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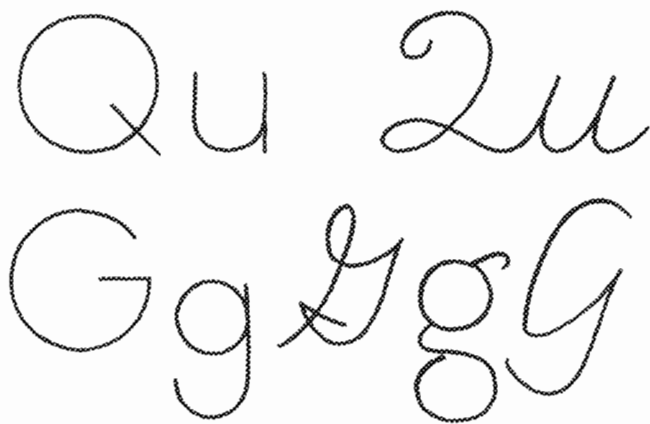
# Letterforms

There are three sacred goals:  
love the pen, love writing, love the book.  
—Sayat Nova

**O**URS IS A literate culture. Every day we are besieged by a frenetic mob of printed words, in all shapes and sizes, screaming for our attention. We rely on words for our news, we share experiences by writing letters, we even use words to talk about words themselves. Why is it, then, that we so seldom pause to ask how and why the forms of our letters came to be? In this section I will outline the sorts of questions that every letter-recognizer should wonder about.

## Reading

We learn at a very young age to read the 26 letters of the alphabet. Recall the time you learned to read. Did you ever wonder how the capital and small letters were related? “S” is just a large “s”, but why do we call “C” and “c” the same letter when their shapes are so different? I remember being personally offended by the ugliness of the cursive “Q”.



Printed “Q”, with its long, flowery tail, I appreciated, but how dare the numeral “2” intrude into the alphabet! Cursive “G” and typed “g” present similar mysteries. The cursive “G” taught in Europe offers yet another possibility.

Printing technology has spawned many new interpretations of letter shapes. Look around at the alphabets in books and signs. If you think you understand

what they all have in common, just try explaining how to recognize the letter “G” to a non-Roman-alphabet-using person. Can you explain it without using pictures? Conversely, a single shape may serve as many different letters, depending on its context.

The point I want to impress upon you is that there are literally thousands of different graphic forms that we recognize as a single abstract letter. There are many more than 26 *letterforms* in the English language. Ultimately all scripts have a single ancestor—the Roman capitals—but such forms as upper and lower case have diverged so far that they deserve to be called separate scripts.

What a curious development this double alphabet is! Chinese, for instance, has no such separate uppercase script. What is most remarkable is that we take this visual multiplicity in stride and don’t even pause to notice the tremendous leaps of adaptation our eyes have to make.

One of the most intriguing aspects of visible language is that it presents so many levels of structure, all of which communicate simultaneously. Strung together, letters become words, words become sentences, sentences become paragraphs, paragraphs become chapters, and chapters become books. Each level has its own way of making its presence known—words are marked by spaces, sentences are marked by initial capitals and final punctuation, paragraphs are marked by indentation or blank lines, chapters are marked by titles, and books are marked by covers.

Sometimes one level affects another. Renaissance scribes trying to form consistent right-hand margins often stretched the last letter to fill the remaining space—the letter was violated to accommodate the line. An alternate approach is hyphenation—the word is violated to accommodate the line. Sometimes text must be rewritten to fit—all levels are violated. Printers trying to avoid “widows”—the worst example being when the last word of the last sentence of the last paragraph of the last chapter of a book is hyphenated onto the last page—may readjust spacing at any one of a number of lev-

els.

