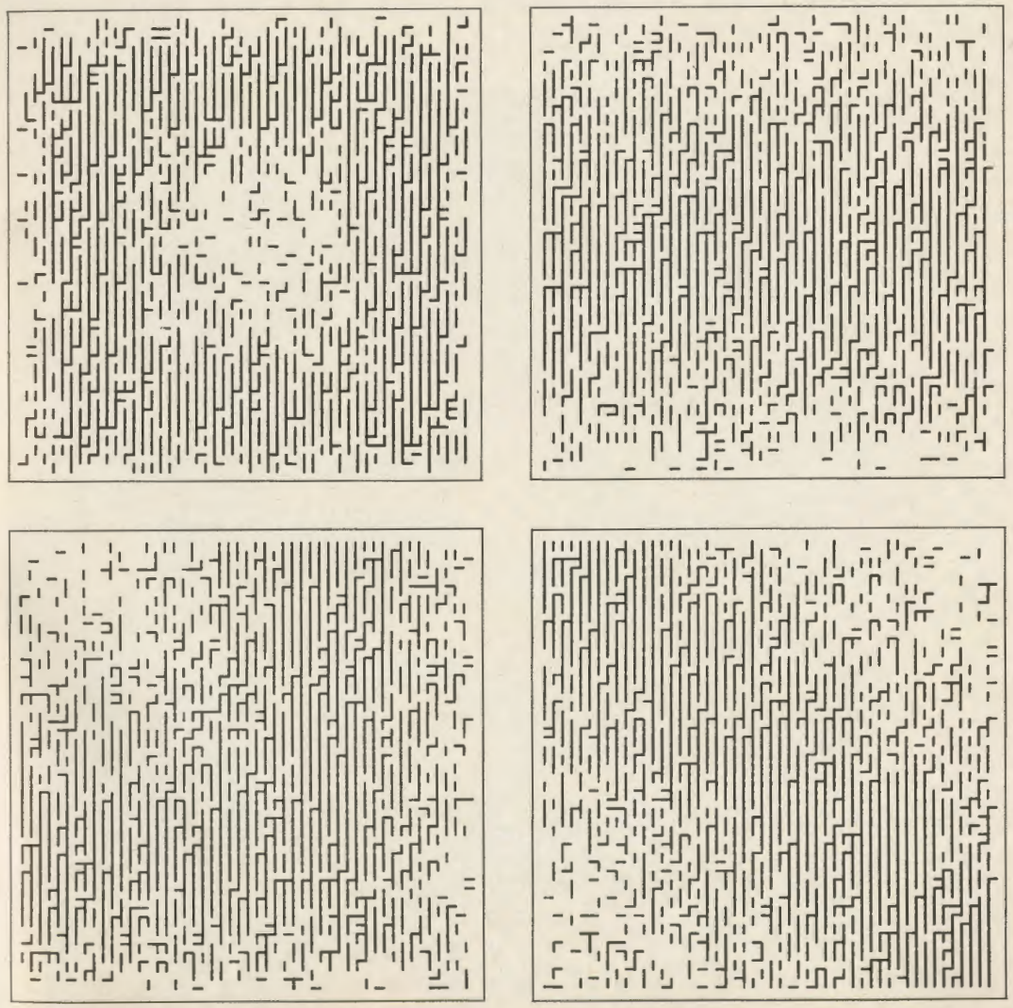
1. In a (more or less subjective) selection process, a person decides on a certain class of visual objects. In concrete terms this means: the elements are fixed which are to appear in the picture or pictures. In the examples below: horizontal or vertical lines of equal length.

2. He or others then formalize the problem radically so that it is suitable for the programming of an automatic production process in which man is involved simply in an ancillary and not a decisive capacity. This means that all the concepts arising (colour, form, completion, selection, proximity, relation, tension, frequency, etc...) must be translated into mathematical language. When the problem has been formulated in mathematical terms, it is translated into a text which the computer can understand. This translation is the "programming of a computer". For this purpose a "programming language" is used, e.g. ALGOL 60. In this language we find sentences like:

"for" i:=1 "step" 1 "until" n "do"
"begin" x:=choose (mx, x1, x2); y = choose (my, y1, y2);
Z:= choose (mz, z1, z2); draw (x, y, z)
"end".

3. The programme is delivered and passed onto modern computers which, working in conjunction with drawing machines, ensure that the process is carried out automatically and deliver the finished visual object.

The use of chance generators plays an important part in this process since they simulate imagination, variations and series formation. A programme can be repeated virtually as often as desired without the same result ever occurring twice. F.N.



Programme as movement

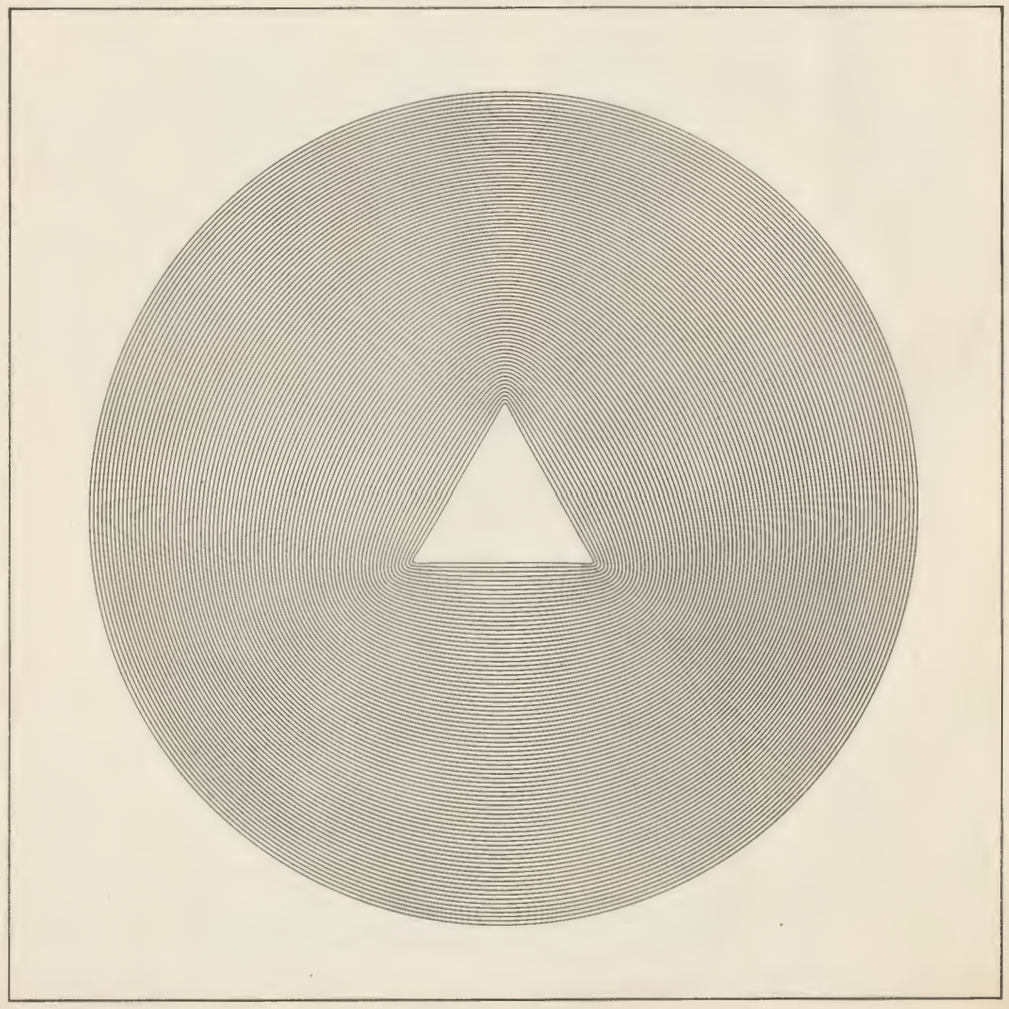
"All elements of the visual are periodic, i. e. capable of being programmed at will". I was glad to have an opportunity to write a commentary on this theme. The opportunity was offered by the periodical "Graphic Design", from which the following extracts are taken. I am, however, replacing the expression "periodic" by "continuous"; it is more apposite and precise.

Numbers are continuous: 1-2-3-4-5-6-7-8-9-10... The step between 1 and 2 is precisely the same size as that between 9 and 10. The steps can be refined ad lib.: 1-1.1-1.2...2 without the step between 1 and 2 being altered.

This truism about numbers is also true of colours: colours are of their nature continuous. A series from white to black, e. g. in ten steps, each step the same size as the next and the one preceding it. Here the question is not one of counting but one of measuring. What is measured is the distance between two points. Between white and black there may be ten steps, or two, or two hundred (the human eye cannot distinguish more): a certain grey will always occupy the same place, an exactly intermediate shade of grey will occupy a place exactly in the centre between black and white, and so forth.

But not only white will pass over continuously into black but any colour into any other colour. Colours form a closed system.
But not only colours but *all the elements of the visual are continuous*. Any form can pass over into any other. Any form of movement (a bird's flight for example) is a process of continuously changing forms, only in this case the change is "fluid". It is because any movement can be resolved back into single forms = phases that the film is possible: it consists of 24 static but continuous single pictures which, when projected, again create the illusion of movement.

I am indebted to Mitsuo Katsai, Tokyo, for an example of a continuous change in the field of elementary geometry: he caused a triangle to merge "imperceptibly" into a circle.

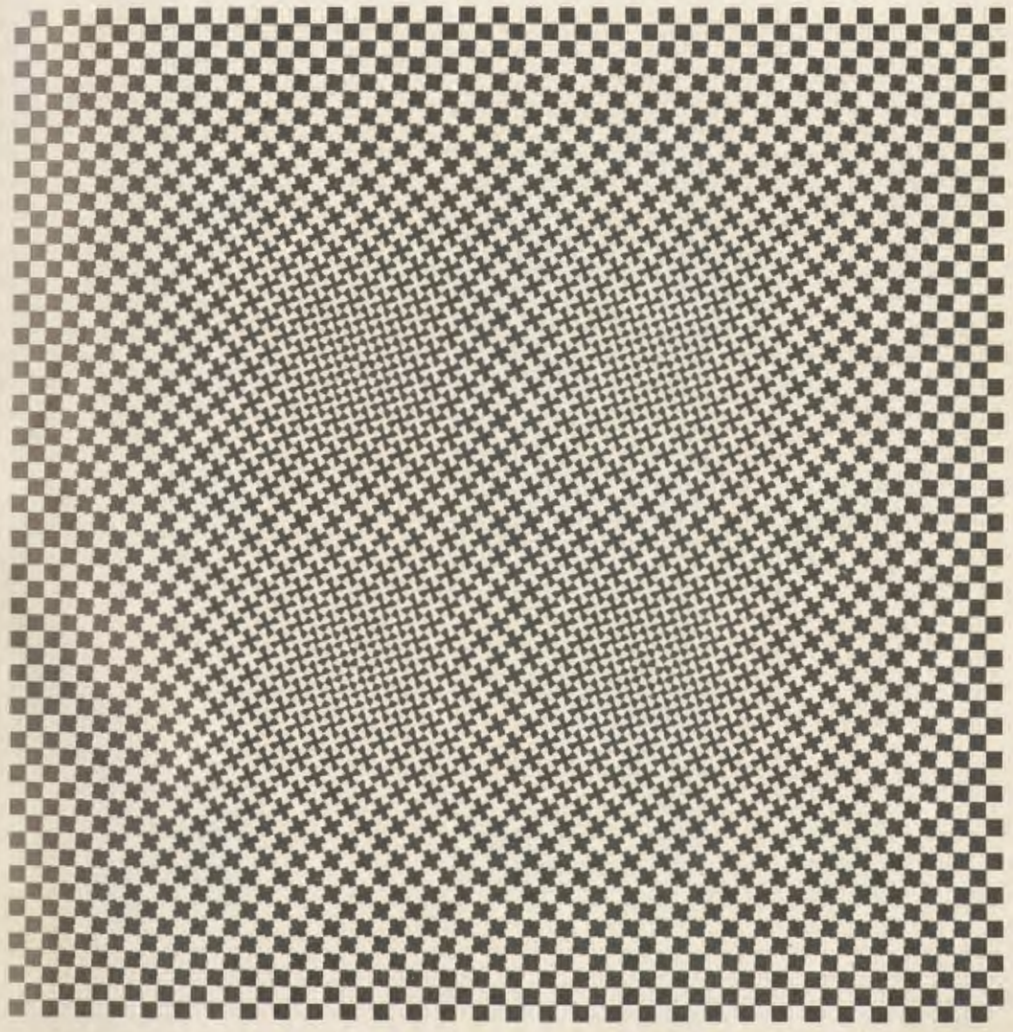


Programme as squaring the circle

The development of colour systems is the concern of account in the book "Farbsysteme" by Günter Wyszecki, Musterschmidt Verlag Göttingen, 1960). scientists. There are special theories of proportions, ornamentation and so forth. There is also a morphology or theory of form (by Wilhelm Ostwald, see p. 8). But there is no general system of forms and volumes. I do not know whether a system of correlating form and colour has ever been attempted. It seems strange that it should not have been when we remember that it is very largely through volumes, forms and colours that we experience the world. I think that continuity would occupy as central a position in such a system as in the system of colours. I will illustrate what I mean by taking an example "from life".

Any kind of growth can be conceived as movement, that is to say a change of form and colour in the smallest steps. Now, out of a white egg develops a black tadpole, from which develops a green frog. The beginning and the end of this process are different, very different. But the intermediate steps cannot be directly perceived. Why not? Precisely because the development is a continuous one.
But "constancy" is not the same thing as "continuity". The circle/triangle figure is continuous, to be sure, but is not constant. I would say that the steps are larger near the triangle than near the circle. This is not a value judgment but emphasizes that both continuity and constancy are controllable at will. In this case as with all visual elements. There is not only a circle to be made into a triangle but also a circle to be squared, as careful examination of the work below will show.

(This, by the way, is an excerpt from a project I began ten years and shall probably never complete. I wanted to make an "optical torture room": a room with a round chequer design in which the pattern changes continuously in every possible way. Just as circles grow out of black-white squares here, so colours, volumes and textures arise in other variants.)



Programme as literature
Programme for Berio
by Markus Kutter

It came about like this:

In his arm-chair on the balcony at Hegenheim (or over a glass in a hotel?) Berio asked whether the lyrics writer could not write lyrics like this:

Few words.
Simple words.
But words which could be sung back-to-front and front-to-back.
Or even over one another.
Or higgledy-piggledy.
Or, of course, after one another.
Now just a few words picked out.
Now one beautiful word alone.
Perhaps a long chain in which the links are continually rearranged.
And it must make sense.
And it must have atmosphere and sound marvellous.

For example, for a woman's voice.
(Because his wife Kathie sings so well).
And so the lyrics writer had to try to write lyrics.
Difficulty: the lyrics writer can only write with confidence in German. But the lyrics must be translatable, for example into English. So they must not be complicated.
The text scheme produced is at the foot of this page.
This programme can be used in the following sequences:

Sequence a b c d e f g h i
or e alone
or a e i
or a d g b e h c f i
or g h i a b c f e d
or a d e f i
or c f i a d g h e b
or c e g

or any sequence one cares to choose.
I hope Berio will compose the programme before long; I should like to hear it – because of Kathie's beautiful voice!

a Give me	b a few words	c for a woman
d to sing	e a truth	f that allows us
g before night falls	h without sorrow	i to build a house

Again: Programme as literature

the ultimate poem by Emmett Williams:

What it amounts to is an eternal project, and, at least for most of us, eternity is more time than we have at our disposal for perfecting works of art. Besides, these days there are far more important things to achieve.

The procedure:
1. *Choose twenty-six words by chance operations, or however you please.*
2. *Substitute these twenty-six words for the twenty-six letters of the alphabet, to form a working alphabet of words.*
3. *Choose a word or phrase (the shorter the better) as the first line of the poem.*
4. *For the letters of this word or phrase, substitute the corresponding word in the alphabet of words.*
5. *Repeat the process with the result of (4).*
6. *Continue the process.*

In the 1966 version, I chose an alphabet of words which reflected some of my preoccupations upon returning to the United States after an absence of seventeen years.

For the first line of the poem I chose IBM, *a tribute to the muse's assistant.*

In the first substitution, these three letters yielded

red up going

in step (5), the ten letters of these three words blossomed into

perilous like sex
yes hotdogs
evil jesus red black devil

The forty-six letters of these ten words in turn produced forty-six words, these forty-six words two hundred and fifteen, these two hundred and fifteen words a thousand and fifty, and so on, quickly multiplying by thousands and millions.

To thicken the plot, and relieve the monotony, the alphabet of words shifts twenty-five times (the "a" word becomes the "b" word, etc.), so that there are twenty-six versions of the poem. Samples of the beginnings of two versions are shown below:

IBM

RED UP GOING

PERILOUS LIKE SEX
YES HOTDOGS
EVIL JESUS RED BLACK EVIL

HOTDOGS LIKE PERILOUS RED KOOL JESUS YES ACTION
KOOL RED TICKLISH LIKE
ACTION LIKE DEATH
NAKED LIKE ACTION
OLD JESUS VIRGINS SEX JESUS EVIL ACTION
LIKE EASY RED KOOL
ZULUS LIKE ACTION YES ACTION
PERILOUS LIKE SEX
UP KOOL MONEY IDIOTS TICKLISH
LIKE EASY RED KOOL

IBM

QUIVERING NAKED ZULUS

BLACK PERILOUS QUIVERING ACTION UP JESUS QUIVERING TICKLISH SEX
TICKLISH DEATH OLD UP MONEY
FEAR PERILOUS RED PERILOUS HOTDOGS

NAKED RED DEATH WHITE OLD
GOING UP JESUS QUIVERING RED KOOL PERILOUS HOTDOGS
BLACK PERILOUS QUIVERING ACTION UP JESUS QUIVERING TICKLISH
DEATH WHITE COMING QUIVERING KOOL TICKLISH
COMING KOOL
EVIL UP HOTDOGS PERILOUS HOTDOGS
BLACK PERILOUS QUIVERING ACTION UP JESUS QUIVERING TICKLISH SEX
COMING QUIVERING WHITE OLD RED QUIVERING HOTDOGS LIKE
JESUS MONEY YES
COMING QUIVERING WHITE OLD RED QUIVERING HOTDOGS LIKE
MONEY UP DEATH COMING LIKE
TICKLISH OLD MONEY
COMING KOOL
ZULUS KOOL TICKLISH UP EASY
IDIOTS UP DEATH JESUS
GOING UP JESUS QUIVERING RED KOOL PERILOUS HOTDOGS
JESUS UP MONEY
GOING UP JESUS QUIVERING RED KOOL PERILOUS HOTDOGS
LIKE KOOL COMING MONEY KOOL SEX HOTDOGS

Programme as music

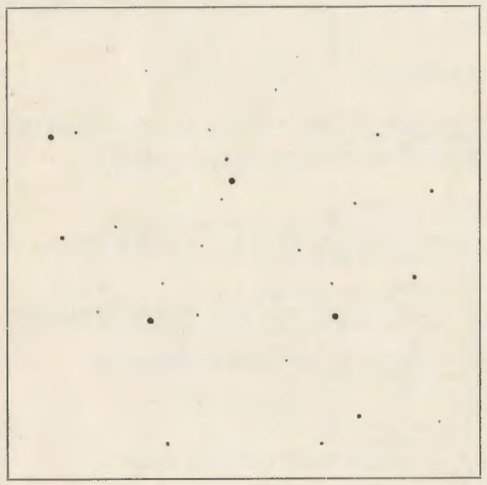
Variations I
by John Cage
for David Tudor, on his birthday (tardily), January 1958

Six squares of transparent material, one having points of 4 sizes: the 13 very small ones are single sounds; the 7 small but larger ones are 2 sounds; the 3 of greater size are 3 sounds; the 4 largest 4 or more sounds. Pluralities are played together or as "constellations". In using pluralities, an equal number of the 5 other squares (having 5 lines each) are to be used for determinations, or equal number of positions, – each square having 4.

