A **Typographic Workbook**

a primer to history, techniques, and artistry

Second Edition



Kate Clair
Cynthia Busic-Snyder

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Ancient Writing Systems

Ancient is generally defined by Western culture as "before the fall of the Western Roman Empire, 476 CE." Few remember to consider the highly developed societies of the ancient Egyptians, Greeks, and Romans with their magnificent architecture, legal systems, epic plays, elaborate religious rituals and myths, comfortable homes with indoor plumbing, and carefully developed writing systems. Many believe that these societies' technological developments would not have been possible without written communication.



1.1 Cartouche of Egyptian queen Cleopatra II, who ruled approximately 69–30 BCE. A *cartouche* (called *shenu* in ancient Egyptian) is a series of hieroglyphics enclosed by an oval or rectangular band representing the name of a royal or divine persona.

The study of written communication is somewhat synonymous with the study of the history of civilization. In prehistoric times, before writing systems were developed, there was no recorded history; knowledge of past events was orally communicated from generation to generation. It is possible that if there had never been written records, the history of the world would be condensed to the point that one human could commit it to memory.

Key Concepts

ancient
boustrephedon
cartouche
cuneiform
demotic script
hieratic script
hieroglyphics
iconography
ideograph
logogram
mnemonics
papyrus
parchment
phaistos disk
phonemes
phonetic
phonogram
pictograph
rebus
Rosetta Stone
Semitic languages
syllable
typography

Fact Find! Archeological evidence indicates the use of fire, tool making, and cooperative activities before the evolution of either a verbal or written language. What are examples of nonverbal communication used today? Log on to to your favorite search engine and find an Internet reference to help you answer the question. Correctly cite your source(s).

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Already subjective in nature, the experience and recollection of events are further affected by personal interpretation and editing; if there were no written record, it would be impossible to know any of the details of the earliest cultures and the the lives of ordinary people who lived in them.

Because lettering and *typography* (the style, arrangement, and appearance of type) are tied closely to available manufacturing technology, writing substrates (clay, stone, or parchment) reflect the raw materials and mechanical abilities of a particular society. Much knowledge of ancient cultures comes to us via secondhand parchment copies of papyrus scrolls, made by monks during the Middle Ages. Most original papyrus texts no longer exist, as they deteriorated in the moist Mediterranean climate, while many of the copies on *parchment* (which is made from animal skins) survived. Contemporary translations, therefore, are based on copies that are assumed to be fairly accurate reproductions of the original texts.

Prehistoric Societies

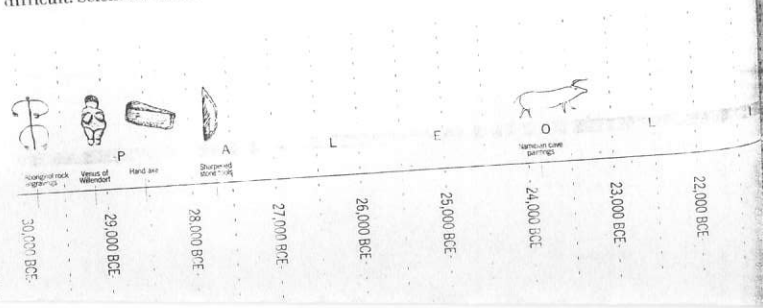
Trying to imagine human existence prior to oral and written communication is difficult. Scientists debate when the ability to enunciate a spoken language evolved. Archeological evidence of fire use, tool making, and cooperative activities predates the evolution of a biological capacity for speech, indicating the probable use of extensive nonverbal communication.

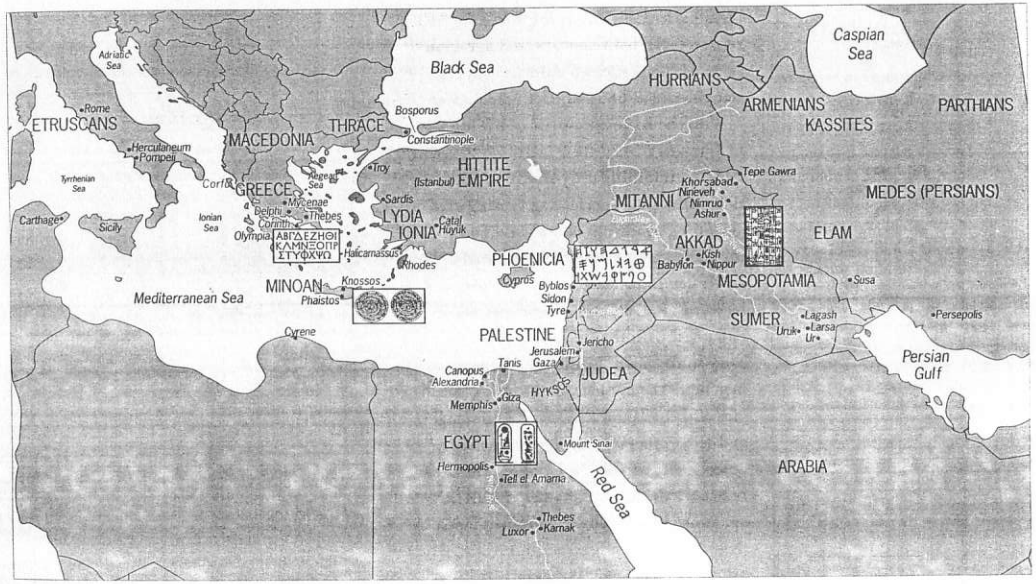
As verbal communication developed, it became easier for humans to interact with and assist one another in organized activities, as well as structure their lives communally to achieve more comfortable, more predictable, and safer lives.

Development of Oral Communication

Oral communication allowed humans to communicate feelings, thoughts, concepts, techniques, and procedures. It brings forth the question of whether thought as we conceive of it today was even possible before humans developed the capacity to express it in words, or whether the expression of thoughts, hopes, and fantasies become possible because humans developed the means of expression through refined speech.

The earliest evidence of agriculture occurs in the Nile River valley in Egypt, the Tigris and Euphrates River valleys in Mesopotamia, and the Yangtze River valley in China. Since the first civilizations developed in these



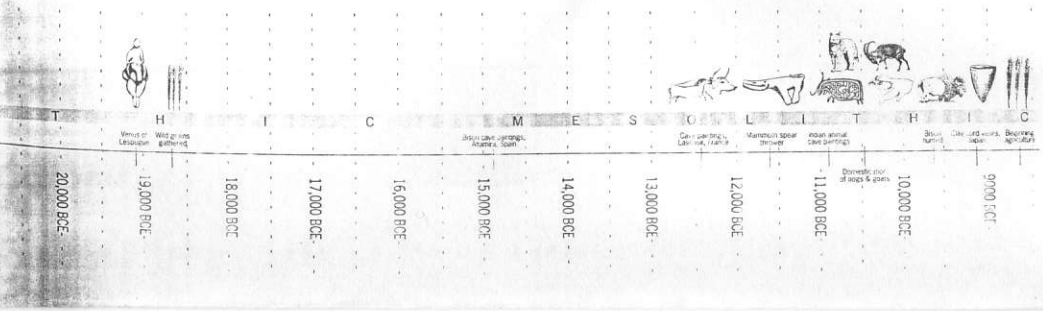


areas, it may be safe to assume that a hospitable climate and agricultural knowledge were two of the most significant contributing factors to the development of human civilization. Because humans no longer spent the majority of their time battling the elements and gathering food, they could devote more time refining their living conditions.

Anthropologists believe that the domestication of animals was a strong factor in the development of human societies. Nomadic tribes used domesticated animals to help

1.2 Early language centers and writing are believed to have evolved in areas surrounding the Mediterranean Sea, from Greece to Mesopotamia.

1.3 Timeline illustrating the development period of prehistoric tool making, cave painting, and agriculture from 30,000 BCE to 9000 BCE.





1.4 Simple pictographs are somewhat representative in appearance. At top is a pictograph for an ox, and below is the pictograph for mountains.



1.5 Cylinder seals were rolled into wet clay to show ownership, to indicate the contents of containers, and/or to commemorate events or for ceremonial purpose. The wet clay could be wrapped over the top of a vessel to prevent tampering. These seals were used in Mesopotamia as early as 1500 BCE.

them more easily transport food and shelter resources. In both nomadic and agrarian societies, domesticated animals could be slaughtered as necessary for sustenance.

With the basic necessities of life attended to, humans turned their attention to refining tools, maintaining the political organization of the tribe, perfecting healing arts, defending against predators and pondering the stars, skies, nature, and spiritual ideals. When information was communicated by word of mouth, certain people were entrusted with the "memory" of the tribe. They were chosen by the tribe's elders to memorize the myths, legends, and genealogies of the community. Sacred knowledge and techniques of healing were passed down orally as well. *Mnemonics*, the use of reminder devices used to help recall large amounts of information, were developed by these ritual specialists and historians. Often relieved of the menial tasks of fulfilling the basic day-to-day needs of the tribe, such individuals were invested with social power and political status in the community.

The tribal historians and other specialists often had the exclusive power to choose their successors, deciding to whom they would pass the knowledge of the tribe for the next generation. This prestigious position required great accuracy in the recall and telling of important information, so many years were devoted to training and memorization. Most of these specialists were respected elders by the time they assumed the position.

Respect for elders in the community was unquestioned. Some indigenous peoples associate the various stages of aging (commonly based on hair color) with status within the tribe. In fact, in some Native American languages the word for "gray-haired" means "knowledgeable" and the term for "white-haired" means "close to the knowledge of the gods." This linkage between thought and word is one example of how language and our perceptions of reality are connected.

Puzzling Evidence

Archeologists have long held that written language was first developed in Mesopotamia, where cuneiform tablets date from 3200 BCE. New evidence emerging from China, however, raises a new question of who may have been first to pen their thoughts.

Tortoise shells etched with symbols have been excavated from the Jiahu site in Henan province in central China. The shells found appear to be part of a funerary ritual in Neolithic graves that have been dated to 7000–5800 BCE. If the incised symbols can be taken as a written language, they will predate what was previously the earliest known written language in China by more than three thousand years, and the written language of Mesopotamia by more than two thousand years.

The tortoise shells, some stone tools, and several bone musical instruments have been incised with up to sixteen different symbols and geometric shapes either identical or very similar to the jiaguwen pictographs used in the second millennium BCE and found at the Yinxu archeological site, generally accepted as evidence of the first written language of China.

Some archeologists point to the great similarity of the symbols and their artifactual context between the Jiahu and Yinxu sites and argue that the Jiahu symbols were part of early attempts at an organized information system.

Others hold that the symbols are isolated geometric decorations, and although they may have had religious significance, they do not represent an early written language.

What are your thoughts? At what point would religious or decorative *iconography* (the pictorial illustration or set of illustrations representing a subject) begin to be recognized as a pictographic written language?

Since all communication was verbal, it was contemporaneous. Before the invention of writing, no one could speak directly to anyone not living at the same time. For ideas, concepts, and practices to have lasting influence, they had to be restated by each succeeding generation and could not help but be influenced and altered by personal interpretation, inaccuracies, embellishments, and memory lapses. As a result, there is a limitation to the accuracy of nonwritten transmission of information over time.

Still, today many spoken languages exist that have no written form. It may seem logical to use an existing alphabet (Roman, Cyrillic, Arabic, etc.) to transcribe them. But because of broad historical associations among certain societies, political and economic and cultural features of those societies, the languages used in those societies and the alphabets used to write those languages, the choice of an existing alphabet to transcribe a previously nonwritten language may be fraught with political consquences. Ultimately, the written form of a language must develop out of the culture of the people who practice it for it to make total sense.

Early Writing Societies

Developed writing systems have been discovered in Sumeria, Egypt, China, and India. Cuneiform is dated to approximately 3200 BCE; hieroglyphics are dated to approximately 3000 BCE; precursors to the Chinese system of writing date to around 1800 BCE; and Sanskrit is dated to approximately 1500 BCE. The introduction of writing allowed these cultures to more rapidly develop complex sociopolitical organizations, as it enabled them to record codes of law, history, literature, philosophy, medicine, mathematics, scientific discoveries, and religious practices.

The single expression of an idea in a visual form cannot be considered an alphabet. For instance, the cave paintings in Lascaux, France, dating back to somewhere between 30,000 and 12,000 years ago, communicate the form of animals but do not qualify as pictographic communication. Because they do not add up to a codified system of standardized symbols, and they are not used repeatedly in a consistent, standardized manner to represent the same concept over a period of time, they are considered images and not a system of writing.

Repetition of agreed-upon shapes is the essence of a writing system. In order to communicate, the simplified drawings must be recognizable and easily interpreted by larger numbers of a population.

Pictograph-Based Writing Systems

Early picture writing employed simplified drawings to represent objects. This is assumed to be the first step in developing most written languages. Called *pictographs* (the simplified drawings of objects), these drawings may have been introduced into use for a variety of reasons. Some historians assume that writing began with small tags of clay inscribed with pictographs that were attached to jugs by string intended to

Fact Find! What other languages can you find that use other alphabets? What about Greek? Cyrillic? Log on to to your favorite search engine and find an Internet reference to help you create your comparison. Print out the results for discussion. List some of your ideas in the space provided below. Be sure to cite your sources correctly!

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URL: http://

Date visited:



1.6 The combination of the top two pictographs, an ox and mountain range, results in the final ideagraph on the bottom, meaning "wild ox."

represent the contents of the vessels during shipping. Others have speculated that writing was used to record gifts to the temples, as people were required to give offerings each year. Another theory posits that writing evolved as a means to indicate ownership; a small distinctive mark or series of marks on an object designated to whom it belonged or by whom it was crafted. Still others theorize that pictographs developed out of drawing as a shorthand means to record memorable events. Exactly how and why writing systems were developed is unclear. What is clear, however, is that distinct but possibly related alphabets developed in different ancient cultures in different geographic locations within a relatively short period of time.

Pictographs are appropriate for the representation of people, places, and things but are not efficient for communicating complex and abstract ideas, emotions, concepts, and actions. Modern examples of pictographs indicate gender-separate restroom facilities, overnight lodging, eating areas, acceptable smoking and nonsmoking environments, and eating establishments. Pictographs are vital in communicating simple meaning in the absence of a common language or script. As the uses for written communication expanded, it was necessary for the written language to express a greater variety of concepts.

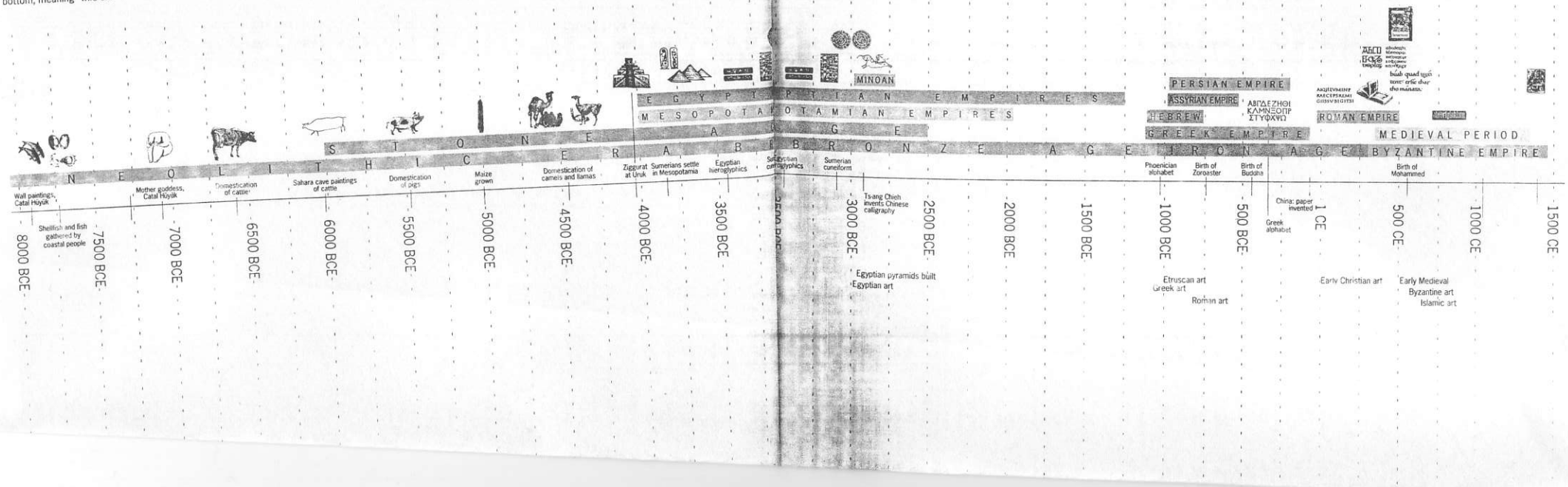
From Pictographs to Ideographs

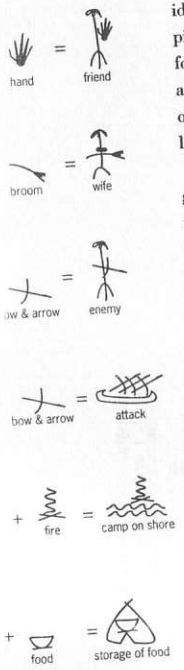
Pictograph-based languages evolved into written systems that allowed the representation of abstract thought rather than simply representing objects. As pictographs were assigned meaning that went beyond a simple visual representation of a tangible thing, they were transformed into a slightly more complicated form of writing known as an ideograph. An *ideograph* (or



1.7 Modern pictographs and ideographs communicate simple messages across multiple languages and cultures.

1.8 The timeline below shows the expansion of literacy, the dissemination of knowledge, and the growth of typographic forms over the centuries.





is combine pictographs to
more complex concepts and

ideogram) is the combination of two or more pictographs intended to represent a concept—for example, the pictographs of a woman and a child may combine to represent the idea of "pregnant" even though it does not show a literal interpretation of a pregnant woman.

Ideographs, in other words, are pictographs that come to mean something other than their original intent. For example, the pictograph of "hand" changed to an ideograph when it is combined with other symbols to convey the concepts of "to give," "to greet," "to offer," or "to take"—actions or concepts associated with the hand in some way. Ideographs mark the true beginning of a written language.

There is an element of abstraction to ideographs, so they may not be instantly understood when seen. They often require interpretation and translation. Each culture developed a specific set of ideographs that reflected it spiritual beliefs and its political, economic, and social structure.

The Semitic Languages

The *Semitic languages* comprise the languages in the Middle East, an area today that includes the countries of Syria, Lebanon, Israel, Palestine, Jordan, Cyprus, Turkey, Iraq, Egypt, Iran, Kuwait, Saudi Arabia, Bahrain, Qatar, United Arab Emirates, Oman, and Yemen.

Semitic languages fall into four groups. North Peripheral includes Akkadian, which was spoken in Assyria and Babylonia and which is the oldest Semitic language. It stopped being used as a literary language in the first century CE. North Central includes Hebrew (the language of Israel today); Aramaic; and Ugaritic and Phoenician, both of which no longer exist. South Central includes the Arabic language in nearly all of its dialects, as well as Maltese, which is an offshoot of Arabic. South Peripheral includes South Arabic dialects and Amharic, as well as other Ethiopian languages.

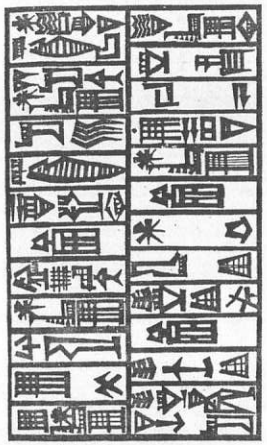
Sumerian Cuneiform

The Sumerian culture arose in Mesopotamia in the region between the Tigris and Euphrates Rivers, known as the "fertile crescent" (present-day Iraq). The soil in this area is rich and productive, but much of the surrounding land is limited in its ability to sustain agriculture. The land has low-lying hills surrounding it to the north that act as a natural barrier preventing attack from that direction. The regular supply of freshwater from the two rivers enabled the culture to grow its own food and become a sedentary, agricultural society.

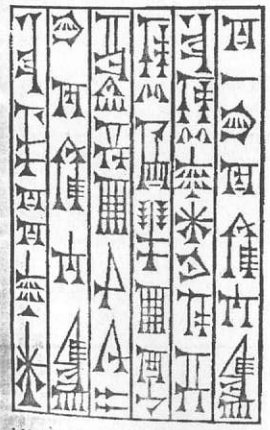
Eventually the Sumerians developed written forms of communication. At first every character represented one word, but many words lacked unique symbols. For these, symbols of related objects were used (a foot could mean both "to go" and "to stand," in addition to meaning "foot").

Abundant clay from local riverbeds served many purposes, among them making writing tablets. The clay tablets could be inscribed with a stylus while still moist, then laid in the sun to dry. As both the stylus and the tablet-making processes developed, the style and form of the written messages changed in appearance. By 3100 BCE a codified system of pictographic symbols called *cuneiform*, existed.

By approximately 2500 BCE scribes had shifted from using a pointed stylus to draw



1.10 Old Akkadian pictographs of ancient Babylonia, from the time of King Sargon, predate the wedge-shaped cuneiform writing.



1.11 The wedge-shaped characters of cuneiform are stacked in vertical rows.

in the clay tablet to using a triangular stylus pressed into the clay, the hallmark of cuneiform writing. Characters had evolved into combinations of wedge-shaped strokes, further abstracting the symbols composing the written language. In its early stages cuneiform was written from top to bottom. During the third millennium BCE this changed into writing from left to right, and also the signs changed: they were turned on their sides.

Cuneiform writing developed into a mixture of logograms and syllables. A *logogram* is a sign that represents an entire word and *syllables* represent certain sounds. Cuneiform writing mixed these two symbol types.

Eventually the Sumerians were conquered by the Assyrians from northern Mesopotamia. The Assyrians were quick to adopt cuneiform as a practical writing system. Cuneiform writing has been used in several languages, and was in use for about 3000 years. When Aramaic spread as the predominant language in the seventh and sixth centuries BCE, its alphabet (derived from Phoenician script) gradually replacing cuneiform writing. The last example of cuneiform writing dates to 75 CE. Western scholars deciphered the cuneiform systems in the 1840s.

Early cuneiform employed ideograms, though later these symbols came to be used as phonograms. *Phonograms* are signs that represent sounds—either whole words, syllables, or *phonemes* (a language's distinctive sounds).

A logogram or logograph is a single written symbol that represents an entire word or phrase. For example, the symbol 8 is a logogram that is pronounced "eight" in English. Compared to alphabetical systems, logograms have the disadvantage that a large

Fact Find! What are examples of logograms, other than numerals, used today? Can you find a modern definition or interpretation? Log on to to your favorite search engine and find an Internet reference to help you answer the question. Be sure to cite your source(s) correctly!

