the penalty of the law in force against witchcraft ... and ... the marriage, upon conviction, shall stand null and void.

The function of typography, as I understand it, is neither to further the power of witches nor to bolster the defences of those, like this unfortunate parliamentary, who live in terror of being tempted and deceived. The satisfactions of the craft come from elucidating, and perhaps even ennobling, the text, not from deluding the unwary reader by applying scents, paints and iron stays to empty prose. But humble texts, such as classified ads or the telephone directory, may profit as much as anything else from a good typographical bath and a change of clothes. And many a book, like many a warrior or dancer or priest of either sex, may look well with some paint on its face, or indeed with a bone in its nose.

1.1.2 Letters have a life and dignity of their own.

Letterforms that honor and elucidate what humans see and say deserve to be honored in their turn. Well-chosen words deserve well-chosen letters; these in their turn deserve to be set with affection, intelligence, knowledge and skill. Typography is a link, and it ought, as a matter of honor, courtesy and pure delight, to be as strong as the others in the chain.

Writing begins with the making of footprints, the leaving of signs. Like speaking, it is a perfectly natural act which humans have carried to complex extremes. The typographer's task has always been to add a somewhat unnatural edge, a protective shell of artificial order, to the power of the writing hand. The tools have altered over the centuries, and the exact degree of unnaturalness desired has varied from place to place and time to time, but the character of the essential transformation between manuscript and type has scarcely changed.

The original purpose of type was simply copying. The job of the typographer was to imitate the scribal hand in a form that permitted exact and fast replication. Dozens, then hundreds, then thousands of copies were printed in less time than a scribe would need to finish one. This excuse for setting texts in type has disappeared. In the age of photolithography, digital scanning and offset printing, it is as easy to print directly from handwritten copy as from text that is typographically composed. Yet the typographer's task is little changed. It is still to give the illusion of superhuman speed and stamina — and of superhuman patience and precision — to the writing hand.

Typography is just that: idealized writing. Writers themselves now rarely have the calligraphic skill of earlier scribes, but they evoke countless versions of ideal script by their varying voices and literary styles. To these blind and often invisible visions, the typographer must respond in visible terms.

In a badly designed book, the letters mill and stand like starving horses in a field. In a book designed by rote, they sit like stale bread and mutton on the page. In a well-made book, where designer, compositor, and printer have all done their jobs, no matter how many thousands of lines and pages, the letters are alive. They dance in their seats. Sometimes they rise and dance in the margins and aisles.

Simple as it may sound, the task of creative non-interference with letters is a rewarding and difficult calling. In ideal conditions, it is all that typographers are really asked to do — and it is enough.

1.1.3 There is a style beyond style.

Literary style, says Walter Benjamin, "is the power to move freely in the length and breadth of linguistic thinking without slipping into banality." Typography, in this large and intelligent sense of the word, does not mean any particular style — my style or your style, or Neoclassical or Baroque style — but the power to move freely through the whole domain of typography, and to function at every step in a way that is graceful and vital instead of banal. It means typography that can walk familiar ground without sliding into platitudes, typography that responds to new conditions with innovative solutions, and typography that does not vex the reader with its own originality in a self-conscious search for praise.

Typography is to literature as musical performance is to composition: an essential act of interpretation, full of endless opportunities for insight or obtuseness. Much typography is far removed from literature, for language has many uses, including packaging and propaganda. Like music, it can be used to manipulate behavior and emotions. But this is not where typographers, musicians or other human beings show us their finest side. Typography at its best is a slow performing art, worthy of the same informed appreciation that we sometimes give to mu-
sical performances, and capable of giving similar nourishment and pleasure in return.

The same alphabets and page designs can be used for a biography of Mohandas Gandhi and for a manual on the use and deployment of biological weapons. Writing can be used both for love letters and for hate mail, and love letters themselves can be used for manipulation and extortion as well as to bring delight to body and soul. Evidently there is nothing inherently noble and trustworthy in the written or printed word. Yet generations of men and women have turned to writing and printing to house and share their deepest hopes, perceptions, dreams and fears. It is to them, not to the extortionist — nor to the opportunist or the profiteer — that the typographer must answer.

1.2 Tactics

1.2.1 Read the text before designing it.

The typographer’s one essential task is to interpret and communicate the text. Its tone, its tempo, its logical structure, its physical size, all determine the possibilities of its typographic form.

The typographer is to the text as the theatrical director is to the script, or the musician to the score.

1.2.2 Discover the outer logic of the typography in the inner logic of the text.

A novel often purports to be a seamless river of words from beginning to end, or a series of unnamed scenes. Research papers, textbooks, cookbooks and other works of nonfiction rarely look so smooth. They are often layered with chapter heads, section heads, subheads, block quotations, footnotes, endnotes, lists and illustrative examples. Such features may be obscure in the manuscript, even if they are clear in the author’s mind. For the sake of the reader, each requires its own typographic identity and form. Every layer and level of the text must be consistent, distinct, yet (usually) harmonious in form.

The first task of the typographer is therefore to read and understand the text; the second task is to analyze and map it. Only then can typographic interpretation begin.

If the text has many layers or sections, it may need not only heads and subheads but running heads as well, reappearing on every page or two-page spread, to remind readers which intellectual neighborhood they happen to be visiting.

Novels seldom need such signposts, but they often require typographic markers of other kinds. Peter Matthiessen’s novel *Far Tortuga* (New York, 1975; designed by Kenneth Miyamoto) uses two sizes of type, three different margins, free-floating block paragraphs and other typographic devices to separate thought, speech and action. Ken Kesey’s novel *Sometimes a Great Notion* (New York, 1964) seems to flow like conventional prose, yet it shifts repeatedly in mid-sentence between roman and italic to distinguish what characters say to each other from what they say in silence to themselves.

In poetry and drama, a larger typographic palette is sometimes required. Some of Douglas Parker’s translations from classical Greek and Dennis Tedlock’s translations from Zuni use roman, italic, bold, small caps and full caps in various sizes to emulate the dynamic markings of music. Robert Massin’s typographic performances of Eugène Ionesco’s plays use intersecting lines of type, stretched and melted letters, inkblots, pictograms, and a separate typeface for each character. In the works of other artists such as Guillaume Apollinaire and Guy Davenport, boundaries between author and designer sometimes vanish. Writing merges with typography, and the text becomes its own illustration.

The typographer must analyze and reveal the inner order of the text, as a musician must reveal the inner order of the music he performs. But the reader, like the listener, should in retrospect be able to close her eyes and see what lies inside the words she has been reading. The typographic performance must reveal, not replace, the inner composition. Typographers, like other artists and craftsmen — musicians, composers and authors as well — must as a rule do their work and disappear.

1.2.3 Make the visible relationship between the text and other elements (photographs, captions, tables, diagrams, notes) a reflection of their real relationship.

If the text is tied to other elements, where do they belong? If there are notes, do they go at the side of the page, the foot of the page, the end of the chapter, the end of the book? If there are photographs or other illustrations, should they be embedded in the text or should they form a special section of their own? And
if the photographs have captions or credits or labels, should these sit close beside the photographs or should they be separately housed?

If there is more than one text — as in countless publications issued in Canada, Switzerland, Belgium and other multilingual countries — how will the separate but equal texts be arrayed? Will they run side by side to emphasize their equality (and perhaps to share in a single set of illustrations), or will they be printed back-to-back, to emphasize their distinctness?

No matter what their relation to the text, photos or maps must sometimes be grouped apart from it because they require a separate paper or different inks. If this is the case, what typographic cross-references will be required?

These and similar questions, which confront the working typographer on a daily basis, must be answered case by case. The typographic page is a map of the mind; it is frequently also a map of the social order from which it comes. And for better or for worse, minds and social orders change.

1.2.4 Choose a typeface or a group of faces that will honor and elucidate the character of the text.

This is the beginning, middle and end of the practice of typography: choose and use the type with sensitivity and intelligence. Aspects of this principle are explored throughout this book and considered in detail in chapters 6, 7 and 10.

Letterforms have tone, timbre, character, just as words and sentences do. The moment a text and a typeface are chosen, two streams of thought, two rhetorical systems, two sets of habits, or if you like, two personalities, intersect. They need not live together contentedly forever, but they must not as a rule collide.

