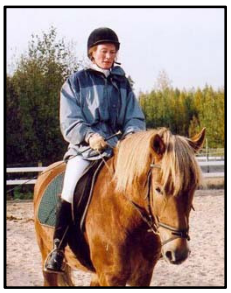
A conference was held in Prague, Czech Republic, in November 2002 that was entitled "Issues Confronting the Post-European World" and that was dedicated to Jan Patočka (1907-1977). ***The Organization of Phenomenological Organizations*** *was founded on that occasion. The following essay is published in celebration of that event.*

Essay 47

Form and Counterform in Graphic Design: A Phenomenological Approach



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Abstract

In this paper I have tried to expose the significance of the idea of eidetic variation to graphic design. When I was teaching in the Laboratory of Experimental Typography, attached then to the Department of Art Education at the University of Jyväskylä, I found myself frequently in the unsatisfactory situation that we did not have any methodological device for dealing with typical problems of the field. It just happened, at the same time, that I began to read Husserl. Since then the idea of eidetic seeing has been a great help as well in teaching as in doing typographical thinking. It offers a kind of logic for the eye, Augenlogik, so to say.

Though making use of Husserl's methodological legacy seems to me rather naturally suitable in the field of graphic design, it might be difficult to discuss the general features of the method itself. There always seems to be so little to tell. Maybe it is, however, a good sign for a method, that one cannot talk about it without trying to use it.

In this paper I have attempted to show how some typical problems of graphic design might be approached using the method of variation with the intention to find out the involved essential content, the invariant. The mutual dialectics of form and counterform appears to be one of the basic constituents of the material ontology of the "visible word."

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I. Eidetic Variation as a Working Method of Graphic Design

The term graphic design was supposedly first used in 1922 by William Addison Dwiggings, an American book and type designer, who is best known of his Caledonia, one of the most popular faces, at least in the US. The term achieved widespread usage only after the Second World War. Of course there had been long before artisans, artists and craftsmen working with what we now call graphic design, but they used to be called printers, typographers, book makers, art directors etc. In point of fact, the field of graphic design began already when the printing press was invented in the fifteenth century. Craftspeople who arranged type and illustrations on the printed page were the first graphic designers, for they had to plan the layout or design of each page before it was printed.

In this modern sense, design is an industrial concept. Before the industrial revolution craftsmen and artists created the objects identified by people as works of art in one smooth process, from the original idea to the final execution. Their work was shaped by a unity of labour. With mass production, however, the structure of the manufacturing process changed. The unity of labour dissolved into a complicated process in which the labour was divided into more and more parts. The artist became the inventor of an idea and he could only occasionally execute the artefact. Instead he had to communicate his ideas to other people who in turn had to execute them. The artist could, however, not be separated from the processes of execution and manufacturing, for he had nevertheless to master it:[1] with decisions to be made beforehand in imaginative perception, his work became more and more dependent on his imaginative power. Accordingly, the designers of today are liable to seek methods and knowledge increasing their ability to master the forces involved in the domain of their authority.

In the following some basic guidelines for mastering typographic decisions will be discussed. Throughout my study, the discussion of typographical elements and their impact on the graphic design is based on the

[1] Walter Gropius, the founder of the famous German design school Bauhaus, defined in his Idee und Aufbau des staatlichen Bauhauses (1924) as its leading idea that the designers should be taught to master the crafts. The workshops of the school were to him “laboratories” where the students should develop “models” in order to get fresh insight into the unity of labour. “Das Bauhaus will in diesen Laboratorien einen neuen, bisher nicht vorhandenen Typ von Mitarbeitern fur Industrie heranbilden,” he wrote 1926 in his Grundsätze der Bauhauswerkstätten.

use of a methodological device which I call a phenomenology of typefaces.[2] Maybe there is, in contemporary philosophy, no homogenous trend or school of philosophy to be called "phenomenology" and maybe this label means very different things to different people. Nevertheless, there are several reasons why one should accept it as a heading, one major reason being this: I will draw on a conceptual tool developed initially in the phenomenological tradition, namely the idea of Wesensschau, eidetic seeing, connected with the somewhat technical issue of what Husserl called regional or material ontology.[3]

I do not, in this study, discuss the main features of the phenomenological theory I am trying to make suitable for a new use. Let me at this point, however, note that I will discuss, according to the methodology so far suggested, the typographical elements not only as they are on the printed page or on the screen of a computer, but rather as they appear on it.

Some things always matter more than others, and to us, working in graphic design, it does not matter first off what actually is on the page, because we have to take care of what appears on it. In order to understand what appears, we need a simple methodology sensitive enough to many different kinds of apparent properties, proportions, functions and forms. Husserl described such a method in terms of "variation" and "ideierende Abstraktion."

Assume, for instance, that on a white page before your eyes, illuminated by a lamp, lies a set of lines printed in black, and, say, in Avant Garde Gothic. And assume that you are interested in finding the qualities common to the letterform recognizable as what is known as Avant Garde Gothic.

Obviously, we are able to perceive the type of which the lines consist as united through a common form. But what do we then perceive? Indeed, I may transform these perceived objects in my fancy by successively varying their colour, their background, their illumination, their strokewidth, certain parts of them and so on. In fact, I may imagine a number of varied letterforms, resulting finally in the insight that in all these variations a set of characteristics remains invariant or constant without which the letterform before my eyes ceases to be

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[2] Cf. my Facing the Faces: An Introduction to the Typography (Jyväskylä 1998), pp. 42 ff.