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URL: http://

URL: http://

Date visited:





1.13 Drawings of the Phaistos Disk exemplify the use of early pictographs. The Phaistos Disk has not yet been deciphered and translated into a modern language.

Meaning	Pictograph	Sideways	Cuneiform	Assyrian
orchard				
to walk				
star				
goose				
sun/day				
plowing				
fish				
ox				
boomerang				

1.12 Pictographs were transformed into hieroglyphs, script hand, hieratic script, and demotic script, shown right.

number of them are needed to be able to write down a large number of words. An advantage is that one does not need to know the language of the writer to understand them—everyone understands what 1 means, whether they call it one, eins, uno, or ichi.

Cuneiform required deciphering for understanding to come about; they could not be intuitively identified and so immediately impart understanding to the reader.

Minoan Writing

A significant piece of evidence alluding to early writing outside of Mesopotamia is found on the island of Crete and is attributed to the Minoans (a culture named after their ruler, King Minos). The remains of this writing are limited as the Minoan culture is believed to have been decimated by a tidal wave caused by a volcanic eruption on a neighboring island. Among artifacts found in archeological excavations of the ancient city of Phaistos that include the Minoan alphabet is a clay disk with symbols spiraling to or from the center.

Found in 1908 at the ruins of the Minoan palace, the *Phaistos Disk* is dated to approximately 1700 BCE. The text is made up of sixty-one words, with forty-five different symbols occurring a total of 241 times. The symbols portray recognizable objects such as human figures and body parts, animals, weapons, and plants.



1.14 Ancient clay tablet inscribed with cuneiform.

Some scholars think the text is a prayer and the language is Greek. Another theory also suggests that the language of the disk is Greek, but claims that it contains proof of a geometric theorem. Others feel that the disk contains a magical text, possibly a curse, and that the language of the disk in Indo-European. Finally, some believe that this alphabet may provide a link between ancient hieroglyphics and ancient Phoenician. The debate continues.

Written Languages Remain Undeciphered

Like the script on the Phaistos Disk, a number of writing systems have been discovered but remain partially or completely undeciphered today. Among them is Vinca or Old European, found on many artifacts excavated from archeological sites in southeast Europe, especially near Belgrade. These samples date between 6000 and 4500 BCE.

The Indus script, named for the valley in India where it was found, dates to approximately 3500 BCE. Sometimes referred to as Harappa script, little is known about the language or the people who utilized it. Some think it may be a form of a Dravidian Language.

A script that first appeared around 2900 BCE in the kingdom of Elam in southwest Persia (modern Iran) is named Proto-Elamite and has yet to be deciphered. So does a script used between 2250 and 2220 BCE called Old Elamite.

Linear A is a script used between 1800 and 1450 BCE on the island of Crete. Although it has not been proven, historians believe that Linear A may be related to Linear B writing, which has been deciphered.

The Etruscan alphabet has been deciphered, but the Etruscan language remains poorly understood. It is assumed to have developed from the Greek alphabet when the Greeks colonized southern Italy, starting in the middle of the sixth century BCE.

Meroitic is an extinct language that was spoken in the Nile Valley and northern Sudan until the fourth century, CE. Although the Meroitic script has been deciphered, little is known about the language it represented.

Rongo Rong is a script representing the Polynesian language Rapa Nui, spoken on Easter Island. Knowledge of the script was lost during the 1860s and has yet to be rediscovered.

What Is a Rebus?

A *rebus* is a series of pictographs of short words combined to have the reader verbally sound out longer words or phrases; it is a mode of expressing words and phrases by pictures of objects whose name resembles those words, or the syllables from which they are composed. An example might include the combination of

moon + light = moonlight, *or*
eye + ball = eyeball.

The invention of the rebus allowed the creation of complex words.



A combination of the pictographs of the sea and the sun results in a rebus meaning "season." The phoenetic sound of each word combine to sound out a new word (season) with new meaning (the natural division of temperate zones, sometimes marked astrologically).



1.15 The fluid appearance of these hieroglyphs was produced with a reed brush on papyrus.

The Voynich Manuscript, named for Wilfred M. Voynich, the antique-book dealer who acquired it in 1912, is a lavishly illustrated, 234-page codex written in an unknown script. Numerous attempts have been made to decipher the text to no avail. One theory that survives is that the manuscript was written by the Franciscan friar Roger Bacon sometime during the thirteenth century.

Egyptian Hieroglyphics

Egyptian pictographic *hieroglyphics* (a writing system that used pictographs to represent words and sounds) are believed to have originated around 3000 BCE. Magnificent examples of hieroglyphs found in Pharaoh's tombs date to approximately 2900 BCE. The highly detailed carved stone tablets required much patience to produce and this level of effort is not seen in everyday written records from ancient Egypt. The hieroglyphs popularly used for historical, legal, and business records consisted of simplified symbol systems to speed the writing process.

Hieroglyphics commonly run in vertical columns, read from top to bottom but not always starting with the far right column. All the people and animals face the same direction in any given passage. To read hieroglyphics, read into or toward the front of the human or animal symbols. The vertical columns are separated by thin rules and delineated by one or two colored horizontal rules across the top and bottom of the adjoining columns.

In hieroglyphics the same *phonetic* (spelling that corresponds to pronunciation)

Object	Pictograph	Hieroglyph	Script hand	Hieratic script	Demotic script
animal skins tied together					
vessel					
harpoon					
papyrus bundle					
whip					

1.16 Pictographs were transformed into hieroplyphs, script hand, hieratic script, and demotic script.

sound could be represented by a variety of symbols depending upon the scribe's geographic location or education. Over three hundred symbols had to be known in order to "read" the story or message. The Egyptians never simplified the system to the twenty-four consonant sounds needed to represent the utterances of their spoken language.

Hieroglyphics evolved into a system of communication that was constructed in a rebus-like fashion. This transition to the use of the rebus device marks the beginning of a phonetic relationship between the spoken word for an object and the objects they represent: there is a detachment from the physical object of the pictograph. A rebus must be deciphered, unlike pictographs, which need only to be identified.

Further embellishments to the manner in which a pictograph was written could add significant meaning to a word or name. For instance, Egyptian pharaohs were believed to be direct descendents of the gods. Their



1.17 In this example the Egyptian hieroglyphics are organized into vertical columns divided by column rules. Each column was read in the direction faced by the symbols.

names were written in hieroglyphs enclosed with the ankh to signify immortality.

Hieratic Script

Pictorial hieroglyphics became more simplified with the invention of papyrus and reed brushes. By 1500 BCE a calligraphic style known as *hieratic script* (meaning "priestly writing") began to appear. Hieratic script was used for religious literature exclusively for a time, until its gradual adaptation for commerce and business uses. It is characterized and influenced by the development of the reed pen as a writing tool, so the characters are more abstract and simplified than previous forms of lettering.

Demotic Script

Around 500 BCE the hieratic script eventually evolved into *demotic script*, (demotic means "of the people"). This writing style is visually simplified even more compared to hieratic script.

Throughout history, the dissemination of knowledge and the ability to read and write have often been reserved for the chosen few: the elite, the scholars, the ruler, and the priests who controlled the religious rituals and early forms of taxation. Those who could read were pursued for advice in all types of disputes and emergencies; their knowledge and judgment were highly respected. In many cultures the scribes—those who could write—were believed to hold power over human life; if an Egyptian scribe wrote your name in the Book of the Dead, it meant that your time in this world had expired.

Although ordinary people could use demotic script, the average working person did not have access to the education required to interpret or write the information using the system. Doubtless the scribes did little to remedy this situation, as it helped to perpetuate the class system and ensure their necessity in society.

The transition away from hieroglyphics was gradual, eventually giving way to demotic script, and ultimately there was no one left who was able to read the ancient Egyptian writing.

Ancient Writing Systems Evolve

A majority of scholars agree that by 1500 BCE ancient Phoenicia had established a phonetically based alphabet consisting of twenty-two characters. This ancient Phoenician alphabet is believed to be the basis of the Greek and Roman alphabets, and hence of the alphabet used in much of the Western world today.

Phoenicia was considered the gateway to the Middle Eastern lands and all the goods and foods its people produced. The Phoenicians were a seafaring and merchant people located at the crossroads

Papyrus

Papyrus is a paper-like material made from the papyrus bulrush that grew wild along the banks of the Nile River. Papyrus is made by soaking the bamboo-like plant in water, then stripping the inner fibers. These fibers are beaten flat and then aligned in a parallel fashion. A second layer of flat fiber strips is placed crosswise to the first. Layered with cloth, the fibers are placed under great pressure to dry. Individual pieces of papyrus, measuring approximately 9 x 15 inches are joined to create scrolls up to 30 feet in length.

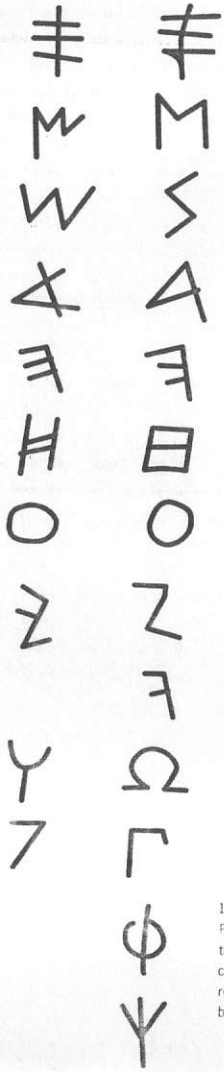
When papyrus became a common writing substrate in about 2400 BCE, a reed brush was found to be the perfect writing tool. The pictographs took on a fluid, sinuous, graceful appearance when drawn using a brush. Corners became rounded as the speed of the scribe increased; often several hieroglyphics were constructed from one continuous, flowing stroke.

of international trade. The Phoenician language was in use along the coast of Syria, Lebanon, and Israel, as well as in Phoenician colonies all around the Mediterranean Sea, as far west as northern Morocco. The Phoenician language was very close to Hebrew and Moabite. The oldest archeological traces of Phoenician date back to eleventh century BCE.

Because of their diverse trade and travel, the culture of the Phoenicians was influenced by many other peoples who lived around the Mediterranean Sea, including the Greeks, Minoans, Etruscans, and Sumerians. The Lebanese, Maltese, Libyans, and even some Somalis, along with certain other island folk in the Mediterranean, still consider themselves descendants of Phoenicians.

The Phoenician alphabet was developed around 1200 BCE from an earlier Semitic prototype. The alphabet was a unique approach to writing. Oral speech was broken down into a series of sounds and a written symbol was assigned to each sound, freeing written communications from the literal visual translations originally used in other written languages. This simplified the number of symbols required to write and read the message. With fewer symbols to memorize, learning to read and write became a less arduous task. Literacy spread among the general population. The Phoenician alphabet also was used to transcribe other oral languages into written versions, making early translation and cross-cultural communication possible. The Phoenician alphabet and language spread quickly in the region as a result.

From this alphabet the Greek alphabet, which forms the basis of all European alphabets, was derived. The alphabets of



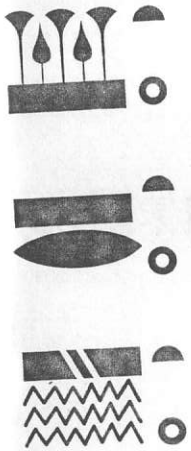
1.19 Comparing the form of Phoenician characters, on the left, with early Greek characters, on the right, reveals the resemblance between the two.



1.18 Ancient Phoenician characters inscribed on a piece of the interior of a bowl.

Writing Compared to Plowing

For a while, Greek writing read from right to left on the first line, then reversed and read from left to right on the following line, and so forth, across the page in a snake-like fashion, flipping asymmetrical letters. This structure was named "*boustrephedon*" and comes from the Greek words meaning "as the ox plows the field." Although just as easy to read backwards, difficult to read text when you have to constantly flip the letters to discern them.



1.20 Hieroglyphs used in ancient Egypt to depict the seasons, from top to bottom: akhet—winter, a time of sowing; pert—spring, a time of growing; shemu—summer, a time of inundation.

the Middle East and India are also thought to derive indirectly from the Phoenician alphabet. Ironically, the Phoenicians themselves are largely silent on their own history—Phoenician writing has largely perished, since their characteristic writing material was papyrus and has disintegrated. What we know of them comes from their neighbors, the Greeks and the Hebrews.

By approximately 800 BCE the use of the Phoenician alphabet had spread to ancient Greece. To write the alphabet the Greeks used an ivory or metal stylus to inscribe wax tablets. The Greeks simply borrowed the original twenty-two characters and adapted them for their own needs. Five consonants were changed to vowels to account for the sounds in the Greek language that had no Phoenician equivalent. The first vowels were alpha, epsilon, iota, omicron, and upsilon. The Greeks introduced three new consonants which were appended to the end of the alphabet in the order in which they were developed. There were several variants of the Greek alphabet, most important were western (Chalcidian) and eastern (Ionic) Greek; the former gave rise to the Etruscan alphabet and the latter to the Roman alphabet.

The Rise of Ancient Greece

The year 500 BCE is considered the peak of arts and learning during the Golden Age of Greece, approximately three hundred years after the adoption of the Phoenician alphabet. With the expansion of the Greek Empire under the rule of Alexander the Great (from 356 to 323 BCE) Greek culture spread. The growth of the Hellenistic culture caused the spread of the Greek alphabet (precursor to our own) as far as Egypt, Mesopotamia, and India. When Alexander died, his generals parceled out the lands of his empire, creating smaller kingdoms. Despite the resulting lack of unification, the effects of the common language and writing system prevailed.



1.21 The Rosetta Stone is believed to have been carved around 200 BCE. The same inscription is written in three different alphabets.

Recovering Ancient Egyptian Hieroglyphics

As demotic became more widespread, understanding of hieroglyphics faded away, and ultimately there was no one left who was able to read the ancient Egyptian writing. A large portion of the hieroglyphic texts were difficult to decipher because of their religious nature, since the names of the gods were no longer recognized. Until the discovery of the *Rosetta Stone*, hieroglyphics had not been completely or correctly deciphered. The Rosetta Stone held the key to translating and understanding

Chapter One Review

ancient hieroglyphics. The stone was unearthed by Napoleon's men in 1799 when they invaded Egypt. This elaborately inscribed stone displays one message in three different forms: ancient Greek, Egyptian hieroglyphics, and demotic script. Using the ancient Greek inscription as a map, archeologist Jean-François Champollion decoded the order and sounds of the hieroglyphs in 1822. Champollion also posed theories, later proved correct, about the structure of the demotic script on the Rosetta Stone. The discovery and transcription of the writing led to the deciphering of other hieroglyphic inscriptions.

Circle one answer for each definitio
correct key concept term for each. W
determine whether the phrase provi

1. The year 5100 BCE is considere
learning during the Golden Age of (
three hundred years after the adopt
alphabet.
   a. True
   b. False

2. Pictures and/or pictographs ass
so as to represent the syllables in a
which meaning can be deciphered.
   a. Hieroglyphic
   b. Demotic script
   c. Cuneiform
   d. Rebus

3. Anthropologists believe that the
animals was a strong factor in the d
societies.
   a. True
   b. False

4. To sound or utter any of the abs
phonetic system of a language that c
similar speech sounds.
   a. Phoneme
   b. Semitic languages
   c. Ideograph
   d. Syllable

5. Tortoise shells etched with sym
excavated from the Jiahu site in He
central China. The shells found app
funerary ritual in Neolithic graves
to approximately 12,000–7800 BCE
   a. True
   b. False

2

Lettering during the Roman Empire and Middle Ages







2.1 Medieval illustrations depict the hardships suffered by those enduring the plagues in Europe during the Middle Ages.

The lettering of the precursors of our English language developed throughout the Roman Empire and its decline into the Middle Ages, up to the Renaissance. The Celtic, Carolingian, Romanesque, and Gothic lettering styles formed a bridge to the letterforms known today.

Because each predominated in a particular area at a particular time, differences in lettering and illumination style provide today's scholars with the clues necessary to identify the geographical location and time period where a given medieval manuscript originated.

During the Middle Ages, lettering developed in two general directions. The first included a number of similar styles showing Celtic influence, followed by the introduction of a consistent hand under the rule of Charlemagne. This period ended with the Romanesque variations. The second is characterized by a Gothic flavor, branching into Rotunda, Textura, Bartarde, and various Humanistic styles simultaneously.

Key Concepts

ascenders
Black Death
black letters
Capitalis Quadrata
Carolingian
Carolingian hand
Celtic
codex
Crusades
descenders
feudalism
Gothic
half-uncials
histrionic capitals
Humanistic Hand
illumination
letter-spaced
ligatures
Littera Antiqua
majuscule
Middle Ages
minuscule
parchment
recto
Romanesque
Rotunda
runic
Rustica
scrolls
serifs
stress
Textura
uncials
vellum
verso
watermark
word spaced

neline illustrating
ent of typefaces
ddle Ages.

The Impact of the Roman Empire

For approximately forty years beginning in 185 BCE the Roman Empire waged war intermittently against the Greeks. Their intent was to extend their empire by conquering neighboring lands. In 146 BCE the Romans finally were successful in their effort to overrun Greece.

The Roman alphabet, considered to be the earliest known version of our own modern alphabet, was derived from the Greek alphabet via the Etruscans, who settled north of Rome. During Roman military encroachment and empire expansion, the twenty-one-letter alphabet was spread throughout England, Spain, Egypt, and the Persian Gulf.

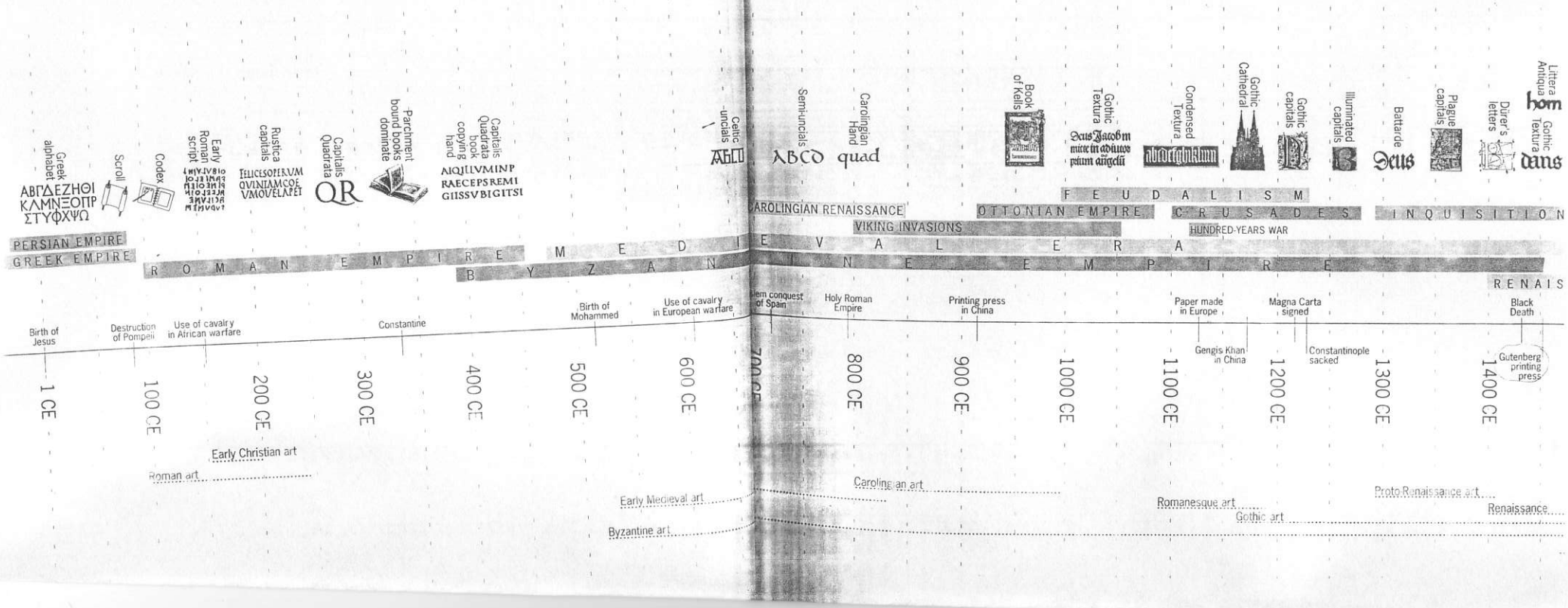
Roman Triumphal Arches

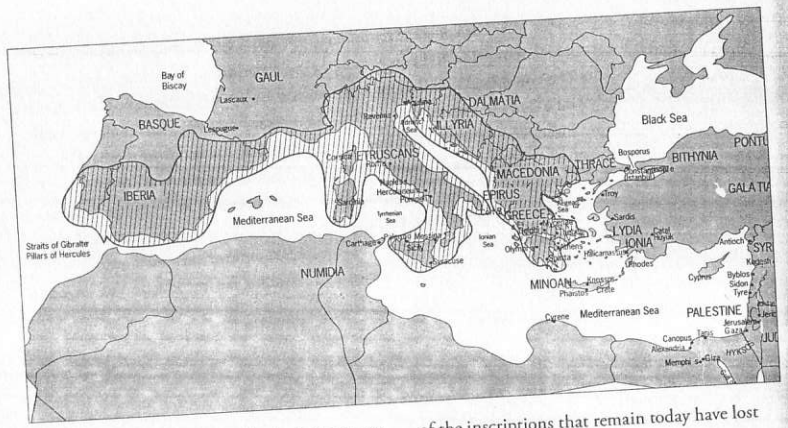
Romans conquered foreign lands and forced the people into slavery. Huge triumphal arches built across main thoroughfares of the conquered cities were the constant reminders of Roman pride and conquest. The conquered populations saw on a daily basis commemorative inscriptions emblazoned on the large arches. The Romans also engineered and built (with slave labor) many of the first roads and bridges connecting the cities of their empire in order to more easily move troops and supplies to new locations.

One lovely example of the structure and weight of Roman capitals is the inscription at the base of Trajan's column in Rome, carved around 114 CE. This inscription is regarded as the finest extant example of chisel-cut lettering. It shows the introduction of *serifs* (the horizontal extensions at the end of a stroke on a letterform), which were not seen in earlier examples.

In approximately 100 CE the Roman Empire was at its strongest, dominating the areas we currently refer to as Europe, Egypt, and parts of Mesopotamia and northern Africa. Part of the success in unifying this extensive

Key Players
- Alcuin of York
- Burgundians
- Charlemagne
- Constantine
- Franks
- Lombards
- Ostrogoths
- Ts'ai Lun
- Vandals
- Visigoths





2.3 The Roman Empire at approximately 100 CE is indicated by the lined area of the map.



2.4 Etruscan script from approximately 600 BCE.



2.5 Engraved Capitalis Quadrata from Trajan's column illustrates the precisely balanced and well-proportioned letterforms of the Roman alphabet in approximately 114 CE.

area is attributed to the use of a single language (Latin), a primary writing style, and a consistent government structure.