The root metaphor of typesetting is that the alphabet (or in Chinese, the entire lexicon) is a system of interchangeable parts. The word form can be surgically revised, instead of rewritten, to become the word farm or firm or fort or fork or from, or with a little more trouble, to become the word pineapple. The old compositor's typecase is a partitioned wooden tray holding hundreds of such interchangeable bits of information. These sub-semantic particles, these bits — called sorts by letterpress printers — are letters cast on standardized bodies of metal, waiting to be assembled into meaningful combinations, then dispersed and reassembled in a different form. The compositor's typecase is one of the primary ancestors of the computer — and it is no surprise that while typesetting was one of the last crafts to be mechanized, it was one of the first to be computerized.

But the bits of information handled by typographers differ in one essential respect from the computer programmer's bits. Whether the type is set in hard metal by hand, or in softer metal by machine, or in digital form on paper or film, every comma, every parenthesis, every e, and in context, every empty space, has style as well as bald symbolic value. Letters are microscopic works of art as well as useful symbols. They mean what they are as well as what they say.

Typography is the art and craft of handling these doubly meaningful bits of information. A good typographer handles them in intelligent, coherent, sensitive ways. When the type is poorly chosen, what the words say linguistically and what the letters imply visually are disharmonious, dishonest, out of tune.

1.2.5 Shape the page and frame the textblock so that it honors and reveals every element, every relationship between elements, and every logical nuance of the text.

Selecting the shape of the page and placing the type upon it is much like framing and hanging a painting. A cubist painting in an eighteenth-century gilded frame, or a seventeenth-century still-life in a slim chrome box, will look no sillier than a nineteenth-century text from England set in types that come from seventeenth-century France, asymmetrically positioned on a German Modernist page.

If the text is long or the space is short, or if the elements are many, multiple columns may be required. If illustrations and text march side by side, does one take precedence over the other? And does the order or degree of prominence change? Does the text suggest perpetual symmetry, perpetual asymmetry, or something in between?

Again, does the text suggest the continuous unruftled flow of justified prose, or the continued flirtation with order and chaos evoked by flush-left ragged-right composition? (The running heads and sidenotes on the odd-numbered pages of this book are set flush left, ragged right. On the even numbered pages, they are ragged left. Leftward-reading alphabets, like Arabic and Hebrew, are perfectly at home in ragged-left text, but with rightward-reading alphabets like Latin, Greek or Thai,
ragged-left setting emphasizes the end, not the beginning, of the line. This makes it a poor choice for extended composition.

Shaping the page goes hand in hand with choosing the type, and both are permanent typographical preoccupations. The subject of page shapes and proportions is addressed in greater detail in chapter 8.

Tactics

1.2.6 Give full typographic attention even to incidental details.

Some of what a typographer must set, like some of what any musician must play, is simply passage work. Even an edition of Plato or Shakespeare will contain a certain amount of routine text: page numbers, scene numbers, textual notes, the copyright claim, the publisher’s name and address, and the hyperbole on the jacket, not to mention the passage work or background writing that is implicit in the text itself. But just as a good musician can make a heart-wrenching ballad from a few banal words and a trivial tune, so the typographer can make poignant and lovely typography from bibliographical paraphernalia and textual chaff. The ability to do so rests on respect for the text as a whole, and on respect for the letters themselves.

Perhaps the principle should read: Give full typographic attention especially to incidental details.

1.3 Summary

There are always exceptions, always excuses for stunts and surprises. But perhaps we can agree that, as a rule, typography should perform these services for the reader:

• invite the reader into the text;
• reveal the tenor and meaning of the text;
• clarify the structure and the order of the text;
• link the text with other existing elements;
• induce a state of energetic repose, which is the ideal condition for reading.

While serving the reader in this way, typography, like a musical performance or a theatrical production, should serve two other ends. It should honor the text for its own sake — always assuming that the text is worth a typographer’s trouble — and it should honor and contribute to its own tradition: that of typography itself.

RHYTHM & PROPORTION

2.1 Horizontal Motion

An ancient metaphor: thought is a thread, and the raconteur is a spinner of yarns — but the true storyteller, the poet, is a weaver. The scribes made this old and audible abstraction into a new and visible fact. After long practice, their work took on such an even, flexible texture that they called the written page a textus, which means cloth.

The typesetting device, whether it happens to be a computer or a composing stick, functions like a loom. And the typographer, like the scribe, normally aims to weave the text as evenly as possible. Good letterforms are designed to give a lively, even texture, but careless spacing of letters, lines and words can tear this fabric apart.

Another ancient metaphor: the density of texture in a written or typeset page is called its color. This has nothing to do with red or green ink; it refers only to the darkness or blackness of the letterforms in mass. Once the demands of legibility and logical order are satisfied, evenness of color is the typographer’s normal aim. And color depends on four things: the design of the type, the spacing between the letters, the spacing between the words, and the spacing between the lines. None is independent of the others.

2.1.1 Define the word space to suit the size and natural letterfit of the font.

Type is normally measured in picas and points (explained in detail on pages 294–295), but horizontal spacing is measured in ems, and the em is a sliding measure. One em is a distance equal to the type size. In 6 point type, an em is 6 points; in 12 pt type it is 12 points, and in 60 pt type it is 60 points. Thus a one-em space is proportionately the same in any size.

12 pt em 18 pt em 24 pt em 36 pt em
Typesetting machines generally divide the em into units. Ems of 18, 36 or 54 units, for example, are commonly found in the older machines. In newer devices, the em may be a thousand units. Typographers are more likely to divide the em into simple fractions: half an em, a third of an em, and so on, knowing that the unit value of these fractions will vary from one machine to the next. Half an em is called an *en*.

If text is set ragged right, the *word space* (the space between words) can be fixed and unchanging. If the text is justified (set flush left and right, like the text in this book), the word space must be elastic. In either case, the size of the ideal word space varies from one circumstance to another, depending on factors such as letterfit, type color, and size. A loosely fitted or bold face will need a larger interval between the words. At larger sizes, when letterfit is tightened, the spacing of words can be tightened as well. For a normal text face in a normal text size, a typical value for the word space is a quarter of an em, which can be written $m/4$. (A quarter of an em is typically about the same as, or slightly more than, the set-width of the letter t.)

Language has some effect on the word space as well. In highly inflected languages, such as Latin, most word boundaries are marked by grammatical tags, and a smaller space is therefore sufficient. In English and other uninflected languages, good word spacing makes the difference between a line that has to be deciphered and a line that can be efficiently read.

If the text is justified, a reasonable *minimum* word space is a fifth of an em ($m/5$), and $m/4$ is a good average to aim for. A reasonable maximum in justified text is $m/2$. If it can be held to $m/3$, so much the better. But for loosely fitted faces, or text set in a small size, $m/3$ is often a better average to aim for, and a better minimum is $m/4$. In a line of widely lettered capitals, a word space of $m/2$ or more may be required.

2.1.2 *Choose a comfortable measure.*

Anything from 45 to 75 characters is widely regarded as a satisfactory length of line for a single-column page set in a serifed text face in a text size. The 66-character line (counting both letters and spaces) is widely regarded as ideal. For multiple-column work, a better average is 40 to 50 characters.

If the type is well set and printed, lines of 85 or 90 characters will pose no problem in discontinuous texts, such as bibliographies, or, with generous leading, in footnotes. But even with generous leading, a line that averages more than 75 or 80 characters is likely to be too long for continuous reading.

A reasonable working minimum for justified text in English is the 40-character line. Shorter lines may compose perfectly well with sufficient luck and patience, but in the long run, justified lines averaging less than 38 or 40 characters will lead to white acne or pig bristles: a rash of erratic and splotty word spaces or an epidemic of hyphenation. When the line is short, the text should be set ragged right. In large doses, even ragged-right composition may look anorexic if the line falls below 30 characters, but in small and isolated patches — ragged marginal notes, for example — the minimum line (if the language is English) can be as little as 12 or 15 characters.

These line lengths are in every case averages, and they include empty spaces and punctuation as well as letters. The simplest way of computing them is with a copyfitting table like the one on page 29. Measure the length of the basic lowercase alphabet — abcdefghijklmnopqrstuvwxyz — in any face and size you are considering, and the table will tell you the average number of characters to expect on a given line. In most text faces, the 10 pt roman alphabet will run between 120 and 140 points in length, but a 10 pt italic alphabet might be 100 points long or even less, while a 10 pt bold might run to 160. The 12 pt alphabet is, of course, about 1.2 times the length of the 10 pt alphabet — but not exactly so unless it is generated from the same master design and the letterfit is unchanged.