[3] See Husserl: Ideen I (Husserliana Ill) §§ 9-10, 16, 149), cf. Logische Untersuchungen §§ 10-11 (HusserlianaXVII) and the lectures 1917/18 with the title Logic and General Theory of Science (Logik und allgemeine Wissenschaftstheorie. Vorlesungen 1917/18, Husserliana XXX). In these lectures Husserl seems to emphasize the role of the hyletic material and the dependence of the regional ontology on the non formal qualities more than in his earlier writings. Formal ontology is universal Ontology "im allerallgemeinsten Sinne," whereas the insights of regional ontologies are universal only within their regions.

one and the same letterform. This set of characteristics, so far necessary to this particular form, we shall call the essence or eidos of this particular letterform.[4]

ABCDEFGHIJKLMN
OPQRSTUVWXYZ
abcdefghijklmn
opqrstuvwxyz

In all variations of the letter A a set of characteristics remains invariant or constant. This set of characteristics will be called the eidos or form A. In the same way, in the stylistic variations of the whole alphabet the style will be called the eidos or form. It can be defined as a set of characteristics common to all the letters of the alphabet in that style.

[4] Husserl: "Dieses Invariante ist ...das Eidos." (Husserliana XVII), p. 255.

As has been noted by scholars, the process of variation is not to be confused with the method of generalization. Borrowing terms from mathematical technique, Husserl called this reduction procedure "bracketing." Through putting in brackets all the features that are possible to change among the imagined transformations and variations we achieve a purified perception of the letterform Avant Garde when we are bound to 'see' that any further removal would destroy it. So the eidos is what appears to be the invariant in the series of imaginative (as well as factual) variations.[5] In the light of such purified perceptions we may even be in the position to describe conceptually, in the mode of theoretical reasoning, the essential features and structures of a whole area of objects. Graphic design is just one of the regions of being, with its own structures, worthwhile to be investigated.

The idea of regional ontology reflects Husserl's belief that there is, in contradistinction to 'formal ontology,' a realm of eidetic knowledge that is directed to and dependent on the "hyletic," factual and concrete, tangible and touchable objects, such like colours and tunes, bodies, minerals and animals.[6]

However, the graphic designer has to make things happen. Therefore s/he must be able to produce what we want to appear, and this presupposes that we must be able to modify real things in what they are. In order to let them appear as we want them to appear, we must be able to handle and control real things. So we are working all along in two interrelated worlds at the same time, in the world of appearances and in the real world of material facts.

In visual arts, one has, therefore, to appreciate the difference between these two worlds; for our visual field, is determined by many regularities affecting the way we see and comprehend what we are seeing. Nothing illustrates this clearer than the numerous visual illusions.[7]

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[5] Husserl discusses the case of factual variations in Ideen I, cf. Husserliana III/1 16.

[6] In Ideen I Husserl wrote that scientific knowledge is dependent on eidetic knowledge, formal or material: "Es gibt keine Tatsachenwissenschaft die rein sein könnte von eidetischen Erkenntnissen und unabhangig ... von den, sei es formalen oder materialen eidetischen Wissenschaften." (Husserliana III/l 26)

[7] Attractive modern presentations of visual illusions include Richard Gregory, Eye and Brain (Princeton 1997); John B. Frisby, Seeing, Illusion, Brain and Mind (Oxford 1980). The 1922 book by M. Luckiesh is still a good introduction, Visual Illusions: Their Causes, Characteristics & Applications (New York 1965).

II. Form and Counter-Form

The graphic designer does not only make decisions about the style of a typeface; at the same time s/he has to make decisions about several other things, interrelated, however, with each other.

One example of this is the grauwert, the tonal colour. It is affected by the weight of the typeface, of course, but also by its letter spacing, interword spacing and line spacing. The examples below will show degrees from wide leading to no leading at all, and there is an obvious progression from light to dark, and from a pattern of lines to a plain surface. In the light of the theory I am using in the course of this study, this progression from a pattern of lines to a plain surface can be described in terms of form and counterform.[8] Generally speaking, the way in which the type and its background have an effect on each other is nothing else than the interplay of form and counterform.

The connection between the form and its counterform may be clarified with the help of Husserl's theory, which applies to an activity of understanding that he calls passive synthesis.[9] Thus, when we perceive a tree, for example, we primarily perceive only the frontside of the tree, but our consciousness does not direct itself to or focus on the frontside alone, it is also directed, in a passive mode, to what, on the strength of our mind, we associate with it: the experience of the frontside acts as a medium of the experience of the backside. Though we are not attending to it, it is copresent in our perception. Front and back here form an "appresentative pair" in the sense that the former appresents (ad-presents) the latter, and this is possible even if the appresented member of the pair is unclear and vague. There will always be some counterform which the form itself evokes or calls forth.—Some famous illusions play on the exceptional case that our mind cannot decide what is the appresenting member of the pair. We are bound to move in zigzag course from one member of the pair to the other.