Roman Lettering

Just as the Greeks borrowed the alphabet from the Phoenicians, the Romans borrowed from the Greeks. The Romans adapted much of Greek civilization, including pieces of their culture, art, philosophy, legal system, and the written alphabet.

Roman lettering was a fine art. For years later scholars believed that the serifs were necessitated by the stonecutting technique, in order to create clean, precise "stops" for the strokes of the letters using a chisel. Recent studies suggest, however, that the serifs may have been created by the reed letterer, who laid out the text in paint or ink on the stone, to be used as a guide by the stonemason. The stonemason followed the reed brush strokes, creating thick and thin strokes and serifs just as in the hand written version. After being cut into the stone, the letters were filled with red paint to look like writing on papyrus, but most of the inscriptions that remain today have lost their coloring.

Capitalis Quadrata to Rustica

Capitalis Quadrata is the written counterpart to the classic carved Roman capitals. Written with a reed pen, the thick and thin strokes incorporate an organic unity of curves and straight lines that form square-shaped capitals. A condensed version of Capital Quadrata, named *Rustica* came into popular use between 100 BCE and 100 CE. Less rigidly constructed, the Rustica capitals saved space, reducing use of expensive parchment and papyrus. The Rustica lettering style allowed scribes to compress the quantity of information that would fit into a given space, often accommodating 50 percent more content. Eventually the letters were linked to increase the speed with which they were written.

Constantine Ends Christian Persecution

By 325 CE, Christianity was a widely recognized religion. The Roman Empire adopted Christianity and the formerly pagan people

ABCDEFGHI
JKLMNOPQ
RSTUVWXYZ



2.6 The Roman letterforms, top, were drawn on stone before being chiseled. Once the letters were engraved in stone, they were usually painted with red ochre paint for greater readability.

no longer persecuted Christians. Around 330 the emperor *Constantine* united the Eastern and Western portions of the Roman Empire and expanded into the area known today as Russia. He set up garrisons, or small bands of military personnel, in the conquered lands to ensure that he would receive tribute and taxes from the conquered people. The capital of the Roman Empire was moved from Rome to Constantinople, named after him.

The Roman Empire Divided

In about 395 the Roman Empire divided into eastern and western factions, ending the religious cohesiveness of the empire. That same year, the empire was overrun by northern outsiders called the *Visigoths* (the western group of Goths who sacked Rome and created a kingdom in present-day Spain and southern France). At first the Romans lost control of distant, outlying areas, but gradually the invaders overthrew Rome. Shortly thereafter, around 476 CE, the eastern division of the empire was overrun by Germanic barbarians who ransacked and looted the cities, leading to the Romans' final downfall.

The Scroll versus the Codex

Most Roman documentation was written on scrolls. *Scrolls* (rolled documents) were constructed of papyrus. Papyrus was too fragile to fold into pages because it would crack, so long documents were rolled for storage and transportation. The vertical strands on the back side of papyrus make it a poor writing surface, so scrolls only accommodated writing on one side.

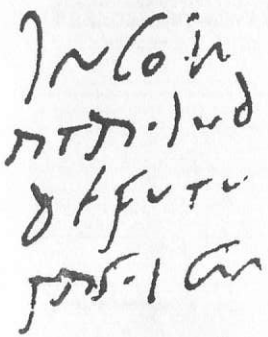
An early form of the book was known as a *codex*. This consisted of two wax-coated boards tied together along one edge. The pointed end of a stylus was used for writing in the soft wax, and the flat end of the stylus was used for erasing. The wax booklet was intended for temporary communication, notes, and correspondence and was used by students and scribes in training.

Later versions of the codex incorporated *parchment* (writing substrate made from animal skin) which could also be used on both

ABCDEFGHIJK
LMNOPQRST
UVWXYZ

ABCDEFGHI
JKLMNOPQ
RSTVWXYZ

2.7 By approximately 300 CE the square Roman capitals appeared shorter, wider, and with thicker strokes than Capitalis Quadrata, top. Rustica from approximately 500 CE, bottom, is a condensed face written with an angled pen.



2.8 An example of ancient Roman script commonly found in daily application of written documents such as business notations, loan documents, and other accounting records.

Tools and Letters

Ancient Roman writing, formed with flat-tipped reed pens, still affects the look of many of our contemporary typefaces, as reflected in the weight variations. The angle of the pen, in addition to the direction of pen movement, produced lines of different widths. The thickening of the lines, especially on curved letters, is called stress. The appearance of our own writing styles and typefaces are reflections of the tools employed in their creation.

sides. Parchment could be folded and stitched. Gradually codices became recognized as a choice among Christian scholars, as they were easier to use. In contrast to a lengthy scroll, the parchment codex used less material, took up less room in storage, and was less cumbersome when searching for a specific area of text.

The form of early books evolved from the codex, with a left-hand page (*verso*) and a right-hand page (*recto*). Although both scrolls and codices survived side by side from about 1 CE to about 400 CE, the practicality of the codex format eventually dominated.

Roman Script

Business transactions, bookkeeping, and correspondence from approximately 400 CE were written in script. This popular handwriting style was faster to use than capitals and required less space and fewer materials to communicate ideas. It was thought to be easier to read and is often identified as the beginning of lowercase letters as we know them today.

These letterforms were dramatically different from the original Roman capitals, and were characterized by long sweeping flourishes. Local chanceries and government scribes developed individual variations on the everyday cursive style, introducing *ligatures*, *ascenders*, and *descenders*.



2.9 Adobe Garamond Pro includes special glyphs called ligatures. A ligature is a combination of two or more connected letterforms. Ascenders are portions of a letterform that extend above the x-height of the form, and descenders are portions of the letterform that extend below the x-height of the form.



2.10 Examples of the uncial lettering illustrate regional and personal style differences in character form most commonly associated with the Celts.

Christianizing of Ireland and the Celtic Lettering

Shortly before the fall of Rome, around 430 CE, the missionary Saint Patrick set out with Bible manuscripts, intent on converting Ireland. Perhaps because Ireland was geographically removed from the mainland of Europe, it was not frequently subjected to invasions by nomadic tribes or warriors. This allowed *Celtic* (pertaining or relating to the Welsh, Cornish, or Scots Gaelic peoples) manuscripts and lettering design to flourish without much outside influence.

Celtic lettering and decoration innovations marked new directions in letterform shape and illustration styles, with extraordinary variation and geometric ornamentation. Introductory pages to each of the gospels use the whole page to illustrate one word or phrase magnificently. The complex interlacing of precise Celtic scrollwork is dotted with animals and supernatural creatures carefully executed with attention paid to minute details. Bright, intense colors are set adjacent to one another to intensify the thick texture of twisted ornamentation, highlighted with gold leaf. The rounded letterforms, with both upper- and lowercase clearly defined, are carefully *letter spaced* and *word spaced* to improve legibility.

The Crumbling Empire Leads to Feudalism

Rome was sacked by a succession of invaders, beginning around 410 CE—first the Visigoths, followed by the *Burgundians, Vandals, Franks, Ostrogoths,* and *Lombards.* Following their participation in the conquest of the Western Roman Empire, these Germanic tribes settled throughout Europe and Iberia, founding kingdoms. Except for the Franks, all have disappeared. Rome was ravaged once again around 533 CE when the Byzantine (eastern roman) emperor Justinian's armies attempted to regain control of the city. As the city became less safe, people moved to the estates of landed nobles in the countryside, trading their liberty for protection by the lord. These vassals, or people who held land from a feudal lord and received protection in return for homage and allegiance, were required to guarantee defensive military service in case of attack.

Following the fall of the Roman Empire in 476 CE, the centers of civilization were looted and Western society fell into the Dark Ages. *Feudalism*, an economic system where serfs or indentured slaves worked for the wealthy lord in exchange for protection, took hold.

Each feudal lord set up a small, self-sufficient community, so the need to interact with other communities and travel was limited. Usually medieval communities were surrounded by a protective wall or set up on a high land mass for protection. Since most people were settled within these enclosed communities, they no longer looked to conquer new lands or build new empires. On the other hand, cultural life was hampered because there was no forum for the interaction of ideas, philosophies, or influences.



2.11 Monastic orders were reponsible for the preservation of ancient texts through copying texts to preserve and disseminate knowledge; often men born to a low societal status joined a religious order to earn the opportunity for education and social respect.

The Roman Christian church emerged as the unifying force in Europe, with the power of the clergy unquestioned. The Christian notion of an all-powerful, father-like God was prominent in all facets of daily life. At the same time, there was a great belief in evil spirits among the average population carried over from the days of pagan belief and worship.

Secluded monasteries were established for religious orders, so learning and copying of biblical

Parchment

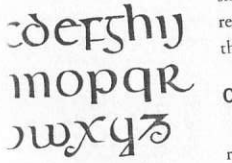
Parchment is a writing substrate that is made from the skin of goats and calves. *Vellum* is the highest quality of parchment, made from newborn calf skin. The fur was removed from the skin surface, which was smoothed by techniques utilizing stones and liquid washes before being stretched over a frame and left to be dried and bleached by the sun.

Unlike papyrus, both sides of parchment could be written on without the ink seeping through. A number of scholars believe that parchment allowed for the evolution from scrolls to books since it was usable on both sides, and could be folded without cracking. The terms *recto* and *verso*, which identified the right and left pages in a book spread, came from the description of the sides of the sheet of parchment. *Recto* referred to the good side or the smooth inside of the skin, while *verso* referred to the back, or less smooth side of the skin.

There were disadvantages to parchment. Even though both surfaces could be written upon, it was more expensive to manufacture than papyrus, hence, the production of books using parchment was very expensive. Because they were costly, books were collected by rulers, as symbols of their great wealth and power.



n Celtic knotwork B's illustrate
d imagination that went into
n of letterforms, often used to
minate texts copied by religious



were named for the grid used
the letterforms. This wide style
eventually developed a second
small uncials, or *minuscules* called
The half-uncials are believed to
d into the lowercase letterforms
y.



se very linear, strongly vertical
le (uppercase) letterforms are of Celtic
but vary greatly from the Uncial style.
e is often referred to as *Runic* since it
follow many of the characteristics
Nordic Runes.

texts was limited to geographically isolated areas. Monks raised their own animals and crops for food; they lived a peaceful life of quiet religious practice and study.

In the monasteries, many of the ancient texts were copied. Some of the manuscripts produced by the monks were sold to provide money for necessities they could not produce themselves, while others were produced for the monks' own libraries. It is these copies on parchment, rather than the papyrus originals, that survive today in small numbers. These parchment manuscripts reveal the different regional styles of lettering that developed during the medieval era.

Celtic Round Uncials

From the Celtic lands emerged a more rounded form of the Roman alphabet called Uncials. *Uncials* (from Latin *uncia*, meaning a twelfth part, referring to the measurement of an inch) are believed to be the precursor of our upper- and lowercase letters. Many scholars feel that uncials grew out of a desire to have small letters in biblical manuscripts for the pragmatic purpose of saving parchment. The new letterforms were quicker to write, compared to earlier lettering styles, and provided the opportunity for monks and scribes to develop beautiful letterforms for sacred texts.

Celtic uncials were distinguished by their roundness, their diminished serifs, and their subtle ascenders and descenders. In the interest of saving time, corners were rounded off. Uncials appear to be lowercase letters, but often sentences were begun with the same uncial characters used in the rest of the sentence.

From the development of the Phoenician alphabet through the introduction of uncials, all prior Roman letters had been uppercase. The introduction of *half-uncials* provided the foundation for lowercase or *minuscule* letters. These half-uncials began to appear in documents around the year 600. Eventually ascenders and descenders were extended, evolving into the letterforms known today. The letterforms developed regional stylistic variations. The practice of reading to oneself influenced the increasing use of small letters because scaled-down books could be more easily transported to different locations for meditation and reflection. Also, the distinctions between upper- and lowercase letters meant that words were more legible.



2.15 Page 285 recto from the Book of Kells (Luke 23:56 through 24:1) infers the resurrection of Christ, as Joseph of Arimathea and others gather to anoint the body and find the rock rolled away from the entrance of the tomb, and the body of Jesus missing.

Lettering as a Declaration of Faith

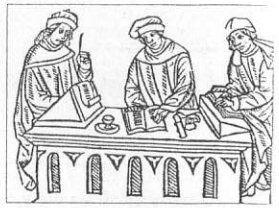
The ornamentation of early papyrus scrolls was limited to the carving of the sticks to which the scroll was attached. As the demand for Bibles in the codex format increased, greater importance was placed on creating beautiful copies of the sacred word. Monks copying the sacred text became imaginative and competitive, and were committed to penning a beautiful Bible to exalt their God. The reference to God as the "light" led to the use of gold leaf in the *illumination* of the words. Initial caps, identifying the beginning of a new section, became highly stylized, including images of the characters featured in the story (called *histrionic capitals*) while the covers of the Bibles were embedded with jewels.

The concept of illuminating was a double entendre, as it was meant to make clear the stories of the Bible as well as to brighten the page with bright colors and reflective gold and silver accents. The average person of the time period could not read, since this skill was reserved for wealthy nobles and those within the church community. Most commoners relied on the pictorial carvings and paintings in churches to recall the scenes from the Bible, as well as the stories and lessons that accompanied them.

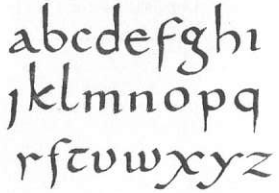
A Unifying Force in Lettering

During the early Middle Ages (500 to 750) the lands of the Roman Empire had disintegrated into independent feudal communities, causing the Latin language to evolve into regional dialects. Strong military leaders' attempts to conquer and consolidate large territories into kingdoms continued. By 768 CE, the Gauls' leader, *Charlemagne*, was known for being a strong military leader, as well as a ruler who favored learning and the arts.

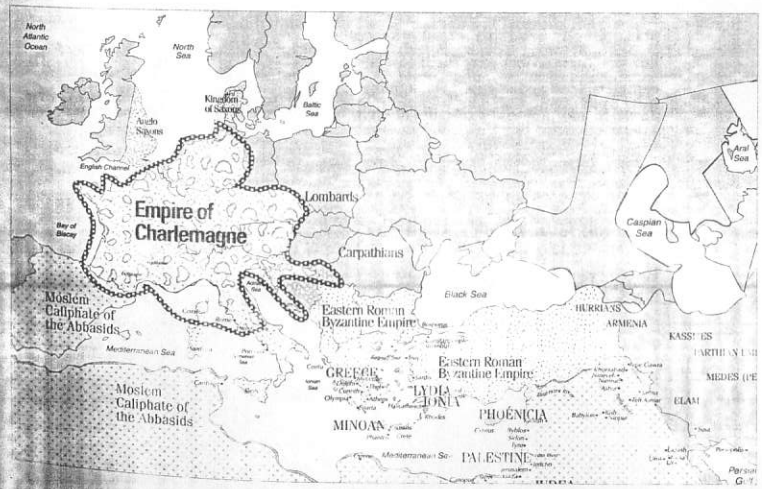
A standardized lettering style was decreed throughout the empire, which extended through much of the area that comprises modern-day Europe. Charlemagne appointed an English monk scholar, *Alcuin of York*, to oversee the copying of many ancient manuscripts. Many assume that Alcuin was a Celtic-trained monk as he assembled a large number of letterers at Charlemagne's court at Aachen in 789 CE. He chose a hand that was similar to Celtic uncials



2.16 Monks copying and binding books.



2.17 The Carolingian manuscript hand was codified during Charlemagne's reign. This example is believed to have been written around 800.



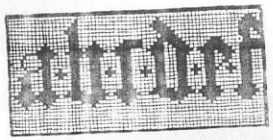
2.18 Empire of Charlemagne around the time of his death, approximately 814.



2.19 An illustration of the variations in Romanesque characters and the practice of enclosing or insetting characters inside another to conserve space.



2.20 An engraving of Romanesque lettering includes a variety of letterforms.



2.21 Gothic lettering was practiced and perfected using a grid that helped the calligrapher determine correct proportions for each letterform while maintaining consistent vertical strokes.

as the imperial lettering style. Alcuin is credited with the introduction of the *Carolingian* (meaning during the reign of Charlemagne) style of lettering that was dictated as the standard copying text.

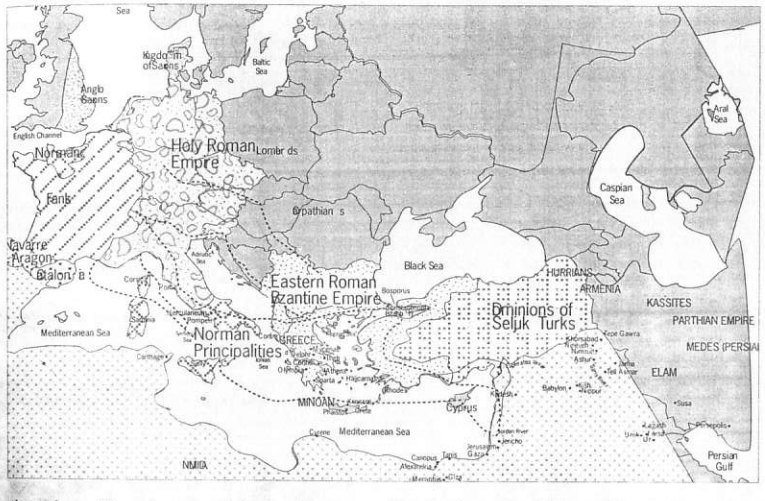
Like Celtic uncials, the *Carolingian hand* is a style of writing in which the characters are round and full. There is a twisting of the pen throughout the downward stroke of the ascenders, giving a slightly tapered appearance to the letters. This standardized hand brought about a uniform lowercase Roman alphabet. By this time (800 CE) the use of larger uncials to introduce a sentence was common practice; however, standardized punctuation and word spacing were not adopted until the 1400s, following the invention of printing.

During Charlemagne's reign a class of scribes was employed to copy secular texts. These commercial letterers were employed by book merchants who pressured them to write with greater speed. It is believed that this practice of encouraging greater speed affected the style of Carolingian hand that spread throughout Europe. These scribes were hired to draw up contracts, loan documents, legal agreements, and deeds, in addition to the copying of texts for the educated elite of the day.

On Christmas day, 800, Pope Leo III crowned Charlemagne the emperor of the Holy Roman Empire, a move calculated to gain military support against invaders intent on the overthrow of Rome. However, it was not long before Vikings began to raid by land and sea, intermittently attacking Europe from about 830. The Lindisfarne Monastery was ransacked in 793, Ireland was invaded in 835, and France in 843, followed by England in 851. These raiders had no appreciation of the culture they were destroying; they stole items made of precious metals and melted



2.22 The practice of Gothic hand lettering illustrates letterform variations.



them down. Since the monasteries were known to have elaborate gifts donated by wealthy patrons, they were a prime target for attack.

By 1000, the Carolingian hand had evolved into many variations and was widely used by monks copying ancient texts. This set the stage for the Italian Renaissance printing fonts as they were mistaken by printers as an ancient hand from Roman times. The development of typography slowed with the decline of Charlemagne's empire during the barbarian raids. Eventually Charlemagne's empire was divided among his three sons, and the visual standards of the empire deteriorated into regional variations once again.

The Romanesque Hand Invites Innovation

The *Romanesque* lettering style formulated between 800 and 1000 is characterized by the extensive manipulation of the forms, which feature innovative additions to the strokes. Inspired by earlier Celtic and Rustica lettering, the Romanesque integrates insets, overlaps, and fused letters in manuscripts and engravings. Inventive geometric experimentation and the truncation of crossbars freed the lettering from the prior austere standardization, with creative results. Multiple forms of the same letter were used in a single manuscript to showcase the scribes' talent and creativity. Romanesque-era lettering differs according to location and is so varied that the influences are difficult to trace.

The Development of the Gothic Textura Hand

There was little consistency in the reigning powers during the seventh and eighth centuries, although the Pope played an important role from time to time. Isolationism in small feudal communities continued, and the era was marked by great devotion to religion. Natural phenomena were explained as curses or blessings from an almighty power. Pilgrimages to faraway lands



2.23 Gothic Textura is characterized by a condensed vertical structure and a boxlike aesthetic conveyed by the diagonal counterforms and serifs.

2.24 Map illustrating the various routes of movement during the Crusades.



2.25 The ornamentation of initial caps during the Gothic period (above) remained intricate but was more structurally restrained along the vertical and diagonal axis of the composition than the Celtic hand styles (below).



Papermaking and Printing in Ancient China

The Greeks were still writing on papyrus scrolls while the Chinese were mass-producing printed works in 300 CE, a full 1,200 years before the Europeans!

Ts'ai Lun was credited with the development of paper in China in about 100 CE. He used an assortment of vegetable fibers such as mulberry tree bark, bamboo, silk, cotton rags, linen, and hemp. These natural fibers were soaked in water and beaten until they broke down into a pulp. Using a wooden frame with a screen attached to one side, he lowered it into the watery pulp mixture. Gently shaking the screen as he brought it up out of the water, he was able to create an even coating of fibers against the screen. The thin mat of plant fiber was flattened, weighted, and pressed until it was dry.

By 270 CE the Chinese were printing from woodblocks. Areas of a solid wood block were carved away, leaving a raised surface. A water-based ink was rolled onto the raised surface and allowed to soak into the wood grain. A piece of paper was applied to the surface and rubbed to transfer the image from the woodblocks to the paper. Often multiple blocks were arranged to print on a single sheet of paper, and could be inked in different colors.

were a commonplace homage of faith, a means of purifying oneself from past sins, proof of one's devotion, or a means to gain heavenly grace. During this era, marked by the importance placed on honor, purity, and chivalry, commoners did not question clergy.

The evolving *Gothic* character was angular and condensed; heavy vertical strokes were dominant, causing the curves to all but disappear. These *black letters* were made with great precision and were evenly spaced to such an extent that the texture on the page resembled woven fabric; for this reason it was referred to as *Textura*.

There were not larger spaces between words, and the copy extended from the left margin to the right in two vertical columns, without exception. This complete use of the page is difficult for the contemporary reader to decipher, as there was little indication of the beginning and ending of words or sentences. A few variations on lowercase letterforms evolved to assist readers in distinguishing between letterforms, such as the dot over the lowercase *i* (the tittle), to help readers distinguish it from a stroke of an *n*, *m*, or *u*. The length of ascenders and descenders was shortened and the vertical space between lines of text was reduced to economize on parchment, resulting in text that is difficult to read.