On a conventional book page, the measure, or length of line, is usually around 30 times the size of the type, but lines as little as 20 or as much as 40 times the type size fall within the acceptable range. If, for example, the type size is 10 pt, the measure might be around $30 \times 10 = 300$ pt, which is $300/12 = 25$ picas. A typical lowercase alphabet length for a 10 pt text font is 128 pt, and the copyfitting table tells us that such a font set to a 25-pica measure will yield roughly 65 characters per line.

2.1.3 *Set ragged if ragged setting suits the text and the page.*

In justified text, there is always a trade-off between evenness of word spacing and frequency of hyphenation. The best available compromise will depend on the nature of the text as well as on the specifics of the design. Good compositors like to avoid con-
Victorian habit. As a general rule, no more than a single space is required after a period, a colon or any other mark of punctuation. Larger spaces (e.g., en spaces) are themselves punctuation. The rule is usually altered, however, when setting classical Latin and Greek, romanized Sanskrit, phonetics or other kinds of texts in which sentences begin with lowercase letters. In the absence of a capital, a full en space (\( \text{m/2} \)) between sentences will generally be welcome.

2.1.5 Add little or no space within strings of initials.

Names such as W.B. Yeats and J.C.L. Prillwitz need hair spaces, thin spaces or no spaces at all after the intermediary periods. A normal word space follows the last period in the string.

2.1.6 Letterspace all strings of capitals and small caps, and all long strings of digits.

Acronyms such as \( \text{cia} \) and \( \text{plo} \) are frequent in some texts. So are abbreviations such as \( \text{ce} \) and \( \text{bce} \) of \( \text{ad} \) and \( \text{bc} \). The normal value for letterspacing these sequences of small or full caps is 5% to 10% of the type size.

With digital fonts, it is a simple matter to assign extra width to all small capitals, so that letterspacing occurs automatically. The width values of full caps are normally based on the assumption that they will be used in conjunction with the lower case, but letterspacing can still be automated through the use of kerning tables (see pages 33–34).

In titles and headings, extra letterspacing is often desirable. Justified lines of letterspaced capitals are generally set by inserting a normal word space (\( \text{m/5} \) to \( \text{m/4} \)) between letters. This corresponds to letterspacing of 20% to 25% of the type size. But the extra space between letters will also require more space between lines. A Renaissance typographer setting a multi-line head in letterspaced text-size capitals would normally set blanks between the lines: the hand compositor’s equivalent of the keyboard operator’s extra hard return, or double spacing.

There is no generalized optimum value for letterspacing capitals in titles or display lines. The effective letterspacing of caps in good classical inscriptions and later manuscripts ranges from 5% to 100% of the nominal type size. The quantity of space is far less important than its balance. Sequences like \( \text{la} \) or \( \text{ava} \) may need no extra space at all, while sequences like \( \text{nn} \) and \( \text{h1lh} \) beg to be printed open.

\[
\begin{array}{c}
\text{WAVADOPATTIMMLTL} \\
\text{WAVADOPATTIMMLTL}
\end{array}
\]

Letterspaced caps, above; kerned but unletterspaced, below.

Many typographers like to letterspace all strings of numbers as well. Spacing is essential for rapid reading of long, fundamentally meaningless strings, such as serial numbers, and it is helpful even for shorter strings such as phone numbers and dates. Numbers set in very short strings – triplets or pairs – need not be letterspaced. This is the rationale behind the long-standing European habit of setting phone numbers in the form 00 00 00 instead of 000-0000.

2.1.7 Don’t letterspace the lower case without a reason.

A man who would letterspace lower case would steal sheep, Frederic Goudy liked to say. If this wisdom needs updating, it is chiefly to add that a woman who would letterspace lower case would steal sheep as well.

Nevertheless, like every rule, this one extends only as far as its rationale. The reason for not letterspacing lower case is that it hampers legibility. But there are some lowercase alphabets to which this principle doesn’t apply.

Headings set in exaggeratedly letterspaced, condensed, unserifed capitals are now a hallmark, if not a cliché, of postmodern typography. In this context, secondary display can be set perfectly well in more modestly letterspaced, condensed, unserifed lower case. Moderate letterspacing can make a face such as lowercase Univers bold condensed more legible rather than less. Inessential ligatures are, of course, omitted from letterspaced text.

\[
\text{wharves and wharfingers}
\]

Lowercase Univers bold condensed, letterspaced 10%.

It would be possible, in fact, to make a detailed chart of lowercase letterforms, plotting their inherent resistance to lett-
terspacing. Near the top of the list (most unsuitable for letterspacing) would be Renaissance italics, such as Arrighi, whose structure strongly implies an actual linkage between one letter and the next. A little farther along would be Renaissance romans. Still farther along, we would find faces like Syntax, which echo the forms of Renaissance roman but lack the serifs. Around the middle of the list, we would find other unserifed faces, such as Helvetica, in which nothing more than wishful thinking bonds the letters to each other. Bold condensed sanserifs would appear at the bottom of the list. Letterspacing will always sabotage a Renaissance roman or italic. But when we come to the other extreme, the faces with no calligraphic flow, letterspacing of lowercase letters can sometimes be of genuine benefit.

Because it isolates the individual elements, letterspacing has a role to play wherever words have ceased to matter and letters are what count. Where letters function one by one, like numbers – as in acronyms, web-site and e-mail addresses – letterspacing is likely to help, no matter whether the letters are caps, small caps or lower case.

Outside the domain of roman and italic type, the letterspacing of text has other traditional functions. Blackletter faces have, as a rule, no companion italic or bold, and no small caps. The simplest methods of emphasis available are underlining and letterspacing. The former was the usual method of the scribes, but letterspacing is easier for letterpress printers. In digital typography, however, underlining is just as easy as letterspacing and sometimes does less damage to the page.

In Cyrillic, the normal lower case is full of forms resembling small caps, and a separate small cap font is therefore out of the question. A Russian typographer calls for разрядка (letterspacing) in Cyrillic where small caps would be used in the Latin alphabet. But a true cursive (курсивный) Cyrillic, like a true italic, should rarely or never be letterspaced.

2.1.8 Kern consistently and modestly or not at all.

Inconsistencies in letterfit are inescapable, given the forms of the Latin alphabet, and small irregularities are after all essential to the legibility of roman type. Kerning – altering the space between selected pairs of letters – can increase consistency of spacing in a word like Washington or Toronto, where the combinations Ww and Tt are kerned. But names like Wisconsin, Tübingen, Tbilisi and Los Alamos, as well as common words like The and This, remain more or less immune to alteration.

Hand compositors rarely kern text sizes, because their kerning pairs must be manually fitted, one at a time. Computerized typesetting makes extensive kerning easy, but judgment is still required, and the computer does not make good judgment any easier to come by. Too little kerning is preferable to too much, and inconsistent kerning is worse than none.

In digital type, as in foundry type, each letter has a standard width of its own. But computerized typesetting systems can modify these widths in many ways. Digital fonts are generally kerned through the use of k kerning tables, which can specify a reduction or increase in spacing for every possible pair of letters, numbers or symbols. By this means, space can be automatically added to combinations like HH and removed from combinations like Ty. Prefabricated kerning tables are now routine components of well-made digital fonts, but they still sometimes require extensive editing to suit individual styles and requirements. If you use an automatic kerning program, test it thoroughly before trusting its decisions, and take the time to repair its inevitable shortcomings.

Kerning tables generally subtract space from combinations such as Aw, Aw, Ay, 'A, A, 'I, and all combinations in which the first element is T, V, W or Y and the second element is a, c, d, e, g, m, n, o, p, q, r, s, u, v, w, x, y or z. Not all of these combinations occur in English, but any kerning system should accommodate names like Tchaikovsky, Tinolos, Tsimshian and Ysaÿe.

The table also normally adds space to sequences like f, F, f, F, P, p, f, F, J, J and J. In some italics, space must also be added to gg and gy. If your text includes them, other sequences – gg, gs, af, aj, for instance – may need attention as well.

Especially at larger sizes, it is common to kern combinations involving commas and periods, such as r, /, t, /, v, /, w, /, w, /, y, /, y. But use care in kerning combinations such as F, /, P, /, T, /, V. Capitals need their space, and some combinations are easy to misread. P.F. Didot may be misread as R E Didot if too enthusiastically kerned.