As an outcome of a number of variations, factual as well as purely imaginative, I claim, indeed: For any shape which we introduce into a field there will appear, in addition to that shape, a shape which is its complement. The form and the counterform are invariably complementary. To produce the one is to

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[8] Form and Counterform—a somewhat similar topic has been dealt with in the aesthetic literature in terms of figure and ground. Numerous instructive notes on the issue can be found in the work of Rudolf Arnheim, cf. his collected essays Towards a Psychology of Art (London: 1966), cf. 222 ff.

[9] Cf. Husserl's analysis in the 5th Cartesian Meditation, Cartesianische Meditationen (Husserliana I). My very first contact with Husserl's concept of appresentation comes from Alfred Schutz's instructive illustration in his Collected Papers I (The Hague 1971) cf. 294 ff.

produce also the other. Thus the printed area evokes its counter area and the two together determine the overall form. Accordingly, the designer must constantly balance both the form and its counterform.[10]

All forms of spacing provide the designer with the means of reducing and/or increasing the effect of counterforms. Excessive leading produces a white ribbon and this counterform may dominate the attention of the beholder more than the form itself—and more than s/he intended.

The interplay of form and counterform can sometimes become even more exciting. We usually work in a two-dimensional field, but we have to take notice of the possibility of an unexpected illusion: in our two-dimensional field an effect of depth will be created, for the eye of the beholder may be led by lines and rows into a third dimension. Sometimes we may, of course, intend to create the illusion of depth, but usually it may hurt our design profoundly. In a well composed type area the print and the blank spaces are in perfect balance. The flat effect of the type area and the ribbon effect of the lines mix together to form a pleasing whole.

To my way of thinking the interplay of form and counterform is the kernel of the theory of typography. So we have to face it frequently.

3. Points and Picas, X-Height, and Ems

In the typographical practice graphic design has in a few decades of huge progress moved out of the era of hot metal setting through a period of photocomposition into the design world of digital media. When all type was metal, the typographic design was essentially conditioned by metal technology. Now it is conditioned by computer technology. At present we hardly know all the consequences of this change in the technology, but as things stand, I do not hesitate to say: In order to understand the terms and concepts of this new technology we still have to understand some basic processes of the old technology, for they still affect the new. This certainly is true of the typographical terminology applied all over the world. But it is true also of the general view we still take into the design world of digital media.

In the following two passages I have summarized some basic typographical terminology for the reader unaquainted with the professional lifeworld of graphic designers.

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[10] Cf. Emil Ruder, Typographie-Typography (Niederteufen: 1967) 48 ff.

There are two basic type measurements: points and picas. Points are still used to measure the type size. In the old technology the description of a type as 6 pt, or 24 pt, indicated only the size of the metal body: it did not indicate the "face" of the type, the appearing size of the letters on the paper. As points were used to measure the "depth" of the metal type, the point size was also called the body size.

There are twelve points in one pica and seventy-two points in an inch and, thus, six picas in an inch. A type of 72 point size had a body almost exactly one inch from the top of the ascender to the bottom of the descender. Note that there remains between the top line of point-size and the ascender line a small difference called "body clearance." Nowadays, all DTP-systems use the standard electronic publishing convention according to which one point is exactly 1/72 of an inch.[11] But most electronic type foundries still use the notion of body clearance. The face of a type 72 pt, thus, is not exactly 72 pts.

The amount of space between lines is likewise measured in points, according to the standard from the baseline of one line of type to the baseline of the next. The standard expression is a fraction such as 9/11, in which the denominator (11) is the base-to-base measurement and the numerator (9) is the designated type size.

Types that are 12 or 14 point and under are called text type and are primarily used for body copy. Sizes above 12 or 14 point are called display type; they are used for titles, headlines, and the like. Today most text types are derived from a 12-point model and most display types from an 18-point model. The more the point size differs from the model size, up or down the scale, the less graceful characters seem. Smaller characters may look too weak and crowded and the large ones too coarse and loose.

Picas (and Ciceros) are used to measure the line length. When referring to the length of a line, we speak of it as so many picas wide. Thus the expression 9/11x24 means 9-point type set with 11-

[11] See footnote 7 above.

point line spacing on a 24-pica line. It is read as 9 on 11 by 24. A block of copy is said to be so many picas in depth.