Because religious texts were the most commonly reproduced at this time, and because this Gothic lettering style was used at the same period of time, unavoidable associations between the two have resulted. The Gothic black letter hand still resonates with religious overtones hundreds of years later. Many historians compare the strong, vertical, angular style to the spires of Gothic architecture from the same period of time.



2.26 Round majuscule letters (top), known as Lombardic, were plump and curvilinear, in contrast to the Gothic Textura.



2.27 The banner example (top) illustrates how the Lombardic and Gothic Textura styles were mixed to create visual contrast and interest, as compared to the example (bottom) which is composed exclusively of the strong vertical Textura hand.

Mediterranean Expansion of Muslims

The Muslim Arabs expanded across Persia, Arabia, and the north coast of the Mediterranean at an unprecedented rate between 620 and 730, bringing political stability and their religion, Islam, to the lands they conquered. The Muslims ruled Arabia, Palestine, parts of ancient Persia, and Egypt by 650.

Their next expansion included North Africa, and by 711 they crossed from Morocco to Spain at the Straits of Gibraltar. They continued, overtaking Spain, and were not stopped until 732, when they reached the Pyrenees, which provided France with a natural barrier. Sicily was invaded in 827, with Rome attacked about twenty years later, in 846. Because St. Peter's Cathedral was not enclosed within Rome's protective walls, it was looted. With this great conquest by the Arabs came the opportunity to control all the shipping throughout the Mediterranean.

Beginning in 1096 and continuing until about 1291, the *Crusades*, or Holy Wars, were fought by Christians from Central Europe against the Middle East. Turkey, Syria, and Arabia were attacked, as well as the Holy Land. (Since the area surrounding and including Jerusalem is considered sacred by three different religions, it remains an area of dispute today.)

Development of Rag Paper in Europe

Books became cheaper during the Middle Ages once it was discovered that paper could be made from rags and plant fibers, creating an alternative to expensive parchment. The lower cost of paper allowed faster, less expensive book production. The growing middle class of guild members was becoming more literate, and it became possible for them to afford books. Soon rag paper became plentiful throughout Europe.

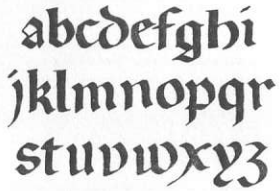
Around 1100 papermaking was introduced in Sicily, and by the end of the 1200s a small paper mill was well established in Fabriano, Italy. Paper mills grew rapidly along rivers because the power of the running water was used to turn great water wheels for production, and also because the papermaking process required large quantities of water. France followed and within fifty years built paper mills as well. These different mills began using watermarks to identify and distinguish themselves. A *watermark* is a design embossed into a piece of paper during its production used for identification of the paper and papermaker. The watermark is visible when the paper is backlit.

The Late Gothic Period

The feudal societies of the Middle Ages transitioned into settled cities as the powers of local lords brought about the establishment of reasonable laws, which curtailed much local crime, allowing the development of trade. Increased agriculture supported international trade, and money began to replace land as a measure of wealth.

Universities were founded in cities and a broader spectrum of society received a formal education. Universities necessitated the use of books in greater quantities, so the demand for craftsmen involved in the production of books grew as well. Guilds of craftsmen organized and began training apprentices for the workforce in many areas, but those specializing in lettering, ornamentation, and binding were particularly popular. Since a number of the universities were secular, there was a transition away from the religious monopoly on education and book production; besides the traditional clerical Latin translations, classical Greek and Roman texts moved into popularity by the end of the era. The study of the ancient Roman and Greek texts developed into a philosophical movement known as humanism. This school of thought placed humans at the center of the universe, without divine intervention.

From approximately 1200 through 1400 the Gothic aesthetic in art and architecture was at its height throughout Europe. Supported by flying buttresses, the spires of cathedrals soared ever higher in their attempt to reach up to heaven. Vast areas of stained glass depicted Biblical stories, making it easier for the clerics who taught and preached to illustrate the concepts. Monasticism was at its peak, with many different orders. Churches were built in small towns along pilgrimage routes.



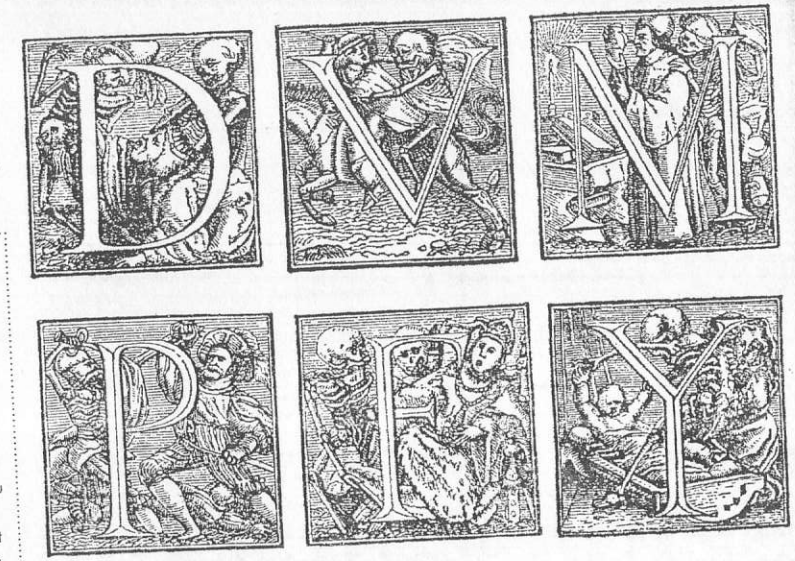
2.28 Rotunda lettering is believed to have been adapted from earlier Gothic lettering, although it is wider and less ornate—perhaps it is a hybrid produced by a combination of Gothic and Carolingian.



2.29 Carefully executed Gothic lettering results in a gracefully elegant aesthetic solution, but it is difficult for contemporary readers to decipher.



2.30 Northern Gothic lettering shows the difference between the full majuscule letters and the minuscule letters; the difference in the wider letterform of the uppercase provides a visual break and a point of emphasis among the strong vertical lowercase forms.



During the thirty years between 1347 and 1377, more than forty percent of the population —that is, more than twenty-five million people— died when the bubonic plague hit Europe. It is frequently referred to as the *Black Death*, because the victims turned black from the plague. The plague was brought by fleas that lived on rats, which came on cargo ships bringing goods from the East. The disease spread rapidly with the existing unsanitary living conditions of the time, and for most victims death came within four days of the onset of symptoms.

Historians believe that a number of religious monuments were built during this time as a symbol of celebration and thanks by survivors. A number of illustrations, bookplates, and initial capital letters represent the plague as a skeleton coming to whisk the living away unexpectedly.

Rotunda Compared to Gothic Lettering

By the early 15th century, Gothic black letter, known as Textura, and Rotunda lettering had emerged. *Rotunda* (also referred to as *Humanistic Hand*, or *Littera Antiqua*) was a more open and round style that was preferred in France and Italy. The condensed Gothic black letter remained popular in Germanic areas into the 1900s. Both of these styles became models with the onset of experimentation with movable type and printing.

Littera Antiqua was inspired by the six-hundred-year-old Carolingian writing forms, combining square Roman capitals with curving, round, lowercase letters. Scholars who read ancient Roman manuscripts that had been copied during the Carolingian period thought that they were reading original texts copied in a writing style developed during the time of ancient Rome, hence the name Littera Antiqua, meaning "ancient letters." Littera Antiqua was the formal style of lettering used for secular manuscripts, so it served to differentiate lay texts from religious texts in many areas of Europe.

Setting the Stage for the Renaissance

Cities began to grow in size and importance, around 1450, just before the Renaissance (which refers to the "rebirth" of learning) bringing about occasional political strife and turmoil. Art was created primarily under the patronage of wealthy lords, politicians, and religious leaders. The de' Medici family in Florence, Italy, was known for sponsoring great works of art and architecture during the Renaissance, as were a number of the Popes, who comissioned religious sculpture, architecture, and frescoes.

When the Turks closed the overland routes to India and the Far East, nations seeking spices and silks began to sponsor explorers to find alternate routes. This led to Christopher Columbus' journey to America in 1492, and Vasco da Gama's successful journey to India in 1497 by sailing around the southern tip of Africa. Humans began to understand enough about world geography and the earth's forces to explain them in natural terms instead of supernatural terms. Humanism flourished during the Renaissance.

Chapter Two Review

Circle one answer for each definition to indicate the correct key concept term for each. When necessary, determine whether the phrase provided is true or false.

1. Black letters that were made with great precision and were evenly spaced to such an extent that the texture on the page resembled woven fabric were referred to as _____.
   a. Textura
   b. Frescoes
   c. Rotunda
   d. Bartarde

2. Part of the success of the Roman Empire in unifying Europe, Egypt and parts of Mesopotamia and northern Africa is attributed to the use of a single language (Latin), a primary writing style, and a consistent government structure.
   a. True
   b. False

3. The study of the ancient Roman and Greek texts developed into a philosophical, secular movement known as _____. This school of thought placed humans at the center of the universe, without divine intervention.
   a. Humanism
   b. Black Death
   c. Feudalism
   d. Monasticism

4. By 270 CE the Chinese were printing from woodblocks.
   a. True
   b. False

5. The western group of Goths who sacked Rome and created a kingdom in present-day Spain and southern France
   a. Muslims
   b. Ostrogoths
   c. Visigoths
   d. Burgundians

rcle one answer to correctly
ntify each example.

abcdefghi
jklmnopqr
stuvwxyz

a. Textura
b. Rotunda
c. Carolingian hand
d. Half-uncials

30.

a. Lombardic
b. Rotunda
c. Gothic
d. Celtic lettering

31. abcdefghi
jklmnopq
rstuvwxyz

a. Etruscan script
b. Rotunda
c. Carolingian hand
d. Celtic lettering

32. ABCDEFGHI
JKLMNOPQ
RSTUWXYZ

a. Textura
b. Rotunda
c. Carolingian hand
d. Uncials

33.

a. Roman script
b. Rotunda
c. Carolingian hand
d. Celtic lettering

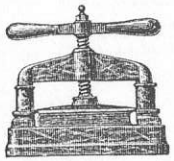
34. ABCDEFGHI
JKLMNOPQ
RSTVWXYZ

a. Roman script
b. Rustica
c. Etruscan script
d. Celtic lettering

35.

a. Lombardic
b. Rotunda
c. Gothic
d. Etruscan script

Renaissance Typography and Printing



3.1 With a simple platen press, up to two hundred pounds of pressure per square inch may be applied to the page to make a clean impression. A great deal of physical labor was involved in printing using this method. Today, these platen presses are used for assembling covers on handmade books.

The changing economies and emerging political stability of the late Middle Ages fostered the growth of cities. The increasing complexity of social organization encouraged the development of craftsmen's guilds and trade networks. Universities were founded in the burgeoning cities, and students were attracted to these centers of learning, art, and culture. Thus, the stage was set for the Renaissance, during which a resurgence of interest in ancient Roman and Greek thought led to the philosophical movement known as humanism.

In Europe, printing with movable, reusable type developed during the Renaissance and is considered an epochal event in the course of human development. A modern comparison is the development and widespread distribution of the personal computer, which has brought about similar changes in the speed and dissemination of information.

Key Concepts
Bartarde
Book of Hours
bracketing
chase
Civilité
Cloister Old Style
colophon
copperplate engraving
42-Line Bible
furniture
italic
kerning
libraire juré
movable type
Old Style
Papal Chancery
precision mold
press bed
quoins
Reformation
registration
Renaissance
Roman typeface
set width

:t Find! Although the
es for the Renaissance are
ieralized here, there are
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erent areas of Europe, with
phasis in different areas of
arts and the humanities. List
examples of more specific
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naissance period. Be sure to
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URL: http://

Date visited:

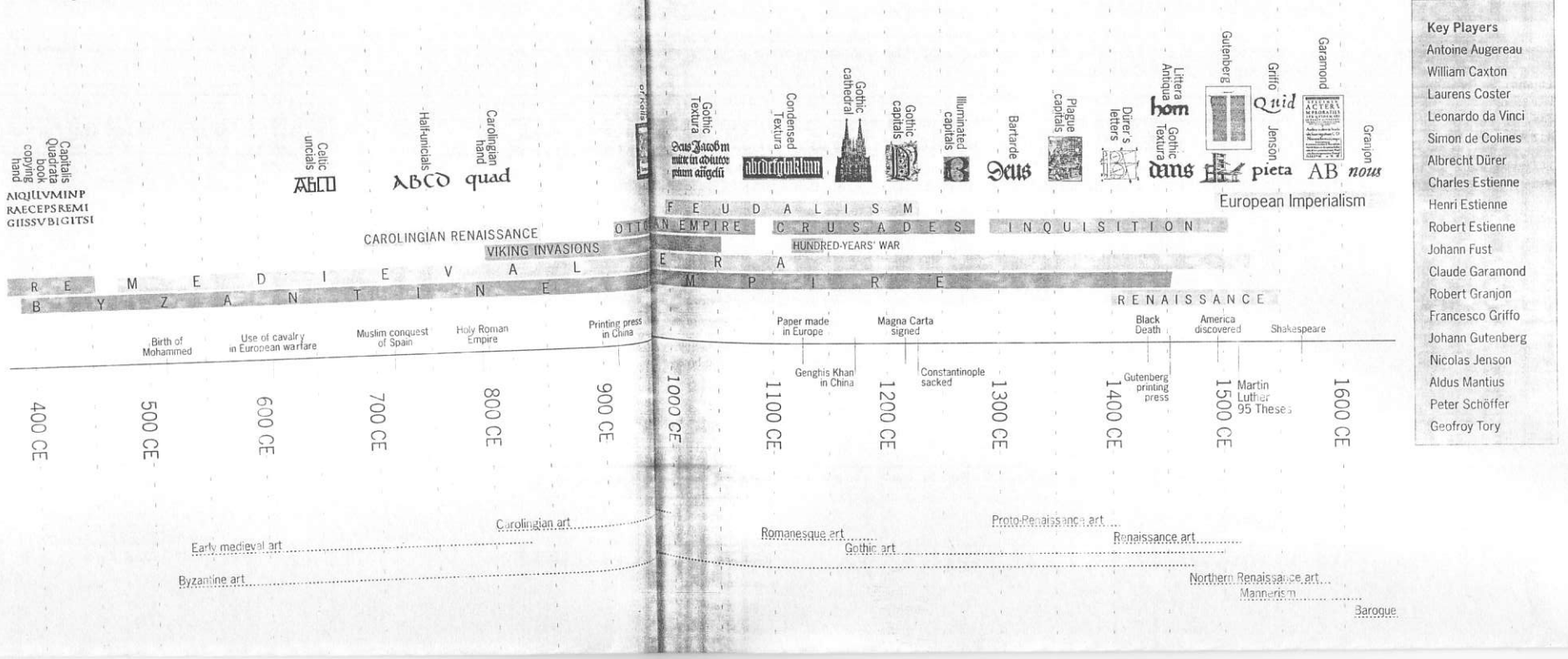
The Renaissance

Often described as the "rebirth of learning," the *Renaissance* lasted approximately two centuries, from the mid-1400s to the late 1600s. The rebirth included a fascination with the artifacts, architecture, and language of ancient Greece and Rome. The writing, music, theater, philosophy, medicine, and law of the ancient cultures were held up as ideals, in sharp contrast to the predominantly Christian-based learning of the Middle Ages. Many ancient works found their way into print as book printing became more common and less expensive.

The Beginning of Printing

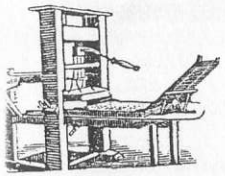
The refinement of the printing press, the innovation of *movable type* (reusable, individual letters cast in metal or carved in wood), and the manufacture of greater quantities of cheaper paper allowed the increase of book production. From the time when oral tradition dominated human interaction through the development of formal writing systems, never had there been such an enormous leap in communication as following the development of Gutenberg's printing technology. This process was much less expensive than the previous hand-copied editions, allowing more widespread dissemination of the written word. The broad availability of books encouraged greater literacy among commoners, since the mass reproduction of texts enabled a greater number of landowners and merchants, as well as many members of the guilds, access to and ownership of books; no longer were books exclusive to nobility.

Johann Gutenberg is credited with the development of movable, reusable type.

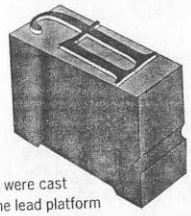


3.2 Timeline highlighting the transition from the Roman Empire to the Middle Ages, with examples of popular lettering styles of the period.

Key Players
Antoine Augereau
William Caxton
Laurens Coster
Leonardo da Vinci
Simon de Colines
Albrecht Dürer
Charles Estienne
Henri Estienne
Robert Estienne
Johann Fust
Claude Garamond
Robert Granjon
Francesco Griffo
Johann Gutenberg
Nicolas Jenson
Aldus Mantius
Peter Schöffer
Geofroy Tory

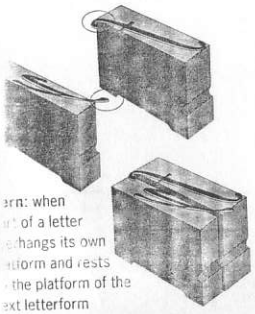


s press is similar to the one modified
fected by Gutenberg.



ture:
two
acters were cast
ie same lead platform

utenberg used 270 different pairs of
e letters in the printing of his 42-Line
so that the end result would more closely
ble the versions hand-copied by scribes.



ern: when
of a letter
changs its own
form and rests
the platform of the
xt letterform

The lead base (platform) was shaved on a
ber of characters to create kerned pairs,
easier reading and to mimic handwritten
rts.

Certainly Gutenberg's commitment to refinement of the printing process and to solving a series of problems and challenges is legendary. Some historians argue that *Laurens Coster* of Holland developed the art of printing slightly before or around the same time as Gutenberg; others argue that Coster merely stole some of Gutenberg's trial forays into printing. Still others propose that we know too little of the actual details of Gutenberg's life to credit him with the invention of printing. This controversy remains an unresolved, contentious issue among historians.

Gutenberg: The Metal Craftsman

The generally accepted version of the printing story is that Gutenberg, an accomplished metalworker and caster, was working toward developing a technique of printing text for books as early as 1438. He joined with goldsmith *Johann Fust*, who agreed to underwrite the cost of Gutenberg's printing experiments, provided Gutenberg repay him.

Gutenberg adapted a press that was originally used to press grapes for winemaking. He developed a method of casting metal type in single pieces that varied in width but maintained a precise and consistent height. He developed a *chase* (a rectangular iron frame in which pages or columns of type are composed) to hold the type in position on the printing press bed. Finally, he formulated inks to the correct consistency for use with lead cast type, and perfected techniques for *registration* (accurate alignment of type and images), for clean and precise impressions, and for keeping the edges of the printed page ink-free. In short, Gutenberg worked out the details that made printing a viable reproduction process.

Movable, Reusable Type

Gutenberg's brilliant innovation was the production of individual, reusable characters, rather than casting an entire page as one solid piece. The printing process required that Gutenberg cast each piece of type to the exact same depth for inking and the exact same height so that they would align along the baseline, but also find a means to cast different widths to accommodate different letter widths—from a lowercase *i* to an uppercase *M*. Gutenberg perfected the process with an ingeniously simple precision mold. First a punch was cut of the letter from hardened iron. Next, the punch was driven into the brass matrix to a precise depth to create the negative mold, from which the final lead alloy character was cast.

The *precision mold* was composed of two L-shaped pieces of metal that could be opened and closed to accommodate letters of varying widths while constraining the height and depth to consistent measurements. The negative brass impression of the letter, known as the brass matrix, was placed into the top of the mold. A mixture of molten lead, antimony, and tin was poured into the precision mold. The mold was quickly clamped shut and swung around by a rope to force the molten metal into all the small pieces of the letter and to prevent air bubbles from being trapped in the molten metal. Air bubbles would result in an imperfect raised letter or one that would deform under the pressure of the press, rendering it worthless.

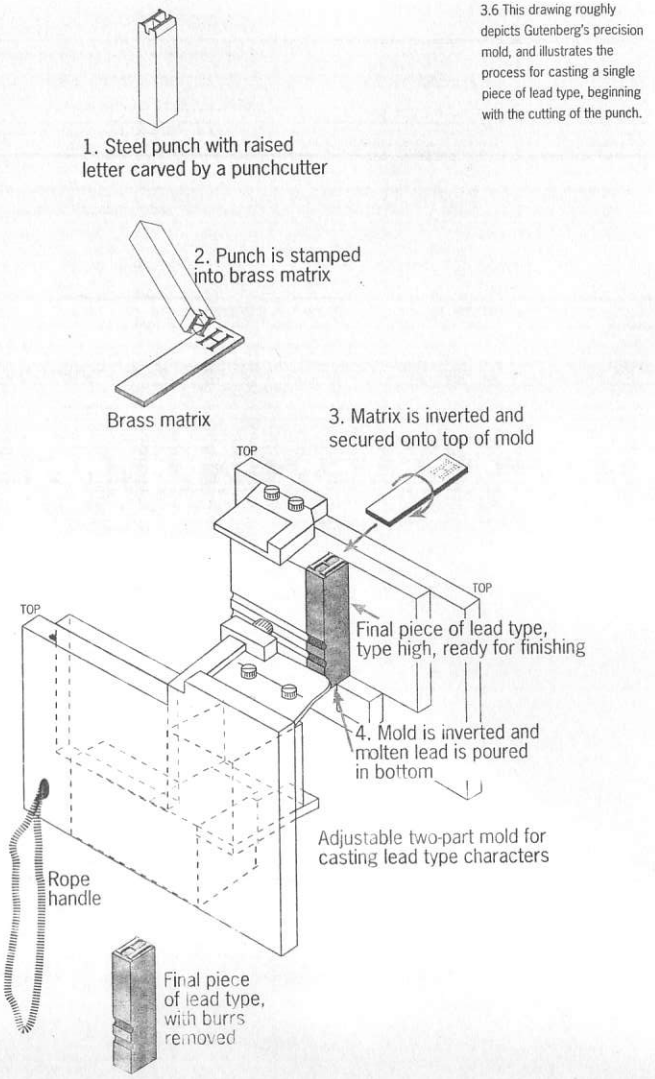
Once the precision mold cooled, it was opened to remove the cast letter. Each cast letter was smoothed, and all burrs were removed. This was a labor-intensive process, but the letters could be used over and over. Ultimately it was faster to cast the individual letters than to copy a single page by hand. Gutenberg and his workers (hired metal-smiths accustomed to working in fine detail) cast over 15,000 lead characters for his first Bible (known as the *42-Line Bible* for the number of lines of text set on each page).