Numbers are often omitted from kerning tables, but numbers frequently need kerning more than anything else. The digit one is usually thinner in form than the other numbers, but it is often assigned the same set-width, so columns of typeset figures will align. Many fonts include an alternative version of the digit
one (the so-called 'fitted one') with a narrower set-width, intended for use in text. Other combinations of digits often need more subtle adjustment, and all digits need careful kerning in relation to the en dash.

1640–1842

un kerned numerals, left, and kerned numerals, right

Whatever kerning you do, make sure it does not result in collisions with floating accents. Wolf can be kerned more than Wölflin in many faces, and Tennyson more than Tête-à-tête. Also beware the composite effect of sequential kerns. The apostrophes in L'Hôtel and D'Artagnan can be brought up fairly close, but in L'Anse aux Meadows, two close kerns in a row will produce a collision.

A kerning table written for one language will need subtle alteration before it can do justice to another. In English, for example, it is normal to kern the combinations ‘d’ in ‘r’ ’s’ ‘t’, which appear in common contractions. In French, ‘a ‘e ‘è ‘é ‘è ‘é ‘é’ are kerned instead, because these appear in elisions. In Czech, it is best to kern the combinations ‘d’ and ‘i’, which are used as separate letters distinct from d and t. For Spanish, one kerns the combinations ‘c’ and ‘ç’. For German, a fastidious typographer will take space out of the combinations ‘t’, ‘v’, ‘w’, ‘w’ and frequently add it to ‘j’ and ‘j’.

The letter ‘c’ is not a full-fledged member of the German alphabet, and in former times it was always restricted, in German to the ligatures ‘ch’ and ‘ck’. English-speaking readers often find these combinations kerned too close for comfort in German-made fonts – or they find the right side-bearing of the ‘c’ too close-cut to begin with. In fonts from the Netherlands, unusually tight kerning is common in the sequence ‘ij’ instead.

Binomial kerning tables are powerful and useful typographic tools, but they eliminate neither the need nor the pleasure of making final adjustments by hand. Names like T.V.R. Murti and T.R.V. Murti, for example, pose microscopic typographic problems that no binomial kerning table can solve. Fonts with polynomial kerning capabilities – the ability to kern a given pair of letters in different ways according to context – now exist, and these are discussed in §9.2.3.

2.1.9 Don’t alter the widths or shapes of letters without cause.

Type design is an art practiced by few and mastered by fewer – but font-editing software makes it possible for anyone to alter in a moment the widths and shapes of letters to which an artist may have devoted decades of study, years of inspiration and a rare concentration of skill. The power to destroy such a type designer’s work should be used with caution. And arbitrarily condensing or expanding letterforms is the poorest of all methods for fitting uneditable copy into unalterable space.

In many fonts, the exclamation mark, question mark, semicolon and colon need a wider left sidebearing than manufacturers have given them, but the width of any character should be altered for one purpose only: to improve the set of the type.

Typographic letters are made legible not only by their forms and by the color of the ink that prints them but also by the sculpted empty space between and around them. When type is cast and set by hand, that space is physically defined by blocks of metal. When the type is reduced to a face, photographically or digitally stored, the letter still has a room of its own, defined by its stated body height and width. But in the world of digital type, it is very easy for a designer or compositor with no regard for letters to squish them into cattle trains and ship them to the slaughter.

letterfit

When letters are maltreated in this way, their reserve of legibility is sapped. They can do little in their turn except shortchange and brutalize the reader.

2.1.10 Don’t stretch the space until it breaks.

Lists, such as contents pages and recipes, are opportunities to build architectural structures in which the space between the elements both separates and binds. The two favorite ways of destroying such an opportunity are setting great chasms of space that the eye cannot leap without help from the hand, and setting unenlightening rows of dots (dot leaders, they are called) that force the eye to walk the width of the page like a prisoner being escorted back to its cell.

The following examples show two among many ways of
2.2 VERTICAL MOTION

2.2.1 Choose a basic leading that suits the typeface, text and measure.

Time is divisible into any number of increments. So is space. But for working purposes, time in music is divided into a few proportional intervals: halves, quarters, eighths, sixteenths and so on. And time in most music is measured. Add a quarter note to a bar whose time is already accounted for and, somewhere nearby, the equivalent of that quarter note must come out. Phrasing and rhythm can move in and out of phase – as they do in the singing of Billie Holiday and the trumpet solos of Miles Davis – but the force of blues phrasing and syncopation vanishes if the beat is actually lost.

Space in typography is like time in music. It is infinitely divisible, but a few proportional intervals can be much more useful than a limitless choice of arbitrary quantities.

The metering of horizontal space is accomplished almost unconsciously in typography. You choose and prepare a font, and you choose a measure (the width of the column). When you set the type, the measure fills with the varied rhythm of repeating letter shapes, which are music to the eye.

Vertical space is metered in a different way. You must choose not only the overall measure – the depth of the column or page – but also a basic rhythmical unit. This unit is the leading, which is the distance from one baseline to the next.

Eleven-point type set solid is described as 11/11. The theoretical face of the type is 11 points high (from the top of d to the bottom of p, if the type is full on the body), and the distance from the baseline of line one to the baseline of line two is also 11 points. Add two points of lead (interlinear space), and the type is set 11/13. The type size has not changed, but the distance from baseline to baseline has increased to 13 points, and the type has more room to breathe.

The text of the book you are reading, to take an example, is set 10/12 x 21. This means that the type size is 10 pt, the added lead is 2 pt, giving a total leading of 12 pt, and the line length is 21 picas.

A short burst of advertising copy or a title might be set with negative leading (18/15, for example), so long as the ascenders and descenders don’t collide:

this is an example of negative leading

Continuous text is very rarely set with negative leading; and only a few text faces read well when set solid. Most text requires positive leading. Settings such as 9/11, 10/12, 11/13 and 12/15 are routine. Longer measures need more lead than short ones. Dark faces need more lead than light ones. Large-bodied faces need more lead than smaller-bodied ones. Faces like Bauer Bodoni, with substantial color and a rigid vertical axis, need much more lead than faces like Bembo, whose color is light and whose axis is based on the writing hand. And unserifed faces often need more lead (or a shorter line) than their serifed counterparts.

Extra leading is also generally welcome where the text is thickened by superscripts, subscripts, mathematical expressions, or the frequent use of full capitals. A text in German would ideally have a little more lead than the same text in Latin or French, purely because of the increased frequency of capitals.

2.2.2 Add and delete vertical space in measured intervals.

For the same reason that the tempo must not change arbitrarily in music, leading must not change arbitrarily in type.

Pages and columns are set most often to uniform depth, but ragged depths are better in some situations. A collection of
style. The typographer must articulate them enough to make them clear, yet not so strongly that the form instead of the content steals the show. If the units of thought, or the boundaries between thoughts, look more important than the thoughts themselves, the typographer has failed.

Ornaments can be placed in the paragraph indents, but few texts actually profit from ornamentation. Paragraphs can also be marked, as this one is, by drop lines, but dotpilcrown paragraphs grow tiresome in long texts. They also increase the labor of revisions and corrections. Pilcrows, boxes and bullets can be used to mark the breaks in a stream of continuous text, sometimes with excellent results. This format is more economical of space than conventional indented paragraphs, but again, extra labor and expense may arise with emendations and corrections. Outdentled paragraphs and indented paragraphs are the two most obvious possibilities that remain. And outdentled paragraphs bring with them other possibilities, such as the use of enlarged marginal letters.

All these variants, and others, have their uses, but the plainest, most unmistakable yet unobtrusive way of marking paragraphs is the simple indent: a white square.

How much indent is enough? The most common paragraph indent is one em. Another standard value is one lead. If your text is set 11/13, the indent would then be either 11 pt (one em) or 13 pt (one lead). One em (half an em) is the practical minimum.

Where the line is long and margins are ample, an indent of 1½ or 2 ems may look more luxurious than one em, but paragraph indents larger than three ems are generally counterproductive. Short last lines followed by new lines with large indents produce a tattered page.

Block paragraphs open flush left and are separated vertically from their neighbors by extra lead, usually a white line. Block paragraphs are common in business letters and memos, and because they suggest precision, crispness and speed, they can be useful in short documents of other kinds. In longer sequences, they may seem soulless and uninviting.

2.3.3 Add extra lead before and after block quotations.

Block quotations can be distinguished from the main text in many ways. For instance: by a change in face (usually from roman to italic), by a change in size (as from 11 pt down to 10 pt or 9 pt), or by indentation.