The 5 lines are: lowest frequency, simplest overtone structure, greatest amplitude, least duration, and earliest occurence within a decided upon time. Perpendiculars from points to lines give distances to be measured or simply observed. Any number of performers; any kind and number of instruments. J.C.

Figs:
41 the square with dots, 42 one of the 5 squares with 5 lines, 43 the lined square placed over the dotted square and 44, the dots connected by perpendiculars to one of the lines.

41



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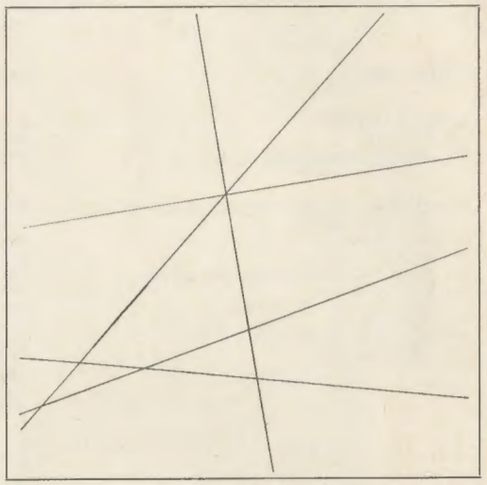

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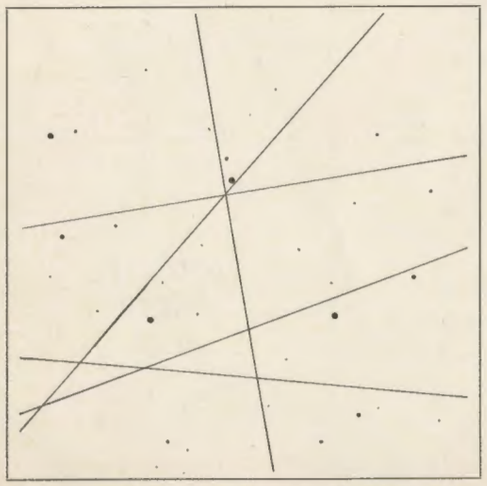

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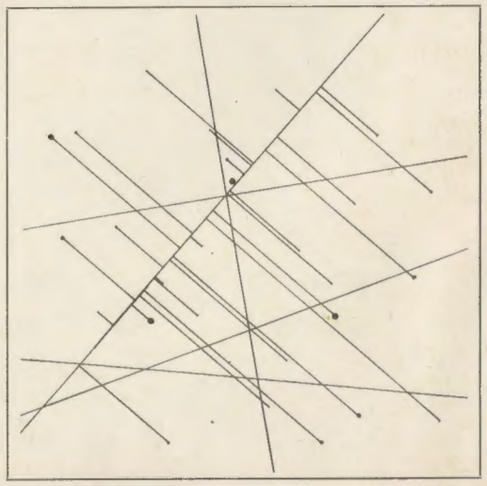


Again: Programm as music

Nr. 14 "Plus Minus" by Karlheinz Stockhausen, 1963

Explanations:
1. *There are 7 pages of notes and 7 pages of symbols.*
2. *One or several interpreters can realize one or several layers with these 14 pages. Up to 7 layers can be combined.*
3. *A page of symbols is to be applied to each page of notes.*
4. *Symbols in a square signify one musical event.*
5. *The symbol pages and their numbered events should follow each other continuously.*

○ *"Zentralklang" (central sound) corresponds to one of the chords (I–VII) on a note-page.*

▼ *short*
◆ *medium*
● *long*
? *indeterminate*

"Akzidentien" (accessories to the Zentralklang) before, with the beginning, during and (or) with the end of the Zentralklang are indeterminate in pitch, but should match the register of the Zentralklang.

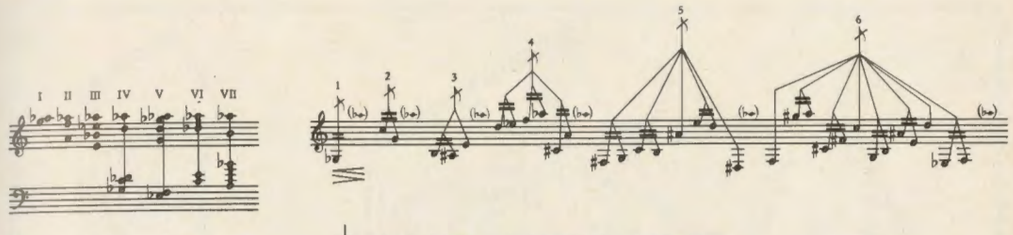
"Nebennoten" (secondary notes) correspond to the groups 1–6 on a note-page. They are used before, with the beginning, during and (or) with the end of the Zentralklang.

as fast as possible

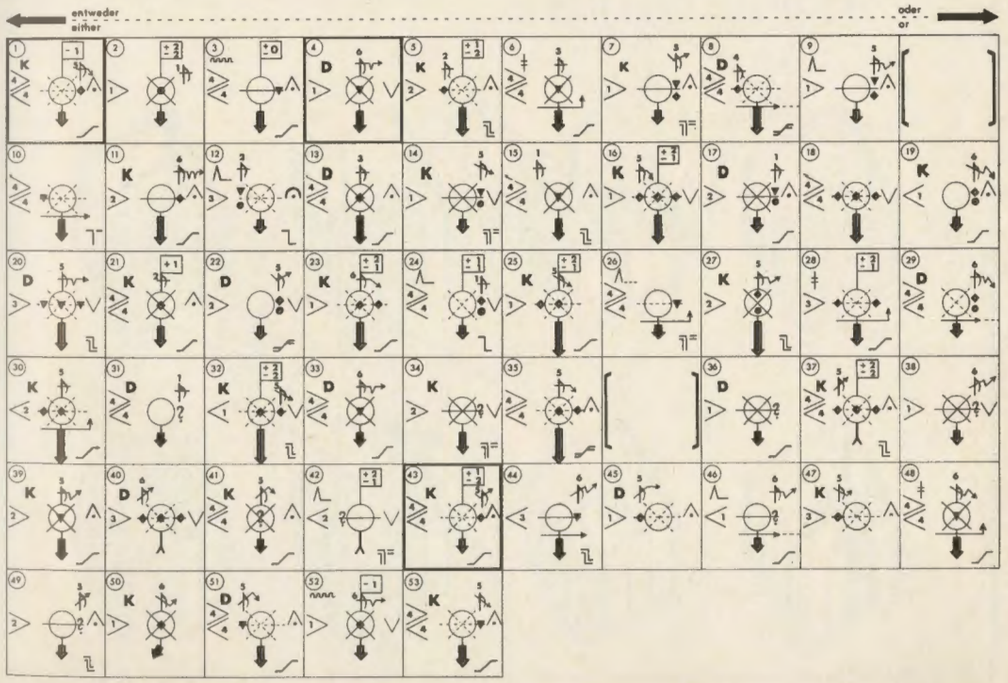
accelerando

ritardando

6. There are 7 types of events.



= Kurzes Tremolo (Triller); bei 1 schnell repetieren.



Programme as architecture

Building system by Schwarz, Gutmann and Gloor, architects, Zurich, and Heinz Hossdorf, engineer, Basle, with Plensky+Zöllner, building contractors, Frankfurt.

To programme dwelling units is first and foremost an economic problem. The smaller the number of elements, the more economical the system the ideal solution: a single "building block"–a cube the size of a minimal living space.

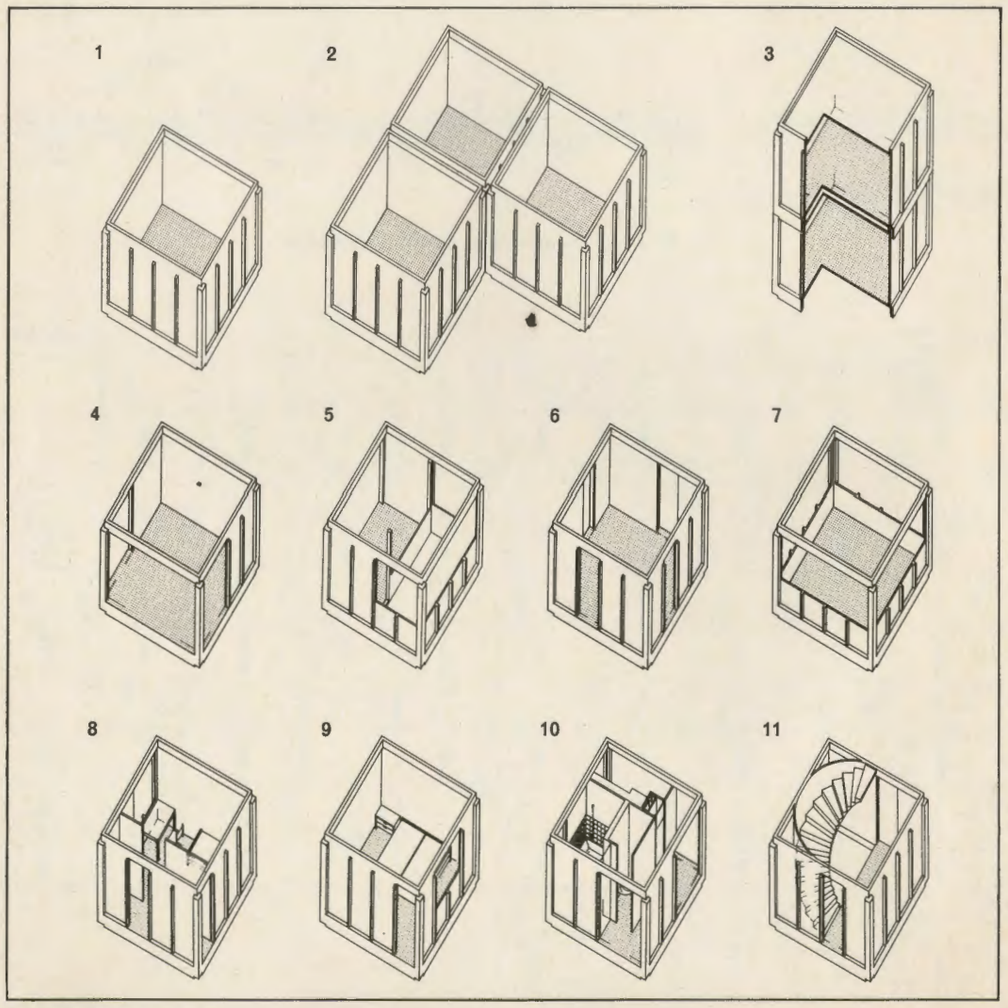
This cube in turn is determined by economic criteria: how big must it be if transported, erected and lived in with reasonable comfort? Here the dimensions are: 4×4×2.5 metres; dimensions of a room and equally the modular unit of the system–Fig.1.

The cube is made of reinforced concrete. The four corner columns bear the total vertical load. They are joined together by thin walls ribbed for extra strength, a load-bearing interfloor, and a thin non-load-bearing slab in such a way as to make the cube a spatial supporting structure.

This cube can be used to extend the room at will. Cubes can be added horizontally, the space between the cubes being used for insulation and to accommodate services–Fig.2. Vertically the cubes can be inserted one into another in the manner of coffee cups, the number being limited to eight storeys for static reasons–Fig.3.

The possibilities of the cube may be specified as follows: it may be used as a frame for building unwalled rooms of any size–Fig.4. Or it can itself be subdivided–Fig.5. Doors can be inserted at any point between the ribs of the walls–Fig.6–or windows put in as required–Fig.7.

The units can be designated as a living area: as day rooms, work rooms, bedrooms and living rooms–Fig.8.
Or kitchen and terrace in one unit–Fig.9.
As bathroom and corridor–Fig.10.
As a staircase–Fig.11. And so forth.
Fig.12 shows how units can be combined in "double harness".



Programme as production process

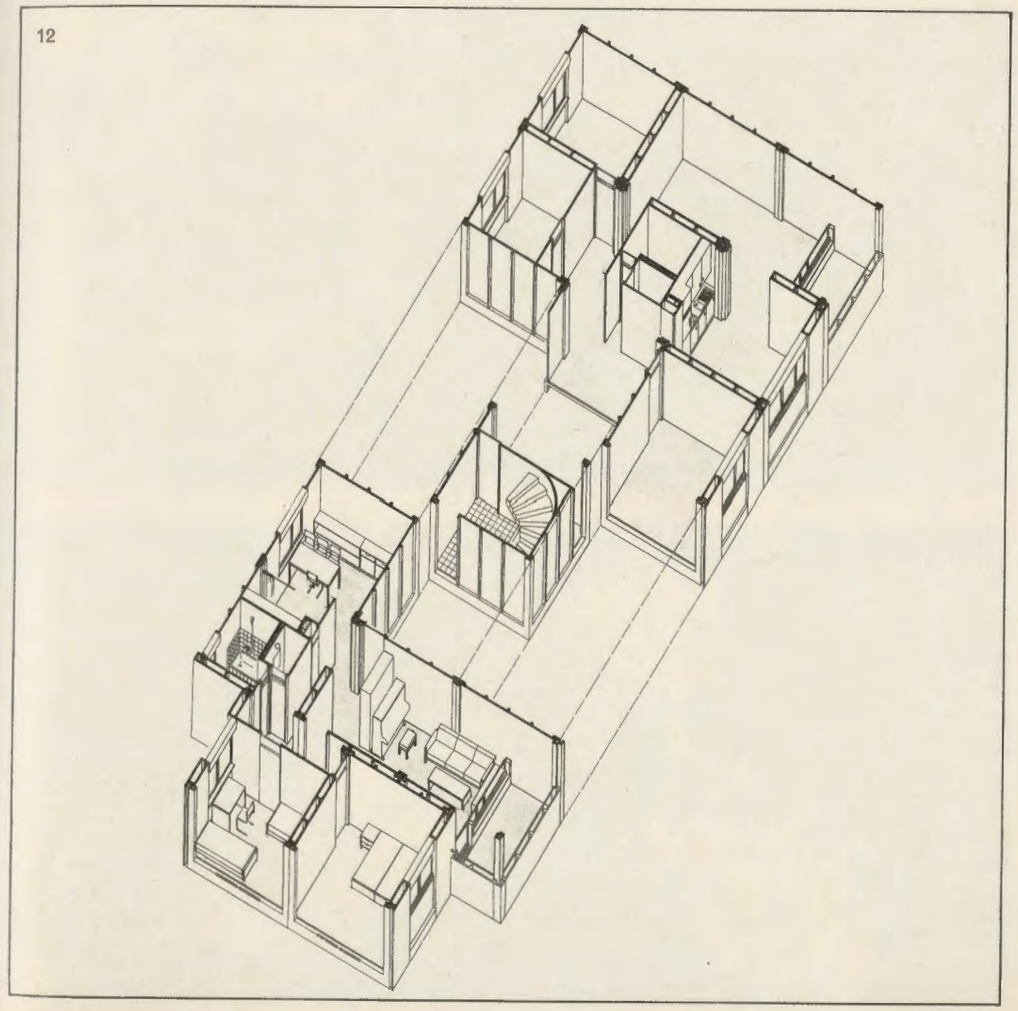
The aim of programming the housing system of Schwarz, Gutmann and Gloor is in principle to produce the maximum variability with the fewest possible units.
developed from the basic functions of living and with the aid of these the most diversified demands can be satisfied.
If this kind of architecture is to be put into effect, it must be programmed not only with the idea but also with the process as the starting point. It is not only the result that counts but also the route by which it is reached: industrial mass rpoduction. A word on the subject of production and programme.

On this point we might quote Peter Behrens and H. de Fries: "Evidence of the correctness of these statements... may be found in Edison's experiments to cast whole houses including bath, staircase, and chimney-piece by pouring a concrete mixture into prepared iron moulds. The inventor believed it would be possible to accomplish the work in twelve hours." Taken from an essay "Vom sparsamen Bauen"–c.1918.

However fascinating Edison's experiment might have been at that time, large series of products in the early days of industrialization were inseparable from monotony of form. Today the position is quite different. Electronic control now makes it possible to design programmes, i.e. processes, which combine optimum rationality with optimum freedom of choice.

In every instance the principle consists in developing elements to the highest possible technical and aesthetic standards and evolving the rules for arranging them in any desired combination.
In this connection another principle leaps to mind when we think of architecture. A house is not to be built just for a lifetime (and the following generations); it can be constantly altered from top to bottom to meet changing needs virtually without anything being forfeited in the process.

So programming does not merely rationalize life in the sense of cramping it; on the contrary it makes it richer. it is processes that are rationalized. The result is freedom and movement. And deliverance from the need to make decisions "for good".



Programme as city planning

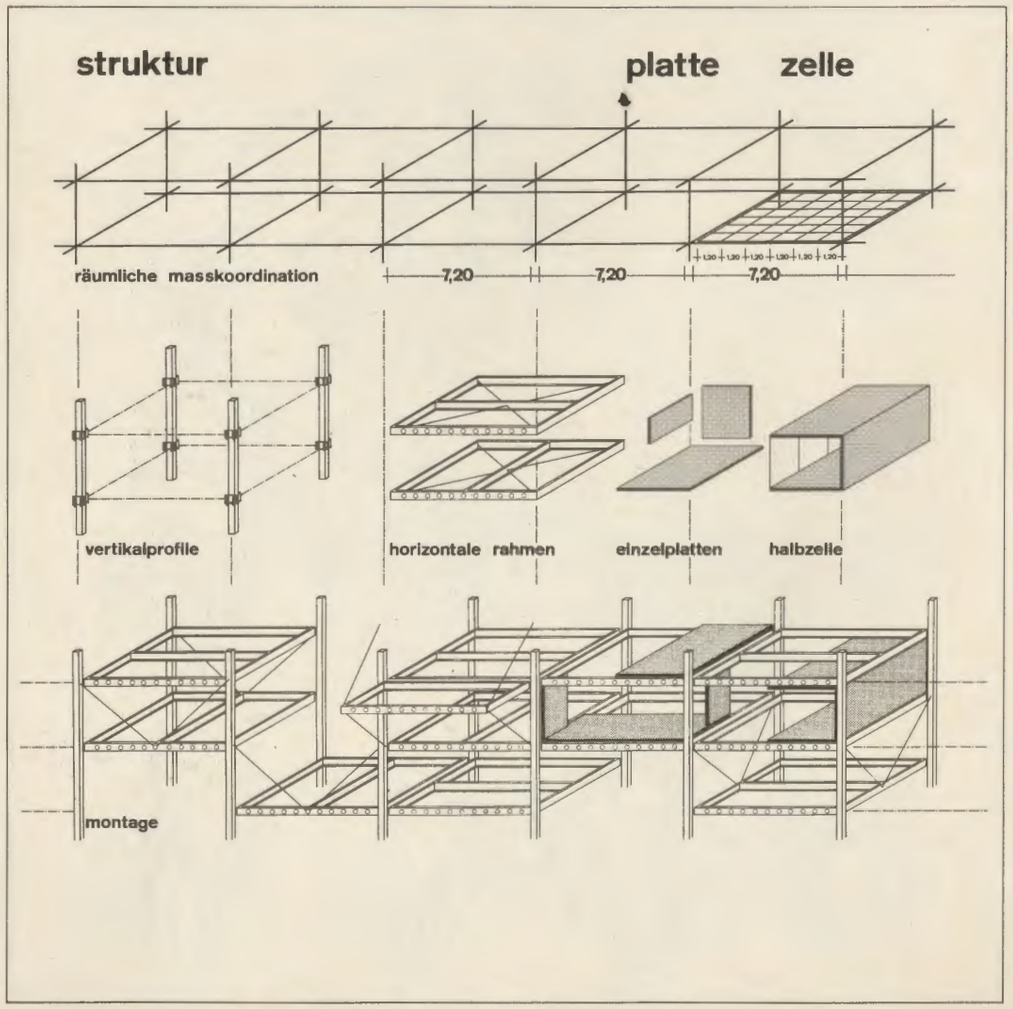
Extract from the periodical "Capital" (No. 3/1967)
"At the beginning of April a helicopter will fly six plastic capsules to the grounds of the Otto Graf Institute of the Stuttgart Institute of Technology. This is the start of a new adventure in architecture: technicians, sociologists and psychologists will test what life is like in synthetic living units measuring 7.2 × 3.6 × 2.8 metres.