Imitation of a Hand-Copied Book

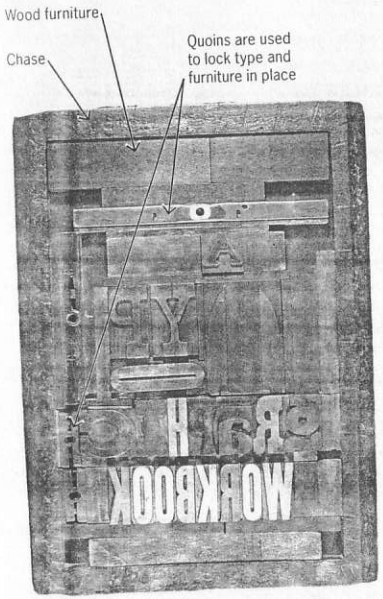
Gutenberg's ultimate goal was to create a manuscript that looked as though it had been hand-lettered by a scribe. Since there was no other form of writing or lettering available to Gutenberg at the time, it was logical that he would copy the existing standard. To approximate the handwriting of the scribes, Gutenberg cast almost 270 pairs of kerned or ligature pairs of characters as one punch. Since the *set width* (the space around a letter and the letter itself) is an inherent part of each cast lead piece, those characters that appeared too far apart underwent *kerning*, which referred to the practice of filing away a portion of the base of one character, allowing part of the letter to rest on the base of the adjacent character. (Today, the term *kerning* refers to the adjustment of the space between letters within a single word, with a goal of increasing legibility.)

The First Printing Ink

Oriental ink, which was thin and soaked into the wood type, then into the paper, produced a blurred edge to the characters and images and would not work for Gutenberg's printing process. It is likely that he borrowed his ideas about ink formulation from oil paint introduced in the early 1430s. Gutenberg's ink had enough



3.6 This drawing roughly depicts Gutenberg's precision mold, and illustrates the process for casting a single piece of lead type, beginning with the cutting of the punch.



3.7 Photograph of a chase with wood type, handset using wood furniture, and quoins to lock it into place.

tackiness to stick to the nonporous surface of the metal letters, yet transferred to paper under pressure. If the ink was too runny, it would stick to the background areas of the type as well as the raised surfaces of the letters, creating a mess. The final mixture consisted of boiled linseed oil with lead and copper added to create a rich blackness.

Composing a Page

It was necessary to hold the type in position on the press as pressure was applied to the platen to transfer ink to the sheet of paper, parchment, or vellum. The individual letters were set into lines, and then the lines were organized appropriately and locked into a *chase* (the metal or cast iron frame set on a platen press that stabilizes handset lead type in letterpress printing), using *quoins* (expandable furniture) and *furniture* (wood and metal spacers to maintain the position of type) for proofing. Gutenberg relied on a paper mask placed over the perimeter of the bed to prevent any excess ink from spoiling the clean page margin.

Printing the 42-Line Bible

The Gutenberg Bible was a two-volume work, measuring roughly twelve inches wide by sixteen inches tall, with a total of 1,282 pages in both. Most copies were printed on rag paper, with approximately one-quarter of them printed on vellum. Only 48 of the estimated 180 original copies are known to exist today.

Scholars believe that Gutenberg printed his 42-Line Bible between 1450 and 1456 in Mainz, Germany. One page of the Bible contained four thousand to five thousand pieces of type. A stock of fifteen thousand to twenty thousand pieces of type had been cast to allow the printing of a page while another was being composed. A proof was pulled, and errors were corrected for all copies of the book, allowing for a consistent product, unlike the hand-copied versions, which included numerous different errors in each edition.

This process of producing a book cost a fair amount of money. Johann Fust, who had helped finance Gutenberg, foreclosed on the loan in November 1455 and locked him out of the print shop once the process was refined. This act prevented Gutenberg from selling the books, which had consumed five years of his life's work and which were only a few months from completion.

Peter Schöffer, Gutenberg's assistant, was brought in as a partner by Fust to manage the press. Together they finished printing approximately 180 Bibles and made a fortune once the Bibles were signed and sold the following August.

Assembly-Line Book Production

Numerous historians consider Gutenberg's workshop to be one of the earliest examples of assembly-line production. Unlike earlier craftsmen, who handled a project from start to finish, each person in Gutenberg's shop worked on a single phase of the process: composing, printing, or binding.

Both the news and the technology spread quickly. In the area of Germany where Gutenberg practiced, other shops quickly established themselves. Many believe that Gutenberg set up a separate press following Fust's foreclosure on his first shop, although records indicate that, destitute, he was taken on as a craftsman for the

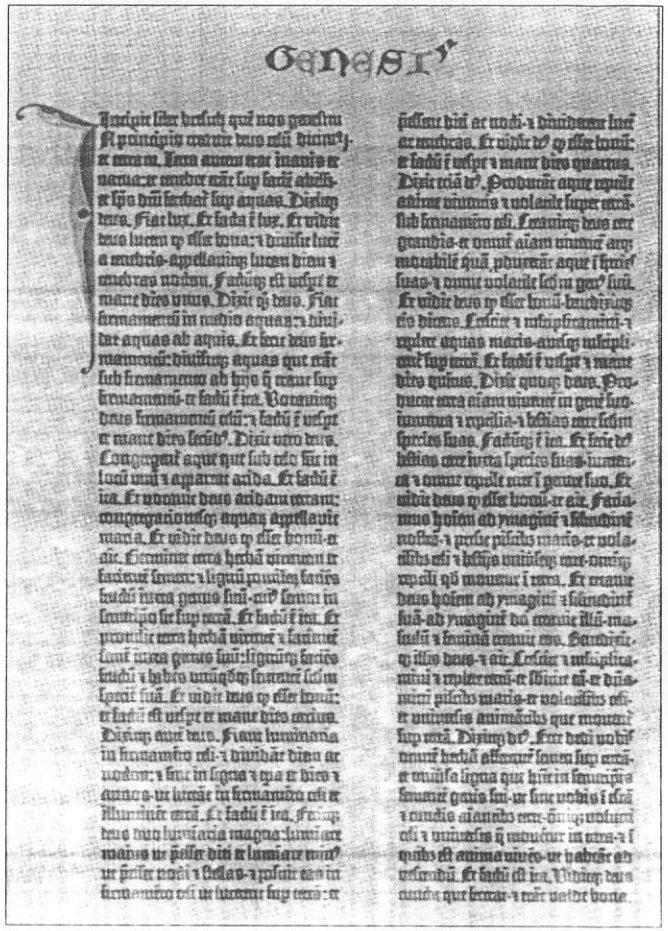
The Use of Colophons



The word *colophon* comes from Latin, and means "finishing stroke." A colophon is an inscription, monogram, or cipher containing the place and date of publication and the printer's name. It was originally placed on the last page of a book. Johann Fust and Peter Schöffer used the printer's mark above in the colophon of each Gutenberg Bible.

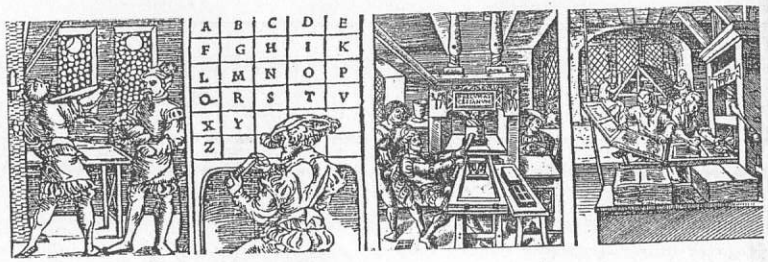
Colophons were first used when someone who had hand-copied a book completed the task by signing and dating the last page. Sometimes the scribe would add a short phrase about himself, including his location or the reason why he had undertaken the writing of the particular text. This tradition carried over into early printed editions of books, when the printer included a printer's mark in the colophon as a means of identifying and authenticating the work.

Today, colophons are used only in limited-edition books. Modern colophons include information about the press, the paper, the printer, the designer, the illustrator, the paper, the ink, and the length of the run or edition. Most limited-edition books are numbered, just as an edition of an original etching, serigraph, or lithograph would be numbered.



3.8 Gutenberg's Bible, printed between 1450 and 1455, is believed to be the earliest example of a full-length book printed in the Western world.

enberg's printing shop is believed to
of the earliest examples of assembly-
duction. These woodcuts illustrate the
ers, press operation, and inking of the



crutādum nobis mōdo
ıcceſſit: fœlice hac hærec
ıus quum geminos genu
ɒſtinuiſſe. Ab iſto natus
m Iſrael etiam appellatu
uſū. Iacob eīm athletā &
ɒppellationē primū habu
ıte labores ferebat. Quu
ionis fruebat bonis: tūc

Nicolas Jenson's Roman typeface was so
in France that it completely replaced
etter styles preferred by Germanic
es.

uolo meo &
poſuit prap
ua lauta ſim

Example of the Humanistic hand, popular
everyday writing and correspondence
ig the Renaissance.

archbishop of Mainz in 1465. Gutenberg died in relative poverty three years later.

A number of early printed books were sold at the same price a scribe would have been paid to hand-copy them, even though the books cost less to produce, since most could not distinguish between the two. When people became more discerning, the printed books were considered inferior to the hand-lettered counterparts. Some of the lettering guilds had printed books outlawed in their precincts because they were afraid that their members would be put out of work. On the contrary, many scribes began laying out books for the press composers by producing hand-lettered prototypes, and their workload increased.

Early Typefaces

The earliest typeset faces were modifications of scribes' hand-lettered alphabets. Gradually, books departed from the manuscript model, and typefaces were cut that used Littera Antiqua as a model hand. Some typefaces were designed specifically for printed books—with smaller but more legible letterforms. The resulting books were more compact and required less material, making books more affordable.

Many of the typefaces cut were variations of a historical lettering form, such as uncials or Carolingian. This marked the beginning of typographic design, establishing typography as an art to be studied and pursued separate from the art of lettering.

The Spread of Printing: Jenson in Italy

As the printing trade spread to Italy book buyers came to prefer the typefaces produced there, rather than Gothic Textura. They favored a Roman style, such as Littera Antiqua, and liked the more open texture and rounded shape of Rotunda. By 1458, French engraver *Nicolas Jenson* was dispatched from the mint at Tours, where he made coins, to Mainz by King Charles VII. He was to bring back information on the new art of printing. Due to the unstable monarchy in France, Jenson settled in Italy and never returned to France.

Jenson developed the first pure *Roman typeface*, characterized by contrast between the thick stem and thin hairline strokes; serifs were blunt and heavily bracketed with an oblique stress. The baselines of the individual letters aligned more accurately in Jenson's type than in any other printed font of the era. The capital letters were shorter in height than the ascenders, so they did not stand out significantly. The lowercase *e* has a distinctive slanted cross stroke. This typographic style became known as *Old Style*; however, after leaving Germany, versions of Jenson's type remain today as *Cloister Old Style*. Old Style exhibits a soft, organic feel, as the serifs appear to grow out of the stem. The often gently rounded serifs are cup-shaped, with generous *bracketing* (the straight or curved transitional area between the letterform stroke and the serif).

Printing in England

The first printed book in England was created by *William Caxton*, a wealthy silk merchant turned printer. After studying printing and working for a number of years in Bruges, Flanders, Caxton set up shop in England around 1478. The first book printed in the English language was set in a flourishing, angular Gothic face called *Bartarde*. Popular in France at the time, it is considered a fusion of Rotunda and Gothic Textura.

Gothic faces were more widely accepted in England than they were in France and Italy, and their popularity lasted much longer there.

Eventually royalty limited the printing industry to the cities of London, Oxford, and Cambridge by requiring all manuscripts to be submitted to a censor and a license obtained.

The Religious Reformation

In 1517 Martin Luther nailed his ninety-five theses to the door of the church in Wittenberg, Germany, calling for reform in Catholicism. Upon his refusal to recant his ideas, Luther was excommunicated and his works became the basis of the Protestant *Reformation*. Other reformists broke from the church in France and Switzerland as well. When Henry VIII wanted to divorce his wife, he was unable to do so through the Catholic Church and broke away, forming the Church of England in 1534. The Reformation sparked great upheaval in Europe, and a number of wars resulted. No longer did a unifying spiritual force link the different countries.

At the Council of Trent in 1545, the Counter-Reformation movement called for changes within the Church. Brought about as a reaction to growing Protestantism, these changes included centralizing the Catholic church, issuing a catechism to the faithful, reinforcing the authority of the Pope and the Bishops, and generally heightening the persecution of heretics and publishers who printed materials for the Protestant Reformation. In the face of continued religious persecution, many religious groups moved to more hospitable areas or set off, like the Puritans, to settle a new land where they would be free to worship as they wished.

The Pinnacle of the Renaissance

The 1500s mark the height of the Renaissance in Europe. In addition to the renewed interest in ancient Greek and Roman culture, aesthetics, and philosophy, the spread of books increased literacy, even among the lower classes. Writing was no longer limited to a few scribes, but was learned and practiced more widely.

One of the most popular and widely available texts of the time was the *Book of Hours*. This medieval book evolved out of the monastic cycle of prayer which divided the day into eight segments of "hours": Matins, Lauds, Prime, Terce, Sext, Nones, Compline, and Vespers. By the early fifteenth century the book had developed into a variety of portable sizes to be used in private devotions, as

ne of p troublous wo
ng and vexyng as
and fraunce as my aff

3.12 William Caxton's font for English printed texts was influenced by the Germanic black letter style.



3.13 William Caxton's printing mark used to identify his work.

is Jacob miserere mei
e in adiutoriū meum p
n angelū glorioſiſſimi
efendat me bodie: et p
b oñibus inimicis me
Michael archangele
e me in plio: vt non per

3.14 Sample of Bartarde, which incorporates some of the flourishes and curves of Rotunda along with the strong vertical emphasis and condensed form of Textura.



Nicolas Jenson's printer's



Robert Estienne's printer's mark is believed to have been drawn by Geofroy

opposed to communal worship. As popularity increased, an efficient system of book production and trade developed to supply the demand. A thriving economy developed around the production of these Books of Hours. Books of Hours remaining today include some of the finest examples of medieval art.

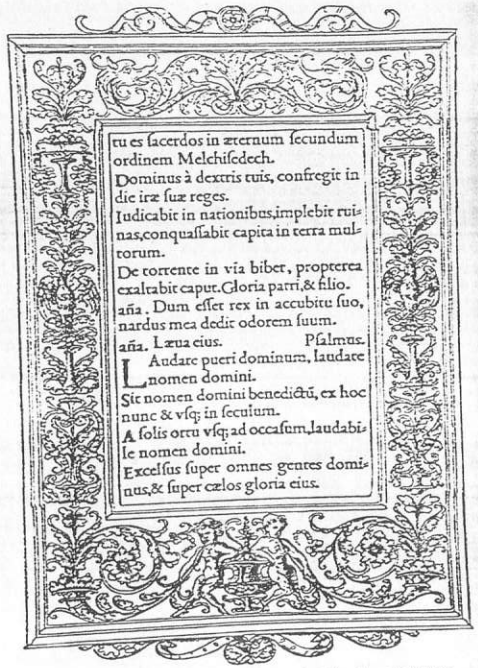
Printers of the 1500s began to face the problem of state and religious censorship of their work. Ideas expressed in classic Greek and Roman texts were often contrary to those held by local clergy or royalty. Eventually the humanist philosophy (which placed man, rather than God, at the center of the universe) gained acceptance throughout Europe despite attempts to prevent its spread.

Intertwining Printeries: The Estienne Family and Simon de Colines

Henri Estienne was the founder of a family of Parisian and Genevan printers of the sixteenth and seventeenth centuries. By 1502, at the time of his death, he was a well-established printer in Paris with more than a hundred beautiful texts to his credit. His foreman, *Simon de Colines*, succeeded him in the business and eventually married his widow.

Like Estienne, Colines became a *libraire juré*, a select printer to the university in Paris. He printed texts used in the study of the liberal arts, theology, and medicine, the Bible, Books of Hours, and editions of classical and contemporary literature. He produced more than 750 editions over twenty-six years.

Years later Henri's son *Robert Estienne* took over his father's print shop, while Simon de Colines moved a few doors away and began his own business. Robert, who was considered a great scholar, shifted the



3.17 A decorated page from the Book of Hours, printed by Simon de Colines circa 1540.

emphasis of the business to the printing of editions of works by classical authors, dictionaries and lexicons, and critical editions of the Bible. The olive tree printer's mark used by Robert's press was designed by *Geofroy Tory* who is believed to have been a proofreader for Robert's father, Henri. Some of the popular Estienne fonts of the time were designed by *Claude Garamond*, who would later lend his name to a well-known font. Although scholars assumed that Simon de Colines and Robert Estienne took up separate careers, there is evidence to the contrary. A substantially large number of the authors and texts found in the more than five hundred editions produced by Robert Estienne are identical with Colines'.

As a humanist who upheld the cause of the Reformation, Robert sustained continual attacks by noted faculty from the University of Paris following the printing of a series



3.18 Simon de Colines' printer's mark.



3.19 Decorative woodcut initial *I* by Charles Estienne around 1545 (Paris, France).



3.20 Decorative metal-cut initial *I* by Robert Estienne around 1536 (Paris, France).

of the New Testament of the Bible. He lost favor with the king and moved to Geneva in 1550. He continued to produce significant historical works there until his death.

Charles Estienne, one of Robert's brothers, succeeded him in the management of the family print shop in Paris in 1551. Charles was educated in medicine, so the emphasis of the shop's printed works became medicine and agriculture. His most famous editions include one of the earliest encyclopedias appearing in France.

Eventually the second Henri Estienne, Robert's son, inherited the press set up by Robert, on the express condition that it would not move from Geneva. Considered the greatest scholar of the family, the younger Henri issued editions of Greek and Latin works, and wrote valuable treatises on the French language. The editions he printed are not considered to equal the works of his father in beauty and typographic art.

Despite a number of social and personal difficulties, the Estienne family continued to hold a prominent place in the printing industry throughout the seventeenth century.

Aldus Mantius as Publisher

During the early 1490s, about the time of Christopher Columbus' voyages to America, the Italian scholar and tutor *Aldus Mantius* envisioned low-priced printed books as a means of making ancient manuscripts available to students, as well as a means for making money. At the age of forty, Aldus signed on with a financial backer and a printer, and began printing reference books. This business venture changed the concept of books; no longer was the unwieldy, large book limited to the lectern, from which scholars

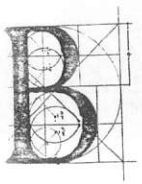
3.21 Example of the font Francesco Griffo cut for Aldus Mantius' books.

read aloud to students. He printed smaller, easily transportable books for individuals to read to themselves.

The design of Mantius' books took on a more modern aesthetic. In 1495 a calligraphic Roman typeface developed by *Francesco Griffo* was commissioned. This typeface incorporated varying weights of hairline and stem strokes with delicate serifs. Griffo's typeface appeared more uniform in the shape, size, weight, and scale of the characters than Jenson's and was legible at a much smaller size.

First and foremost, Mantius was a businessman, and he continually experimented with ideas to produce books at a lower cost, allowing for a higher profit margin. His modern book layout was established using a more open and airy design, minus the heavy borders previously incorporated. This was a cost-saving measure—without borders, the press setup time was shortened, resulting in faster production and less cost. The smaller type allowed Mantius the opportunity to compress more information into a smaller space, using fewer materials and further reducing the cost of producing the individual product.

Influenced by the *Papal Chancery* cursive handwriting, Aldus Mantius worked with Francesco Griffo to develop the first *italic* type in 1506. Originally italic type was intended as a lowercase book typeface only, and relied on the Roman capital letters (nearly a quarter century passed before italic capital letters appeared). Mantius discovered that the italic characters were much narrower than the Roman characters and proceeded to set entire books in the italic version to conserve space, again helping him keep the cost of book production as low as possible



Giovanni Battista Palatino's uppercase *B* with the addition of the construction lines indicating the thought behind the letterform design. Palatino was a letterer who published writing guides to teach correct lettering technique.

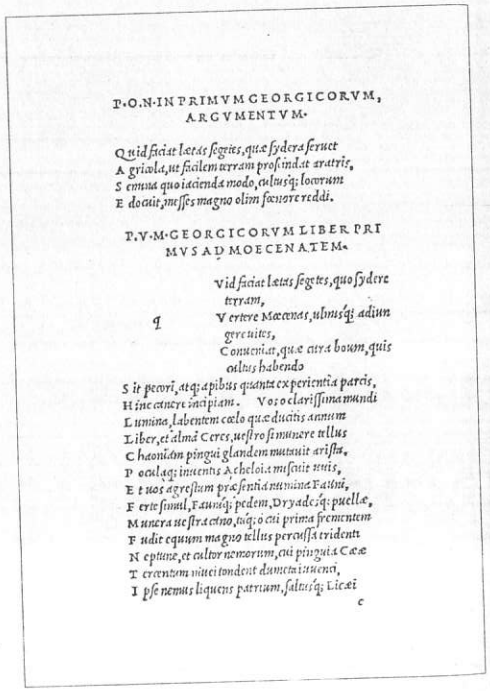
One of Mantius' most famous works, *Hypnerotomachia Poliphili*, was a distinctive typographic masterpiece using clear-cut Roman letters, richly ornamented with decorative woodcuts. *Albrecht Dürer* was commissioned to illustrate the text, bridging the gap between the Gothic and Humanist typographic traditions.

Mantius was a fastidious editor and proofreader, and his books set the standard for accuracy in spelling and syntax. His successful and accurate translations were made available to scholars and students alike. He created a high-quality book with consistent content at affordable production rates, and his work became well known throughout the region. Mantius' forward thinking and effort helped Venice become a printing center that exported many small, affordable books.

The Letter as Art

In the 1500s, during the Renaissance in Europe, book design and type design evolved as a formal area of study. Painters and sculptors were dependent on the patronage of the wealthy, and they broadened their practice to include different skills so as to produce what their patrons desired. As a result, many artists became fine letterers and calligraphers. Lettering was considered an art, as important as drawing and writing poetry.

This expansion of individual skills followed the philosophy of the Renaissance period and allowed an artist with many talents to explore a variety of employment opportunities. Artists often worked in different media, creating woodcuts for printing in addition to paintings, drawings, and sculptures. Type was seen as an additional form of artistic expression, and the artists did not view themselves as separate from the graphic arts and graphic design practices, as is common today.



P·O.N·IN PRIMVM GEORGICORVM,
ARGVMENTVM·

Quid faciat lætas segetes, quæ sydera ſeruet
A gricola, ut facilem terram proſcindat aratris,
S emina quo iaciendæ modo, cultusq; louorum
E docuit, meſſes magno olim fœnore reddi.