Combinations of these methods are often used, but one device is enough. If your paragraph indent is modest, you may for consistency's sake want to use the same indent for quotations. And even if your block quotations are set in a size smaller than normal text, you may want to leave the leading unchanged. If the main text runs 10/12, the block quotations might run 10/12 italic or 9/12 roman. If you prefer greater density or are eager to save space, you might set them 9/11 or 9/10 ½.

However the block quotations are set, there must be a visible distinction between main text and quotation, and again between the quotation and subsequent text. This usually means a white line or half-line at the beginning and end of the block. But if the leading within the block quotation differs from the leading of the main text, these blanks before and after the quotation must be elastic. They afford the only opportunity for bringing the text back into phase.

Suppose your main text is 11/13 and a five-line block quotation set 10/12 intervenes. The depth of the quotation is 5 × 12 = 60. This must be bulked up to a multiple of 13 to bring the text back into phase. The nearest multiple of 13 is 5 × 13 = 65. The remaining space is 65 – 60 = 5, and 5/2 = 2-½, which is not enough. Adding 2-½ points before and after the quotation will not give adequate separation. The next multiple of 13 is 6 × 13 = 78, which is better: 78 – 60 = 18, and 18/2 = 9. Add 9 pt lead before and after the quotation, and the text will realign.

2.3.4 Indent or center verse quotations.

Verse is usually set flush left and ragged right, and verse quotations within prose should not be deprived of their chosen form. But to distinguish verse quotations from surrounding prose, they should be indented or centered on the longest line. Centering is preferable when the prose measure is substantially longer than the verse line. The following passage, for example, is centered on the first and longest line.

God guard me from those thoughts men think
In the mind alone;
He that sings a lasting song
Thinks in a narrow bone.

William Butler Yeats, "A Prayer for Old Age."
Suppose your main text is set on a 2.4-pica measure and you have decided to set verse quotations in italic at the text size. Suppose that the longest line in your quotation measures 269 points. The indent for this quotation might be computed as follows: 24 × 12 = 288 pt, which is the full prose measure, and 288 – 269 = 19 pt, which is the difference between the measure and the longest verse line. The theoretically perfect left indent for the verse quotation is 19/2 = 9.5 pt. But if another indent close to 9.5 pt is already in use, either for block quotations in prose, or as a paragraph indent, then the verse quotation might just as well be indented to match.

Suppose however that the longest line in the verse is 128 points. The measure, again, is 288 points, and 288 – 128 = 160. Half of 160 is 80 points. No other indent in the vicinity of 80 points is likely to be in use. The verse quotation would then be indented by precisely that amount.

2.4 ETIQUETTE OF HYPHENATION & PAGINATION

The rules listed below are traditional craft practice for the setting of justified text. Except for the last rule, they are all programmable, but the operation of these rules necessarily affects the spacing of words and thus the texture and color of the page. If decisions are left to the software, they should be checked by a trained eye — and no typesetting software should be permitted to compress, expand or leterspace the text automatically and arbitrarily as a means of fitting the copy. Copyfitting problems should be solved by creative design, not fobbed off on the reader and the text nor cast like pearls before machines.

2.4.1 At hyphenated line-ends, leave at least two characters behind and take at least three forward.

Finally is conventionally acceptable line-end hyphenation, but finally is not, because it takes too little of the word ahead to the next line.

2.4.2 Avoid leaving the stub-end of a hyphenated word, or any word shorter than four letters, as the last line of a paragraph.

2.4.3 Avoid more than three consecutive hyphenated lines.

2.4.4 Hyphenate proper names only as a last resort unless they occur with the frequency of common nouns.

2.4.5 Hyphenate according to the conventions of the language.

In English one hyphenates cab-ri-o-let but in French ca-brio-let. In German, when Glockenspiel is broken before the k it is re-spelled Glock-enspiel, and when ösze is broken in Hungarian, it changes into ösz-ze. In Spanish the double consonants ll and rr are indivisible. (Thus the only possible hyphenations in the phrase arraz con pollo are a-ra-zo con po-illo — and a-ra-zo is unacceptable because it leaves too little behind.) The conventions of the individual language should, ideally, be followed even for single foreign words or brief quotations.

2.4.6 Link short numerical and mathematical expressions with hard spaces.

All you may see on the keyboard is a space bar, but typographers use several invisible characters: the word space, fixed spaces of various sizes (em space, en space, thin space, figure space, etc) and a hard space or no-break space. The hard space will stretch, like a normal word space, when the line is justified, but it will not convert to a linebreak. Hard spaces are useful for preventing line-breaks within phrases such as 6.2 mm, 3 in., 4 × 4, or in phrases like page 3 and chapter 5.

When it is necessary to break longer algebraic or numerical expressions, such as a + b = c, the break should come at the equal sign or another clear logical pause.

2.4.7 Avoid beginning more than two consecutive lines with the same word.

2.4.8 Never begin a page with the last line of a multi-line paragraph.

The typographic terminology is telling. Isolated lines created when paragraphs begin on the last line of a page are known as orphans. They have no past, but they do have a future, and they need not trouble the typographer. The stub-ends left when paragraphs end on the first line of a page are called widows. They
3.5 CONTRAST

3.5.1 Change one parameter at a time.

When your text is set in a 12 pt medium roman, it should not be necessary to set the heads or titles in 24 pt bold italic capitals. If boldface appeals to you, begin by trying the bold weight of the text face, \textit{u8lc}, in the text size. As alternatives, try \textit{u8lc italic}, or lettered caps, or letterspaced full caps in the text weight and size. If you want a larger size, experiment first with a larger size of the text face, \textit{u8lc} in the text weight. For a balanced page, the weight should decrease slightly, not increase, as the size increases.

3.5.2 Don’t clutter the foreground.

When boldface is used to emphasize words, it is usually best to leave the punctuation in the background, which is to say, in the basic text font. It is the words, not the punctuation, that merit emphasis in a sequence such as the following:

... on the islands of Lombok, Bali, Flores, Timor and Sulawesi, the same textiles ...

But if the same names are emphasized by setting them in italic rather than bold, there is no advantage in leaving the punctuation in roman. With italic text, italic punctuation normally gives better letterform and thus looks less obtrusive:

... on the islands of Lombok, Bali, Flores, Timor and Sulawesi, the same textiles ...

If spaced small caps are used for emphasis — changing the stature and form of the letters instead of their weight or slope — and thereby minimizing the surface disturbance on the page, the question of punctuation does not arise. The punctuation used with small caps is (except for question and exclamation marks) the same as roman punctuation; it is only necessary to check it for accurate spacing:

... on the islands of Lombok, Bali, Flores, Timor and Sulawesi, the same textiles ...

4.1 OPENINGS

4.1.1 Make the title page a symbol of the dignity and presence of the text.

If the text has immense reserve and dignity, the title page should have these properties as well — and if the text is devoid of dignity, the title page should in honesty be the same.

Think of the blank page as alpine meadow, or as the purity of undifferentiated being. The typographer enters this space and must change it. The reader will enter it later, to see what the typographer has done. The underlying truth of the blank page must be infringed, but it must never altogether disappear — and whatever displaces it might well aim to be as lively and peaceful as it is. It is not enough, when building a title page, merely to unload some big, prefabricated letters into the center of the space, nor to dig a few holes in the silence with typographic heavy machinery and then move on. Big type, even huge type, can be beautiful and useful. But poise is usually far more important than size — and poise consists primarily of emptiness. Typographically, poise is made of white space. Many fine title pages consist of a modest line or two near the top, and a line or two near the bottom, with little or nothing more than taut, balanced white space in between.

4.1.2 Don’t permit the titles to oppress the text.

In books, spaced capitals of the text size and weight are often perfectly adequate for titles. At the other extreme, there is a fine magazine design by Bradbury Thompson, in which the title, the single word \textit{boom}, is set in gigantic bold condensed caps that fill the entire two-page spread. The text is set in a tall narrow column \textit{inside the stem} of the big B. The title has swallowed the text — yet the text has been reborn, alive and talkative, like Jonah from the whale.

Most unsuccessful attempts at titling fall between these two extremes, and their problem is often that the title throws its weight around, unbalancing and discoloring the page. If the
one another except public disagreement. None makes a good companion face for any of the others, because each of them is rooted in a different concept of what constitutes a letterform. If the available palette is limited to these faces, the first thing to do is choose one for the task at hand and ignore the other three.