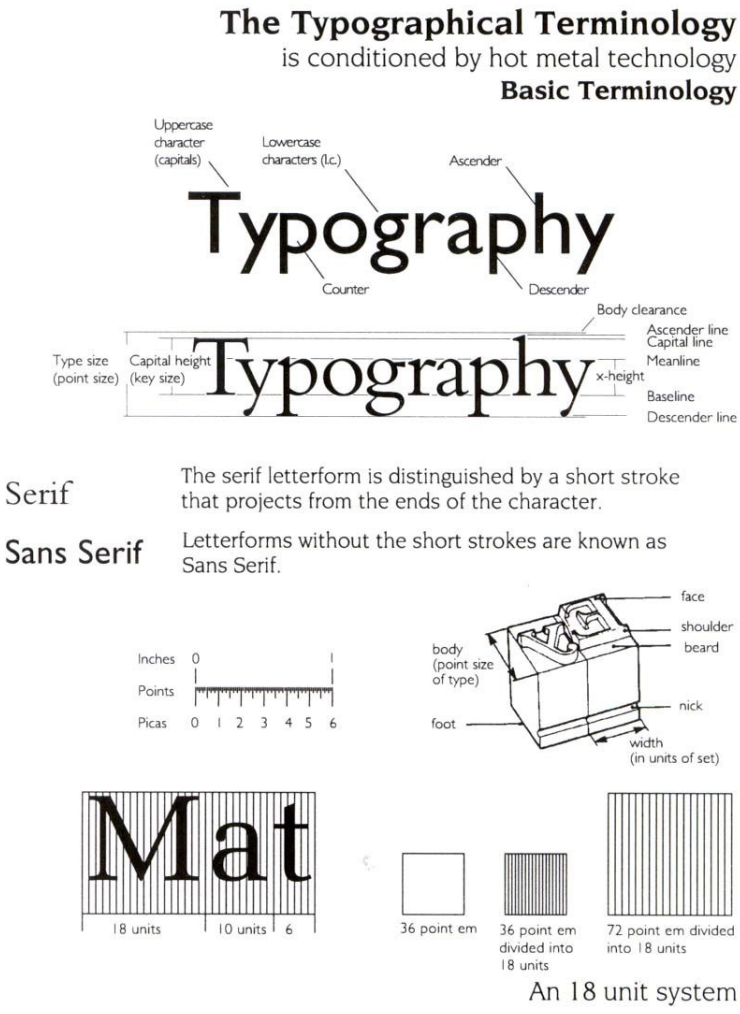
The actual appearing size of the face can be described by defining the x-height. Although the x-height is not a unit of measurement, it is significant: it is the x-height, not the point size that indicates the true visual impression of the size of the letter. Typefaces of the same point size may appear larger or smaller because of variations in the x-height. The 10 pt Garamond with its small x-height appears much smaller than the 10 pt Helvetica with its larger x-height. This is important to keep in mind when selecting type faces and determining their sizes. A useful device for judging the appropriate size of a type you have selected is a table which counts how many characters of that size, on the average, will set in the width of one pica. This is known as the characters per pica or cpp of the type.

In the old technology, word spacing and letter spacing were accomplished mechanically by inserting pieces of metal between the words and letters.

These pieces were called quads. They are all related to the em quad, i.e. the letter “m”. It is (theoretically at least) the square of the type size. If the type is 10 pt, the em quad is 10 pt, etc. Half of the width of “m” is “n” and was called the en quad. Other subdivisions of the em were used, and are still used occasionally. In typographical text is often referred to “thin space”. It is a somewhat crucial expression, for it meant in the old days 1/5 em space and means nowadays usually—1/3 or, I’m sorry, in some texts, 1/4 of em quad. Anyway, it is a very thin space.

IV. Units and Set Width

In phototypesetting the width of the characters was called set width. It included a small amount of space to either side of the character for normal interletter spacing. With no space added or subtracted, the letters thus came off the machine without touching each other. The new digital technology employs a similar theory of set width. Note that the set width of a character will vary from typeface to typeface.



All symbols, including individual letters of the alphabet, are called characters.
The complete set of characters unified through the same design is called a character set, a font or a fount.

The set width is measured in units: each character is assigned a certain number of units. The upper case "M" for instance may be 18 units wide whereas the lower case "I" may be 6 units and the lower case "a" 10 units wide. Please note that the unit is a proportional, not a fixed measurement.[12] Do not confuse it with typographic points, picas, ciceros or other fixed measurements.

> You may ask, why such a proportional measurement is required. Here comes the answer: The unit is based on another typographic measurement, namely the em quad, which is, as I said above, the square (at least roughly) of the particular point size of a character. The em is divided into equal vertical segments the number of which varies from system to system. Let us suppose that the number of these units is 18. In such a system one unit will be 1/18 no matter what the point size of the particular letter will be. These relative spaces refer always and only to horizontal space—the space within the type line. By programming the computer to increase or decrease the number of units assigned to an individual character, we can control the spacing between the letters.
>
> Also indentations of various kinds and spaces around display elements are often specified with ems, ens and thin spaces.

V. Spacing

Perhaps the most important concept in typographic design is spacing, the amount of space between the letters, the words and the lines. It takes great skill to specify any of these three kinds of space, for they work in close connection with each other. Letters must flow rhythmically and gracefully into words, words into lines and lines into the whole page. Actually, all kinds of spacing amount to the creation of the interplay between form and counterform.

Through "spacing" the graphic designer determines for instance much of the overall tonal colour of the printed page. Thus, variations in line, word and character spacing affect the overall look of body copy. I do not hesitate to say: Here is the domain where graphic designers display their skill and aesthetic judgement.

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[12] See footnote 9 above.

In the old technology there were no possibilities at all of close spacing.—Accordingly, close spacing was no problem at all. We now have a total control over all forms of spacing, but we have also more problems and that means we have to make many new decisions. By adjusting letter spacing we can improve, but also reduce the readability or legibility of the design.[13] But we can also affect the tonal value of the design, and so we have a new problem and a new decision to make. How much do we have to value the tonal colour in our design? How much do we have to value the legibility in our design?

As I claimed above, all these problems lead to one and the same topic, to the main topic of form and counterform. So we have to work out how the interplay of form and counterform affects the typographical design through the various forms of spacing. We will illustrate how spacing can be used as an instrument for controlling the overall form of the design.

VI. Letter Spacing

Jan Tschichold emphasized in his famous Asymmetric Typography: "the correctly set word is the starting-point of all typography."[14] Indeed, the letters themselves we usually have to accept—at least in text setting—because they are shaped by the type designer. The task of the graphic designer is to take care that letters achieve the right regularity and rhythm.