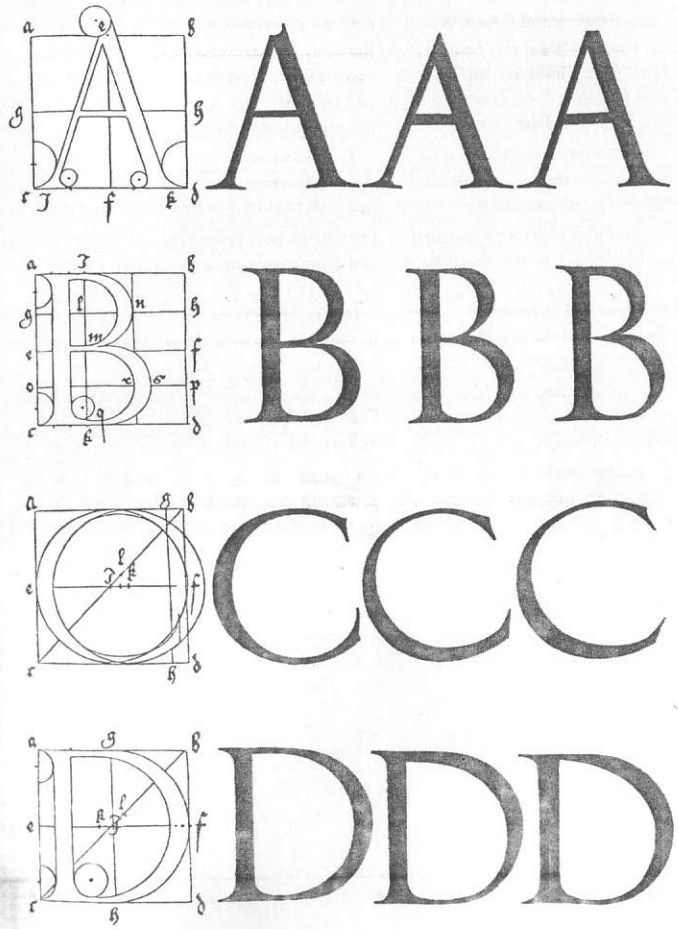
P.V·M·GEORGICORVM LIBER PRI
MVS AD MOECENATEM·

Vid faciat lætas segetes, quo ſydere terram,
Vertere Mæcenas, ulmisq; adiungere uites,
Conueniat, quæ cura boum, quis cultus habendo
S it pecori, atq; apibus quanta experientia parcis,
H inc canere incipiam. Vos o clariſſima mundi
L umina, labentem cœlo quæ ducitis annum
Liber, et alma Ceres, ueſtro ſi munere tellus
C haoniam pingui glandem mutauit ariſta,
P occula q; inuentis Acheloia miſcuit uuis,
E t uos agreſtum præſentia numina Fauni,
F erte ſimul, Faunique pedem, Dryadeſq; puellæ,
M unera ueſtra cano, tuq; o cui prima frementem
F udit equum magno tellus peraſſa tridenti
N eptune, et cultor nemorum, cui pinguia Cææ
T ercentum nitei tondent dumeta iuuenci,
I pſe nemus liquens patrium, ſaltuſq; Lycæi

3.23 One of Mantius' pocket-sized books using Griffo's italic for the lowercase. The uppercase letters are in roman at the beginning of each line. Because the italic font was thinner, it was used for the entire text to conserve space.

Renowned artists of the Renaissance felt that the proportions of the perfect letter were as predictable as those of the human body. In his *De Divina Proportione* of 1509, *Leonardo da Vinci* analyzed the construction of letterforms using geometric elements. He also compared the proportions of letters to the human body.

In 1525 Albrecht Dürer wrote an essay entitled "On the Just Shaping of Letters" as part of a treatise on applied geometry. Dürer constructed letters by inscribing them in



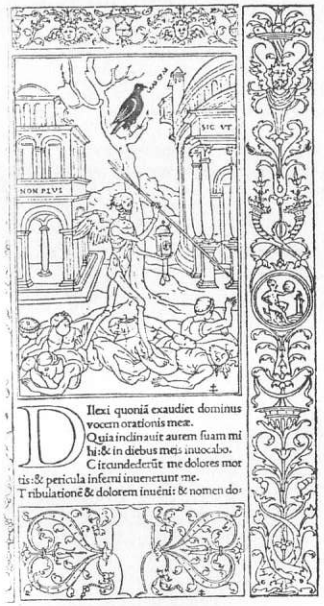
3.24 Albrecht Dürer's construction of capital letters. Artists such as Dürer saw letters and lettering as a legitimate avenue for their expertise in scale and proportion.

Fact Find! Albrecht Dürer was a famous Northern Renaissance painter and engraver. What are some of his significant contributions during the Renaissance? What characteristics define his work? Can you find out any information on his education and training? List a few sentences describing your find below, and cite your Internet source(s) correctly.

URL: http://

URL: http://

Date visited:



...r Book of Hours, printed by Geofroy Tory, first appeared ... 1525. The delicate woodcut illustration was made using ...ained boxwood. The composition embodies a sense of ...tion and classic elegance; the dark bird near the top in a ...sition creates a dominant focal point.

a square of a specific size, then building the character from the elements of the square and the arcs of circles. Complete instructions and alternative designs for each letter are provided in his text. Although commonly known for his impressive woodcut illustrations, he made a significant contribution to the field of typography with this essay.

Geofroy Tory Establishes Bookmaking as an Art

Parisian printer, typographer, and author Geofroy Tory studied in Italy and was a well-known professor before going to work as an editor for the elder Henri Estienne. After Henri Estienne's death, Tory returned to Italy to study drawing and engraving and worked as a bookbinder. He was famous for his intricate and beautiful initials, borders, illustrations, and design of printer's marks.

Tory's *Book of Hours* appeared around 1525 and was significant in that the type he used was not modeled after handwriting styles. This work helped to establish the practice of designing books as an art form in France, and his distinctive high-quality work earned him an appointment to King Francis I.

One of Tory's most significant writings was *Champfleury*, dated around 1529, in which he outlines and elaborates on the theory behind the design of his Roman capitals. With the exception of Albrecht Dürer's works, most earlier treatises on letterform design over the previous decades had been in Italian.

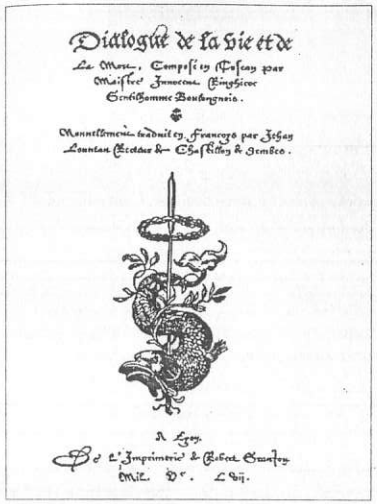
Tory believed that one of the tendencies of this era was the desire of the elite to conceal knowledge from the rest of the population. In recognizing and understanding knowledge as power, his concerns revealed a new social understanding.

Geofroy Tory is known for introducing accents, the apostrophe, and the cedilla into printed French texts.

France Offers a New Look in Type: Garamond

Claude Garamond's most noted accomplishment was the development of a Roman typeface that moved away from the calligraphic forms of the day. Just as earlier forms of writing were affected by and evolved from the tools and the substrate used, Garamond was sensitive to the fact that the printed word relied upon a metal substrate. His letters moved away from mimicking the traditional hand-lettered forms and toward refined, accurate, consistent forms made possible by this medium. His Roman typefaces were introduced around Paris in 1530.

Garamond was not a printer, but having grown up in the family printing business, he was well versed in the processes. He established a business exclusively to cast letters and sold them to printing shops. Garamond was the first full-time punch cutter and type founder, separating the foundry from the printing workshop. He studied under *Antoine Augereau*, a contemporary of Simon de Colines.



3.26 Example of a cover using Civilité from 1557 illustrates the French style of Renaissance Roman type.

Garamond cut a face, based on the Aldus Roman face, that bears his name and is considered one of the finest in typographic history. The Old Style face was readily and widely accepted, and was used almost exclusively in Europe for two hundred years. With simplicity and careful blending of letters into legible, classic forms, the type allowed tighter word spacing which resulted in a more even visual tone when printed. Garamond understood that there are more lowercase letters than uppercase letters on a page, and therefore paid special attention to their design. The lowercase letters in Garamond are as beautiful as the uppercase letters, and he started the trend to using lowercase letters in book titles where previously only capital letters had been used.

The wide acceptance of Garamond's work is credited with France's move away from the black letter style, and his style monopolized the printing industries in France and Italy well into the 1700s. Variations on Garamond's faces, based on the same basic forms, are still popular today.

Prevalence of Italic and Script Faces

Robert Granjon, an apprentice of Claude Garamond's, cut ten outstanding italic faces. One of these was a companion to the Roman Garamond face, incorporating graceful descenders and small hooks at the end of the final strokes instead of serifs; The lowercase *k* had a loop, replacing the upper diagonal stroke. The new italic faces hinted at their handwriting origins but clearly were designed for the printed page, with careful attention given to the advantages and constraints of the medium.

In 1577 Granjon cut a typeface intended to simulate everyday handwriting rather than formal hand-lettering. His most famous, based on the popular handwriting style of the day, *Civilité*, is considered the first cursive face. This face linked lowercase letters and led to the development of a class of specialized script faces.

Handwriting as a Status Symbol

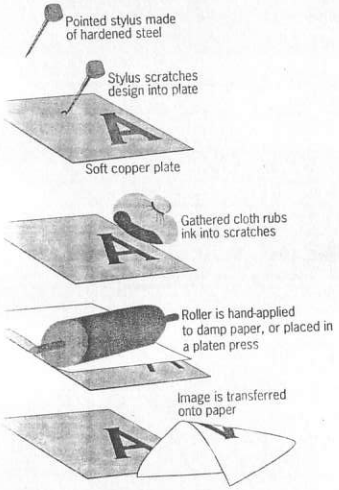
During the Renaissance, fancy script faces and elaborate handwritten documents that were cut into a copperplate were an instant success. Complicated handwriting with flourishes and curlicues, thick and thin contrast in the strokes, and the linking of letters was considered a sign of status. Many people were employed as handwriting masters during this period, but oddly enough, Granjon's Civilité was one of the few script faces cast in lead. As the writing trends changed fairly quickly during this time, with the explosion of experimentation and rapid

Vostre & tant d'autres,
ian nous résume ici les
lle dans cette œuvre nou
couragée par plusieurs n
ie n'avait, jusqu'au co
ièle, inspiré en France

3.27 Granjon italic features delicate strokes, and the majuscule letterforms are slanted just as the lowercase letterforms are, unlike earlier italic styles which slanted only the lowercase and maintained Roman uppercase forms.



3.28 An early example of a page printed in the English language about the "English Usurer." The letter *U* pronunciation and letterform did not become separate from the *V* until much later. Early works incorporate the letter *V* where modern works would use the letter *U* today.



The process of creating a copperplate for printing involves use of a hardened steel engraving stylus and a soft, polished copperplate. The stylus is used to scratch an image into the plate surface. Ink was applied to the plate, with any excess carefully removed. Ink remained in the surface scratches so that when a damp sheet of rag paper was laid on the surface and put under pressure, the image transferred to the paper. Because copper is soft enough to draw on with the stylus, it would not maintain clarity and detail for a large number of impressions.

development of faces, Civilité was considered somewhat illegible and so it faded in popularity.

By the 1600s, *copperplate engraving* was used to re-create the popular scrollwork of the writing masters because it could reproduce the fine lines of the trendy scripts. Copperplate illustrations were more refined than those created on woodblocks, since the medium could hold fine hairlines for details and for cross-hatching shaded areas, creating the illusion of depth.

Whereas lead type was relatively durable and could be reused, the soft copperplates were inscribed with a single message, and once two hundred or so impressions were printed, the plate had to be repaired or ground down to be inscribed once again. Both media had found their niche in the printing industry.

Printing Innovations

Printed materials during the Renaissance reflected the artistic sensibility of the era. The dark borders filling every inch of available space popular in hand-lettered texts of the Middle Ages were gone. Presswork was refined, and a high degree of accuracy, consistency, and cleanliness was common among the finest printers of the time.

The majority of books published during this period were of a religious nature, though toward the end of the seventeenth century many were secular. Contributions included the design of the Old Style families of type, small capitals, italic faces, printer's marks, type registration on the printed page, two-color printing, colophons, and movable type. Noted contributors to the innovations of the period include Gutenberg, Coster, Jenson, Mantius, Garamond, and Granjon.

Estimates suggest that the number of books expanded 180-fold, with approximately fifty thousand housed in Europe's monasteries and libraries in the 1450s but nine million in 1500. Over thirty-five thousand different editions were printed in the first fifty years following the invention of printing. This boom grew to include not just books, but also short-lived broadsides, posters, and leaflets.

By 1500, printing establishments existed in 140 cities on the continent. A number of historians argue that without printing technology, the political revolutions (American and French) that ensued over the next centuries would not have been possible. Printing enabled the dissemination of ideas over great distances without requiring large assemblies of people. Ideas about human rights became widespread, and language was standardized throughout Europe. Printing led to the democratization of information as less expensive books were produced, allowing the lower classes equal access to information previously reserved for the wealthy.

Chapter Three Review

Circle one answer for each definition to indicate the correct key concept term or key player for each. When necessary, determine whether the phrase provided is true or false.

1. The first printed book in England was created by William Caxton, a wealthy silk merchant turned printer.
   a. True
   b. False

2. The practice of filing away a portion of the base of one character, allowing part of the letter to rest on the base of the adjacent character.
   a. Registration
   b. Copper plate engraving
   c. Kerning
   d. Bracketing

3. Often described as the "rebirth of learning," the _____ lasted approximately two centuries, from the mid-1400s to the late 1600s
   a. Ottonian Empire
   b. Reformation
   c. Renaissance
   d. Papal Chancery

4. To approximate the handwriting of the scribes, Claude Garamond cast almost 270 pairs of kerned or ligature pairs of characters as one punch.
   a. True
   b. False

5. A Parisian printer, typographer, and author who studied in Italy and was a well-known professor before going to work as an editor for the elder Henri Estienne.
   a. Robert Estienne
   b. Albrecht Dürer
   c. Nicolas Jenson
   d. Geofroy Tory

6. Goldsmith who agreed to underwrite the cost of Gutenberg's printing experiments, provided Gutenberg repay him.
   a. Johann Fust
   b. Albrecht Dürer
   c. Nicolas Jenson
   d. Peter Schöffer

7. The precision mold was composed of two N-shaped pieces of metal that could be opened and closed to accommodate letters of constant width while varying the height and depth measurements.
   a. True
   b. False

8. Whereas lead type was relatively durable and could be reused, the soft copper plates were inscribed with a single message, and once two hundred or so impressions were printed, the plate had to be repaired or ground down to be inscribed once again.
   a. True
   b. False

9. One of his most significant writings was *Champfleury*, dated around 1529, in which he outlines and elaborates on the theory behind the design of his Roman capitals.
   a. Aldus Mantius
   b. Geofroy Tory
   c. Francesco Griffo
   d. Albrecht Dürer

10. An apprentice of Claude Garamond's, who cut a famous typeface, based on the popular handwriting style of the day, named Civilité, which is considered the first cursive face.
   a. Aldus Mantius
   b. Nicolas Jenson
   c. Robert Granjon
   d. Albrecht Dürer

11. The first book printed in the English language was set in a flourishing, angular Gothic face called _____.
    a. Civilité
    b. Gothic Textura
    c. Bartarde
    d. Rotunda

12. One of Aldus Mantius' most famous works *Hypnerotomachia Poliphili* was a distinctive typographic masterpiece using clear-cut Roman letters, richly ornamented with decorative woodcuts and illustrated by:
    a. Henri Estienne
    b. Albrecht Dürer
    c. Leonardo da Vinci
    d. Peter Schöffer

13. He believed that one of the tendencies of this era was the desire of the elite to conceal knowledge from the rest of the population. In recognizing and understanding knowledge as power, his concerns revealed a new social understanding.
    a. Henri Estienne
    b. Albrecht Dürer
    c. Geofroy Tory
    d. Peter Schöffer

14. In the 1300s, during the Renaissance in Europe, book design and type design evolved as a formal area of study. Painters and sculptors were dependent on the patronage of the wealthy, and they broadened their practice to include different skills so as to produce what their patrons desired.
    a. True
    b. False

15. He is known for introducing accents, the apostrophe, and the cedilla into printed French texts.
    a. Johann Fust
    b. Robert Granjon
    c. Nicolas Jenson
    d. Geofroy Tory

16. One of the most popular and widely available texts of the Renaissance in Europe was the Book of Hours.
    a. True
    b. False

17. The Old Style face was readily and widely accepted, and was used almost exclusively in Europe for three hundred years.
    a. True
    b. False

18. His foreman, Simon de Colines succeeded him in the business and eventually married his widow.
    a. Johann Fust
    b. Henri Estienne
    c. William Caxton
    d. Geofroy Tory

19. Robert Granjon understood that there are more lowercase letters than uppercase letters on a page, and therefore paid special attention to their design.
    a. True
    b. False

20. Jenson's first pure Roman typeface characterized by contrast between the thick stem and thin hairline strokes; serifs were blunt and heavily bracketed with an oblique stress.
    a. Civilité
    b. Cloister Old Style
    c. Bartarde
    d. Papal C hancery

21. Printing enabled the dissemination of ideas over great distances without requiring large assemblies of people.
    a. True
    b. False

22. He was taken on as a craftsman for the archbishop of Mainz in 1465 and died in relative poverty three years later.
    a. Henri Estienne
    b. Johann Gutenberg
    c. Charles Estienne
    d. William Caxton

23. In his *De Divina Proportione* of 1509, Leonardo da Vinci analyzed the construction of letterforms using geometric elements.
    a. True
    b. False

4 Typography During Colonization and Industrialization

Beginning in the seventeenth century, mechanization made type production increasingly faster. In that same era, printers are often credited with producing the literature that spread concepts of freedom and liberty, encouraging the American and French revolutions and the other political movements they inspired. During this period, typography transitioned from clean, practical, readable text faces to the highly ornate faces seen in early advertisements dating from the Victorian era.



4.1 This capital letter A captures the essence of the excessive decoration indicative of the Rococo era.

Key Concepts
baroque
Baskerville
Bodoni
California job case
Didot
Egyptian
furniture
Gothic
Grotesque
Industrial Age
letterpress printing
lithographic printing
Modern Style
monospacing
pica
proofs
Rococo
Romain du Roi
sans serif
slab serif
Transitional Style
type high
typewriter
Victorian era

Colonial Era Typography

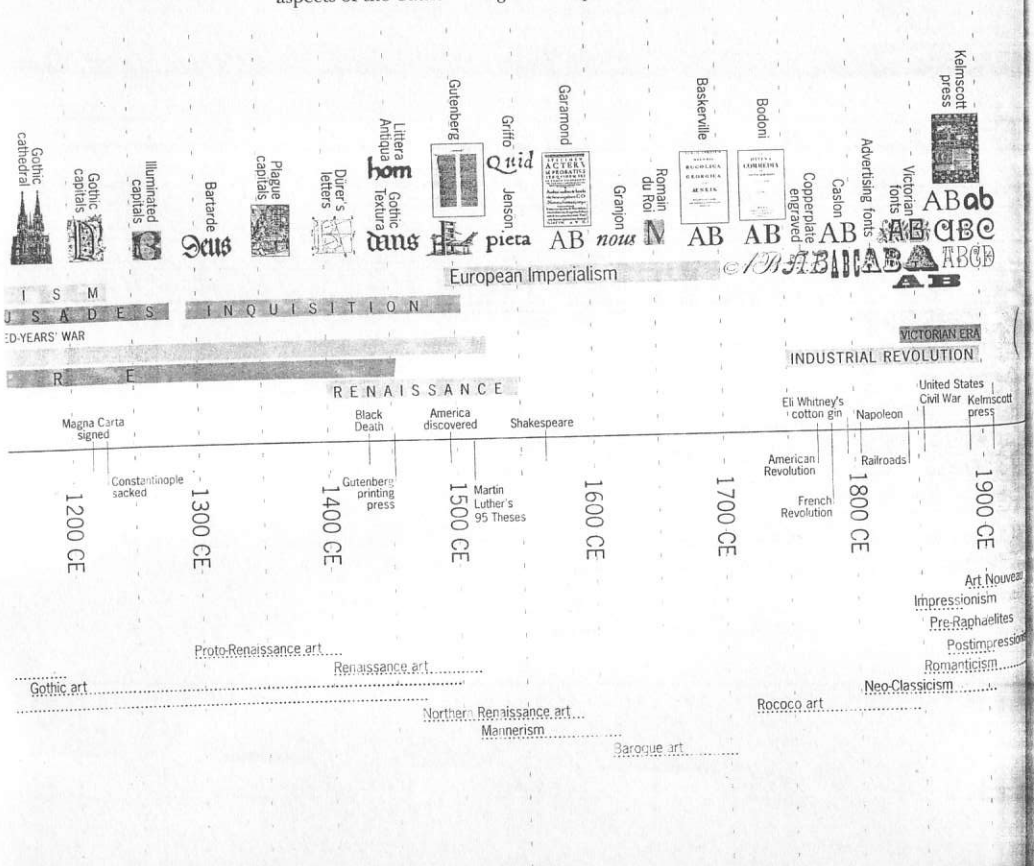
Colonization of America began in the sixteenth century by individuals looking for economic opportunity and freedom from religious oppression. The first permanent colony was the 1607 settlement at Jamestown, Virginia. The Pilgrims landed in Plymouth, Massachusetts, and the Dutch settled in New Amsterdam (New York) in 1623, escaping the absolutist monarchs of Europe.

In Europe, playwright William Shakespeare died in 1616, seven years before his entire collection of works was published in 1623. Bach and Vivaldi lived at the end of this century, and operas began to appear onstage. Baroque music and art were in style. Printed works for recreational purposes became more common, and the printing industry flourished in the 1600s and 1700s despite the

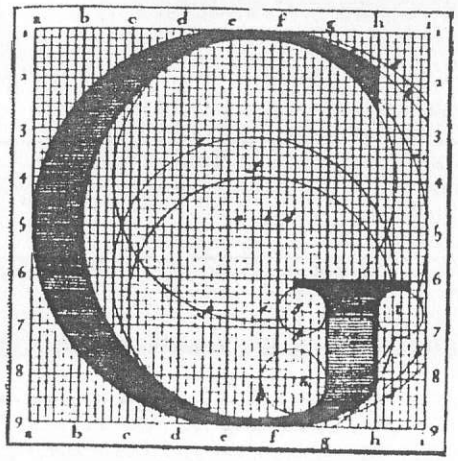
lack of technological innovation in the equipment.

Some historians see the Baroque style as connected to the Counter-Reformation of the Roman Catholic Church, which emphasized spirituality and the emotional aspects of the Catholic religion. *Baroque* art is seen as based on the expression of emotion in vibrant colors. Some Baroque artists turned to classical themes while others placed Christian heroes in ancient settings.