### 6.3 HISTORICAL CONSIDERATIONS

Typography, like other arts, preys on its own past. It can do so with the callousness of a grave robber, or with the piety of unquestioning ancestor worship. It can also do so in thoughtful, enlightened and deeply creative ways.

Roman type has been with us for more than five centuries. Its root components – the roman upper and lower case, basic alphabetic symbols, and the arabic numerals – have been with us for much longer yet. There are typographers who resolutely avoid using any typeface designed in an earlier era, but even they must learn something of how the older letterforms functioned, because the ancient forms are living in the new. Typographers who willingly use the old faces, and who wish to use them intelligently, need to know all they can learn about the heritage they enjoy.

#### 6.3.1 Choose a face whose historical echoes and associations are in harmony with the text.

Any contemporary North American library will furnish examples of typographic anachronism. There are books on contemporary Italy and on seventeenth-century France set in typefaces such as Baskerville and Caslon, cut in eighteenth-century England. There are books about the Renaissance set in faces that belong to the Baroque, and books about the Baroque set in faces from the Renaissance. To a good typographer it is not enough merely to avoid these kinds of laughable contradictions. The typographer seeks to shed light on the text, to generate insight and energy, by setting every text in a face and form in which it actually belongs.

It is not that good typographers object to mixing centuries and cultures. Many take delight in doing so – especially when they have no other choice. A text from ancient Athens, for example, cannot be set in an ancient Athenian version of roman type. A face designed in North America in the 1990s may well be used instead. Texts from seventeenth-century France or eighteenth-century England also might be set perfectly well in faces of recent design. But a face that truly suits an historical text is likely to have some fairly clear historical content of its own. There is no typeface equally suited to texts from Greek antiquity, the French Baroque and the English Neoclassical period – though faces equally unsuited to each of them abound.

The historical affiliations of individual typefaces are discussed in chapters 7 and 10.

#### 6.3.2 Allow the face to speak in its natural idiom.

Books that leap historical boundaries and mix historical subjects can pose complex and exciting typographic problems. But often, if a text calls for a Renaissance type, it calls for Renaissance typography as well. This usually means Renaissance page proportions and margins, and an absence of bold face. It may also mean large Renaissance versals, Renaissance style in the handling of quotations, and the segregation of roman and italic. If the text calls for a Neoclassical type, it likewise often calls for Neoclassical page design. When you undertake to use an historical typeface, take the trouble to learn the typographic idiom for which it was intended. (Works of reference that may be useful in solving particular problems are listed in appendix 8, page 327.)

### 6.4 CULTURAL & PERSONAL CONSIDERATIONS

#### 6.4.1 Choose faces whose individual spirit and character is in keeping with the text.

Accidental associations are rarely a good basis for choosing a typeface. Books of poems by the twentieth-century Jewish American poet Marvin Bell, for example, have sometimes been set in Bell type – which is eighteenth-century, English and Presbyterian – solely because of the name. Puns of this kind are a private amusement for typographers. But a typographic page so well designed that it attains a life of its own must be based on something more than an inside joke.

Letterforms have character, spirit and personality. Typographers learn to discern these features through years of working first-hand with the forms, and through studying and comparing the work of other designers, present and past. On close in-
design. Nevertheless, some typefaces seem more redolent of national character than others. Frederic Goudy, for example, is widely regarded as the most ebulliently American of all American type designers. The sensitive typographer would not choose one of Goudy's faces to set, let us say, the text of the Canadian or Mexican constitution.

This subject is a lifelong study, and for serious typographers it is a lifelong source of discovery and delight. Here it is pursued at greater length in chapter 10. Appendix c (page 299) is a cross-indexed list of type designers.

6.5 THE MULTICULTURAL PAGE

Consistency is one of the forms of beauty. Contrast is another. A fine page, even a fine book, can be set from beginning to end in one type in one size. It can also teem with variety, like an equatorial forest or a modern city.

6.5.1 Start with a single typographic family.

Most pages, and most entire documents, can be set perfectly well with only one family of type. But perhaps the page confronting you requires a chapter title, two or three levels of subheads, an epigraph, a text in two languages, block quotations within the text, a couple of mathematical equations, a bar graph, several explanatory sidenotes, and captions for photographs and a map. An extended type family, such as Legacy, Lucida or Stone, may provide sufficient resources even for this task. Another possibility is Gerard Unger's comprehensive series known as Demos, Praxis and Flora – which is a family with no surname to unite it. Each of these series includes both roman and italic in a range of weights, matching serifed and unserifed forms, and other variations. If you restrict yourself to faces within the family, you can have variety and homogeneity at the same time: many shapes and sizes but a single typographic culture. Such an approach is well suited to some texts, poorly suited to others.

You can also, of course, mix faces at random, by drawing them out of a hat.

Between these two extremes is the wide arena of thoughtful mixing and matching, in which the typographic intelligence often does its most creative work and play.

6.5.2 Respect the integrity of roman, italic & small caps.

It has been the normal practice of type designers since the middle of the sixteenth century to offer text faces in the form of a matched triad, consisting of roman, italic and small caps. Because some of these marriages are more successful than others, it is wise to examine the roman and the italic both separately and together when choosing a text face.

There are several celebrated instances in which an italic designed by one artist has been happily and permanently married to another designer's roman. These matches always involve some redrawing (and the face that is most heavily redrawn is almost always the italic, which is the subsidiary and 'feminine' font in post-Renaissance typography). There are also instances in which a roman and its italic have been designed by the same artist many years apart. But casual liaisons, in which the roman of one family is paired momentarily with the italic of another, have little hope of success. Mixing small caps from one face with full caps from another is even less likely to succeed.

If you use type strictly in the Renaissance manner, treating the roman and italic as separate but equal, not mixing them on the line, you may find that greater latitude is possible. Jan van Krimpen's Lutetia italic mixes well with his later Romanée roman, for example, if the two are not too intimately combined. One is visibly more mature than the other, but they are close in color and structure, and they are patently the work of the same designer.

6.5.3 Consider bold faces on their own merits.

The original boldface printing types are the blackletters used by Gutenberg in the 1440s. For the next two centuries, blackletter fonts were widely used not only in Germany but in France, Spain, the Netherlands and England. (That is why blackletter fonts are occasionally sold in the U.S.A as 'Olde English'.)

Boldface romans, however, are a nineteenth-century invention. Bold italic is even more recent, and it is hard to find a successful version designed before 1950. Bold romans and italics have been added retroactively to many earlier faces, but they are often simply parodies of the original designs.

Before using a bold weight, especially a bold italic, ask your-
8.2 THE GOLDEN SECTION

The golden section is a symmetrical relation built from asymmetrical parts. Two numbers, shapes or elements embody the golden section when the smaller is to the larger as the larger is to the sum. That is, \( a : b = b : (a + b) \). In the language of algebra, this ratio is \( \phi = \frac{1}{\phi} = \frac{1}{(1 + \sqrt{5})/2} \), and in the language of trigonometry, it is \( \phi = \frac{1}{2 \sin 54^\circ} \). Its approximate value in decimal terms is \( \phi \approx 1.61803 \).

The second term of this ratio, \( \phi \) (the Greek letter \( \phi \)), is a number with several unusual properties. If you add one to \( \phi \), you get its square \( \phi \times \phi \). If you subtract one from \( \phi \), you get its reciprocal \( \frac{1}{\phi} \). And if you multiply \( \phi \) endlessly by itself, you get an infinite series embodying a single proportion. That proportion is \( \phi : 1 \). If we rewrite these facts in the typographic form mathematicians like to use, they look like this:

\[
\phi + 1 = \phi^2 \\
\phi - 1 = \frac{1}{\phi} \\
\phi^{-1} : 1 : \phi : \phi^2 = \phi^3 : \phi^4 : \phi^5 : \phi^6 : \phi^7 : \phi^8 : \ldots
\]

If we look for a numerical approximation to this ratio, \( 1 : \phi \), we will find it in something called the Fibonacci series, named for the thirteenth-century mathematician Leonardo Fibonacci. Though he died two centuries before Gutenberg, Fibonacci is important in the history of European typography as well as mathematics. He was born in Pisa but studied in North Africa. On his return, he introduced Arabic numerals to the North Italian scribes.