"Whole cities are to be erected with these plastic capsules. To this end three architects last summer founded the 'City Planning Systems Company for Research and Development Ltd.' in Wiesbaden. They are Rudolf Doernach, 38, formerly assistant to the famous American architect Buckminster Fuller; Hans-Joachim Lenz, 41, winner of the first prize in the competition for the Euratom Institute for Transuranic elements in Karlsruhe; and Eckhard Schulze-Fielitz, 38, Deubau prizeman of the City of Essen.

"These wayout architects have discovered affinities between man's biological system and the living conditions he desires. The human system of bones/organs/brains is paralleled by the urban system of framework/living-unit/control.

"City planner Rudolf Doernach has concrete ideas as to how such a dwelling system will look. He says: 'To start with, one buys one's living capsules for, say, 30,000 marks and hangs them up on the framework near the centre of the city. Later one can load them on a truck and take them to the quieter outskirts. On retirement, one loads one's living unit on a helicopter and flies it to Majorca."

"The supporting framework for these living units will consist of steel or concrete posts and beams. Instead of renting flats or rooms, one will hire space in which to hang one's living unit as one wishes. 'There will be plenty of scope for variety,' architect Lenz promises us; 'for instance one room can be rigged out as a front garden'."



Programme as design for the future

"City planning systems" do more than just provide dwelling houses. "Paths and roads will also be incorporated in the supporting framework as the volume of traffic requires. All service mains such as hot and cold water, heating, power, telephones, antennae and drainage will run along the posts and beams."

The illustrations below show the system as projected for the University of Bochum. The upper picture clearly shows that even contingencies are programmed: the complete flexibility of the structure enables the university to be altered inwards and outwards in every direction as its various needs develop.

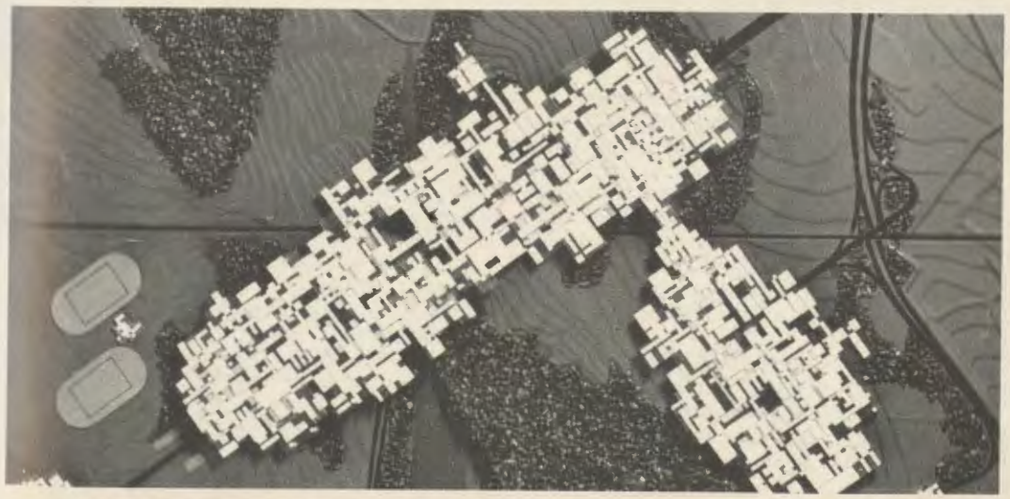
The example of this university clearly spells out the principle: "in this new conception of city planning man is no longer adapted to the layout of buildings and town but these are adapted to man."

Doernach, Lenz and Schulze-Fielitz see their programme in the context of the complete urbanization of the earth.

Today 50 % of humanity live in cities: by the end of the century the population of the earth will have developed and 90 % of them will be urbanized. Population growth will be concentrated in existing megalopolises and agglomerations; small towns will decay; villages will become extinct.

Under the pressure of this development new social structures will come into being and these will find expression in new city planning programmes.
Schulze-Fielitz: "Our task is the development and production of *spatial* city-planning programmes with the maximum possible adaptability."
He believes that the density of utilization should be maximized not only for economic but also for psychological reasons: "to step up social intensity as a remedy against desocialization and to obviate the malaise of our new towns."

Above all it is mental and spiritual density that is involved: the city of the future is to be literally a framework, objective and neutral, into the voids of which individualized living space can be filled.



While engaged in this work, we were sometimes asked whether we were not proceeding on rather too rigid lines.

I think there is a misunderstanding implicit in such a question. It is true we looked for a scheme. But by scheme we do not mean making a decision and then carrying it out regardless of consequences. What we wanted was that both the single type and the whole family should conform optimally to a governing principle. Looking at it like that, we cannot be schematic enough.

We went ahead on entirely conventional lines. We slowly passed over from analysis to synthesis. By analysing existing typefaces, we learnt what we could discard. The synthesis was approached by trial and error in a hundred different attempts. Step by step we measured our abstract ideas (the principles we evolved) against the result, i.e. the actual appearance of the typeface. In principle we now know what we want. But we also know that there still remains a great deal to be done in detail. Let me repeat our principle: not to design new faces but to improve (where possible) and to develop the best, perfecting them to the utmost and making them conform to a governing principle as far as possible.

Why is this conformation to a governing principle so important? Because we set such store by being able to combine the letters harmoniously and without restriction. But is the typographer not free to combine as he likes? No, all he can do is combine the material available. And in our opinion that is too little.

Perhaps I may be permitted a personal observation. In the future there may be a closer link between text and typography, between content and form. Certainly there will be in advertising, probably in journalism, and perhaps in literature.

As the flood of printed matter grows in volume, copywriters and typographers must look for ways and means of making what is printed easier to read. The typeface is the medium of communication and typography is the packing. The face must be legible but the typography must make the print inviting. This function is very important, and the typography can fulfil it in a variety of ways.

But there must also be more variety in the material. There must be variety but in our view there must also be a strict constant. That is the new basis we want for the old Berthold sans-serif.

We in our agency are primarily typographers not "typeface artists". It was never our intention to design a new typeface. Quite apart from that, we did not originally even aspire to do the work I am here presenting to a professional public for the first time. It has given us enjoyment because tackling these problems has given us a sharper eye and a deeper understanding not only of typefaces but also of the typography of the future.

It will soon be three years since we first began this work. It gives me pleasure to record that when our work began to yield results we approached the firm of Berthold. The management and artistic director showed sympathetic interest in what we were doing. Berthold provided a tangible basis for our work and have assured us that they will be bringing out this new design in photocomposition on Diatype.

Integral typography

A new label? The typographical aspect of a new ism? No, this is just what is not meant. The times of both, pioneers and isms, are over. After the adventurers of the 'teens and the twenties we are the settlers, the colonizers.

The continent of modern creation is not only discovered, but it already figures on various maps. Isms are the countries of the spiritual map, each one with a border separating it from the others as in a school geography – and like everything in school books right and wrong at the same time. For today the borderlines between isms are beginning to be obscured. And what interest us are not so much the surrounding constructions as the matter itself, the individual achievement which stands finally behind collective theories. In my opinion, for the sake of honesty, no new ism should be created[1].

Today it is time (at any rate so it seems to me) to gain distance from the theses of the "new" and "elementary" typography of the twenties and the "functional" typography of the early forties.

Let us recapitulate these theses once again. Max Bill writes in 1946: "We call elementary typography a typography entirely developed out of its own data; that is to say, which works in an elementary way with basic typographical elements, and if, at the same time, it aims at the sentence-picture in such a way that it becomes a living sentence-organism without any decorative addition and without any strain, we would call it functional or organic typography. Which is to say that all demands – technical, economic, functional and aesthetic – should be fulfilled and should determine together the sentence-picture[2]."

It is precisely in typography that the difficulty of setting theoretical boundaries is plain[3]. For example discussing Bill's functional claim, Jan Tschichold, the editor of "Elementary Typography"[4] said even in 1928: "The New Typography is different from the earlier because it is the first to attempt the derivation of the appearance from the function of the text[5]." And Moholy Nagy even five years earlier: "This first of all: an unambiguous clarity in all typographical works. Legibility and communication should never suffer from a previously held aesthetic[6]."

Those were the theses which caused the typographical revolution and let loose discussion forty, twenty and even ten years ago. Today it can be said that they are no longer controversial; they are accepted – and thus they have lost their object, their currency. This is what is up to date in the situation of the new typography of 1959. After all a dream has been fulfilled, but the envisaged paradise has remained as far away as ever. In the twenties for instance it was claimed for the first time that the typographer should proceed from the data of his material, from the basic typographical elements; today it is hardly conceivable that he should not proceed from them.

If most of the pioneers' theses have become self-evident, the aesthetic criteria have been generally outlived. For example: Is sans serif or Roman type the type of the twentieth century (Tschichold 1928:

"Among all existing types the sans serif . . . is the only one which conforms spiritually to our time[5]"? is symmetrical or asymmetrical typography the genuine, contemporary way of expression? do flush left, ragged right or flush left, flush right correspond to present-day feelings? can a type be set vertically or not? and so on.

Such "either or" criteria have served their time and their purpose. Today typographers use both sans serif and Roman type, set books both symmetrically and asymmetrically, use both flush left, ragged right and flush left, flush right. Today everything is stylistically allowable, allowable from the point of view of up-to-dateness. "There remain only open doors to be unlocked", as the German saying has it. And we shall not be spared the necessity of rendering an account of the state of our spiritual inheritance. Nobody will relieve us of the task of searching for new criteria.

Typography is an art not in spite of its serving a purpose but for that very reason. The designer's freedom lies not at the margin of a task but at its very centre. Only then is the typographer free to perform as an artist when he understands and ponders his task in all its parts. And every solution he finds on this basis will be an integral one, will achieve a unity between language and type, between content and form.

Integral means: shaped into a whole. There the Aristotelian dictum that the whole is greater than the sum of its parts is assumed. And this vitally concerns typography. Typography is the art of making a whole out of predetermined parts. The typographer "sets". He sets individual letters into words, words into sentences.

Letters are the elementary particles of the written language – and thus of typography. They are figurative signs for sounds without content, parts which acquire a meaning and a value only if they are combined. This means that combinations of two, three and more letters show in any case a word-picture, but definite letters render a definite idea only in a certain sequence; literally they constitute a word. To clarify the example from the other angle let us take four letters which can be combined in four different ways. From this we can see that only one combination makes sense. The 23 remaining are indeed both legible and pronounceable, they contain the same elements and give the same total. But they do not constitute a linguistic whole. They remain meaningless.

1

EFIW	FEIW	IEFW	WEFI
EFWI	FEWI	IEWF	WEIF
EIFW	FIEW	IFEW	WFEI
EIWF	FIWE	IFWE	WFIE
EWFI	FWEI	IWEF	WIEF
EWIF	FWIE	IWFE	WIFE

The importance of the whole, the integral in general, for language and typography, is obvious. If the proportion between the correct and the possible combinations in words of four letters is 1 : 24, in five-letter words it will be 1 : 120, in six-letter words 1 : 720, in seven-letter words 1 : 5040 and so on.

This means that what we can write and set with our letters in all languages – if it makes sense, it makes a whole – always remains a mere fraction of the mathematical possibilities of the alphabet.

Morgenstern, the Dadaists, Schwitters and others have tried the abstract language which stands for nothing outside itself, consisting of unconventional combinations of sounds and letters, of words which are not words because they have no meaning but their own acoustic and visual rhythm[7]. The poets explode what has become natural and meaningless for us in the language. And in so doing they give us back a feeling for the natural and elementary. Kurt Schwitters' "Sonata in Primeval Sounds" is especially illuminating with respect to the accord between elementary, linguistic and typographical form.

The author says: "The Sonata consists of four movements, an introduction, a coda and a cadenza in the fourth movement. The first movement is a rondo with four main elements which are especially marked in this text of the Sonata. It is rhythm in strong and weak, loud and soft, compressed and extended and so on."

Page 1 of the "Sonata in Primeval Sounds" published in Hannover in 1932. (Typography by Jan Tschichold):

In our contemporary reality abstract word-creations which seem at first sight the eccentric ideas of a poet, have developed into an everyday economic factor. Every day new words are created. Perhaps they grow out of abreviations like UNO, are pieced together from foreign words like Ovomaltine, or are new inventions like Persil; in each case they are independent of their source. And now names for industrial products are found by means of electronic computers. This happens as follows: some three random vowels and four consonants are fed into the computer which registers in a few moments thousands of combinations (see above), replacing imagination by mechanical choice. These meaningless word-creations have become indispensable to publicity. The label departments of every firm of importance have dozens of them in stock; before the products exist the name is already registered and protected by law.

Elementary optics correspond to elementary speech sounds, the formal value of the type corresponds to the acoustic value of language. What Schwitters says about his "Sonata in Primeval Sounds", applies, if correspondingly modified, to the next example, an advertisement for the Delft Cable Works designed by Piet Zwart around 1928. It is a rhythm in black and white, large and small, compressed and extended.

2

einleitung:

Fümms bö wö tää zää Uu,
pögiff,
kwii Ee. 1

Ooooooooooooooooooooooooooooooo, 6

dli rrrrrr beeeee bö, (A) 8
dll rrrrrr beeeee bö fümms bö,
rrrrrr beeeee bö fümms bö wö,
beeeee bö fümms bö wö tää,
bö fümms bö wö tää zää,
fümms bö wö tää zää Uu:

erster teil:

thema 1:
Fümms bö wö tää zää Uu,
pögiff,
kwii Ee. 1

thema 2:
Dedesnn nn rrrrrr, 2
Ii Ee,
mpiff tilllf too,
tilllll,
Jüü Kaa?
(gesungen)

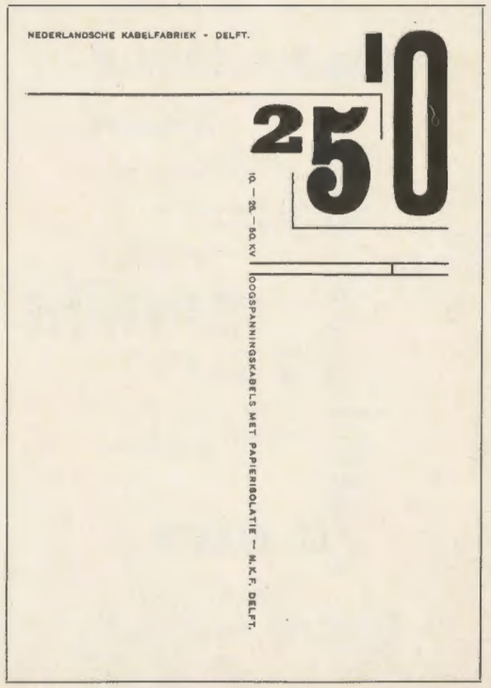
thema 3:
Rinnzekere bee bee nnz krr müü? 3
ziiuu ennze, ziiuu rinnzkrrmüü,

rakete bee bee. 3a

thema 4:
Rrummpff tilllf toooo? 4

157

3



From the point of view of integral typography the illustration below is an interesting example of an influential experiment with fundamentals, though, as its author admits, an imperfect typographical achievement. It is a page of the first printing of Mallarmé's "Coup de dés", published in 1897 in the magazine Cosmopolis[8].

Paul Valéry writes on this[9]: "His (Mallarmé's) whole invention, derived from analyses performed for years on language, books and music, is based on the conception of the page as a visual unity. He had studied very carefully (even on posters and in newspapers) the effect resulting from the distribution of black and white and had compared the intensity of various types . . . He creates a surface reading which he combines with the lineal reading, thus enriching the domain of literature with a second dimension." And: "I believe the composition of the "coup de dés" should not be considered as created in two distinct operations, the one consisting in writing a poem in the traditional way, independently of each visual form and the size of the spacing, the other in giving the text its appropriate setting. Mallarmé's attempt must necessarily have been more profound. It happens in the very moment of creation, it is itself a sort of creation."

Mallarmé himself writes in a letter to André Gide: "The poem has just been printed with my sentence-arrangement, in which the whole effect lies." It would not be possible to underline more clearly the relationship existing between the contents and the setting of the text.

If the Schwitters example is a composition of pure type-combinations, Mallarmé's is one of pure word-constellations[10].

The author Eugen Gomringer says: "The constellation, the word-group, replaces the verse. Instead of syntax it is sufficient to allow two, three or more words to achieve their full effect. They seem on the surface without interrelation and sprinkled at random by a careless hand, but looked at more closely, they become the centre of a field of force and define a certain scope. In finding, selecting and putting down these words he creates "thought-objects" and leaves the task of association to the reader, who becomes a collaborator and, in a sense, often the completer of the poem[11]." Further: "Silence distinguishes the new poetry . . . in this its prop is the word[12]."

Gomringer calls himself the "play-leader, the one who invites others to play with him". The words he puts down are not words applied to some subject, but a reality, conceptual and rhythmical values in themselves. They are again and again points in relationship to one another in a vacuum in which the reader's imagination wanders, rapidly or leisurely, according to his mood. And the less numerous the points of reference, the more precise they are – which means, in application to typography, the more fixed the unity of word and word-picture, the more natural it is. Lissitzky, addressing the reader, says as early as 1925: "You should demand that the writer take pains over the presentation, because his ideas come to you through the eye and not through the ear. Therefore typographical sculpture, through its visual quality, should do what the speaker's voice does for his thoughts[13]."

4

425

c'était

issu stellaire

le nombre

EXISTÂT-IL
autrement qu'hallucination éparse d'agonie

COMMENÇAT-IL ET CESSÂT-IL
sourdant que nié et clos quand apparu
enfin
par quelque profusion répandue en rareté
SE CHIFFRÂT-IL

évidence de la somme pour peu qu'une
ILLUMINÂT-IL

ce serait

pire
non
davantage ni moins
mais autant indifféremment

LE HASARD

(*Choit*
la plume

5

baum
baum kind

kind
kind hund

hund
hund haus

haus
haus baum

baum kind hund haus

Gomringer also tells us that the poet's distance from the so-called reality of everyday life is at best only apparent. If his constellations are artistically concentrated concentrates, they are often very close to slogans centred on a definite subject, such as: "Cyclists attention-attention cyclists". Or "Face oncoming traffic". Or like the classic among slogans: "Dubo-Dubon-Dubonnet". As publicity for a torch battery the Parisian writer Arman Salacrou conceived: la pile wonder ne s'use que si l'on s'en sert (la pile wonder – the name of the battery – is used up only when in use.)

The newspapers' headlines often become constellations of a particular force[14]. They shape and reduce to the briefest and most direct not only a poetic idea but daily events.

For instance how much is said and at the same time left unsaid in their contemporary context by the four words: Meg to wed courtfotog: Princess marries photographer. A subject to excite the imagination of the reading millions. Sensation beyond the scope of normal print. Everyday speech is too elaborate for the headline, too space-consuming. A special solution, then. Abbreviate (fotog); draw upon the thesaurus (wed instead of marries); substitute nicknames (Meg for Margaret). We are interested by the fact that the effect here not only lies in the words, the content of their factual communication. Without any doubt the same words, if they, for example, stood somewhere in the middle pages, would have a completely different effect. Again content and presentation of the language result, cumulatively, in an entirely new unity.