## Writing

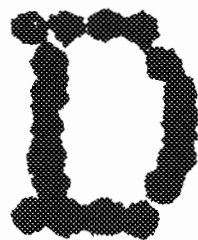
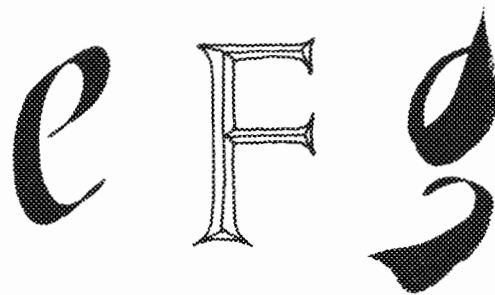
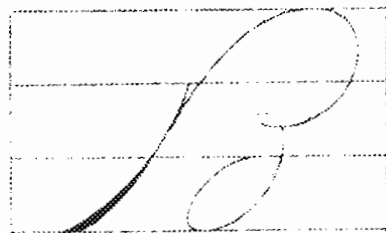
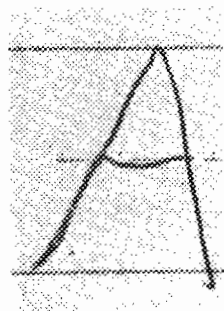
We learn to write the 26 letters of the alphabet at a very young age. Recall the time when you learned to write. The tool you used probably had a large effect on your experience. If you began with a fat pencil on widely lined, brittle paper, you learned that letters were enormous blobs that were prone to straying outside the lines. Writing required frequent trips to the pencil sharpener. If you began with a dip pen, you learned that letters were messy and prone to blobbing, smearing, or running out of ink. If you began with a typewriter, you learned that letters were tiny symbols all the same width, available in red or black, and prone to jamming. If you began with a computer terminal, you learned that letters were made of luminescent dots, easily lost, and a means for picture drawing, game playing, and two-way communication.

The same effect applies to other writing tools. Writing with a quill pen makes one vastly more sensitive to the quality of the paper and of the ink. The care with which

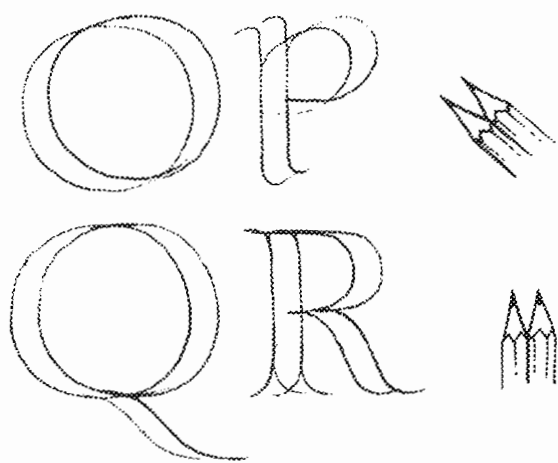
the quill must be maintained makes writing much more of a deliberate, refined process. Chiseling in stone requires even more advanced planning, since the medium of stone is far more permanent than paper. Writing with a brush turns the activity of making lines into a dynamic three-dimensional performance akin to dance.

The same effect applies to letters in books. The invention of movable type totally changed attitudes toward literacy. At first the printed book attempted to mimic the handwritten book—Gutenberg's typeface was directly based on contemporary scripts—but soon it established a logic of its own. Printing made the book a repeatable, transportable commodity, which made tangible the classical ideal of linear order.

Printing technology has lent many new words to the English language. The term *font*—which refers to a complete alphabet, including lower case, upper case, numbers, and punctuation—comes from the same root as *fountain* and *fondue*, and refers to the foundry process of melting hot metal. The terms *lower case* and *upper case* refer to the physical drawers of metal type used for hand-set type. The word *print* itself refers to the act of pressing physical type against paper.



hîjklmn  
hijklmn



SS TT



WXYZWXYZ

The point I want to impress upon you is that there are literally thousands of different tools that we can use to make the same graphic letterforms. The classical Roman alphabet, from which all of our scripts evolved, was based on the thick and thin lines naturally produced by a wide brush. You can imitate this effect by binding two pencils together so that they draw a double line. Most calligraphic scripts keep the pen at a fairly constant angle of about 45°/sloping up to the right—this is why the letter “O” in many older typefaces seems to tip to the left. Recreating the elegance of the Roman capitals is a real test of a calligrapher’s skill. The Romans had no small letters. The minuscules (small letters) evolved from the Roman majuscules (capitals) over many centuries as scribes sought shapes that were more suited to the movements of the broad-edged pen.

What a curious development this double alphabet is! Chinese, for instance, is based instead on brush forms. What is most remarkable is that we take all this visual logic in stride and don’t even pause to notice the tremendous body of conventions our eyes have assimilated.

One of the most intriguing aspects of visible language is that it records so many levels of influence, all of which communicate simultaneously. When we see a letter we are seeing its history, the biases of the writing tool, the character of the recording medium, the role of language in a society, the prevailing visual aesthetic of the time, the logic of the other 25 letters, the overall effect intended by

the designer, and the visual requirements of the eye. Each level has its own way of making its presence known—the way characters are built up is influenced by the interaction of tool and medium, character shape is influenced by visual considerations, character sequence is influenced by grammar and the message of the author, and page layout is influenced by visual aesthetics.