Novels, journals, and political pamphlets became widely available to the



4.2 Timeline emphasizing the context of colonial and industrialized innovations in typography.



4.3 Left: An example of the letter G of the Romain du Roi font designed by the French Academy of Sciences to be a mathematically and geometrically perfect font.

rts. Les Hérétiques domptez, la Maiſo
ite Royale reſtablie, rendoient le Roy
. Mais il manquoit au Roy un fils qu
ois ans de mariage ſans enfans luy avoi
n avoir iamais. Enfin, Dieu touché des

4.4 This example of the Romain du Roi font shows that many of the details of the original design were lost as the punch cutters worked by hand from much smaller reproductions of the detailed drawings.

emerging European middle class, and there was an unquenchable thirst for the printed word. Novels had tremendous impact on morals and cultural norms. Posters and broadsides, as well as newspapers (the first was printed in Strasbourg in 1609), were found in most cities throughout Europe. In Amsterdam, books were printed in condensed type to fit into vest pockets. The first Bible was printed in English by *Robert Baker* in 1612.

Reportedly the first printing press was established in the American colonies in 1640. By 1775 there were fifty printers in the thirteen colonies, despite the tax on paper and advertising. These presses spread the word of the revolution throughout the New World faster and more consistently than word of mouth could, encouraging a unified front for a strong rebellion.

A Mathematically Perfect Font

In 1692 King Louis XIV of France ordered the French Academy of Sciences to develop its own geometric formula for the correct construction of letterforms. A committee of scholars and mathematicians developed a detailed theory of design based on a grid of 2,304 squares. In 1702 *Philippe Grandjean*, royal punch cutter, cut a face called the *Romain du Roi* (Roman of the king) in keeping with the geometric proportions established by the academy. This is the first recorded face based on precise mathematical analysis and consistency, as compared to the artistic approaches used by calligraphers previously. The face exaggerated the difference in weight between the stem and hairline stroke, reduced bracketing, and created thin, horizontal, squared-off serifs. This face was reserved for exclusive use by the royal printing office of France and any other use was considered a crime.

Rococo-Era Typography

In the 1720s, a flowery, ornamental style of design and fashion known as *Rococo*, appeared in Paris. This style of design reflected a monarch who lived lavishly—a

Key Players
Robert Baker
John Baskerville
Stephenson Blake
Giambattista Bodoni
William Austin Burt
William Caslon
William Caslon IV
Firmin Didot
Henry Fourdrinier
Philippe Grandjean
John Handy
Friedrich Koenig
Aloys Senefelder
Darius Wells



The decorative initial E illustrates the French reference for ornate, three-dimensional leaves rented by contrasting curvilinear texture.



4.6 Letterpress compositor assembling letters for a page from the shallow drawers, called *California job cases*.

Setting Letterpress Type

Letterpress type is set by hand, one character at a time. Typographic characters are sorted into different small compartments of a large, shallow drawer, called a *California job* case. The capital or majuscule letters were sorted into the top drawer, or upper case, while the small or minuscule letterforms were sorted into the lower case, resulting in the names we use today.

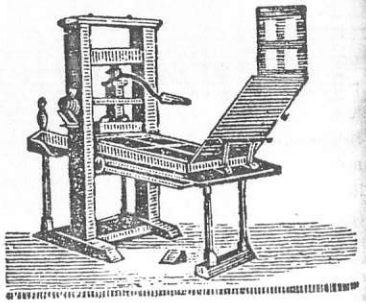
lifestyle that was soon overthrown in favor of a government fueled by the people in the French Revolution. The royals continued to enjoy a life of extravagance and frivolity, unaware of the anger that was brewing in the hearts of those condemned to lives of misery and poverty.

The flamboyance of the style of the Rococo-era art and typography was expressed as fine lines and curvilinear flourishes. Copperplate engraving was best suited to reproducing this style, rather than the rigidity of letterpress printing. The handwriting craze of earlier years experienced a renaissance, with calligraphic masters creating elaborate cards exhibiting their talents to lure students. These elaborate flourishes and scrollworks were sought after as a sign of refinement by the upper classes, which remained completely out of touch with the harsh reality of the living conditions of the poorer classes throughout Europe.

Letterpress Printing

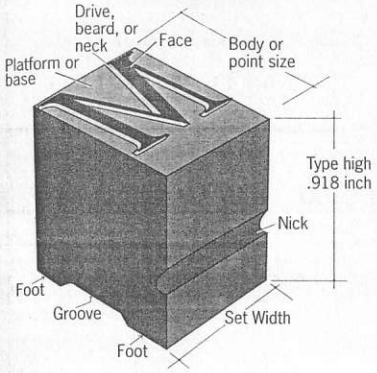
The earliest printing presses were constructed by modifying the design of a fruit press. The original platen press included a large horizontal press bed with a frame around it. All type or images intended for printing were precisely .918 inch tall, called *type high*. Accuracy in the bed dimensions as well as the composite type was required; any blocks or lead taller than type high could tear the paper or printing substrate, while any imagery less than .918 inch would not be inked correctly, resulting in a poor if nonexistent impression. Precise depth was essential for even distribution of ink and a uniform impression.

The frame around the press bed was shorter than .918 inch so that it would not be inked or print. The wood or lead type was arranged on the press bed, and then furniture (blocks of wood and metal) was placed between the sides of the type and the sides of the chase. The combination of the furniture shapes locked the type in place to prevent it from shifting under the high pressure of the platen during printing. Preliminary test prints, called *proofs*, allowed the pressman to check for a clean, crisp impression.



4.7 The earliest pressure presses were used by placing a sheet of paper between the type and a platen.

Letterpress printing is a variation of the original platen press. In the beginning, letterpress printing was limited to a horizontal and vertical compositional structure or layout. It was not until Dada artists experimented with more free-form compositions, composed directly on the printing press bed, did printed works move away from the highly structured compositions. It is a complicated process that involves practice and patience; packing behind the



4.8 A piece of lead type. The dimension of the height of the piece of lead measures .918 inch, while the letterform is a raised surface above that dimension. That way, only the raised letter is inked and the recessed background remains clean.

type is sometimes required to accurately meet type high dimensions in all areas to be printed. Ink has to be mixed with oil to an exact viscosity for a clear, clean impression. Temperature and humidity affect both the ink and the paper, so trial-and-error methods of proofing are required until the perfect impression results.

Typography During Colonial Expansion

Colonial expansion became a necessity for obtaining the raw materials needed for expansion in European countries, as well as a source of tax revenue for the kingdom. The colonies provided a ready market for the goods manufactured in Europe. While the French aristocracy contributed money to support the American colonies in their move toward independence, their own lower classes became more and more dissatisfied. Ironically, a number of historians are convinced that the success of the American Revolution in the colonies inspired the French peasants to incite a fight for freedom a decade later in 1789.

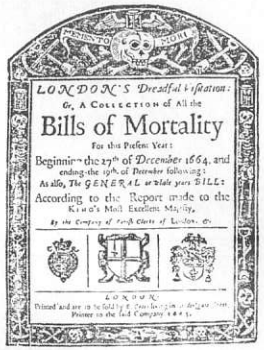
The end of the eighteenth century saw the steam engine become a mainstay in a number of manufacturing industries. The first one was placed in a cotton-spinning factory in Nottinghamshire in 1785. Eli Whitney is credited with the invention of the cotton gin in 1793, the same year Louis XVI and Marie Antoinette were executed by guillotine in France. Following the Reign of Terror (in which any noble person could be sentenced to guillotine death by verdict of the lower classes as a crowd, a young general named Napoleon Bonaparte seized dictatorial power in France in 1799.

4.9 William Caslon's Old Face, below, was known for the clarity of the lowercase letters and the accurate alignment of the baselines. Many believed these characteristics allowed for easier reading.

ENGLISH ROMAN.
Quouſque tandem abutêre, Catilina, patientia noſtra? quamdiu nos etiam furor iſte tuus eludet? quem ad finem ſeſe effrenata jactabit audacia? nihilne te nocturnum præſidium palatii, nihil urbis vigiliæ, nihil timor populi, nihil conſenſus bonorum omnium, nihil hic munitiſſimus
ABCDEFGHIJKLMNOPQRSTVUW

Type Fashion in England

Around 1730, goldsmith *William Caslon* designed a type that included Roman and italic, called Old Face. This typestyle was an instant success in England. It maintained balanced proportions, and the thick strokes of the letters had a slightly heavier weight than was seen in other contemporary type, increasing its legibility. In contrast to the light-type Romain du Roi, there were no flourishes to distract the reader. Although the font relies on an organic style, it has


LONDON'S Dreadful Viſitation:
Or, A COLLECTION of All the
Bills of Mortality
For this Preſent Year:
Beginning the 29th of December 1664, and ending the 19th of December following:
As alſo, The GENERAL weekly year BILL:
According to the Report made to the King's Moſt Excellent Majeſty.
By the Company of Parish Clerks of London, &c.

4.10 The 1664 Bill of Mortality is an example of English printing incorporating italic and Roman fonts within an illustrative frame.

ll preſerve my former authority
wiſh me joy in the other of my l
to the firſt, if to mean well to
ıd to approve that meaning to e
may be conſidered as maintaini
ıt you have heard is certainly tr
ing thoſe ſentiments effectual to t
: in daring freely to ſupport

4.11 John Baskerville's font is crisp and light in texture as compared to its predecessors.

A 26-Letter Alphabet

Throughout the 1700s there were mix-ups over the use of the letters I, J, U, V, and W. As a result, J, U, and W were assigned separate sounds and full recognition, resulting in the 26-letter alphabet we know today.

more refinement in the weights of the strokes than Garamond. Caslon's Old Face quickly became the standard for books printed in English. The first editions of both the Declaration of Independence and the Constitution were printed in Caslon, so to this day the Caslon Old Face italic and swash capitals still convey an antique American feeling.

Writing Master Turns Type Designer

John Baskerville, an accomplished stonecutter, began his professional career as a writing master in the 1700s. After making money as a manufacturer of japanned ware (objects layered with lacquer and then decoratively carved), he returned to letters and printing at the age of forty one. Like Gutenberg, Baskerville perfected many elements of the printing process. He was interested in all phases of the production process: he designed type, carefully casted it, refined the technique of "packing" the press, introduced new papers with a smoother surface, improved press designs, and refined ink formulas to achieve a rich purple-black.

Considered a *Transitional Style* type (orginally called "improved type" during the late 1700s), the *Baskerville* font marks the beginning of the influence of printing mechanization on the field of type design. The new typeface (in Roman and italic) was introduced in England by Baskerville with his publication of an edition of Virgil's works in 1757. The precise, extremely thin strokes and straight serifs in a relatively heavy face were a departure from the cruder, craftsmanlike faces seen in examples of Old Style. The new Baskerville

PUBLII VIRGILII
MARONIS
BUCOLICA,
GEORGICA,
ET
AENEIS.

BIRMINGHAMIAE:
Typis JOHANNIS BASKERVILLE.
MDCCLVII.

4.12 A layout by John Baskerville, above, illustrates an open and spacious style devoid of extraneous decorative elements.

font was straight, with a vertical stress and flatter serifs. This face reflected a number of qualities seen in Romain du Roi, the mathematically engineered face.

Baskerville has been recognized as the first pure type designer, distinguishing him from those who were also punch cutters (*John Handy* was Baskerville's punch cutter). He is considered one of the earliest type designers to create and refine his letterforms on paper rather than directly cutting the punches in metal. Baskerville considered the goals, possibilities, and constraints of the whole printing process during the drawing of a typeface.

Knowing at the outset of the design that he did not want a heavy impression of the letters pushed into the paper, he made his own extremely black printing ink by boiling linseed oil, aging it with black resin, and burning the lampblack himself. A committed perfectionist, he searched for a smoother printing surface and eventually developed the first woven paper. Rejecting the traditional laid texture, he hot-pressed the surface of damp paper to ensure added smoothness. During the printing process, he packed the blanket behind the sheet of paper with harder material than was usually used, achieving a crisper result.

Baskerville's work is identified by the generous use of white space incorporated into the layout, and the lack of extraneous ornamentation; it relied exclusively on the typography to convey meaning and feeling

PAPALE

Quousq;
tandem
abutêre,
Catilina,

SALUZZO

4.13 A layout by Giambattista Bodoni illustrates a typical layout known for its clean, crisp composition and contrast in size.

ousque tandem abutêre,
ilina, patientiâ nostrâ?
dacia? nihilne te noctur·

4.14 Bodoni's Modern Font.

in the composition. Initially his efforts were met with criticism, as many complained that the paper was too smooth and the ink too black. Some thought that the reflection caused by clean, smooth paper with large areas of blank space would hurt their eyes. Unfortunately, John Baskerville died before knowing that his printing innovations and commitment to excellence were widely accepted by the general public.

Typography in Italy

In 1788 in Parma, Italy, *Giambattista Bodoni* introduced the first *Modern Style* typeface, with extreme weight variations between the thick and thin strokes. The round letters were narrow with thin serifs that were not attached to the stem (no bracketing). The geometric precision of this face imparts a classical feel with its vertical stress and small x-height in proportion to the capital letter height, as well as in the details seen in the sharp right angles of the serifs and the ascenders that are the same height as the capital letters. There is a mechanical consistency to the design, as Bodoni used repetition of shape to create similar letters throughout the alphabet.

It is possible that Bodoni was familiar with, and found inspiration in, the work of French designer *Firmin Didot*, who in turn was likely influenced by the Romain du Roi. The Modern Style faces of *Bodoni* and *Didot*

Fact Find! After multiple reproductions and deterioration over time, the examples of early classic faces are difficult to discern. Search the Internet for modern versions of Baskerville, Bodoni, and Didot, then print them out for class discussion. In the space below, identify the type designer and foundry who developed the contemporary variations you found. Analyze a few of the letterforms and list the similarities and differences to begin to better understand the subtleties of typographic design.

URL: http://

URL: http://

URL: http://

Date visited:

AVIS

AUX SOUSCRIPTEURS

DE

LA GERUSALEMME

LIBERATA

IMPRIMÉE PAR DIDOT L'AÎNÉ

SOUS LA PROTECTION ET PAR LES ORDRES

DE MONSIEUR.

Les artistes choisis par Monsieur pour exécuter son édition de la Gerusalemme liberata demandent avec confiance aux souscripteurs de cet ouvrage un délai de quelques mois pour en mettre au jour la premiere livraison. Il est rarement arrivé qu'un ouvrage où sont entrés les ornements de la gravure ait pu être donné au temps préfix pour lequel il avoit été promis : cet art entraîne beaucoup de difficultés qui causent des retards forcés; et certainement on peut regarder comme un empêchement insurmontable les jours courts et obscurs d'un hiver long et rigoureux. D'ailleurs la quantité d'ouvrages de gravure proposés actuellement par

4.15 Firmin Didot's layout, right, was typically a classically understated arrangement with center-aligned headings and justifed text, resulting in a balanced composition.

Plus beau, plus fortuné, toujo
Ton règne ami des lois doit br
Tous nos droits affermis signa
Le ciel t'a confié les destins de
Qu'il exauce nos vœux, qu'il
De ta carrière auguste exempt
Que sa bonté pour nous prol

4.16 Firmin Didot's Modern font.

may have been influenced by changes in the engraver's tool, a thin, pointed stylus used to mark on metal plates. As this tool was refined over time, the creation of more precise letterforms became possible.

The Dawn of Industrialization

As the 1700s closed, political revolutions had occurred in both America and France, and a transition from an agrarian, handcraft society to mechanized, mass-produced economies was under way. Some made the transition overnight, selling their farms and moving to cities to find viable employment for survival. The path to the Industrial Age was littered with many unemployed and many overworked among a few who prospered, emphasizing the contrast in social status. Great changes in the society and the economy were reflected in the art and literature of the time.

As the *Industrial Age* gained momentum, the 1800s saw even faster production of goods and services as steam power was deployed in all areas of the manufacturing process. English slums grew at a staggering rate, as many who were barely getting by on meager farms moved to the cities in search of work. Squalid living conditions were exacerbated by overcrowding.

Eventually a middle class emerged from these political and economic revolutions. As the standard of living of the working classes improved, they were better able to afford the goods and services made available through industrialization. Wealth was no longer measured by land ownership, but by capital investment. The growing urban population demanded inexpensive goods. Advertising of such products resulted in an explosion of printed materials. Through the creation of the middle-class consumer, Industrialization had given birth to a market economy, as well as an entirely new and immense opportunity for the printed word.

Many European countries had colonized distant lands during exploration for inexpensive raw materials. Under the pretense of "Christianizing" the natives, the church expanded its hold as well. As Napoleon's rise to power continued in France, he attempted to militarily take over larger areas of Europe. Napoleon's defeat by Wellington at Waterloo in 1815 led to greater definition of independent national identities throughout the century. In 1860 Italy was united as one nation, and in 1870 Germany was unified under Bismarck, more clearly defining borders and territories.

CASLON

4.17 William Caslon IV's sans serif font was unpopular when it was introduced, and therefore the name coined for it was *Grotesque*.

Printing Gains Momentum

In 1803, Englishman *Henry Fourdrinier* engineered a continuous-roll papermaking machine, revolutionizing paper manufacturing. By 1840 it was possible to make paper out of wood in one continuous sheet. This resulted in a paper product that was consistent, plentiful, and inexpensive compared to the old process of making one sheet at a time by hand. The consistency in the paper weight and surface texture allowed innovations in printing presses to increase speed and accuracy.

In 1814 *Friedrich Koenig* built two steam-powered presses for the *Times* of London. Prior to Koenig's mechanized presses, 250 sheets per hour was considered fast on the handpresses. These new Koenig presses were capable of printing up to 1,100 sheets per hour—a 440 percent increase in production.

Eventually the addition of curved printing plates and inking rollers added to the speed of the production process. By 1851 printing presses commonly ran 20,000 sheets per hour. The mechanical advancements made information affordable, accessible, and timely for more people. Literacy increased as a result.

Introduction of Sans Serif Fonts

All printed type through the early 1800s had been serif. The introduction of *sans serif* (without serifs) type in 1816, by *William Caslon IV,* was referred to as *Grotesque* in Europe and *Gothic* in America as many felt it was barbaric-looking and strange. By 1832 the novelty of the sans serif aesthetic had worn off, and Stephenson Blake and Co. (a Sheffield typefoundry started by William Garnett and John Stephenson, and financially supported by James Blake) produced a broad range of sans serif faces that soon became popular in the United States.

A New Era in Typography: Advertising

In 1820 the application of typography moved from the use of predominantly book faces to the increased use of decorative display faces. The Industrial Revolution was in full swing, with economic expansion never before seen. Dramatic changes in society continued, and large groups of immigrants



4.19 Above: Arboret, a fanciful Victorian era font, is indicative of the popular, highly ornate style that emerged during the Industrial Revolution.

4.20 Far right: Large posters, called bills, evolved as the mass-marketing medium of the Industrial Revolution era.

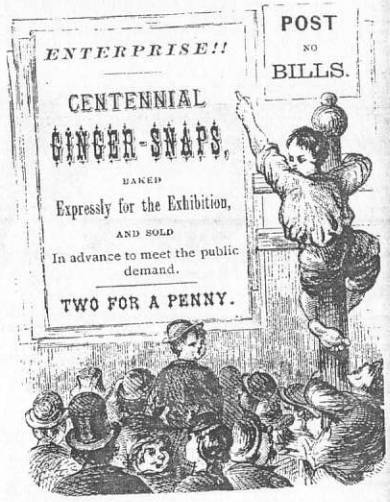
4.21 Right: Tall vertical fonts were cut from wood. The exaggerated serifs and unusual condensed proportions created a dark headline intended to catch the viewer's attention.

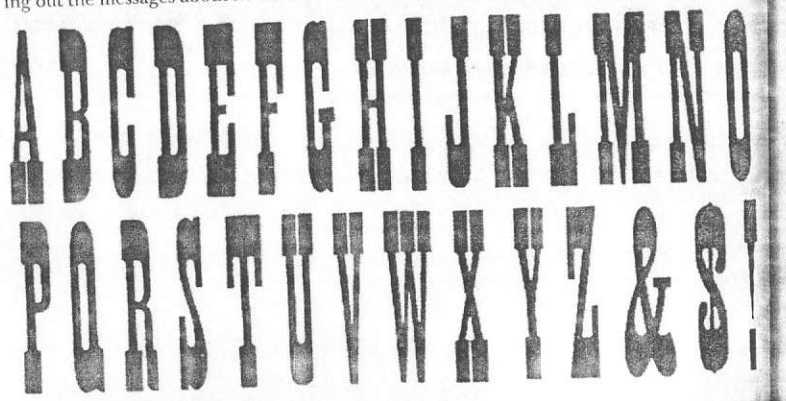


4.22 Karmac is another example of a Victorian font that employs the use of decorative curlicues to evoke viewer interest.

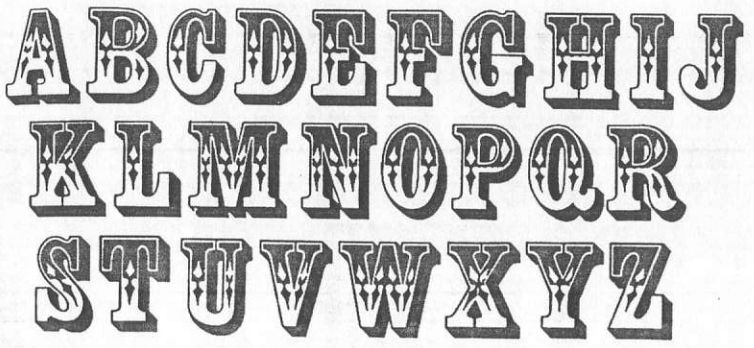
were rapidly absorbed into the American workforce, often exploited as inexpensive labor.

To serve the needs of the growing manufacturing sector, advertising became more prevalent. Unusual display faces emerged for use on posters, stationery, catalogs, timetables, trade cards, and other necessities of a manufacturing and marketing economy. Manufacturers felt the need to draw greater attention to their own products and services within the crowded visual environment by developing ornate, shadowed, and three-dimensional-looking fonts. Large 2-inch and 3-inch fancy variations of fonts became the norm, suitable for shouting out the messages about new wares.





These large headlines were cut from wood since it was lighter and less expensive than cast lead. Larger-sized type became more popular, and by 1827 the American *Darius Wells* (New York inventor and printer) was known for producing large hand-cut wood type. There was no limit to the size of type that could be printed, and variations in the type width became popular. Condensed and extended versions of the large wood type found popularity as well. Wells eventually developed a mechanical router (called the vertical revolving cutter) so that he could produce wood type more



quickly and accurately. In 1828 he released the first catalogue of typefaces known in the United States.