The above examples do not follow any plan and are certainly not intended to be an anthology of pioneer work. I should prefer to look at the theme of integral typography- of the integration of language and type – from as many angles as possible. And there I cannot but mention questions we take for granted. I hope the reader will not consider this too much of a liberty.

We take for granted for instance that on the poster one does not read: "Allianz is organizing an exhibition in the Zurich Museum . . . and so on". The astonishing thing is: nothing is said of an exhibition! The text is reduced to the barest essentials, to names and dates scaled according to their significance – the rest is filled in by the onlooker. Or, in Gomringer's words: "The onlooker completes the poster". The information, though employing only type as its medium, is not as much read as "seen".

Here, using elementary means, the poster fulfils its function in an exemplary way, it conveys its message to the reader in the simplest possible manner, it literally puts him in the picture at the first glance – the information's content and form correspond to one another.

Poster by Max Bill, Zurich 1942:

6


DAILY NEWS
NEW YORK'S PICTURE NEWSPAPER
5¢

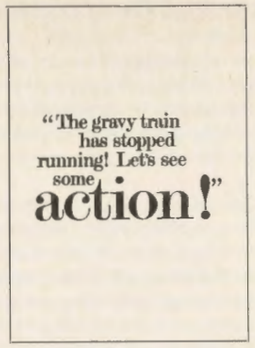
MEG TO WED COURT FOTOG

Commoner Gets in Picture

7

Another phase of integral typography is illustrated by the following examples. The reader must imagine what is not shown on the illustrations. Each one is part of one folder for the New York Times, designed in 1958 by Louis Silverstein.

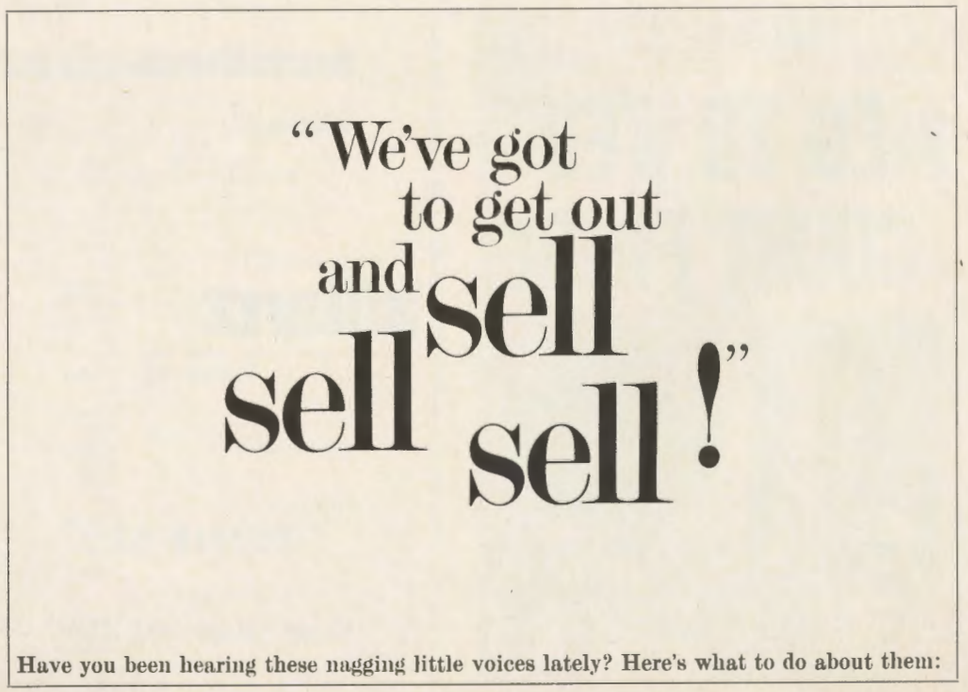
8



9

10

11



The mailee receives the prospectus with the figure 8 on the front. He unfolds it, 9, and with each following unfolding, 10 and 11, the size becomes twice as big, the text more insistent and the type heavier. After the dramatic climax "sell sell sell!", – there comes in conclusion the propaganda message – "Put the New York Times Magazine on your magazine schedules ... use it consistently all year long".

With the elements so far accepted a new one is integrated. The reading-time becomes important, its rhythm is intensified, and it is incorporated into the typographical structure. One can say that text and typography develop simultaneously, as the paper is unfolded. (What is true here for unfolding a sheet of paper can as well be said of turning the pages of a book.)

12

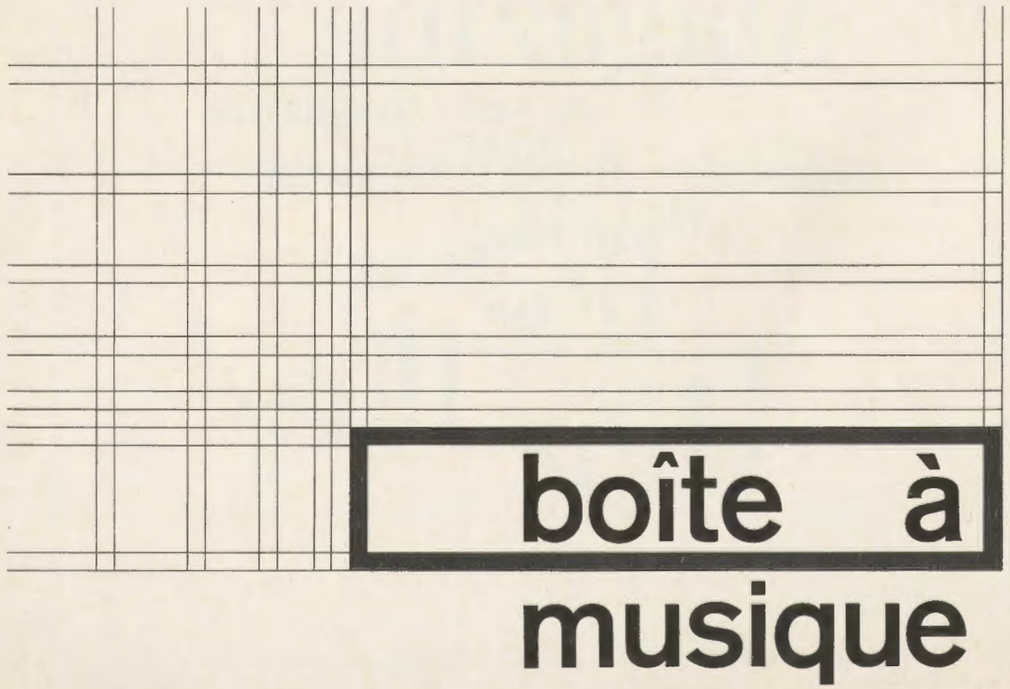
The New York Times folder shows the solution of a complex problem; it displays the integration of an idea, a text and typographical presentation through several phases. It would be a further task to integrate this type of folder with other advertising media or printed matter. Today more than ever, firms need not only a folder here, a poster or an advertisement there. Today something else is needed: a physiognomy, a public face.

The examples on these pages show the physiognomy of "Boîte à musique", a record shop in Basle. "Boîte à musique" has a signature and a style of its own – but not in the sense of an unchangeable mark or of a mere aesthetic principle. Rather do the elements, definitely established though adapted in every case to the functions and proportions, constitute the signature and style in one.

Fig. 13 shows the structure. The lettering and frame are fixed elements; so are the connection between them and the principle of variability. Starting from the bottom right corner, the frame can be increased upward or to the left by whole units at a time. There is no case which is pre-eminent for its proportions. There are only variants of equal value; and the variant is pre-eminent when it is best adapted to the particular problem awaiting solution.

Fig. 14 shows the New Year's card with variants embodying different proportions at one and the same time; 15 the notepaper, in which the insignia is adapted to the (given) DIN A 4 format; 16 and 17 advertisements tailored to fit the advertising space available; 18 a gift voucher.

13



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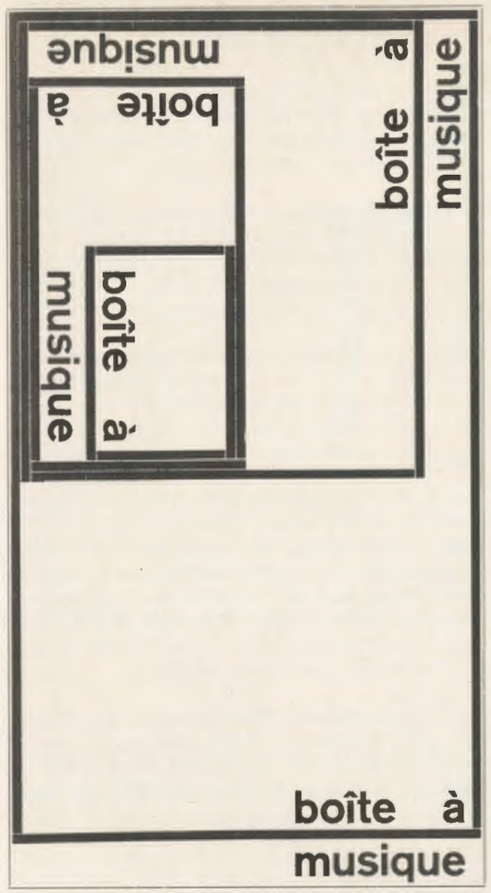

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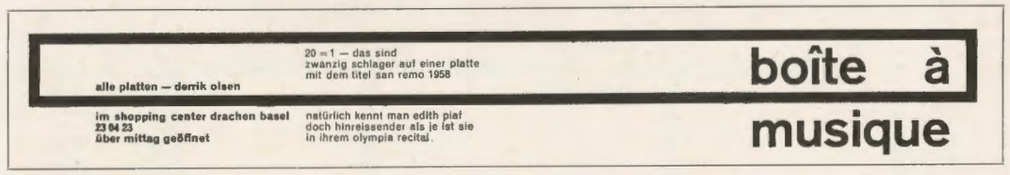
16



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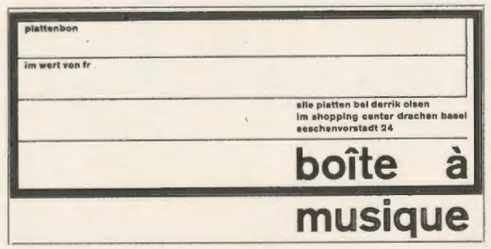
18



As an addition to Boîte à musique two other cases are quoted which may also be adduced as proof. What is to be shown is the ability of the principle to prove itself in practice; its general applicability first of all with various aids and secondly under various basic conditions.

In the case of Bech Electronic Centre the problem was different only in that the name involved quite different basic conditions. It answers the question Who? (Bech, the proprietor) What? (Electronics, the article) How? (Centre, the type of offer) A description, then, rather than a name; and under the disadvantage of comprising a great deal of text.

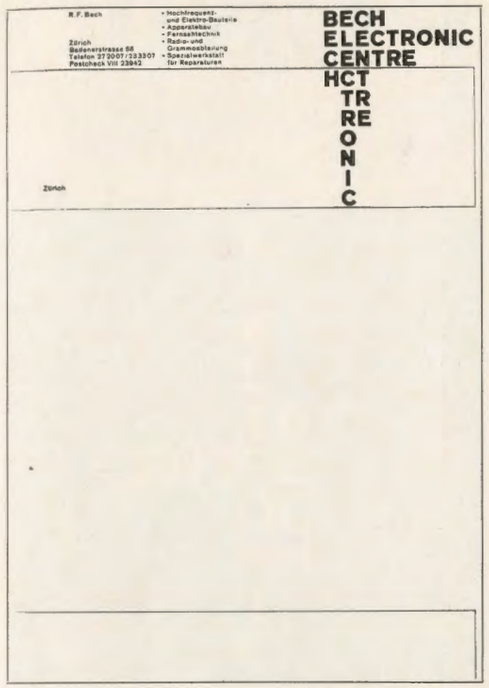
I must add that the name does not have this form, as many think, in order to oblige graphic artists. Just the opposite: the design is simply and solely a matter of discerning two characteristics of the name (basic conditions) which lend themselves to the system.

Firstly: the initial letters coincide in the manner of a crossword puzzle when the words are written together so as to read two ways. In other words: the name appears twice without actually being repeated. What appeared a handicap at first, is artificially intensified.

Secondly: the expanded form (horizontal and vertical) contains from the outset variants and combinations. Thus the sign, consisting solely of letters (and without additional aids like the frame in the case of Boîte à musique) can be adapted (within limits) to various proportional requirements. Moreover: through the combinatory variants, it suggests, although not actually interpreting, electronic technique.

Fig. 19 and 20 show the New Year's and also Introductory Card; 19 is the most condensed yet still identifiable form, 20 shows the full range of variability; 21 the firm's notepaper; 22 a repair slip with separable coupon.

21



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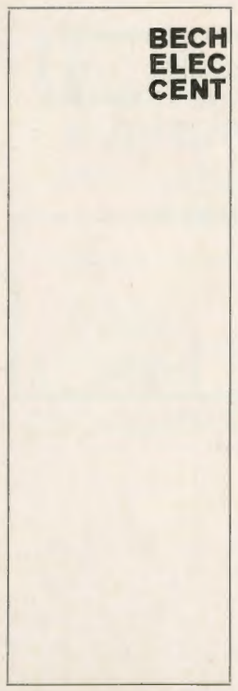
19



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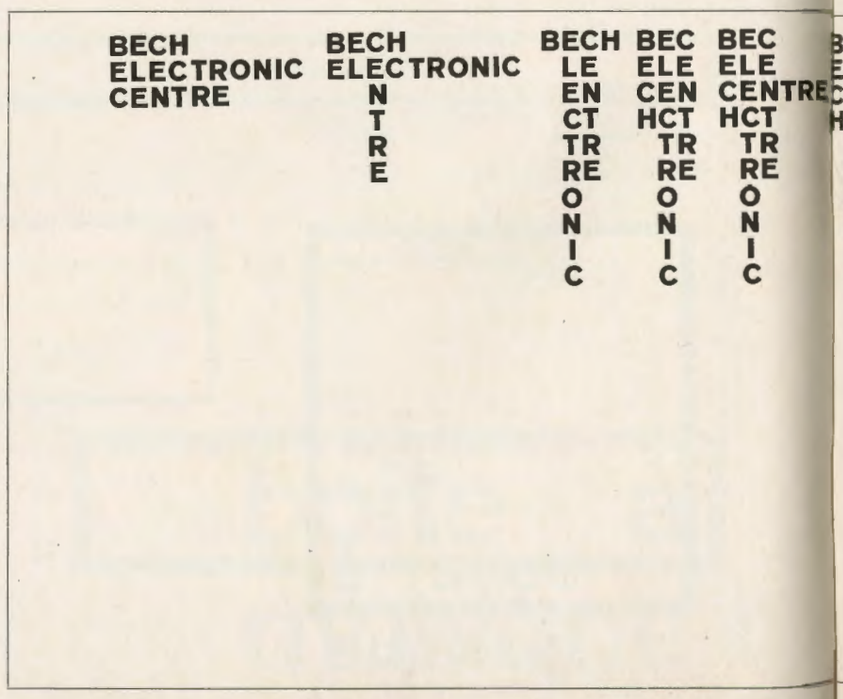
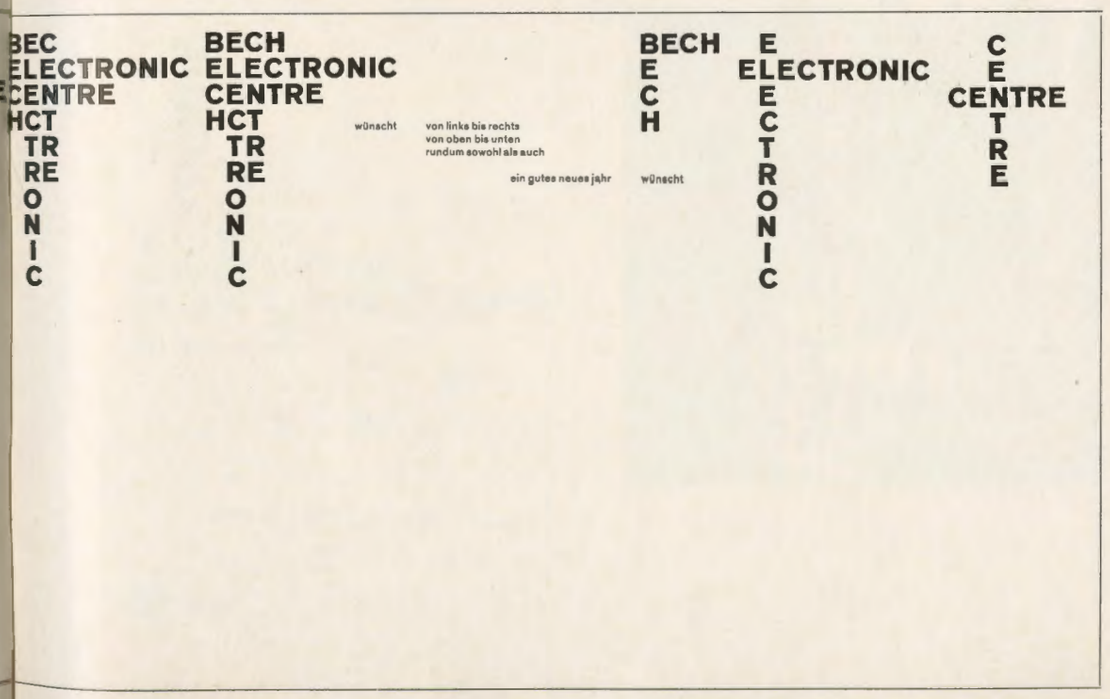




23

Fig. 23 shows the poster in four colours with a sequence from yellow through blue-violet to red, following the movement from horizontal to vertical; 24–26 disc sleeves; 27 an advertisement in the daily press.

24

25

27

26

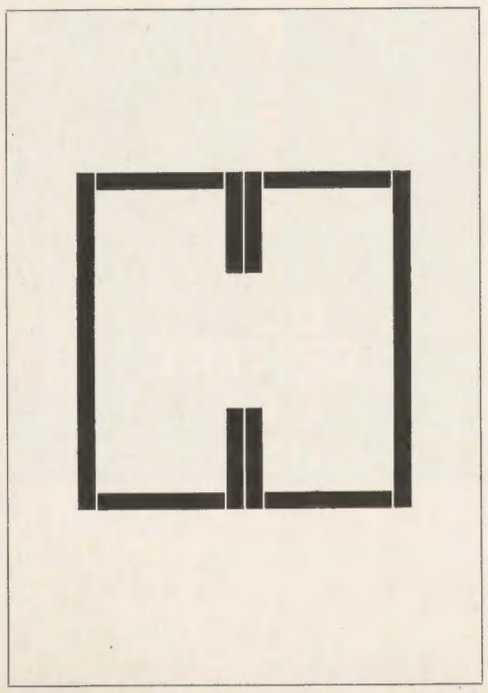
With both Boîte à musique and Bech the basic conditions are the same in the way they affect the problem: both are retail shops. In both cases the firm had to be characterized as such and given a physiognomy for the outside world.

In the case of Holzäpfel the structure had an additional task to perform: it had to characterize the products as well as the firm. In other words, a trademark had to be designed in the widest sense of the word.

Vital question: can a mark be variable without at the same time forfeiting its mark-like character? Counter-question: what is typical about a mark, the proportion or the "configuration"? My answer is known: it is not and cannot be a question merely of proportions as such. Proportions can never be anything but good (or bad) relative to the task. But: in the structure of any sign, however great the number of variants, there is always one which must be declared to be the exemplar. The "configuration" must not suffer as a result of the variability; Fig. 28.

Fig. 29 shows the "printed frame". This characteristic is common to all examples: all consist of parts which are components of the case. There is an economic and also a disciplinary reason for this. Economic because otherwise originals would have to be drawn of every variant of the structure and blocks would have to made of every size. Disciplinary because the typographical units simplify decisions as to proportion from the outset. Fig. 30 is a portion of the system. The thickness of line is the same in all the variants: the size, proportion and boldness are changed. Fig. 31 is a business form; 32 a dispatch label.