Letter spacing can have a decisive effect on legibility; therefore, it must be specified by the designer, not by the typesetter in the printing office, as Ruari MacLean has wisely stated.[15] As a matter of fact, faulty letter spacing is the most frequent cause of poor quality in modern type setting. Unpleasing "spotty" effects in words, lines and whole pages will result, when letter spacing is too wide, too tight or irregular.

A good starting point for character spacing is the structural form, the appearance of the lettertype itself: letters should neither be so tight that they lose their distinct outlines nor so open that the words cease to be perceived as words.

Already the photocomposition machines had the ability to reduce or increase the intercharacter spacing, the fitting as the old masters used to call it. Letters could be set closer to each other until they overlap. This was called

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[13] A still valuable bibliography on readability and legibility studies was published by Herbert Spencer, in his The Visible Word (London: 1969), p. 62 ff.

[14] Asymmetric Typography, translated by Ruari McLean (London: 1967), p.12 (Typographische Gestaltung, Birkhauser Verlag: 1935).

[15] Ruari McLean, Typography (London: 1980), p. 44 ff. 36.

minus-setting. Through digital instruments all this has become still easier because you can see the result immediately on the screen.

In addition to normal spacing, the distances between the characters can be manipulated further to tight and very tight, or to loose and very loose. Such a freedom creates easily the impression that the character spacing is simply a matter of choice. But it is not. Too much or too little space between letters destroys the natural rhythm of a typeface.

The interior areas of letters are fixed by the shape of the letters, but the spaces on each side of them are chosen at will. The fitting of letters means that we have to achieve a visual balance of white both inside and outside a character when used in combination with other characters. A series of eidetic variations will easily show that a successful fitting simply means: in any combination of letters a nearly equal space of white between characters will be apparent, regardless of their irregularities of form. So, the fitting is an integral part of the design.

Ideally, it may be said, for each typeface and for each size of a type there is only one correct letter spacing. But in the real world this ideal is obscured and becomes a matter of decision. An old rule states that the space between letters should be the same than the space inside "m" or "n".[16] This rule obtains especially in the field of old style letters, but it reveals one secret of all correct letter spacing: letter spacing is a function of the "counters," i.e., the internal spaces within the letters. If we change the space between letters we change at the same time its proportion to the internal spaces of letters. But these spaces are nothing else than counterforms of the letterforms! Thus, the old rule is based on this idea of proportionality of form and counterform. The smaller the internal space, the closer the letter spacing; the greater the internal space, the wider the letter spacing required. It is easy to see that letter spacing, if it is wider than the average internal whites of the letters, will result in word-images that seem to fall apart. Too tight a letter spacing gives "spotty" effects because the counters seem too large. Another good rule, obviously derived from the above one, states that any variation in letter spacing is too much if it is noticeable.[17]

Let me now quote a nice text by Michael Beaumont, set in Monotype Bembo in six different variations.[18] You will immediately recognize the

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[16] See Jan Tschilhod, The Form of the Book—Essays on the Morality of Good Design, edited by Robert Bringhurst (Lund Humpries: 1991) (Ausgewählte Aufsätze über Fragen der Gestalt des Buches und der Typographie Birkhäuser Verlag: 1975), pp. 12 ff, pp. 95 ff. See also: Ruari McLean, Typography (London: 1980), pp. 44 ff.

[17] Ibid., 102 ff.

[18] Michael Beaumont, Type and Colour (London: 1992), pp. 44f.

differences and their consequences. On closer examination, these six variations (pp.14-15) are revealing and we may now be able to explain some of their faulties.

Eidetic variations of Letter Spacing

Fasluons come and go.Tlus certainly applies very much to typographical design, and in particular, to letter spacing. When computer-generated semngs fir>t arrived and the advantages of its infinitely flexible letter spacing were recognized, very tight letter spacing, particularly for headlines, soon became fashionable. Now, however, the movement is in the opposite duection, with many designers opting for an extremely open style of typography reminiscent of the 1950s.This control over letter spacing means that you can alter the tonal colour of your body copy subtly by varying the standard spacing.This is done by adding, or subtracting, units from the set WJdth. But all destgners must remember that, when all is saJd and done, we are comnlunicacors. Our messages have to be read and understood. Letters that are too close or too open, designed for the sake of fuhion at the experue oflegibiliry, do NOT make good typography.

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(set through PageMaker 6.0 wrth very ugl1t t,..ck)

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(set throogh PageMaker 6.0 with normal track)

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8110 pt Bembo
(set through PagcMakcr 6.0 with very loo"' track)

Fashions come and go.This cenainly applies very much to typographical design. and in particular, ro letter spacing. When computer-gener:Hed settings first arrived and the advantages of its infinitely flexible letter spacing were recognized, very right letter spaci ng, particularly for headlines, soon became fashionable. Now, however, the movement is in the opposite direction, with many deslgners opting for an extremely open style of typography reminis-cent of the 1950s.This control over letter spacing means that you can alter the tonal colour of your body copy subtly by varying the standard spacing. This is done by adding, or subtracting, unjts from the set width. But all designers must remember that, when al.l is said and done, we an! communicators. Ou r messages have to be read and understood. Letters that are roo close or roo open, designed for the sake of fashion at the expense of legibility, do NOT make good typography.