As a mathematician, Fibonacci took an interest in many problems, including the problem of unchecked propagation. What happens, he asked, if everything breeds and nothing dies? The answer is a logarithmic spiral of increase. Expressed as a series of integers, such a spiral takes the following form:

\[
0 \cdot 1 \cdot 1 \cdot 2 \cdot 3 \cdot 5 \cdot 8 \cdot 13 \cdot 21 \cdot 34 \cdot 55 \cdot 89 \cdot 144 \cdot 233 \cdot 377 \cdot 610 \cdot 987 \cdot 1597 \cdot 2584 \cdot 4181 \cdot 6765 \cdot 10,946 \cdot 17,711 \cdot 28,657 \ldots
\]

Here each term after the first two is the sum of the two preceding. And the farther we proceed along this series, the closer
8.3.2 Choose page proportions suited to the content, size and ambitions of the publication.

There is no one ideal proportion, but some are clearly more ponderous, others more brittle. In general, a book page, like a human being, should not peer down its nose, nor should it sag. The narrower page shapes require a soft or open spine so that the opened book lies flat, and at smaller sizes, narrower pages are suitable only for text that can be set to a narrow measure. At larger sizes, the narrow page is more adaptable.

For ordinary books, consisting of simple text in a modest size, typographers and readers both gravitate to proportions ranging from the light, agile 5 : 9 [1 : 1.8] to the heavier and more stolid 4 : 5 [1 : 1.25]. Pages wider than 1 : \sqrt{2} are useful primarily in books that need the extra width for maps, tables, side-notes or wide illustrations, and for books in which a multiple-column page is preferred.

When important illustrations are involved, these generally decide the shape of the page. Typically, one would choose a page somewhat deeper than the average illustration, both to leave extra blank space at the foot of the page, and to permit the insertion of captions. The \( e/n \) or turned hexagon page, 1 : 1.16, for example, which is slightly deeper than a perfect square, is useful for square artwork, such as photographs taken with a square-format camera. The \( n/e \) or broad hexagon page, 1 : 0.87, is useful for landscape photographs in the 4 \times 5 format, and the full cross octagon page, 1 : 0.83, for landscape photos in the wider format of 35 mm. (Uncropped 35 mm transparencies embody the proportion 2 : 3.)

8.3.3 Choose page and column proportions whose historical associations suit your intended design.

Early Egyptian scribes (when not writing vertically) tended to write a long line and a wide column. This long Egyptian line reappears in other contexts over the centuries — on Roman imperial writing tablets, in medieval European charters and deeds, and in many poorly designed twentieth-century works of academic prose. It is a sign, generally speaking, that the emphasis is on the writing instead of the reading, and that writing is seen as an instrument of power, not an instrument of freedom.
Early Hebrew scribes generally favored a narrower column, and early Greek scribes a column narrower still. But they, like the Egyptians, were making scrolls instead of bound books. It is difficult, therefore, to compare modern notions of the page directly with theirs. You can open a scroll as wide as you like, exposing one column, two columns, three. This flexible approach to the concept of the page survives to some extent in early codices (bound books). There are early books that are three times taller than wide, others that are close to square, and many shapes between.

In medieval Europe, most books, though certainly not all, settled down to proportions ranging from 1:1.5 to 1:1.25. Paper—once the mills were built in Europe—was commonly made in sheets whose proportions were 2:3 [1:1.5] or 3:4 [1:1.33]. These proportions, which correspond to the acoustically perfect musical intervals of fifth and fourth, also reproduce one another with each fold. If a sheet is 40 × 60 cm [2:3] to start with, it folds to 30 × 40 [3:4], which folds to 20 × 30, and so on. The 25 × 38 inch (roughly 2:3) and 20 × 26 inch (roughly 3:4) press sheets used in North America today are survivors of this medieval tradition.

The page proportion 1:√2, which is now the European standard, was also known to the medieval scribes. And the tall half octagon page, 1:1.3 (the shape enshrined now in North American letter paper) has a similar pedigree. The British Museum has a Roman wax-tablet book of precisely this proportion, dated about AD 300.

Renaissance typographers continued to produce books in the proportions 1:1.5. They also developed an enthusiasm for narrower proportions. The proportions 1:1.87 (tall hexagon), 1:1.7 (tall pentagon), 1:1.67 [3:5], and of course 1:1.62, the golden section, were used by typographers in Venice before the end of the fifteenth century. The narrower page was preferred especially for works in the arts and sciences. Wider pages, better able to carry a double column, were preferred for legal and ecclesiastical texts. (Even now, a Bible, a volume of court reports or a manual on mortgages or wills is likely to be on a wider page than a book of poems or a novel.)

Renaissance page proportions (generally in the range of 1:1.4 to 1:2) survived through the Baroque, but Neoclassical books are often wider, returning to the heavier Roman proportion of 1:1.3.

8.4 THE TEXTBLOCK

8.4.1 If the text is meant to invite continuous reading, set it in columns that are clearly taller than wide.

Horizontal motion predominates in alphabetic writing, and for beginners, it predominates in reading. But vertical motion predominates in reading for those who have really acquired the skill. The tall column of type is a symbol of fluency, a sign that the typographer does not expect the reader to have to puzzle out the words.

The very long and very narrow columns of newspapers and magazines, however, have come to suggest disposable prose and quick, unthoughtful reading. A little more width not only gives the text more presence; it implies that it might be worth savoring, quoting and reading again.

8.4.2 Shape the textblock so that it balances and contrasts with the shape of the overall page.

The proportions that are useful for the shapes of pages are equally useful in shaping the textblock. This is not to say that the proportions of the textblock and the page should be the same. They often were the same in medieval books. In the Renaissance, many typographers preferred a more polyphonic page, in which the proportions of page and textblock differ. But it is pointless for them to differ unless, like intervals in music, they differ to a clear and purposeful degree.

For all the beauty of pure geometry, a perfectly square block of type on a perfectly square page with even margins all around is a form unlikely to encourage reading. Reading, like walking, involves navigation, and the square block of type on a square block of paper is short of basic landmarks and clues. To give the reader a sense of direction, and the page a sense of liveliness and poise, it is necessary to break this inexorable sameness and find a new balance of another kind. Some space must be narrow so that other space may be wide, and some space emptied so that other space may be filled.

In the simple format shown overleaf, a page whose proportions are 1:1.62 (the golden section) carries a textblock whose proportions are 1:1.8 [5:9]. This difference constitutes a primary visual chord which generates both energy and harmony in
Stone Type Foundry, Palo Alto. A digital foundry established in 1991 by Sumner Stone. It issues faces designed by the proprietor.

Tetterode. See Amsterdam Foundry.

Typoart, Dresden. A metal foundry formed in the 1950s by nationalizing the existing operations of Schelter & Giesecke and Schriftguss. It is important also for its castings, during the twentieth century, of original designs by its artistic director, Albert Kapr. The surviving typographic material is now at WMD, Leipzig.

URW (Unternehmensberatung Karow Rubow Weber), Hamburg. Established as a software firm in 1971, URW was diverted into digital typography by Peter Karow, a physicist excited by typography, who joined it in 1972. It was the original developer of the Ikarus system (a predecessor of PostScript) for digitizing type. It issued a large number of historical revivals as well as original faces by Hermann Zapf, Gudrun Zapf-von Hesse, and others. The firm entered receivership in 1995. Its library has since been distributed by a corporate successor known as 'URW+.'


Johannes Wagner, Ingolstadt. A metal foundry established at Leipzig in 1902 by Ludwig Wagner and relocated to Ingolstadt in 1949 by his son Johannes. It has acquired matrices from Berthold, Johns, Weber and other foundries, and continues to cast type.

Weber Foundry, Stuttgart. A metal foundry that issued original faces by Georg Trump and others. In 1971 it was absorbed by the Wagner Foundry, Ingolstadt.


Y&Y, Concord, Mass. A digital foundry specializing in fonts and system software for the setting of mathematics and scientific texts. It has issued original designs by Charles Bigelow, Kris Holmes and Hermann Zapf.

APPENDIX E: RECAPITULATION

1.1.1 Typography exists to honor content.

1.1.2 Letters have a life and dignity of their own.

1.1.3 There is a style beyond style.

1.2.1 Read the text before designing it.

1.2.2 Discover the outer logic of the typography in the inner logic of the text.

1.2.3 Make the visible relationship between the text and other elements (photographs, captions, tables, diagrams, notes) a reflection of their real relationship.

1.2.4 Choose a typeface or a group of faces that will honor and elucidate the character of the text.

1.2.5 Shape the page and frame the textblock so that it honors and reveals every element, every relationship between elements, and every logical nuance of the text.