28



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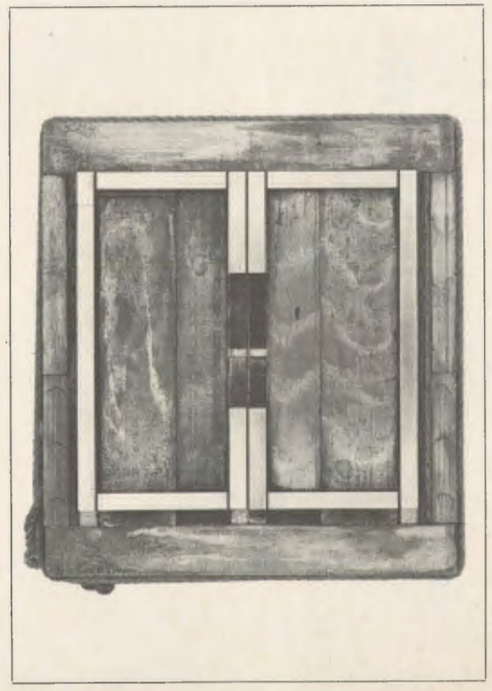

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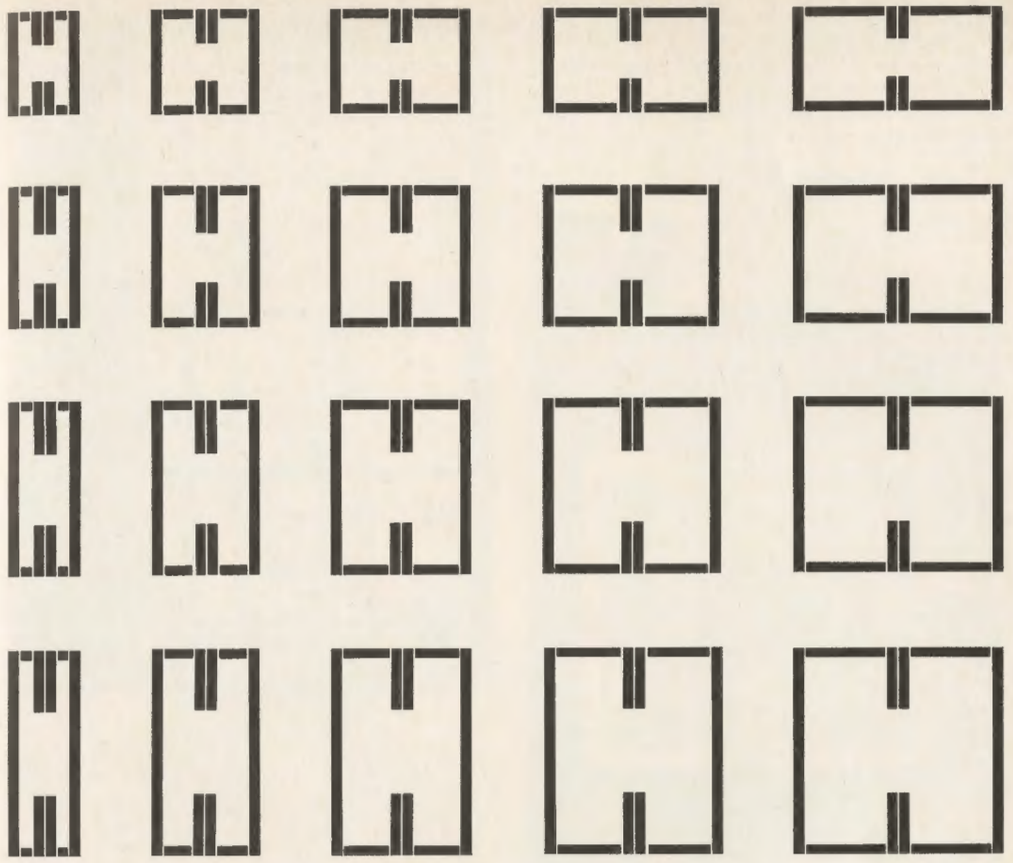


31

Christian Holzäpfel KG
Ebhausen Württemberg
Telefon 119/205

Auftrags-Bestätigung

Ihre Bestellung vom — diese Nummer nicht bei Schriftwechsel angeben
Ihre Bestätigung Nr. — Tag
Ihre Kommission Nr. — Voraussichtliche Lieferzeit
Vertreter
Versandart
Versandvorschrift

wir danken für Ihren Auftrag, den wir zu unseren umseitigen Verkaufs- und Lieferungsbedingungen angenommen haben und wie folgt bestätigen

	Pos.	Stück	Bezeichnung	zu DM	DM

Zahlungsbedingungen

mit freundlichen Grüßen
Christian Holzäpfel KG

32

PEN niedriger Schrank

Bezeichnung

Kommissionsnummer

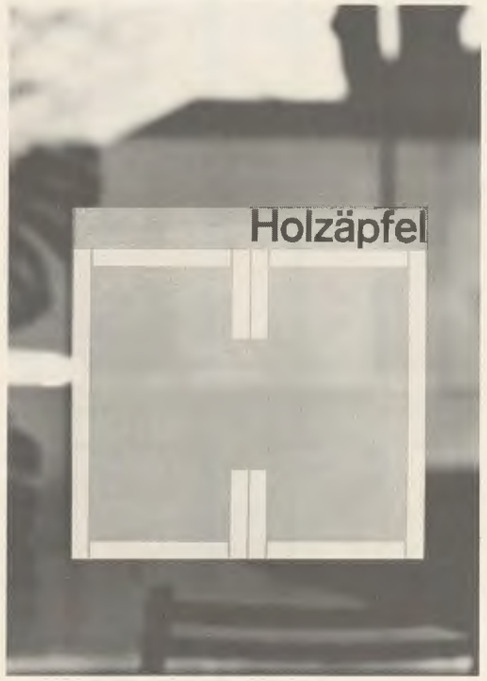
Kunde

Holzäpfel

To pick a variant out of the system and declare it to be a trademark makes sense only where the mark is the sole centre of the item as in examples 33–36. 33 shows the window mark for retailers; 34 a customer giveaway (the sign cast in a perspex cube); 35 matchbook; 36 export mark.

In examples 37–39 the mark is a means to an end. 37 cover for a catalogue. 38 cover for the booklet of instructions for assembling INTERwall – a unit cabinet and partition wall; 39 shows the packing for LIF, an article of furniture for on-the-spot assembly.

33



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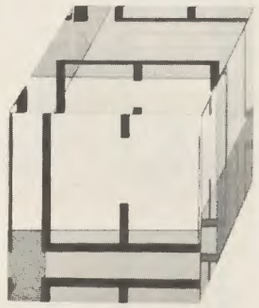

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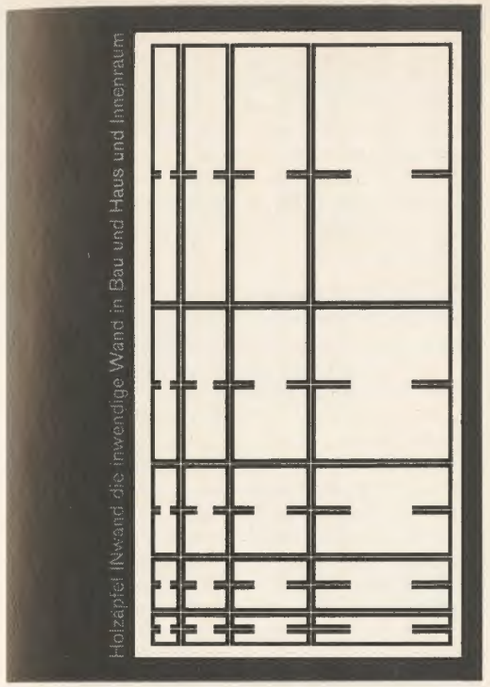

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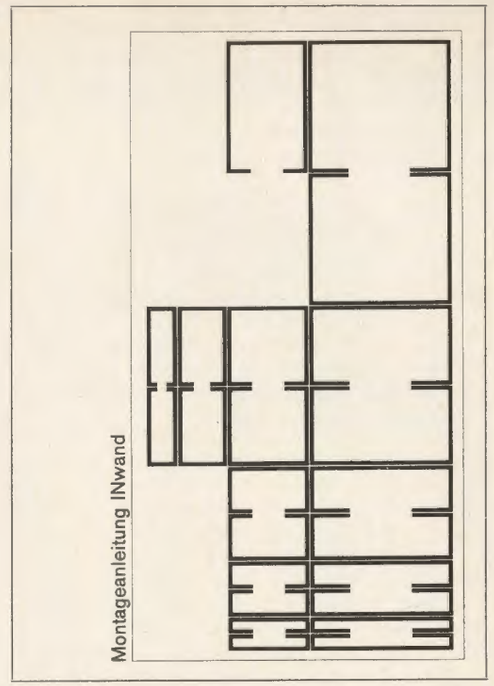

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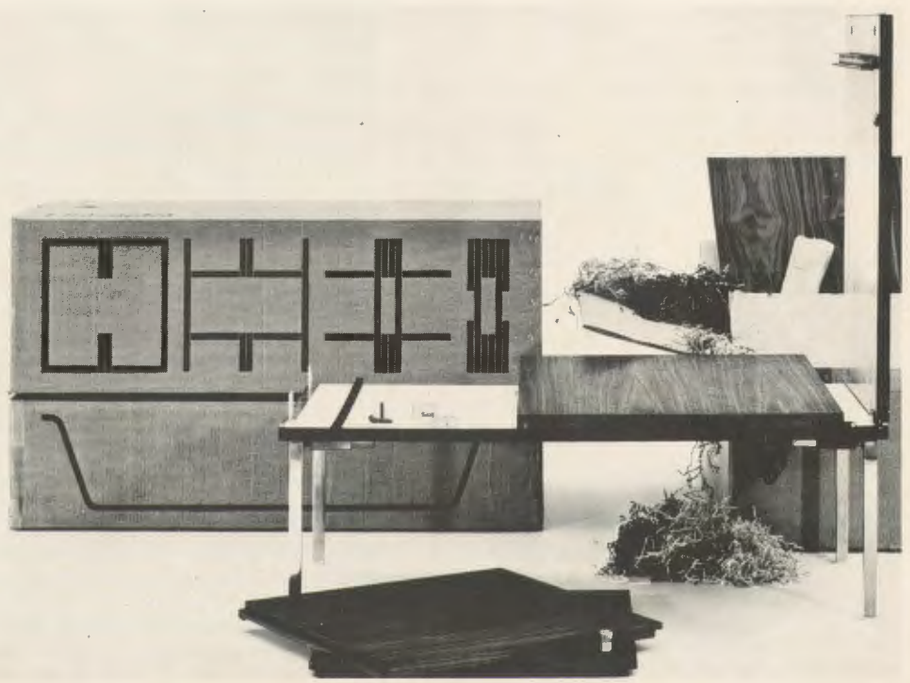


Summarized:

1. Integral typography strives for the marriage of language and type resulting in a new unity, in a superior whole. Text and typography are not so much two consecutive processes on different levels as interpenetrating elements.

2. Unity is reached in different phases, each successor including its predecessor:
- in the integration of different signs, different letters into the word. Examples 1 to 4
- in the integration of different words into the sentence. Examples 5 to 8
- in the integration of different sentences into the "reading-time" dimension. Examples 9 to 12
- in the integration of independent problems and functions. Examples 13 to 39.

At the beginning I was rash enough to speak of "searching for new criteria". Has this article been productive of such? Some of the examples cited are old and have already become historic documents. The problems have already arisen and been solved. They have been solved in such a way that the results have remained fresh, living exemplars. Figure 7, the work of Max Bill, for example: If Allianz had to organize an exhibition again, today, twenty years later, the poster might be different but it could scarcely be more pertinent, better, more up to date.

As already said: In essentials these principles of "elementary" and "functional" typography are still valid and are observed to a very great extent. And new ones cannot be added where the solution of single problems is concerned.

However, today there are some changes: the production of printed matter has assumed unforeseen proportions. We are not only threatened by the danger of extravagance and superficiality where the individual creation, however excellent it may be, becomes lost, but also by the menace that the knowledge and experience of the pioneers, what has already been done and is generally recognized, will degenerate into mere formalism, become fashionable. The fulfilment of a dream threatens to become a nightmare. Here we are not allowed to resign. Here the designer must intervene, he must in a sense aim at a larger whole; he must not continue to carry out the single task so much as create structures from which single solutions can be derived.

This adds to the work of design a new dimension of planning, from the angle of both language and type.

The structure, once planned, always contains the elements of text and typography, always comprehends the whole and makes the single task possible. (Consider "Boîte à musique": each task is always typical of the whole, bears the firm's image, and at the same time each is created in view of its special use, from the label to the poster). Thus work becomes more complex, and presupposes an intensified cooperation among all participants. But here design acquires meaning again. The greater effort and longer time dedicated to the development of the structure pays off in the end because it makes the detail work so much easier. And finally the new experience brings forth new impulses for the work on single tasks. In short: From the viewpoint of the whole structure, the integral design itself gains a new stability, a new up- to-dateness, a new significance in this age of short-lived production and corresponding waste of printed matter.

What I have tried to show on these pages cannot be a new typographical style. Because the "New Typography" was not an arbitrary fashion which has now served its purpose. It was the sweeping reform of our most important means of communication, the type face, in a period of sweeping changes. What we can and must do today is not change the inherited principles but extend them to new tasks. From the elementary, from the functional to the structural, the integral: this is the raw material for the new criteria.

Notes on the Essay "Integral Typography".

1

On the isms from 1914–1924 a book by Hans Arp and El Lissitzky appeared: "die Kunst-Ismen". Eugen Rentsch, Erlenbach 1925.

2

From an essay, "über typographie", in "Schweizer Graphische Mitteilungen", May 1946.

3

In other fields than typography the boundaries are more sharply drawn. Georg Schmidt, the apologist of functionalism, writes: "Dutch constructivism acted like a catalyst on architecture and on decorative arts and reduced house, furniture and utensil construction to the most elementary surface, body, space, and material tensions. The result was a much more direct relationship to material and construction in the field of house, furniture, and utensil construction, a complete renouncement of ornament and the discovery of the beauty of 'unornamented form'". But: "Very soon one had to recognize that one had only slipped into a new formalism. Houses and furniture like this tried to be interesting constructivistic sculptures and cared very little for actual use."
"Like every historical error this one was very salutary too. From it arose the further knowledge that house, furniture and utensils are not only conditioned by material and construction like a constructivist picture or a constructivist sculpture but even before this by the function." From an essay "Von der Beziehung zwischen Architektur und Malerei um 1920", in the magazine "Werk", July 1946.

4

"Elementare Typographie" was the title of a special issue of the magazine "Typographische Mitteilungen" edited by Jan Tschichold in Berlin, October 1920.

5

From "Die neue Typographie" by Jan Tschichold, Berlin 1928, Verlag des Bildungsverbandes der Deutschen Buchdrucker.

6

From an essay "Die neue Typographie" from the book "Staatliches Bauhaus in Weimar 1919–1923", Bauhausverlag, Weimar-München 1923.

7

"Die Galgenlieder" by Christian Morgenstern was first published in 1905 by Inselverlag.
To the "Dada" creations in question belong above all Hugo Ball's "Lautgedichte", Hülsenbeck's "Simultangedichte", Raoul Hausmann's phonetic poem "fmsba" which inspired Schwitters, following Hans Bolliger's "Dada-Lexikon", to write his "Sonata in Primeval Sounds". The reader can learn more from the "Dada-Monographie" published by Willy Verkauf, Arthur Niggli, Teufen 1957 and from the "Anthologie des Abseitigen" by Carola Giedion-Welcker, Benteli AG, Bern-Bümpliz 1946.
In a more restricted sense, i.e. rather as artificial than abstract poetry, mention should be made of the recent experimental texts of Max Bense. These texts are produced mechanically on a basis of aesthetic programming: "Bestandteile des Vorüber" and "Entwurf einer Rheinlandschaft"; both were published by Kiepenheuer and Witsch in Cologne. In 1962 the same publishers brought out Bense's "Theorie der Texte".

8

An excellent edition of the "Coup de dés" was published in accordance with the last directions of the poet, who died in 1897, at the "Librairie Gallimard in "Editions de la Nouvelle Revue Française", Paris 1914. Also in 1897, another poet was giving thought to the typographical presentation of his work: Stefan George. At the "Verlag der Blätter für die Kunst" appeared "Das Jahr der Seele". The typographical design was by Melchior Lechner. In 1898 Arno Holz published the first "Phantasusheft". It contained fifty poems which were free of metrics, strophe, rhyme and were accentuated typographically by the fact that words which belong together rhythmically were always taken together in one line and the lines of most varying length were set on the central axis. A complete edition appeared at J. H.W. Dietz Nachfolger, Berlin 1925.
In the following years the poets Apollinaire and Marinetti applied themselves intensely to typography. "Caligrammes" by Apollinaire was published by Gallimard, Paris 1925. Marinetti's principal work in this respect, "Les mots en liberté futuriste", appeared at the "Edizione futurista di poesia", Milan 1919.
Besides Schwitters, Käthe Steinitz and Theo van Doesburg ("Die Scheuche", Apossverlag, Hanover 1925) belong to the typographical poet revolutionists.
An equally important work is the poetry volume written by Majakowsky and typographically designed by Lissitzky, "Dlja Gôlossa" (to be read aloud), Russian State Edition, Moscow 1923. And so on.
A more recent publication in this field is "Les Epiphanies" by Henri Pichette whose typography was designed by Pierre Lefaucheux and appeared 1948 at "k éditeur", Paris. And I may also mention in this ancestors' gallery the novel "Schiff nach Europa" by Markus Kutter, which I organized visually and which was published by Arthur Niggli, Teufen 1957.

9

From the essay on Stéphane Mallarmé in "Variété II", Gallimard, Paris 1930.

10

From "Konstellationen", poetry volume in four languages, Spiral Press, Berne 1953.

11

From an article in "Neue Zürcher Zeitung", September 1954, on the page "Young Swiss Authors answer".

12

From an essay "vom vers zur konstellation, zweck und form einer neuen dichtung", in the magazine "Spirale", No. 5, Spiral Press, Stadion Wankdorf, Berne 1955. "Spirale" publishes in each number authors spiritually related to Gomringer such as Augusto de Campos, Helmut Heissenbüttel, Décio Pignatari and so on. Furthermore Daniel Spoerri publishes a magazine in Darmstadt which counts among its collaborators the same authors as "Spirale".
In 1959 there appeared in Sao Paulo at Editora Kos-

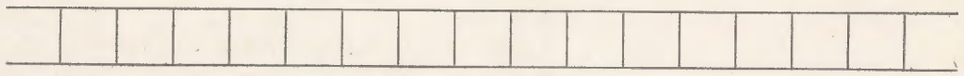
Structure and movement

Four equal sides
four right angles:
one square.

a 1:

Displaced horizontally by the length of one side.
To infinity on the left.
To infinity on the right.

a 2:



The equal areas are distinguished by different shades.
An infinite group of elements.
With terminal limits in black and white.

a 3:

The number of elements
is determined by the gradations between the extremes.
If the gradations are large,
the number of elements is small;
at least two: black and white.
If the gradations are small,
the number will be large; perhaps a thousand,
perhaps the eye can distinguish even more;
probably less.
There are no theoretical limitations:
one shade is darker
than the last even if the gradations are fine,
and vice versa.
Ideally the gradations between successive
shades are equal.
Then the series forms a natural order.

In this case:
a series of 16 equal elements
with 15 equal gradations.
Again, the number of elements is unimportant.
Only the order, the system of reference, is important.