8110 pt Bcmbo
(set through PagcMaker 6.0 wrth no track)

The effect of excessive decrease or increase of space is in these examples clear: A letter is almost completely altered through too much or too little space about it. The success or failure of a type depends on the balance of white both inside and outside of letters. So, when a type design is good it is not because each individual letter of the alphabet is perfect in form, but because each letter is successfully related to every other: there is an air of harmony and unbroken rhythm that breathes the whole design. Matthew Carter, one of the great type designers of the 20th century, once said that a typeface is not the same thing as lots of letters—but instead, all words of the language.[19] Letters have to work together in all words of the language and of so many languages as possible.

Hence, it is important for the graphic designer to evaluate the types he/she is dealing with. This presupposes that the designer has trained his/her eye to perceive the delicate and artful ways in which letters and spaces relate to each other. Eidetic variations, imaginative as well as factual ones, make up a good working method for that.

Letterspacing is, however, a typographical tool. We can use it to modify our design. And it is a very effective tool for working with rhythm. Indeed, in typography, we can use letter spacing to create different kinds of rhythm. For instance, space between letters may be made to echo both the width of the stem and that of the partly-enclosed areas of the letter design. A different spacing rhythm is set up by contrasting the open counters of letters with close letter spacing to produce a "ribbon" effect. Let us look at two examples set in Gill Bold and Avant Garde.

GillSansBold
AvantGardeBook

The echo effect is very apparent in the Gill Sans example whereas the ribbon effect in Avant Garde Book example is created by contrasting the open counters with rather close letterspacing.

Minus-setting can be done consistently throughout the font or it can be done for separate character combinations, for instance such as VA, AV, LT, Ty. This is known as kerning or pair kerning. Kerned letters such as f in italics and the V and W were always a problem in metal type. Here is an advantage of today's new design: So-called kerned characters are no problem any more, "and you can design the nicest f's of your imagination," as Hermann Zapf puts it.[20]

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[19] Cf. Lewis Blackwell, The 20th Century Type (London: 1992) p. 194.
[20] Hermann Zapf and his Design Philosophy, (Society of Typographic Arts, Chicago 1987), p 94.

The kerning of specific letter combinations can be programmed into the typesetting system. As type is set, appropriate letterspacing appears automatically. For example, when uppercase "T" appears with a lowercase "a," space is removed in such a way that the "a" can be tucked under the cross-bar of the uppercase "T." This spacing is mostly built into a font by the font designer and can vary among fonts and type styles. In text setting, pair kerning is usually restricted to the exceptionally difficult pairs and to the exceptionally difficult alphabets, such as Avant Garde and Lubalin Graph, because each altered pair may affect the appearance of all the other pairs in the alphabet.

So, kerning controls the spacing between two characters. Overall minus-setting inserts uniform spacing between characters in selected text. It is sometimes called compensation and especially in the DTP-technology tracking. You use tracking when you want to adjust the spacing of a word or of an entire text object. Positive tracking values move characters apart; negative tracking values move characters closer together. Tracking values are also measured in units.

VII. Letter Spacing of Capitals

An old rule of thumb forbids us to change the normal spacing of lower case letters. But the same rule states that capitals must always be letter-spaced.[21] Why? Of course, capitals have greater internal space than lower cases and that is why they require a great deal of spacing. But how much? There is no valid rule. You only have to examine closely the case and rely on your experience and judgement—or if you do not have any—on fate. Here are some guidelines to think about and perhaps to follow.[22] Usually the letter space is correct when the letters with holes—C, D, O,—and those with space outside—A, J, L, P, T, N, W; Y,—merge inconspicuously into words without standing out. Thus, we start with a minimum amount of space which can be more or less increased according to circumstances. The minimum letterspacing depends on the largest internal spaces in the round letters C, D, G, O, Q. If any of these letters makes a conspicuous "hole" in a word, the letter spacing is obviously too tight. Misfit letter combinations and irregular spacing are a common problem for capitals. In visually even spacing the amount of space between letters will vary according to the letters which come next to one another. Spaces between letters should be

[21] Ibid.
[22] Cf. Emil Ruder, Typographie-Typography pp. 81 f.

about the same size whatever the shape. The problem to be solved is to achieve the correct rhythm of capital letters, the rhythm of a well formed word. Too little or too much letter spacing will destroy the correct rhythm and also decrease legibility.

A well known visual illusion[23] plays an important role here. The white space outside the print area, the paper colour, seems to flow from above into the counters of the letters and the spaces between letters. The white of the upper half of a page thus looks more effective than the lower half. This is why, for instance, the letter "n" in most sans serif faces must be slightly wider than "u" in the same face, if it is to look the same width. Similarly, (if we assume that "A" and "V" have the same apex angles) the space between "I" and "A" must be slightly less than that between "I" and "V."

VIII. Word Spacing and Line Spacing

Word spacing is similarly affected by the style of the typeface. Small type sizes read much more better, if you increase word spacing, but in headlines you usually have to decrease it more than you expect. Our analysis of letter spacing applies to some extent to word spacing as well. Space between letters and words should be proportional to the width of letters and to the internal spaces in letters, i.e., to the counterforms of letterforms. There can of course be no fixed rules for establishing how much this space should be. It will vary with each typeface and with each type size.