Sometimes one level affects another. At the lowest level, the idiosyncrasies of vision demand that subtle shape adjustments be made in order for a typeface to be perceived correctly. For instance, the top half of an “S” is smaller than the bottom half, and the crossbar of a “T” is thinner than the vertical stroke.

Visual demands can also work against legibility. The Gothic visual aesthetic molded writing into an almost illegible blur of peaked vertical lines. Legibility gave way to overall texture. The dot was invented to rescue the Gothic “i” from complete indistinguishability.

*Serifs* (the little spurs at the ends of strokes) originated as characteristic motions of the broad pen. In typefaces, they serve to guide the eye along horizontal motions. Contemporary typographers favor sans-serif (“without serif”) fonts, whose clean lines are in keeping with a functional, unembellished visual style.

Each new writing tool offers both new freedoms and new limitations. It will be interesting to see how the merging of communication and computer technology will influence the evolution of letter shapes

## Design

The best way to probe the limits of letterforms is to experiment. Working under different constraints produces characteristically different solutions. The alphabet on the opposite page samples the sorts of letters I was led to design in the course of preparing the inversions in this book. Many of these forms I never would have considered as letters under other circumstances.

Invent a 27th letter of the alphabet. Design versions of it to match existing typefaces. Remember that it must be different enough from the other letters that it does not cause confusion, yet similar enough that it does not look out of place.

If you had a chance to invent your own alphabet from scratch, what would you do? How would you judge the success of your design? Korean and Armenian are prime examples of scripts that resulted from deliberate invention, rather than from natural evolution. Would your alphabet have looked different if your native language had been Polish? What other possibilities could you consider?

Gain new perspectives on the reading and writing skills you already have. Try reading a book upside down. Try writing while looking only at the mirror image of your hand. Try writing so that the mirror image reads normally. Try writing with your other hand. Try writing with both hands simultaneously in contrary motion. Try writing with a pencil in your toes. Try writing blindfolded. Try writing behind your back. How do these experiences differ from normal writing?

Try making letters in radically different media. Draw 20-foot letters with a stick on a beach. Bake a cake in the shape of a letter. Signal letters with your hands. Form the shape of your name with your body (you may have to enlist the help of friends). Invent a three-dimensional alphabet that assembles into sculptural words and sentences. Make an alphabet of partially eaten pretzels. Find letters in close-up photographs of butterfly wings.

Pursue graphic themes. Write a word in one continuous line without lifting your pencil. Connect letters in unexpected ways. Design an entire alphabet that is derived from different arrangements of a very small number of

different shapes. Make letters entirely out of circles. Produce alphabets that create strong textural effects based on different perceptual mechanisms. Draw a letter so that it clearly expresses a concept that begins with that letter. Design a signature that expresses who you are. You might even want to try writing words that read the same upside down.

Observe an existing typeface. Which letter is your favorite? Which letters, if any, stand out as inconsistent? What is the underlying idea that unifies all letters? How can the idea be generalized? What happens if the style of one typeface is mixed with the style of another?

An excellent way to gain insight into the problems of type design is to cover up one letter of a newspaper headline and then try to reconstruct the missing letter on the basis of the style of the other letters. You will soon find that the task is not so simple. The inverse problem is even more interesting: Generalize a single character to create a whole alphabet. Try this with a friend and compare results. How do your assumptions differ?

Type design must be approached as a unified problem. The type designer considers the alphabet as a community of interrelated shapes—shapes that are understood in terms of each other and in terms of the traditions of letterform design. A good type design must survive the rigors of the printing process, serve the intended functions (who will read it? under what conditions?), compensate for the peculiarities of human vision, and at the same time express a coherent aesthetic message.

One of the most important facts a letterform designer must realize is that the reading eye takes in whole words or groups of words at a time. Letters should blend harmoniously into easily recognized word shapes. For this reason, a word set in lower case (which has both ascenders and descenders: strokes that go above and below as in “b” and “q”) is read more easily than the same word set entirely in upper case. In fact, if the overall shape of a word is correct, individual letters can be distorted or even left out without affecting legibility. This triumph of word over letter is an excellent demonstration of the power of context, and is one of the most important principles to remember in the design of inversions.