If it forms a whole, self-contained in principle,
we define it as a *structure.*
Movement: means a disturbance of the natural order.

Upsetting the equilibrium of the series;
or giving it a new equilibrium
(which cannot be less complex
than the original structure).
Introducing movement:
starting activity; creating tensions.
Changing the positions of the elements means
giving their relationships new weight,
giving the whole a new appearance.

This implies: creating different effects
with the same elements.
Deriving different constellations
from a single structure.

In simple words: giving form to the material.
Using visual elements
as the composer uses the scale.

For example:

a 4: interchange two of the 16 elements.
Namely 8 and 9. The sequence is broken.
The change of place of the two elements
determines the change of value of the entire series.

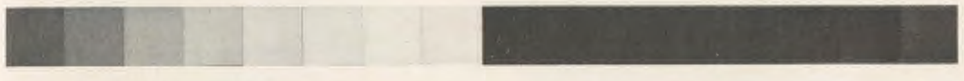
But order is maintained, and symmetry preserved
It has only become more complex,
let us say more differentiated.

a 5: The one-dimensional series
contains many possible constellations (factorial 16)
but few order principles.

One of these is Arp's Law of Chance.
Random rearrangement causes all the elements
to change their position
without detectable equilibrium.

a 6: The same: each element changes its position,
but not its order.
The sequence is preserved, but reversed:

a left-right problem
as meaningless geometrically as it is optically.
(But it may be significant psychologically.)



a 7: A cyclic permutation of the series.
I.e. the right taken away and added to the left:
in this case exactly half.

The ends meet; they provide maximum contrast.
The ends no longer form terminal limits;
they are joined by an imaginary path
from grey to grey via infinity.

a 8: A reciprocatory arrangement.
With white in the middle,
and the next darkest shade

placed alternately on the left and right:
giving a dark end on each side.
In figures: ....6–4–2–1–3–5–7....

a 9: The series with the elements interspersed.
I.e. with the lighter and
darker halves regularly interposed.

The intervals between successive shades are greater,
with four, then three (then four again and so on)
shade gradations between adjacent elements.

a 10: The next example is like a 9.
The darker half has been rotated through 180 degrees.
Thus two operations are used for a single grouping:
interposition and rotation.

The shade gradations are different;
once again regular, but following a different rule:
This arrangement contains
both the greatest and the smallest contrasts.

One step further removed
from the original arrangement:
(see above) increasing the scope for conscious design.

Instead of retaining the elements in their original
one-dimensional row,
they can be grouped in a two-dimensional field.
There is no longer a self-contained order.
But there are more possibilities:
the relationships between the elements are multiplied.

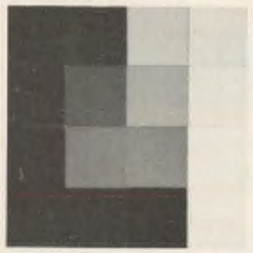
As well as a one-dimensional
left-to-right proximity we now have
the top-to-bottom and the diagonal proximities
giving two-dimensional interrelationships.
While in the line series each element has two neighbours
(and each end element only one),
on the field it will have
eight if it is in the centre,
five if it is on the edge,
and three if it is in the corner.

b 1: If it is folded upon itself like a jointed rod
the line series becomes a two-dimensional grouping
but with its one-dimensional origin still discernible.

The jointed-rod principle can be generally defined
as a line coiled down
on a field of 4x4 units.
Following the rule
that the line must pass
through each of the 16 positions;

it may not be broken,
or intersect itself.

This principle can be utilised
to give a finite number of variations.
Some of them: b 2 to b 5.



b 6: Special case of the jointed rod:
a right-angled spiral

b 7: A double spiral

b 8: The jointed rod folded diagonally

b 9: The line series has been divided into four
equal sections,
and the sections placed side by side.

b 10: The arrangement takes on
a more characteristic appearance
once the order of the line series is abandoned.
The elements interspersed
in two dimensions

b 11: A "magic square".
(A puzzle familiar from the schoolroom:
each horizontal, vertical and diagonal
column of four elements always adds up to 34.
If the four shades in each column are "added together"
their sum is always the same shade of grey.)

b 12: A random arrangement.
Here: a grouping obtained by shuffling numbers.

Sixteen different elements grouped in a field
and moved around;
the field defined
(in this case 4x4, though others would be possible):
the number of possible ways
of grouping the elements in a line series is finite.
The formula is constant: factorial 16,
which nevertheless gives
20 922 400 000 000 different possibilities.
Programming a problem
means planning in stages.
(With feedback, of course.)
The first stage is the material in its original form.
(With colours, for example, it is the colour solid.)
From stage to stage experience is accumulated,
and each stage provides material for the next.

Four like groups added together:
a group composed of groups.
Or: a structure composed of structures.

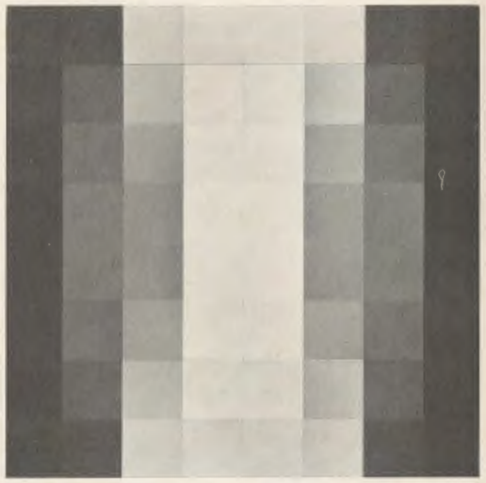
In the first place groups are formed from groups
by symmetrical replication.

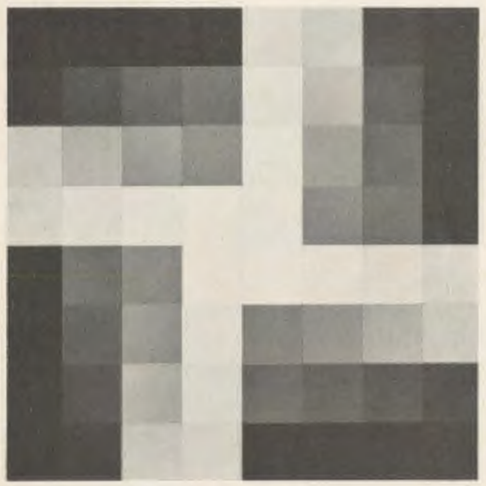
Group b 1 is

The requirement remains the same:
to stay within the two dimensions of the surface.

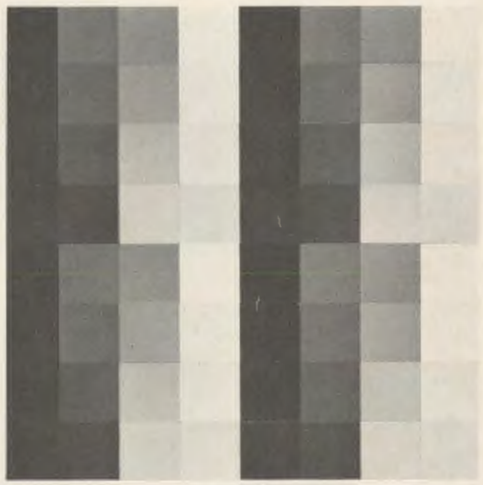
The space dimension is not taken into account.
That means: even if it is not intentionally included
it is automatically incorporated;
its presence is virtual, not actual,
but perceived nevertheless:
it is not possible to visualise all the shades
as lying in the same plane.
But it is left to the beholder
to choose which shades are in the "foreground"
and which in the "background".

c 1: reflected





c 2: rotated

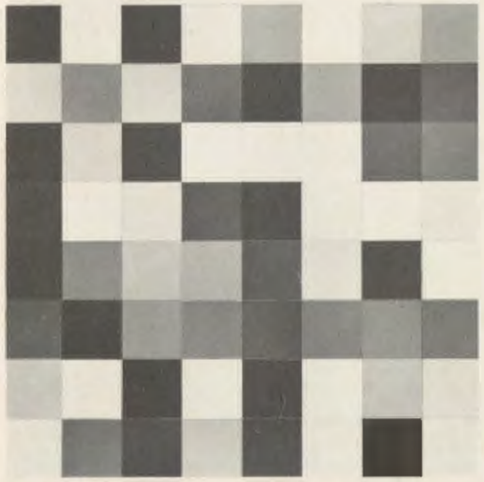


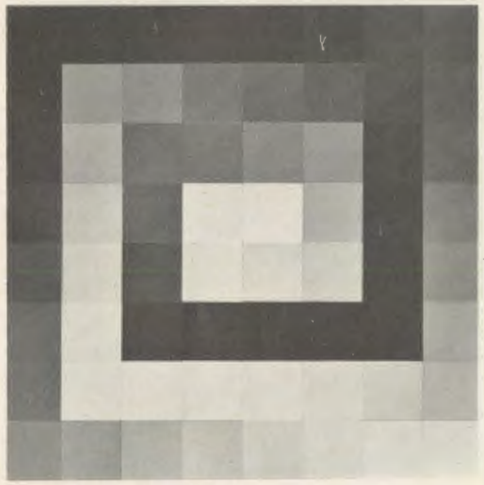
c 3: displaced.

Limiting the number of replications to four
is of little importance when the group is displaced.
When it is rotated or reflected
more and less complex units are thereby produced.
That means: by the addition of the individual groups
a whole is formed that is more than the sum of its parts.

In the second place groups are formed from groups
by integration on the larger field.
That means: in examples c 1 to c 3
the sixteen-element group b 1
is replicated as a whole four times
and by an operation of symmetry
the four groups are combined together
to form a new whole.
The new field measures 8x8 units.

c 4: following the law of chance.

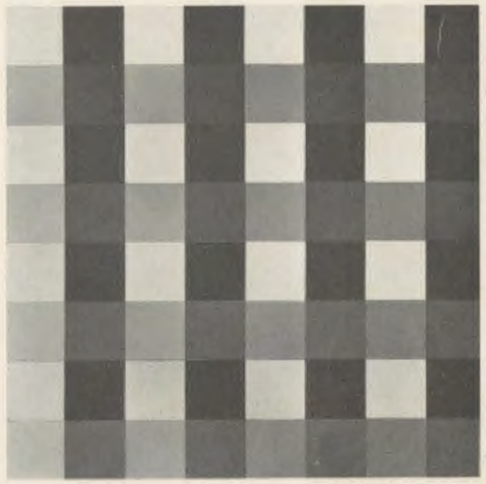


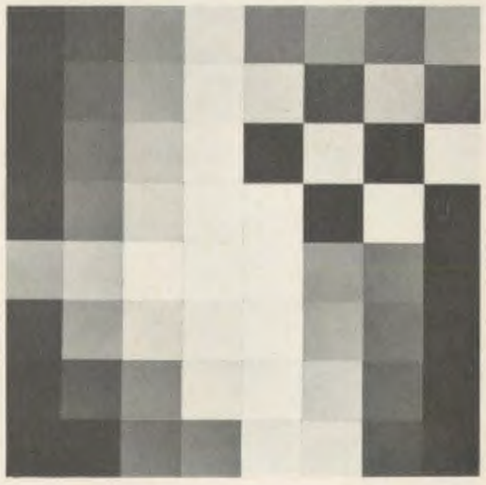


c 6: as alternately reversed series,
i.e. from white to black to white again in turn
and arranged as a spiral on the larger field.

Instead of being regarded as a result, this field
may be used as a starting point.
Instead of placing together
four groups of 16 elements
the groups may be broken up and
the 64 elements distributed
at will over the entire field.

c 5: in groups with the like elements ordered
and interposed.





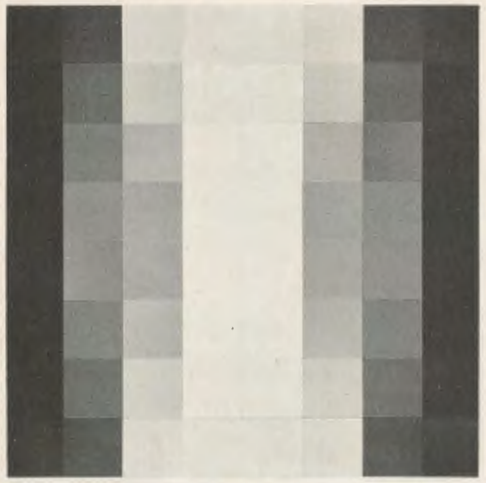
c 7: grouped by an arbitrary act,
that is, following no definite rule
and yet not deliberately at random.
Composed, that is to say, as prompted "by feeling".

Examples c 1 to c 7
are not self-contained.
There is even less self-containedness
in the replicated groupings than in simple ones.
They demonstrate principles.
The possibilities are as uncountable
as their number is finite.
But here also general views can be obtained.

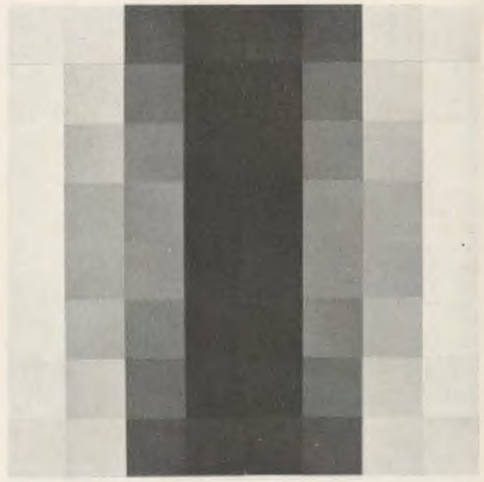
Following the practice of the surveyor,
the system of datums may be refined.
The lower orders of possible groupings
may be systematically placed between the higher orders.

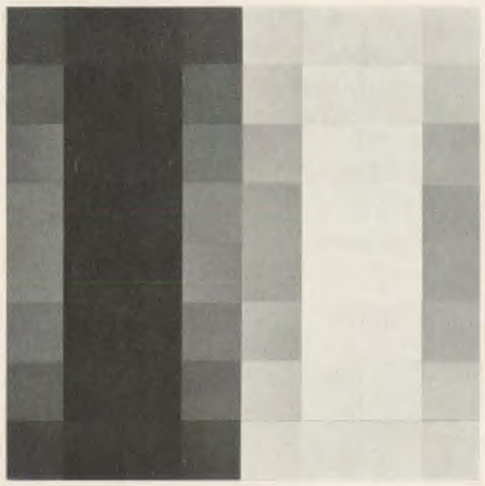
Each grouping
may be changed by a permutation
that may be more or less regular.

The reflected grouping c 1 is seen as a "negative" if

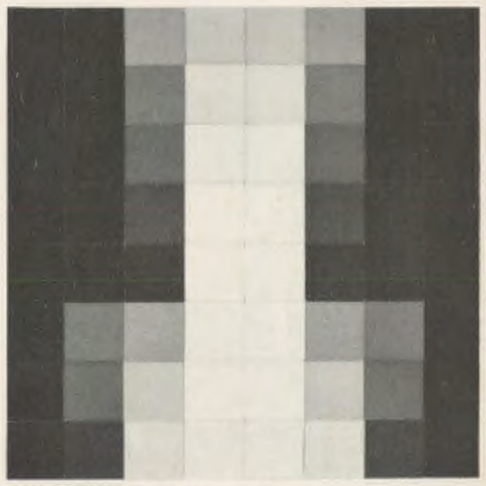


c 8: the order of the elements is reversed.





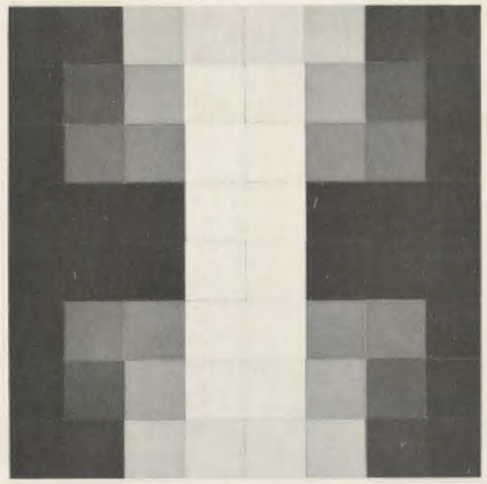
c 9: two vertical rows of c 1 have been taken
from the right and added to the left.



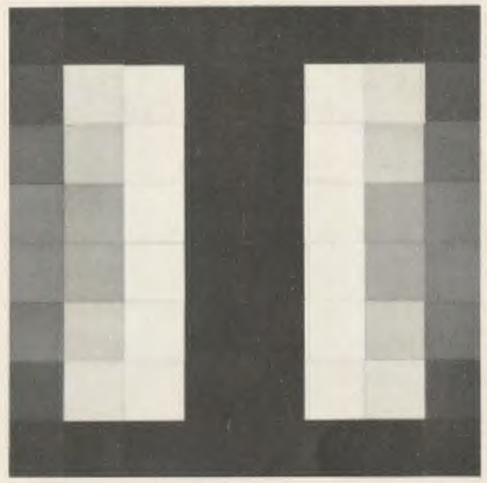
c 10: the basis is again c 1:
the black centre has been displaced
one element downwards.
All the other elements change their positions
following this first move.
The original symmetrical arrangement
has lost its horizontal axis;
the vertical axis is preserved.

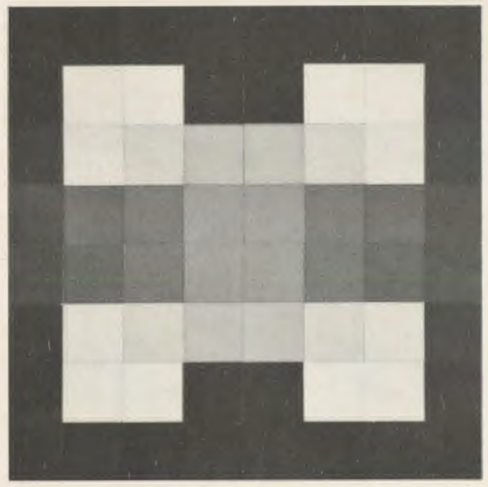
It is also interesting
to examine the results of the same operation
carried out with other groups.
The line series of elements arbitrarily coiled
in the sixteen-element groups
are reflected twice
and thus provided with an optimum degree of order,
i.e. the maximum degree
of symmetry relationships.

c 11: b 2 reflected

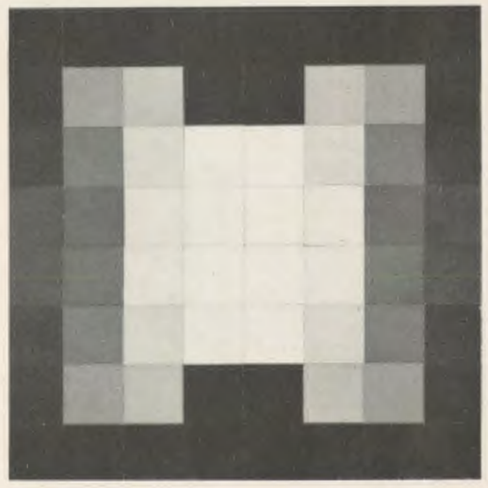


c 12: b 3 reflected





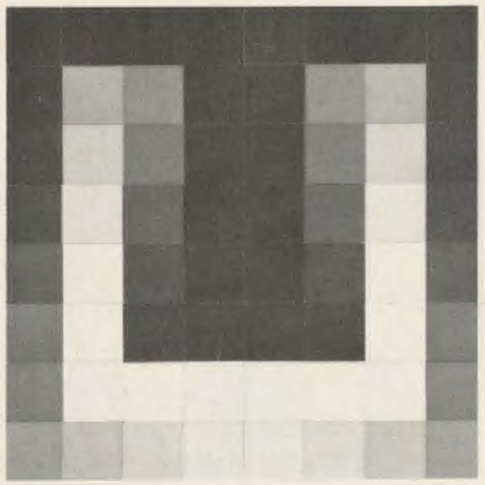
c 13: b 4 reflected



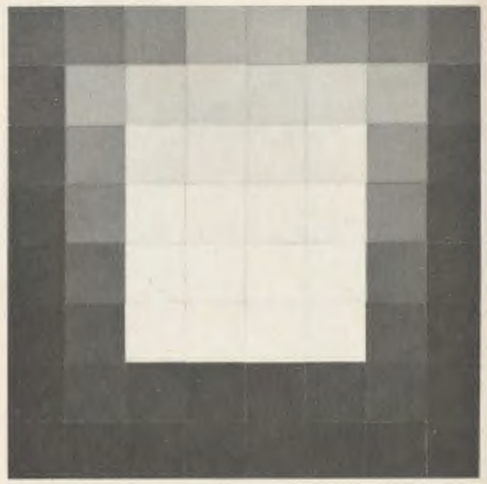
c 14: b 5 reflected

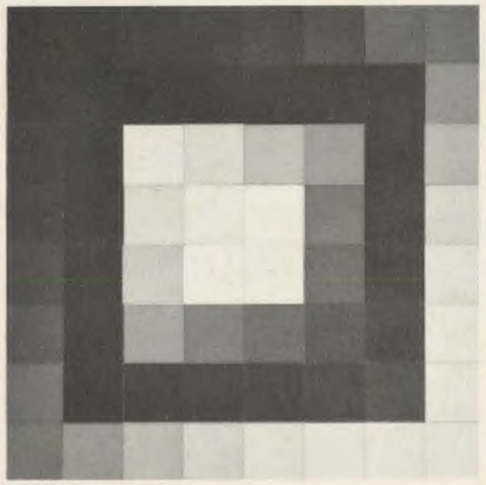
Example c 10 is a reflection with a single axis
of symmetry
obtained from c 1 by means of a permutation.
Single-axis symmetry of this kind
may also be obtained from first principles.

c 15: all the elements are divided into two halves;
they are coiled as desired in one half
and reflected in the other.