Spacing between words must not be so large that it disturbs the harmonious unity of a page. That is a requirement for comfortable reading. Too much or too little space between words can seriously affect the legibility. In a handbook of ITC, I once read the following passage: "The individual words should be far enough apart so they will retain their identity. Words placed too closely together force the reader to work harder to distinguish one word from another. On the other hand, words should be set close enough together so the horizontal flow of the line is not interrupted by too much white space." Indeed, too much space can cause the illusion of white rivers running down the page. This creates a vertical emphasis that disrupts the natural movement of the eye from left to right. Rivers are a common problem within narrow measure justification as anyone reading newspapers has noticed.

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[23] Ibid.

The general rule, one of the old master's rules, says, that words should be set close to each other, about as far apart as the width of the letter "i",[24] but this is only a starting point.

The same rule states that there should be more space between the lines than between the words. And this is truly one of the golden rules! The interlinear spacing or line spacing—leading as it was called in the old technology—affects the legibility essentially. Why? In order to answer it may be helpful to illustrate how the printed word is perceived by the human eye. According to the recent findings of the legibility research the eye reads word by word, or in word clusters, not letter by letter. If the gap between words becomes too big, bigger than the space between the lines, our eye begins to jump to the next line rather than to the next word or word cluster.[25]

So the apparent space between lines must look greater than, or at least not less than, the space between the words. Therefore good setting must be leaded. The amount of leading depends on the amount of white around the type and the general colour required. Thus, with too much leading, the white space between the lines of type becomes more important than the lines themselves; the lines will seem to float loosely on the page. In small quantities, this effect might be desirable, but not for sustained reading.

When we are working with display types, we have to give special attention to the ascenders and descenders. They can optically lessen the amount of white space between lines. Optical adjustments in display types should be made when spaces between lines appear inconsistent because of ascenders and descenders or accents. This problem appears also when we use Roman and Italic together, for instance, in the headline. The line may appear to slant.

IX. On Legibility and Readability

I have so far often mentioned legibility and readability; sometimes as synonyms, sometimes not. In the theory of typography, legibility means the clarity of individual characters; it depends on how quickly they are deciphered. Thus the measure of legibility is the speed at which a character can be recognized. Normally, type is legible if it is large enough and distinct enough for discriminating individual letters and words.

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[24] Cf. Carl Dair, Design with Type (Toronto: 1967), p. 78 ff.
[25] See Rolf F. Rehe, Newspaper Typography (in: Designer's Guide to Typography ed. by Nancy Aldrich-Ruenzel and John Fennell, London: 1991), pp. 78 ff.

Reading experiments and legibility studies have often provided evidence to support the opinion that a distinction between objective legibility and subjective attractiveness of the one and the same text setting should be done. For example, type set in 10 point solid (without obvious interlinear spacing) may be more legible than the same typeface in 8 point but 2 pt leaded. Nevertheless, as Tinker has observed, experienced readers do not like solid text.[26]

And now we must ask: Why do experienced readers not like a solid text? As leading separates a line from another it improves the legibility, of course. At the same time it creates a pattern of constantly recurring sequence of black and white, line and line space, dark and light. We may call this pattern rhythm as it is similar to what is produced by emphasis and duration of the notes in music. On the printed page this rhythm of black and white develops, however, gradually into a complex interplay of the flat effect of the typed area and the ribbon effect of singular white lines, i.e., the leading. All this contributes to the visual interest of the page. Because of its overall evenness of colour, the solid text does not have enough visual interest to sustain the reader's attention, especially when he has to read many pages.

A similar problem comes into view with some sans serif types. Many people do find that reading long passages set in some sans serif types can be tiring. The reason for this is the same as above. The overall even colour and the flat texture typical of many sans serif pages tend to diminish visual interest and may thus decrease the readability.

With the notion of readability we thus take the considerations of the attractiveness of text setting one step further. Readability means the level of aesthetic quality of the printed page. In other words, your text may be highly legible, but its readability may remain low because the reader is unable to read easily and smoothly. Legibility is a matter of optical clarity, readability involves already aesthetic components. A good criterion of readability is simply the attractiveness, the quality that makes the page easy to read and inviting and pleasurable to the eye.

Spacing is one of the most important factors for both legibility and readability. Especially Tinker emphasizes the interdependence of line spacing, type size and length of line for legibility. It is difficult to generalize about which sizes of type should be used, how long the lines should be, or how much space should be inserted between the lines. These variables, when properly employed, can enhance the legibility of letterforms usually considered highly legible and improve the legibility of even poorly designed letterforms. A good rule of thumb

[26] See Herbert Spencer, The Visible Word, pp. 23 f.

tells to set a line about two and a half alphabet long, i.e. some 65 characters. Studies have shown that reading a line of 50 to 70 characters is the most comfortable. Overly short lines will tire the reader, because many line endings will be hyphenated and the reading rhythm will be broken. Overly long lines will also tire the reader, because he or she must move his head at the end of a line and search for the beginning of the next. Thus, an appropriate line length is essential for achieving a pleasant reading rhythm, which allows the reader to relax and concentrate on the content of the words. Of course, the design of the face and the nature of the material as well as the context in which it will be read should also be taken into consideration.

Too small or too large a text type makes reading difficult, too. According to legibility research, the most legible sizes of text type at normal reading distances range from 9- to 12-point. Small type reduces the visibility of counterforms and harms effective word recognition. This is of utmost importance for designers working with pages to be read on computer screen, even in the modern pdf-format.