1.2.6 Give full typographic attention even to incidental details.

2.1.1 Define the word space to suit the size and natural letterfit of the font.

2.1.2 Choose a comfortable measure.

2.1.3 Set ragged if ragged setting suits the text and the page.

2.1.4 Use a single word space between sentences.

2.1.5 Add little or no space within strings of initials.

2.1.6 Letterspace all strings of capitals and small caps, and all long strings of digits.
2.1.7 Don’t letterspace the lower case without a reason.

2.1.8 Kern consistently and modestly or not at all.

2.1.9 Don’t alter the widths or shapes of letters without cause.

2.1.10 Don’t stretch the space until it breaks.

2.2.1 Choose a basic leading that suits the typeface, text and measure.

2.2.2 Add and delete vertical space in measured intervals.

2.2.3 Don’t suffocate the page.

2.3.1 Set opening paragraphs flush left.

2.3.2 In continuous text, mark all paragraphs after the first with an indent of at least one en.

2.3.3 Add extra lead before and after block quotations.

2.3.4 Indent or center verse quotations.

2.4.1 At hyphenated line-ends, leave at least two characters behind and take at least three forward.

2.4.2 Avoid leaving the stub-end of a hyphenated word, or any word shorter than four letters, as the last line of a paragraph.

2.4.3 Avoid more than three consecutive hyphenated lines.

2.4.4 Hyphenate proper names only as a last resort unless they occur with the frequency of common nouns.

2.4.5 Hyphenate according to the conventions of the language.

2.4.6 Link short numerical and mathematical expressions with hard spaces.

2.4.7 Avoid beginning more than two consecutive lines with the same word.

2.4.8 Never begin a page with the last line of a multi-line paragraph.

2.4.9 Balance facing pages by moving single lines.

2.4.10 Avoid hyphenated breaks where the text is interrupted.

2.4.11 Abandon any and all rules of hyphenation and pagination that fail to serve the needs of the text.

3.1.1 Don’t compose without a scale.

3.2.1 Use titling figures with full caps, and text figures in all other circumstances.

3.2.2 For abbreviations and acronyms in the midst of normal text, use spaced small caps.

3.2.3 Refer typographic disputes to the higher courts of speech and thinking.

3.3.1 Use the ligatures required by the font, and the characters required by the language, in which you are setting type.

3.3.2 If you wish to avoid ligatures altogether, restrict yourself to faces that don’t require them.

3.4.1 To the marriage of type and text, both parties bring their cultural presumptions, dreams and family obligations. Accept them.

3.4.2 Don’t use a font you don’t need.

3.4.3 Use sloped romans sparingly and artificially sloped romans more sparingly still.

3.5.1 Change one parameter at a time.

3.5.2 Don’t clutter the foreground.

4.1.1 Make the title page a symbol of the dignity and presence of the text.
4.1.2 Don't permit the titles to oppress the text.

4.1.3 Set titles and openings in a form that contributes to the overall design.

4.1.4 Mark each beginning and resumption of the text.

4.1.5 If the text begins with a quotation, include the initial quotation mark.

4.2.1 Set headings in a form that contributes to the style of the whole.

4.2.2 Use as many levels of headings as you need; no more and no fewer.

4.3.1 If the text includes notes, choose the optimum form.

4.3.2 Check the weight and spacing of superscripts.

4.3.3 Use superscripts in the text but full-size numbers in the notes themselves.

4.3.4 Avoid ambiguity in the numbering and placement of endnotes.

4.4.1 Edit tables with the same attention given to text, and set them as text to be read.

4.4.2 Avoid overpunctuating lists.

4.4.3 Set lists and columns of figures to align flush right or on the decimal.

4.4.4 For text and numerals alike, choose harmonious and legible tabular alignments.

4.5.1 Leave adequate space at the beginning and end of every publication.

4.5.2 Give adequate space to the prelims.

4.5.3 Balance the front and back matter.

5.1.1 To invoke the inscriptive tradition, use the midpoint.

5.3.2 Use analphabetic symbols and diacritics that are in tune with the basic font.

5.3.3 In heads and titles, use the best available ampersand.

5.3.4 Consider even the lowly hyphen.

5.2.1 Use spaced en dashes – rather than em dashes or hyphens – to set off phrases.

5.2.2 Use close-set en dashes or three-to-em dashes between digits to indicate a range.

5.2.3 Use the em dash to introduce speakers in narrative dialogue.

5.2.4 In lists and bibliographies, use a three-em rule when required as a sign of repetition.

5.2.5 Use the virgule with words and dates, the solidus with split-level fractions.

5.2.6 Use a dimension sign instead of a serifed x when dimensions are given.

5.2.7 Use ellipses that fit the font.

5.2.8 Treat the punctuation as notation, not expression, most of the time.

5.3.1 Use the best available brackets and parentheses, and set them with adequate space.

5.3.2 Use upright (i.e., "roman") rather than sloped parentheses, square brackets and braces, even if the context is italic.

5.4.1 Minimize the use of quotation marks, especially with Renaissance faces.
5.4.2 Position quotation marks consistently in relation to the rest of the punctuation.

5.4.3 Omit the apostrophe from numerical plurals.

5.4.4 Eliminate other unnecessary punctuation.

5.4.5 Add punctuation, or preserve it, where it is necessary to meaning.

5.5.1 Use the accents and alternate sorts that proper names and imported words and phrases require.

5.5.2 Remap the font driver and keyboard to suit your own requirements.

6.1.1 Consider the medium for which the typeface was originally designed.

6.1.2 When using digital adaptations of letterpress faces, choose fonts that are faithful to the spirit as well as the letter of the old designs.

6.1.3 Choose faces that will survive, and if possible prosper, under the final printing conditions.

6.1.4 Choose faces that suit the paper you intend to print on, or paper that suits the faces you wish to use.

6.2.1 Choose faces that suit the task as well as the subject.

6.2.2 Choose faces that can furnish whatever special effects you require.

6.2.3 Use what there is to the best advantage.

6.3.1 Choose a face whose historical echoes and associations are in harmony with the text.

6.3.2 Allow the face to speak in its natural idiom.

6.4.1 Choose faces whose individual spirit and character is in keeping with the text.

6.5.1 Start with a single typographic family.

6.5.2 Respect the integrity of roman, italic & small caps.

6.5.3 Consider bold faces on their own merits.

6.5.4 Choose titling and display faces that reinforce the structure of the text face.

6.5.5 Pair serifed and unserifed faces on the basis of their inner structure.

6.6.1 Choose non-Latin faces as carefully as Latin ones.

6.6.2 Match the continuity of the typography to the continuity of thought.

6.6.3 Balance the type optically more than mathematically.

6.7.1 Add no unnecessary characters.

6.7.2 Add only characters that are visually distinct.

6.7.3 Avoid capricious redefinition of familiar characters.

6.7.4 Don't mix faces haphazardly when specialized sorts are required.

6.8.1 Choose your library of faces slowly and well.

8.3.1 Choose inherently satisfying page proportions in preference to stock sizes or arbitrary shapes.

8.3.2 Choose page proportions suited to the content, size and ambitions of the publication.

8.3.3 Choose page and column proportions whose historical associations suit your intended design.
8.4.1 If the text is meant to invite continuous reading, set it in
columns that are clearly taller than wide.
8.4.2 Shape the textblock so that it balances and contrasts with the
shape of the overall page.
8.5.1 Bring the margins into the design.
8.5.2 Bring the design into the margins.
8.5.3 Mark the reader's way.
8.5.4 Don't restate the obvious.
8.6.1 Use a modular scale if you need one to subdivide the page.
8.8.1 Improvise, calculate, and improvise some more.
8.8.2 Adjust the type and the spaces within the textblock using
typographic increments, but rely on free proportions to adjust the
empty space.
8.8.3 Keep the page design supple enough to provide a livable
home for the text.
9.5.1 If the text will be read on the screen, design it for that
medium.
9.5.2 Check the type at every stage.
9.5.3 Follow the work to the printer.
9.6.1 Consult the ancestors.
9.6.2 Look after the low- as well as the high-technology end.
10.1.1 Call the type by its proper name if you can.

APPENDIX F: FURTHER READING

Typography is an ancient and polylingual enterprise, and the recent literature on digital typography is vast. Much of that literature is, however, highly technical, and much is quite remarkably superficial. This short list includes only a selection of the more important works available in English.

F.1 GENERAL HISTORY & PRINCIPLES


F.2 SCRIBAL ROOTS