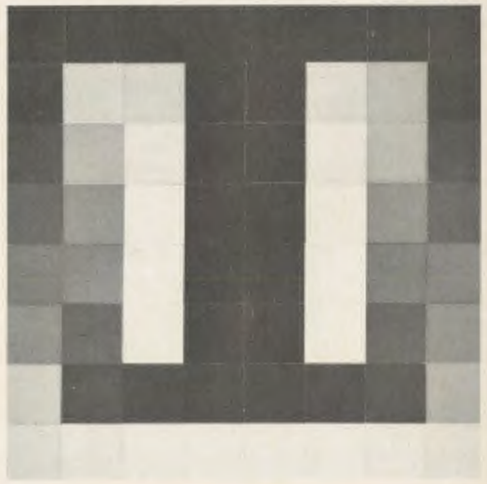


c 16: c 15 permutated





c 17: reflection along a diagonal.

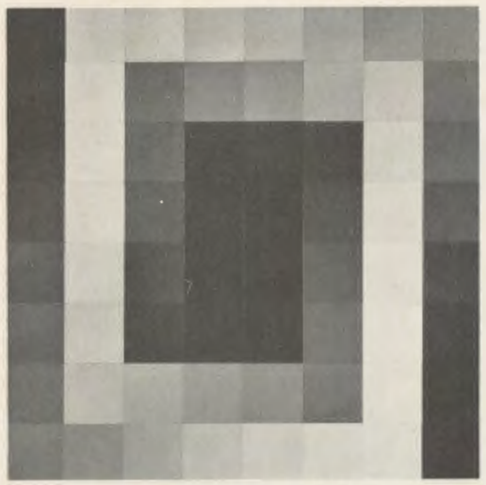


c 18: reflected spirals.

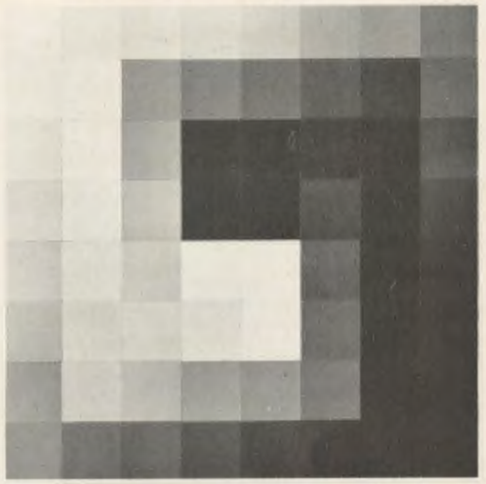
Examples c 15 to c 18
are combinations of two different operations:
coiling and reflecting.

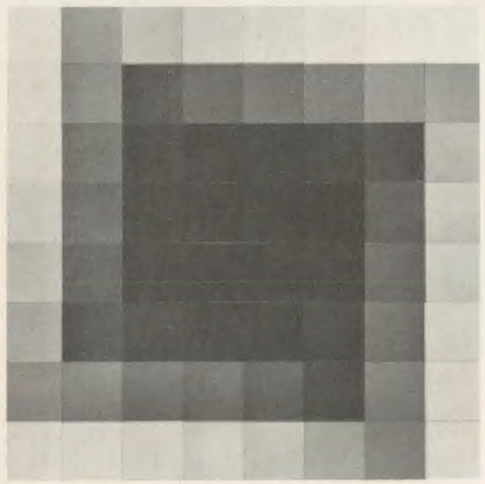
The following examples are of coiling,
or more precisely:
of spiralling combined with rotation,
with the spirals within one another
rather than adjacent to one another;
thus we have a third operation:
interpenetration.

c 19: two spirals mutually inverted at 180 degrees.

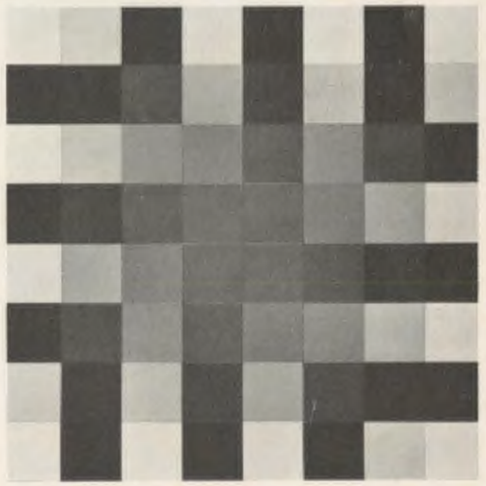


c 20: as c 19, with the sequence of the elements
in the second spiral reversed.





c 21: four spirals interpenetrating at 90 degrees.



c 22: as c 21, but using the line series a 10.
The figure has a transparent appearance.
The interpenetration of a 10
is potentiated.

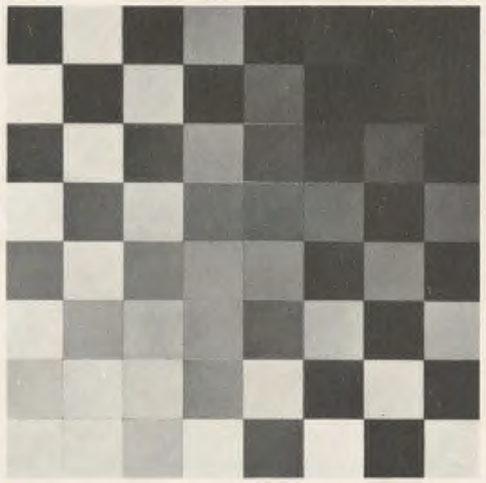
A characteristic of groups of repeated elements:
to the relationships between the different elements
are added relationships between like elements.

These relationships may
not only be taken as automatic results,
but used as the basis
of new groupings.

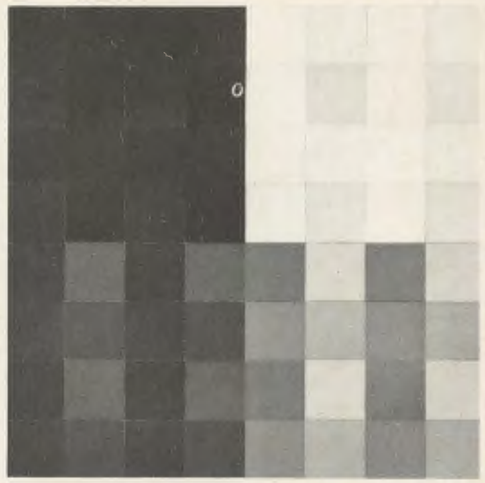
The total of 64 elements is composed of 16 groups
of 4 like elements.
The operations consist in interposing them.

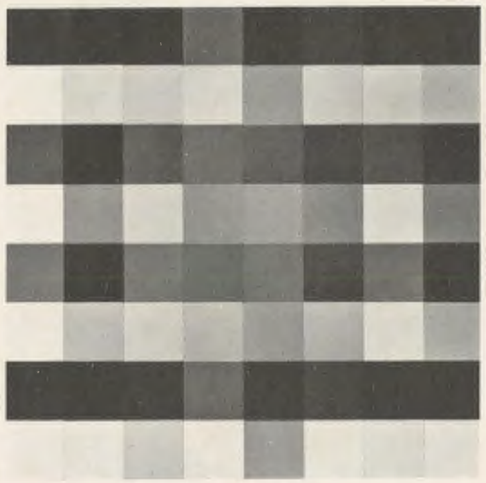
Because of their arrangement
and the impression they give of spatial transparency
(see c 22)
let us call this type of grouping:
interpenetration.

c 23: interpenetration and rotation in two halves.

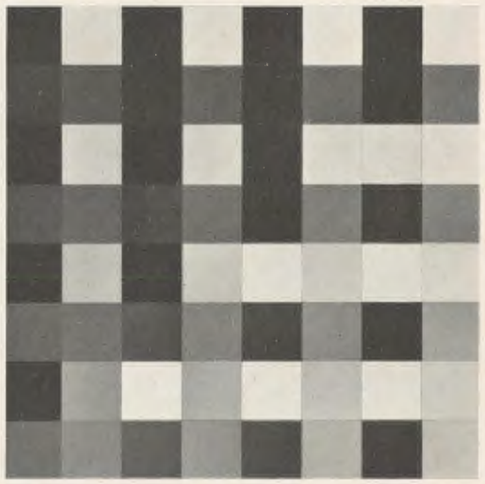


c 24: interpenetration and rotation
starting from a grey centre.





c 25: as c 24, in a permutated order,
i.e. with a black-white centre as the starting point.



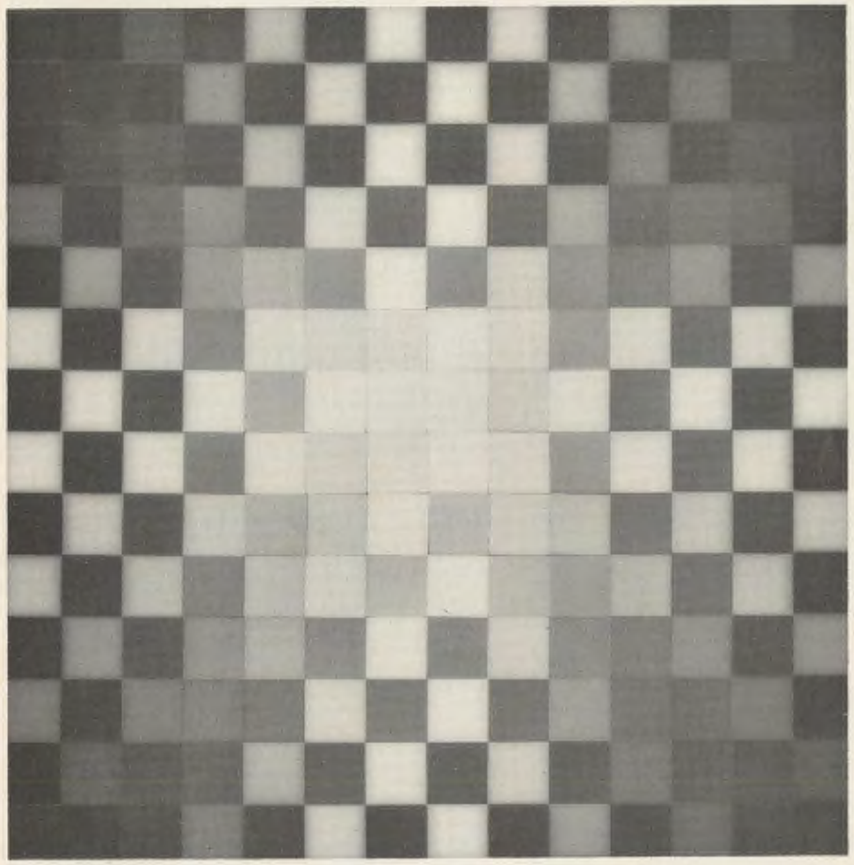
c 26: interpenetration of groups in graded zones.

Extension of the group
by repetition of the elements
is also possible.

In the examples the replication factor is 4.
Four is a special case
among x cases. See c 3.
But in decoration
bands of any length
or areas of unlimited size may be produced.

A second possibility
for extension within a bounded area:
to refine the original structure
instead of repeating the elements.
That is to say, to use more, i.e. smaller gradations,
between the extremes of black and white.

Interpenetration analogous to c 23
obtained with a basic structure of 28
instead of 16 elements.

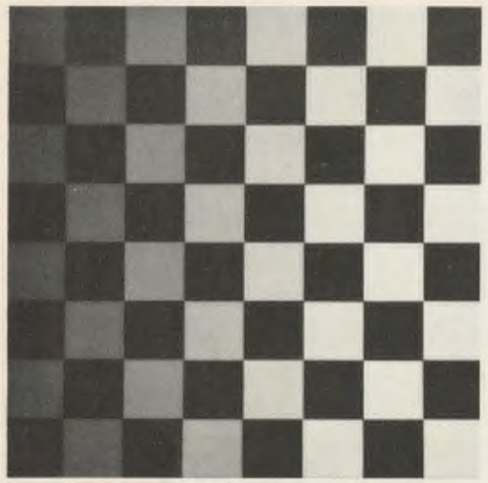


Each constellation is a combination
of free choice and predestined result;
of chance and order.

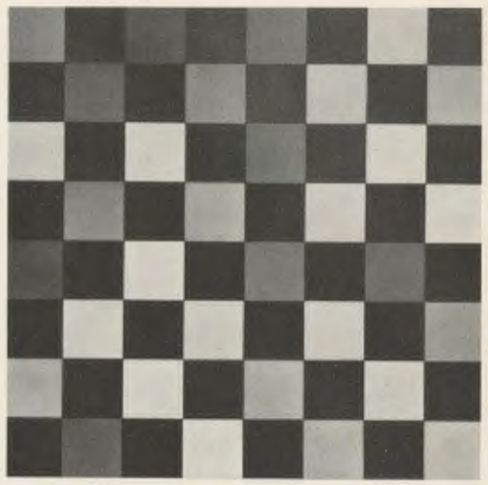
Each order is a special case
among all the possible groupings.
Determined by the combination of criteria,
as numerous and as self-contained as possible.
The more complex its principle,
the more typical is its configuration.
Its form.

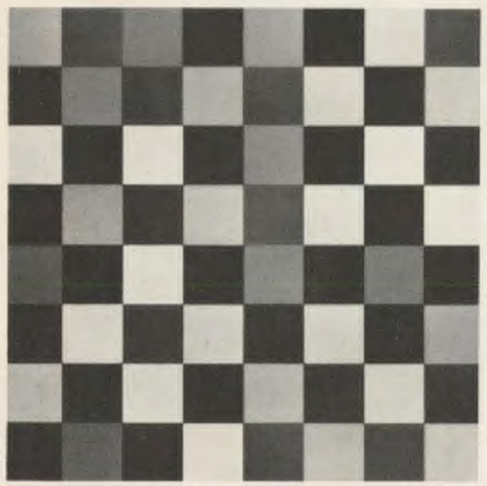
Chance is a different matter.
It may be harnessed in any number of ways:
with dice, lots, a roulette wheel;
by using the telephone directory
or with the help of a blind person,
or the whims of a monkey –
the results will always be different,
but they will nonetheless be scarcely distinguishable.
We may perceive 1000 different kinds of order.
But the differences between ten chance arrangements
can be identified only with difficulty.

c 27: chessboard interpenetration.

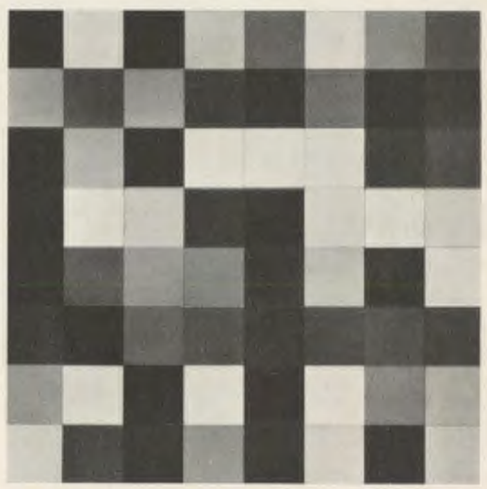


c 28: the lighter half has been deprived of order,
and distributed according to chance.





c 29: as c 28, with the darker half
also in a chance distribution.
No element is any longer in its original position;
but the two halves are.
This is the criterion of order,
and its effect is preserved.



c 4: this final criterion has also been abandoned;
all the elements are mixed at random.

The interpenetration c 27
contains a particularly high degree of order.
This order is now reduced successively,
i.e. in the proportion in which
the chance component becomes more important.

These examples could be multiplied (almost) at will.
But just as the point of programming consists
in finding solutions to individual problems,
it is purposeless to show
all the individual solutions of a given programme.

The purpose is only
to reveal the innumerable variations
that can be obtained from a simple structure
by controlled movement.
To demonstrate the programme of a programme.
The advance from the material to the design.

Again:
The examples are based on a linear structure,
a series of 16 elements of equal size
and 16 equal gradations from white to black.
Without changing the elements,
the structure has been changed:
a in the line series itself,
b by substituting a two-dimensional order for the
linear, and
c by repetition.

The elements may also be changed.
We may take x instead of 16,
or elements of different size instead of equal size,
or unequal gradations of shade
instead of equal gradations,
or a different colour series
instead of the black-white series.

All the possibilities can not (or hardly)
be considered at once, but only some of them.

Thus:
retain all the components,
but change only the colour series:
what are the possible variants?

The black-white series
is a special case, a part of a larger structure.
It occupies a precise position in the colour solid.
That is, in the complex order
of all perceivable colours.

The colour solid also contains
the following special cases:

– The one-dimensional closed series of
the colour circle of pure colours.
– The open, one-dimensional series
of the pure colours to black, or to white.
– The closed two-dimensional colour triangles
from colours to black and white
with all the resulting mixtures
following the co-ordinates.

– The less individual structures
that nevertheless exhibit a high degree of order:
all kinds of related series, surfaces, elements.

For example:
half of a colour circle,
an open series from colour to complementary colour.
Or one-third, one-quarter of the colour circle.

Or:
There are many paths from a colour
to its complementary colour.
The most uniform follows
the circumference of the circle;
the shortest passes through grey.
But it need not follow either route.
Thus fixed points, say red, grey, green,
may be joined by sine curves.
In other words:
We may proceed from red to grey
not by the direct route
but via the red-yellow quadrant.
Each successive shade becomes not only greyer
but also yellower.
But the yellow converges with the grey.
On the other side the same movement
leads to green.
See page 91.

Or:
by following the same path,
but displacing the colours by one or more shades.
See pages 92 and 93.

Furthermore:
If designing is programming,
then the basis is the material.
That is, a precise knowledge of the material.
Colour, proportions, dimensions:
what are the other parameters?
What are the components?

Discovery is a part of design.
Let us mention one more:
texture,
i.e. the outward nature of the material,
its surface.