However, legibility will always be only one of the factors to be considered in designing. Not all reading matter is continuous reading matter, as Ruari McLean aptly puts it. An announcement in the newspaper, for instance, should be noticed; if it is not noticed, it will not be read and there is little use of its excellent legibility. To make it noticed, the designer may have to make it less legible. S/he may turn it literally upside down, and it may still work very well. Often elimination of the space between letters creates a visually fascinating pattern that challenges the reader to decipher it.[27]

Every typographic problem has its own legibility requirements. We must ask, for instance, what kind of reading rhythm we want to create. What kind of rhythm is in harmony with the content of the text? What is a pleasant reading rhythm in the special case we are dealing with?

X. The Lesson in Brief

In the preceding sections, I have discussed spaces and spacings. Professionals seem to agree that even line, word, and character spacing are the very first criterion of good typesetting. I tried to show what this criterion involves. Concluding my discussion let me now stress the main lesson, once again:

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[27] Cf. Carl Dair, Design with Type (Toronto: 1967), pp. 78 ff.

(1) With even spacing we mean the apparent regularity of spacing. If the spacing appears uneven, it is uneven. Since spacing should appear even, it is not a matter of rule. In all spacing, hence, the experienced eye is the final arbiter.

(2) The most important factor to keep in mind is this: all spaces are proportional to each other. If type is set open, word spacing should also be open to maintain the integrity of the word. If type is set tight, normal word spacing may appear very large. The internal design of letters also affects the desirable degree of openness. A type with large internal spaces, for example, will require more word spacing to balance those spaces.

(3) There is no ideal amount of spacing which the graphic designer has only to find out. There is no ideal relationship between form and counterform. Not only have we to find out, but we have to decide. Spacing is a visual problem. In order to face the problem we have to create a number of variations, factual as well as purely imaginative, and try to find the best one.

(4) If you prefer to make the experience of reading as comfortable as possible, guidelines must be considered; if you like to be more experimental, then you need to understand these principles more than ever.

XI. The Three Kinds of Design Problems

Let me now say some few words about the philosophical side of the "world of design problems." To my way of thinking, all design activity is ultimately problem solving activity. But please note my words; I use the word problem in a specified sense. After all, some might maintain, design is much more than mere problem solving.

In what follows I am preferring three problem space theorists: C. West Churchman, Peter G. Rowe, and L. Routila.[28] In the world of design problems, a distinction can be made between problems that are closed or well defined and those that are open or ill defined. In the latter category a further distinction can be drawn, resulting in the subclass of wicked problems, as Churchman and Rowe have suggested in their famous works.

Closed problems are those the ends of which are already prescribed and apparent. Their solution requires the provision of appropriate means. A common example is the solution of two algebraic equations with two unknown values. Here the aim of the operation is to find the values for a and y. The solution

[28] Peter Rowe, Design Thinking (Cambridge, MA: 1987), pp. 41 ff; Lauri Olavi Routila, Metaphysics of Art (Turku: 2001), pp. 98 ff.

requires application of rules of algebra to the specific equation structure that is given. Other common examples of this class are crossword puzzles. Here problems are closed through definitions and we can easily imagine a rule that states when a satisfactory solution to the problem has been given.

For open problems, on the other hand, both the ends and the means of solution are unknown. Most design problems are of this type. Although the "general thrust of the problem"[29] may be clear, considerable time and effort have usually to be spent in order to clarify what is required. The crossword puzzle becomes an open problem when you begin to think whether it is wise to use time and effort for it. A large part of the problem-solving activity, then, consists of closing the problem through definition and redefinition. But many design problems are so open that they can be called wicked problems. This class has the following characteristics, according to Rowe:

First, they are: problems without a definitive formulation, or indeed without the very possibility of becoming fully defined at all. Questions opening new avenues can always be stated, and they lead to reformulations.

Second, they are problems with no stopping rule, i.e. a rule that gives us an effective, mechanical and finite procedure for deciding about any given solution whether it is acceptable or not. Whenever a solution has been proposed, it can be reopened, in principle, and developed still further.

Third, not only do the differing formulations of the problems of this class imply differing solutions; even the same formulation of the problem may give more than one acceptable solution. In other words, solutions that are proposed are not necessarily correct or incorrect. Plausible alternative solutions can always be provided. This characteristic follows logically from the first property, from the openness, i.e. the impossibility of definitive formulation.

In the final analysis, good design can be seen as a solution to many problems of which at least some are open and wicked. The problem depends on a preconception that, in turn, implies a definite direction toward the solution of the problem. Usually we describe the solution as the personal style of the designer, i.e. as his personal habit to take a direction toward the solution of the problem.[30] Choosing the correct typeface is a typical design problem. Some parts of the problem are well defined, whereas some are ill-defined, and some are wicked. It

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[29] Peter Rowe, op. cit., p. 42.

[30] I have dealt with the issue in my book on Leon Battista Alberti's design philosophy, based on my doctoral thesis (Kaunis ja sopiva,[The Beautiful and the Suitable] Jyväskylä: 1998), pp. 235 ff.

is a good idea to keep this classification of our problems in mind and stop when the problem is becoming very wicked. There may be no definitive or correct solution to such a problem. We only have to make a choice.