The same programme
that is based on the effects of colour
can be based on the effects of texture:
instead of different gradations of colour
differently derived light reflexes
following the same structure.
See pages 94 and 95.

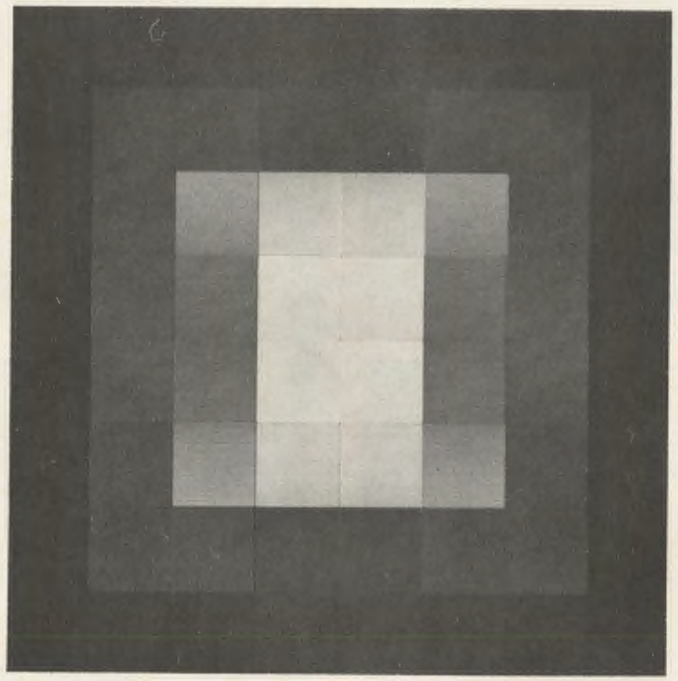
And
so
on.

Thus the designer
proceeds from material to form?
And perhaps from form to art?
Where are the thresholds?

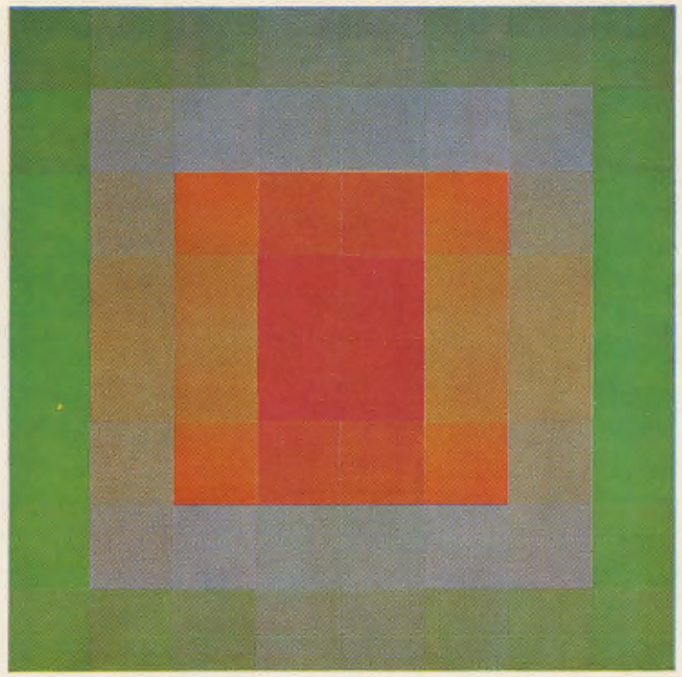
I do not know. (I do not want to know.)

If my pictures are not art:
that would be my misfortune.
(The price of my conviction.)

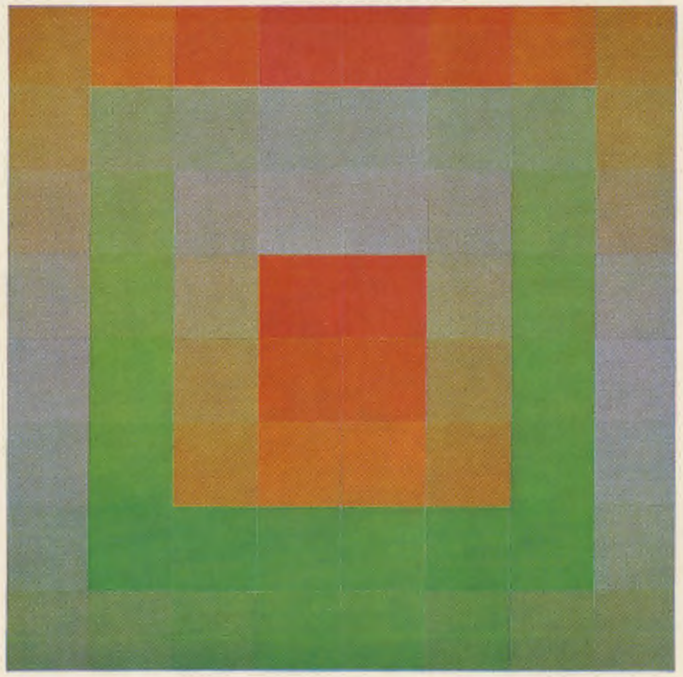
The c-structure of 64 elements
(I acknowledge it): I have declared it to be a picture.
I have christened it carro 64:



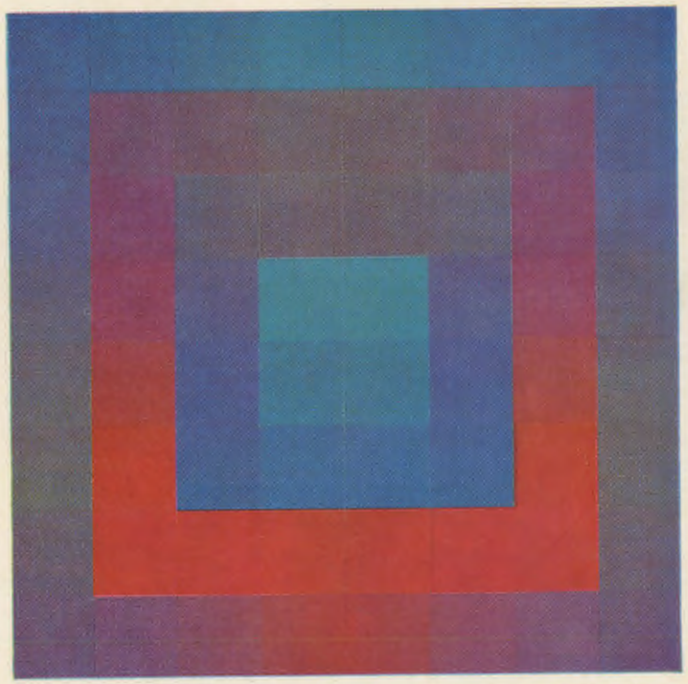
carro 64
black–white
1956-61



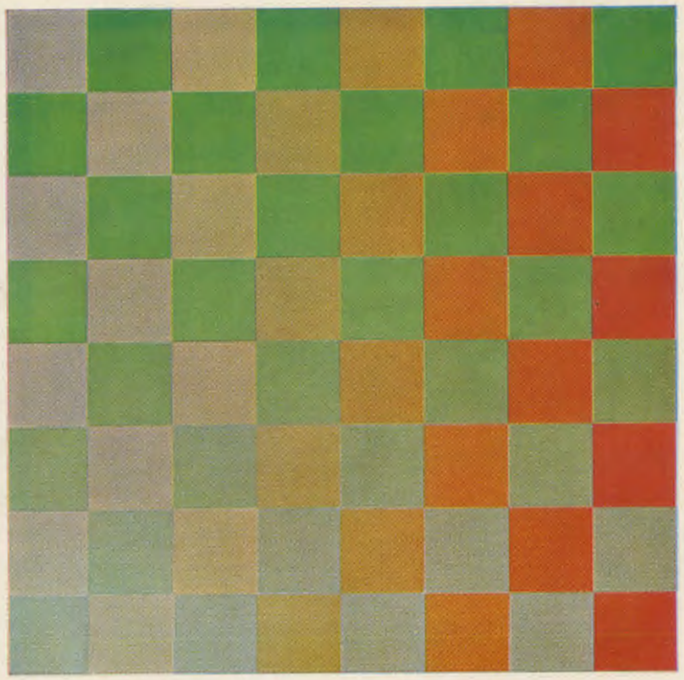
carro 64
red-grey-green
1956–61



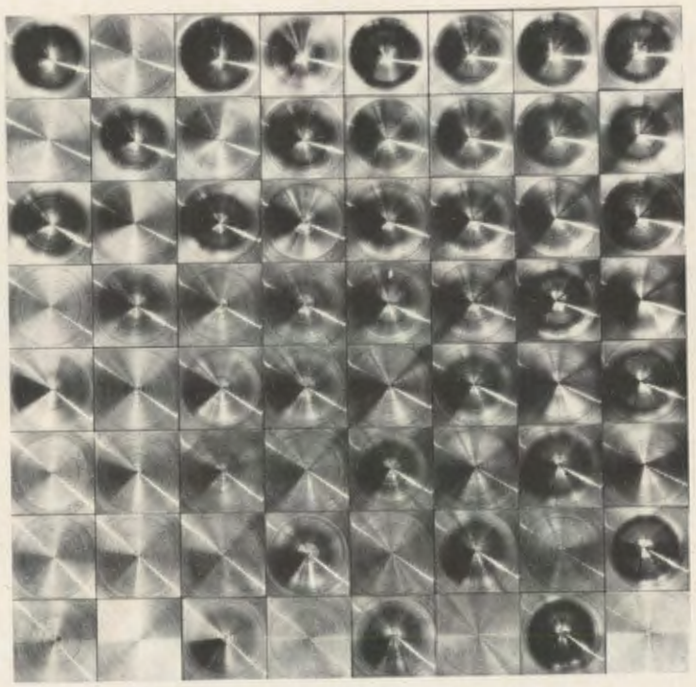
carro 64
red-grey-green
1956–61



carro 64
red-grey-blue
1962

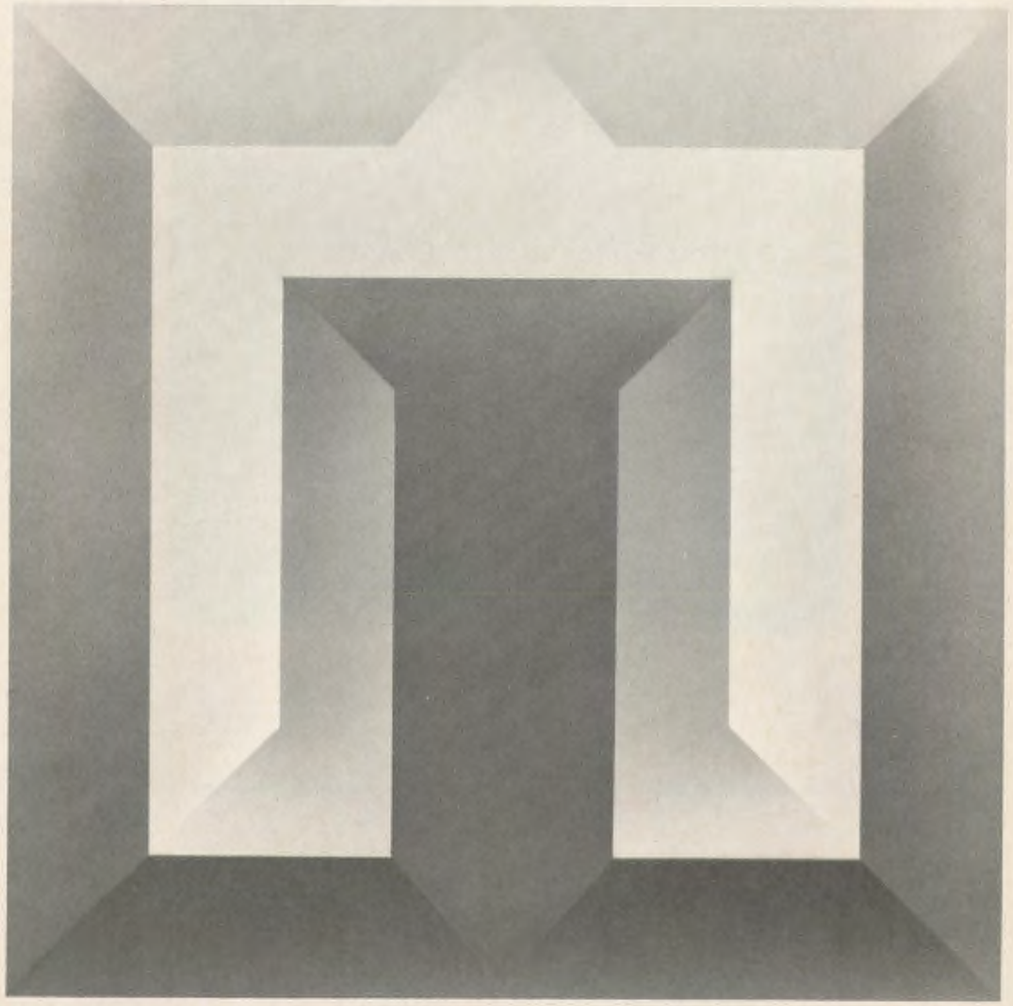


carro 64
red-grey-green
1956–61

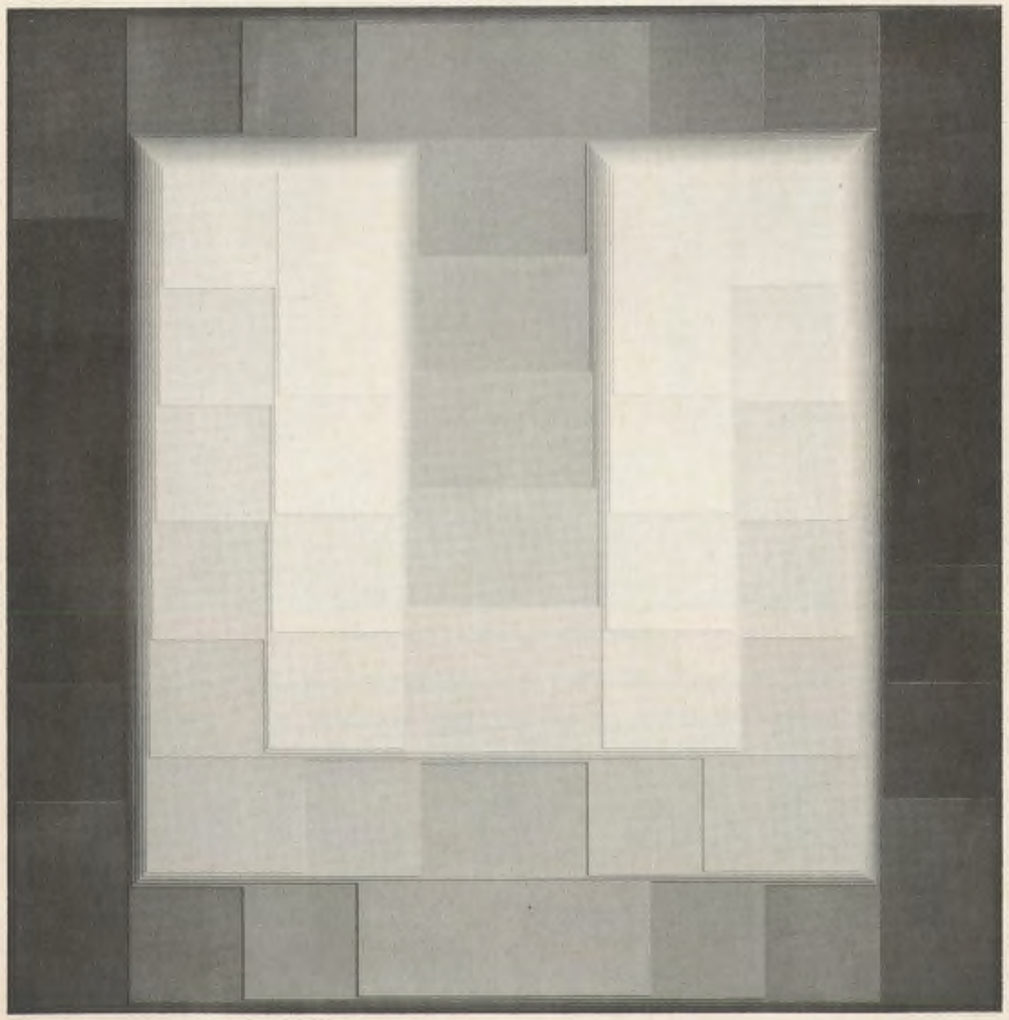


carro 64
turned metal
1962

Mirror picture: derived from the Carro 64 idea. (Taken from the book "Spiegelbilder", Verlag Galerie Der Spiegel, Cologne, 1964.) Here it is not squares but bars which go through the various evolutions, the diagonals being created by turning through 90 degrees. In principle it is the same figure as seen in illustration C15.



Another development of the Carro 64 idea: Colour Relief 1966/67. Again the figure is in principle the same as that in C15. Here, however, the colours are arranged over one another instead of side by side.



Carro 64 has meanwhile gone through four editions, each with a different colour combination.

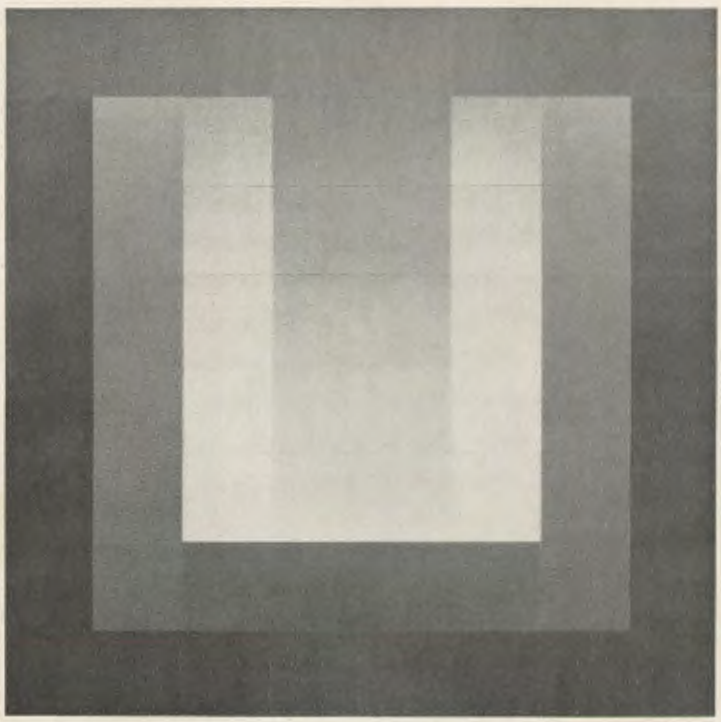
1st version: blue-grey-yellow
1962
Christian Holzäpfel KG, Ebhausen.
Edition of 120 units
Exhausted

2nd version: red-grey-blue
Staempfli Gallery, New York.
Edition of 120 units
Exhausted.
Sale by mail order selling.

The prospect below was sent to prospective customers and served at the same time as instructions for use.

3rd version: white-red-black
1966
Tokyo Gallery, Tokyo.
Edition of 20 units.
Exhausted.

4th version: white-yellow-black
1966
Edizione del Deposito, Genoa.
Edition of 20 units.
Exhausted.



This picture is called Carro 64.

Here is the same picture in five of an unlimited number of versions:

Carro 64 is made of 64 accurately tooled aluminum cubes which are set in an adjustable white frame. The size is 16" × 16".

You can arrange and arrange and rearrange these colored cubes until you are satisfied. Only your taste and imagination limit the number of possible designs.

You get thousands of pictures by buying one, one of a limited edition of 120, issued by Staempfli Gallery.
They are designed, numbered and signed by the Swiss artist Karl Gerstner. The price of each is $125. Are you interested? Order one from Staempfli Gallery, 47 East 77 Street, New York 21, N. Y.