Sans serif typefaces were mixed into the compositions to add to the bold, black look of the page intended to draw greater viewer attention. New type forms evolved, exhibiting thick, black strokes and heavy slab serifs. These fonts acquired the name *Egyptian* due to England's preoccupation with the archeological discoveries and expeditions taking place simultaneously along the Nile River. With stems and *slab serifs* of nearly equal weight, they were considered highly visible in crowded advertising broadsides. One example of type from the period, P. T. Barnum, with swelled, stretched, three-dimensional incised, shaded letters was designed to catch the attention of the buying public.

The emphasis on selling goods drove the type design of the period. Formerly, changes in typography had been driven by the available tools, materials, and technology available to printers and by their sense of aesthetics. The output was reading material in the form of books and pamphlets. But now the shift was driven by the manufacturing industry, and the needs of advertisers influenced the aesthetic issues of type design.

The Practical Writing Machine

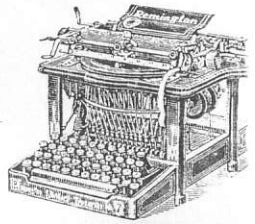
A primitive *typewriter* was patented in 1714, but it was not until 1829 that *William Austin Burt* patented a practical writing machine in the United States. The earliest models produced only capital letters and primarily embossed the letters, so they were usually only considered as a tool to prepare materials for the blind. Eventually the modern typewriter became the writing machine of choice for the male secretaries, replacing their neatly written business correspondence and records.

The typefaces for the refined machines resembled Bodoni, but the thin serifs did not allow the operator to make multiple copies in any significant quality. The mechanics of the typewriter were such that

4.23 Coffee Can is a font that was widely on signs and posters for circuses during th Victorian era, and it is still associated with circus today.



4.24 The availability of prepackaged foods brought about the need to create unique product identites with the intent of develop consumer brand loyalty.



4.25 The typewriter allowed the preparation professionally finished documents. Almost business office had a male secretary to typ formal contracts and correspondence.

AaBbCcDdEeFfGgHhIi

4.26 Monospaced fonts allow the same amount of horizontal space or set width, no matter what the character is; modern fonts are optically spaced, so the set width varies according to the width of individual characters.

the letters were monospaced on the resulting printed page. *Monospacing* refers to the equal spacing of letters within a word, so that all the wide letters such as *W* take up the same amount of space as the letter *i*.

The monospaced letters made it difficult for readers to read fluidly, causing an uneven staccato rhythm. To compensate for this technical difficulty, serifs of the thinner letters were extended to fill a larger horizontal space. The new typewriter lettering became known as *pica*, and typewriters proliferated.

The typewriter allowed individuals the opportunity to create finished, printed-looking documents in the privacy of their own homes and offices. Typing caught on very quickly in the business sector, and within a couple of decades typewriters were standard equipment in business offices, bringing about the decline of the use of scribes for writing out formal legal documents and for transcribing court documents. With the invention of the electric typewriter in 1935 came variable spacing options, causing more designers to become interested in the design of type styles for the typewriter.



4.27 The practice of fitting typography together like a jigsaw puzzle extended beyond poster design into package and label designs during the Victorian era.

Stone Chromolithography Printing

The *lithographic printing* process is based on the principle that oil and water do not mix. Images are drawn on a stone with a grease marker. The stone is coated with a mixture of water and gum arabic, which does not adhere to the image area. When an oil-based ink is applied to the stone surface, it adheres only to the image area and can be printed.

Invented around 1796 by *Aloys Senefelder*, the lithographic printing process did not gain commercial popularity until the beginning of the 1900s. Because the artist or designer drew directly on the stone, this method allowed a great deal of freedom and spontaneity in type design and imagery, as well as the opportunity to use multiple colors. The theater industry took advantage of this media, creating lavish and colorful posters. Type gracefully and often whimsically swept across labels and posters with an ease not seen in the traditional letterpress productions.

The Victorian Era Influences Typography

The last half of the 1800s is commonly referred to as the *Victorian era*, after Queen Victoria, who ascended the British throne in 1837 at the age of eighteen. She ruled the kingdom until 1901. The era was marked by social optimism, strong moral and religious beliefs, and emphasis on correct manners and social conventions. A naive sweetness and romance marked this era, attributed to the ruling sentiment of a youthful queen. This time brought about a gentler social attitude toward children, partially exhibited by the wide publication of children's books.

A love of minute detail and intricate decoration marks the architecture, furniture, clothing, and artistic styles of the period.



4.28 Extremely tall fonts su as Tombola (top) and wide, highly extended fonts such Lambada (bottom) enabled poster printers to fit the intended message into the allowed space; one word could be made to fit an entire line of justified type if necessary.

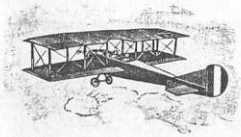
When Victorian aesthetics were applied to type design, however, often the result was not promising. It frequently led to filigreed and embellished typefaces that were nearly impossible to read. Many Victorian faces feature curlicues intertwined with natural, leafy themes not seen since the Middle Ages. Today, few faces from this period find application in modern compositions, as their poor legibility prohibits their use.

Documenting the American Civil War

A portion of the Victorian era coincides with the American Civil War (1861–1865), followed by Reconstruction in the Southern states. Ostensibly the reason for the war was philosophical opposition to race-based slavery; however, the largely industrial-based economy of the North was in direct conflict with the plantation economy of the South, and this schism fueled the war as well. The American Civil War was the first to be documented photographically, and firsthand accounts were carried in newspapers. Over a million American men lost their lives during the bloody war, and with the advent of photojournalism the craving for timely news of the individual battles propagated the wide distribution of daily newspapers.

Early Twentieth-Century Typography

The world continued to change rapidly as Charles Darwin published his 1859 *Origin of Species*, shocking Victorian society. Commercialism and industrialization managed to creep into almost every aspect of American and European life. Great innovation and excitement ushered in the new century, with Sigmund Freud's psychological theories, long-distance communication via telegraph, the visual interpretations of the French Impressionists, and the connection of the American continent from east to west by rail.

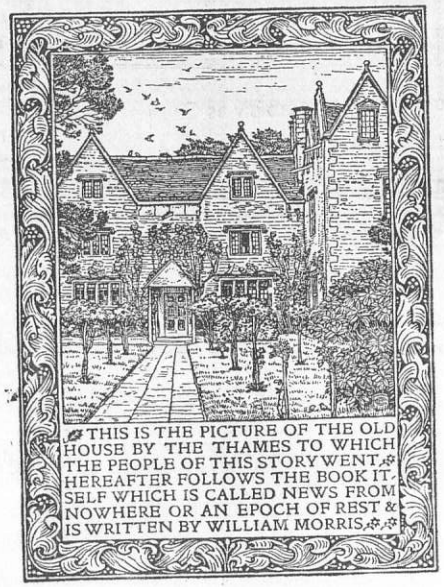


5.1 The Wright brothers completed the first engine-powered flight in Kitty Hawk, North Carolina in 1903.

During the first two decades of the 1900s, significant innovations in science and technology were introduced. Electric light became a brighter alternative to gas light. In 1901 the first radio transmission from Britain to America was completed by Guglielmo Marconi; in 1903 the Wright brothers completed their first engine-powered flight; in 1905 rotary offset lithography was introduced by Ira Rubel; in 1908 Henry Ford produced the first fifteen Model T motor cars.

Key Concepts

American Type Founders
Art Deco
Art Nouveau
Art Workers Guild
Arts and Crafts Movement
Bauhaus
Constructivism
Cubism
Dada
De Stijl
die neue typographie
Futurism
Intertype
Jugendstil
Kelmscott Press
Linotype
matrices
Monotype
neon
offset lithography
Suprematism



5.2 A page printed by the Kelmscott Press, right, illustrates William Morris' elaborate home and printing facilities.

ype, in black and red. 425 paper copi
ıe printed, at Twenty Pounds. 13 on ve
ıf which 8 are for sale at 120 Guineas
hese have already been subscribed for).
ıublished by William Morris at the Ke
ott Press. Half holland. All paper copies

5.3 A sample of William Morris' Golden typeface, above, was made popular by its use in many Kelmscott Press publications.

in 1909 Russian ballet was introduced to European audiences, and artists experimented in the Surrealist and Cubist styles of painting.

The tension between the old and the new forms of technology manifested itself in a number of ways. One force was the new practices evolving from new printing technology and industrialized mass production. In opposition was a nostalgic look back that brought about a revival of lost vehicles for expression by small presses of Great Britain and America.

The Arts and Crafts Movement

In contrast to the mass production of banal products, the *Art Workers Guild* was formed in 1884. The primary intent was to create functional products that also involved great aesthetic deliberation and intent. The movement praised the work of individual craftsmen, since the artists were convinced that the faster production of manufactured goods compromised design quality and resulted in ugly products of poor quality. *William Morris* and his followers yearned for a return to the values of individual craftsmanship not seen in industrial production.

The *Arts and Crafts movement* intended to produce high-quality, well-designed home goods such as furniture, fabric, books, wallpaper, and architecture. Because the goods produced as a result of the crafts resurgence were handmade, however, they were affordable only to the wealthy. What began as an attack on mass production evolved into a kind of elitism. Historians argue whether this movement had a positive effect in the end, raising the aesthetic standards and construction quality of manufactured products.

Kelmscott Press

William Morris established *Kelmscott Press* in 1889, looking to books printed in the 1500s for inspiration. After studying printing, papermaking, bookbinding, and type design for three years, he began producing books. His books were oversized tomes that included Morris' own Roman typeface after the style of Nicolas



5.4 A page from *Canterbury Tales* printed by Kelmscott Press, circa 1896. These oversized books were reminiscent of the Middle Ages when books were handcrafted on substrates with irregular surfaces. The imperfect handmade paper used by Kelmscott Press was part of the political statement against industrialization.



5.5 The nameplate used to identify books produced by Kelmscott Press symbolized the beautiful but imperfect handcraft by the Arts and Crafts movement.

Jenson. The type was a heavier, blacker face surrounded by ornate woodcut borders and ornamental initials inspired by the medieval manuscripts. Morris' fastidious craftsmanship extended from the composition to the rag linen paper exclusively produced for all his printing. Through his efforts, printing was reaffirmed as an art form, as opposed to a mechanical process devoid of human input. The use of beautiful and lavish decoration was considered to enhance the emotional experience of the book. Morris cut three faces: the first named Golden, another named Chaucer, and the last Troy. Although these faces did not become popular during this time, Morris championed the notion that well-designed pages affect the reader's perception and comprehension. His work supported the proliferation of private presses and limited-edition books throughout Europe and America.

Morris applied the same care and perfection to his furniture design, wall hangings, fabric, and wallpaper. His everyday works for the home were works of art and he is sometimes

Key Players
Josef Albers
Herbert Bayer
Peter Behrens
Morris Fuller Benton
A. M. Cassandre
Georges Claude
Theo van Doesburg
Otto Eckmann
Lyonel Feininger
Eric Gill
Bertram Goodhue
Frederic Goudy
Walter Gropius
Edward Johnston
Wassily Kandinsky
Paul Klee
Rudolf Koch
El Lissitzky
Filippo Marinetti
Otto Mergenthaler
Laszlo Moholy-Nagy
Piet Mondrian
William Morris
Stanley Morrison
Paul Renner
Ira Rubel
Kurt Schwitters
Jan Tschichold
Henry Van de Velde

Neon Lights up Type

Neon sign technology was first successfully demonstrated in France in 1910 by French chemist and inventor *Georges Claude*. His first patent was granted in 1915. In 1923, Claude and his company, Claude Neon, introduced neon gas signs to the United States by selling two to a Packard car dealership in Los Angeles, California. Earle Anthony purchased the two signs reading "Packard" for $24,000. Neon lighting quickly became a popular fixture in outdoor advertising, and by 1930 there was a booming neon sign industry.

Neon signs are created by bending hollow glass tubes into shapes, limited only by the scale and expertise of the artisian. The tubes are filled with gas (usually neon or argon) and an electrode is attached to each end of the tube. When the sign transformer is turned on, the gas molecules become excited and emit light.

This scientific discovery dramatically changed the general public's perception of typography and signage as glowing script and sans serif fonts appeared against the dark night sky.

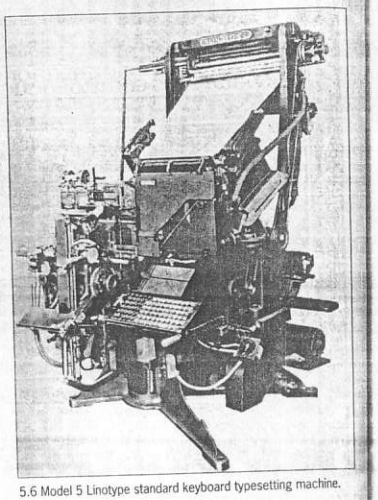
referred to as one of the earliest industrial designers.

Page Type Composition Speeds Up

Although printing technology had advanced greatly since Gutenberg's time, the setting of type had made only one technological leap in several hundred years. Originally known as hot type because it was cast in molten lead, each letter was laid in a galley or composing guide one character at a time. This meant a great amount of handwork went into composing the daily newspapers. In the late 1800s the New York newspapers offered a half-million-dollar reward to anyone who could improve the type composing process, cutting the required time by 25 percent. Three thousand patents were issued to inventors who worked on mechanized typesetting machines, competing for the award.

In 1886 *Otto Mergenthaler* designed the first *Linotype* machine. The linotype machine's *matrices* or molds of letters are linked to a corresponding key on a typewriter keyboard. As the operator types, the matrices are aligned through a tube, adjacent to one another. All characters, including minuscule and majuscule letters, numerals and punctuation marks, have a corresponding key on the keyboard and a corresponding matrix. Once the operator has typed to the correct column width and word ending, a button is pressed and the molten lead is poured into the matrices creating a line of cast type in one piece—hence the name Linotype.

The molten lead cools quickly, is shaken out of the matrix, and lands next to the previous typeset line. The edge of each line of type is notched along the top and bottom edges so that they align accurately and lock together. The original matrices return to their original positions via a mechanical combination of chains and pulleys, ready for the process to create the next line of type.



5.6 Model 5 Linotype standard keyboard typesetting machine.

If the Linotype operator types a word incorrectly, the line may be discontinued or it may be cast then removed from the column of type. After realizing they had made a mistake, composers often ran their finger across the keyboard creating a nonsense phrase to bring a proofreader's attention to the incorrect line.

Spacing on the Linotype machine was its greatest limitation. Kerning can be accomplished and justification is possible, but both require keystroking on the part of the operator during the input process.

Mergenthaler's hot-type method could compose ten times faster than the hand composition method. The increase in productivity allowed newspapers to produce more copies at a lower price. Because less time was required in the composing room, the newspapers reached

press sooner and timely editions were more quickly available to the general public.

Technological change continued to proceed, and by 1911 the Linotype machine was able to carry three magazines of matrices at one time and change fonts at the press of a lever. Reacting to competition by *Monotype*, a new linecasting machine was developed by *Intertype* in 1912 following the expiration of the Mergenthaler patent. In 1918 the *New York Times* purchased a number of Intertype casters which helped to firmly establish the new competition in the industry.

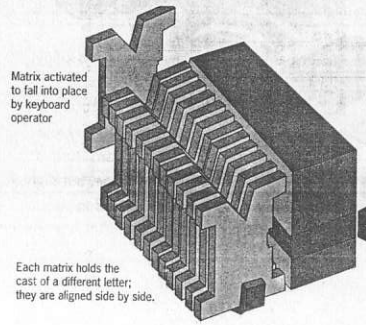
Mergenthaler's Linotype machine also meant that entire composing rooms of twenty people who worked to assemble a newspaper in a day were replaced by only three operators. The same efficiency that brought about positive economic changes for the printing industry caused hardship for those who became unemployed. Former type composers found themselves looking for new training and other employment.

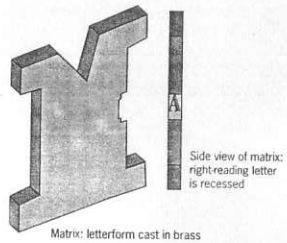
Setting headline type was still done by hand with wood type, since this task was beyond the capabilities of both the Monotype and Linotype machines. Although Monotype was able to strengthen its market position by 1914, when it became capable of casting larger type (up to 24 points in size), it was not until the Ludlow machine was developed that wood-letter industry moved into decline.

Art Nouveau

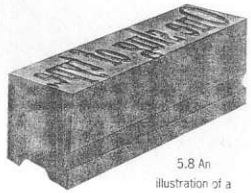
The aesthetic influence of the Victorian era and the Arts and Crafts movement flowed together to create the *Art Nouveau* movement (called *Jugendstil* in Germany). Based on graceful, sinuous, curving lines and images of svelte young women, the style frequently appeared in posters. There was a renewed interest in hand lettering as it could be incorporated easily into works printed using stone lithography. Alphonse Mucha's posters display an elegant integration of type and illustration possible when the illustrator/artist is also the typographer.

The most distinctive Art Nouveau typeface was designed by *Otto Eckmann* for the Klingspor foundry around 1900; its aesthetic was a blend of organic themes from Jugendstil and a form of black letter traditional to Germany incorporating the medieval pen and open bowls on letterforms. This distinctive display face was not





5.7 The matrices for each letter are aligned, then the Linotype machine casts one piece of lead with a complete sentence or phrase the width of the column.



5.8 An illustration of a single line of cast lead type from a Linotype machine



5.9 A book cover in the Art Nouveau style incorporates stylized flowers with writhing stems and caps to create a sense of movement.

highly legible due to the complex decorative style.

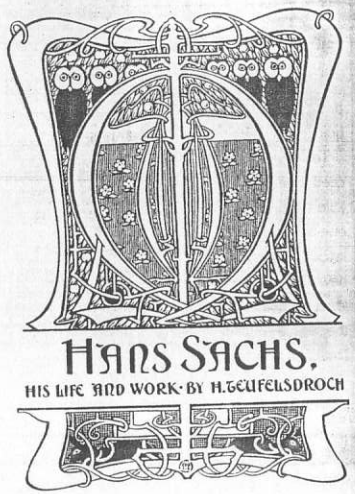
German designer *Peter Behrens* was influential through out his career, beginning with illustrative work in the Jugendstil. Around 1900 he designed faces for Klingspor foundry, the most popular of which was Behrens Roman. It was similar to Otto Eckmann's type, but slightly less florid and more visually related to the German black letter forms.

Behrens is noted for his wide-ranging variety of design styles and for the progression in his aesthetic ideals during his career. At approximately the same time as he designed Behrens Roman, he designed a book set in sans serif entitled *Feste des Lebens*, which was an abrupt shift from the Textura style. Historians often cite this as a precursor to the changes from Germanic black letter to bold sans serif faces in Europe.

One of Behrens' most noted accomplishment is the development of the visual identity for AEG, which involved the design of several company tradmarks between 1907 and 1914. AEG (Allemeine Electricitäts-Gesellschaft), originated in 1887 as the German Edison society for applied Electricitaet which was the German equivalent of General Electric in the United States.

Type for Mass Production

Morris Fuller Benton was asked to develop a new sans serif aesthetic for the *American Type Founders* (ATF). Franklin Gothic was among the new sans serif designs he produced just after the turn of the century; subtle details in the thinning of strokes where round strokes join stems distinguished these from other heavier sans serif fonts. During a similar period of time, *Frederic Goudy* designed Copperplate Gothic



5.10 Book cover graphic illustrating a symmetrical Art Nouveau composition.

(not a true Gothic), with tiny serifs used to hold character definition, and *Bertram Goodhue* created Cheltenham, a popular display type for advertising, that was noted for its robust flexibility, as it was cut in a wide range of weights and sizes.

Offset Lithography

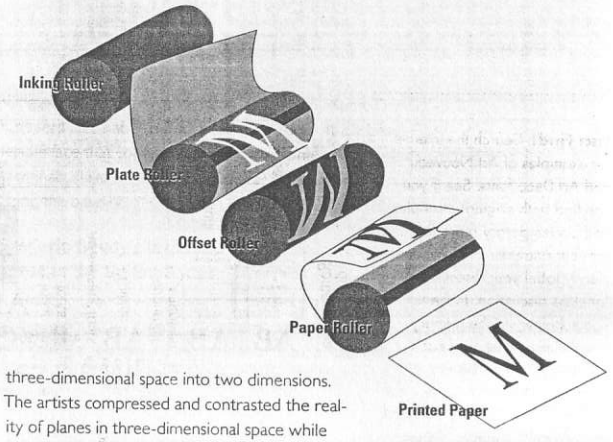
In 1905 *Ira Rubel* introduced *offset lithography*. Refined in the 1930s, the main concepts behind offset lithography remain similar today. In offset printing, the images and type that constitute a final layout or composition are pasted onto board. Continuous-tone images, such as photographs, are converted to halftones, and areas of photoset type are accurately arranged. A negative film is made using a photographic process; this film is placed on an aluminium alloy printing plate and exposed. Once prepared, the aluminium plate is attached to a cylinder on the printing press. The image from this plate is

offset onto the surface of a rubber roller, then printed onto the sheet of paper. The paper never touches the printing plate.

Offset lithography helped to revolutionize the industry: press preparation time was reduced, and the presses could run faster with the plates on cylinders than with flat platens containing lead type. Although offset lithography is the most popular form of commercial printing today, it took fifty years for it to dominate the industry.

An Aesthetic Revolution

By the end of the first decade of the 1900s, profound changes across Europe sparked new interpretations of visual language. The fracturing of realism sprang into prominence with *Cubism* and Futurism, while Suprematism and Constructivism extended the visual revolution into pure abstraction of content. The works of Georges Braque and Pablo Picasso expressed the ideals of Cubism by abstracting three-dimensional space into two dimensions. The artists compressed and contrasted the reality of planes in three-dimensional space while adding a consideration of the fourth dimension of time. The deviation from reality inherent in this abstraction from the third and fourth dimensions provides a foundation for many of the artistic visual explorations in abstract compositions. Experimentation with these ideas incorporating typography is seen around 1911 and 1912 in papiers collés (collage) constructions.



5.11 The process of offset lithography includes a plate that picks up ink from a roller. The inked plate transfers the image onto a rubber offset roller, which, in turn, transfers the image to the sheet of paper.

Franklin Gothic

COPPERPLATE GOTHIC

Cheltenham

5.12 ITC Franklin Gothic Book, Copperplate Gothic 29a, and ITC Cheltenham Bold are contemporary versions of fonts developed for printing and mass production in the early 1900s.

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ır examples of Art Nouveau
nd Art Deco fonts. See if you
ın find both original examples
ınd contemporary reproductions
or your analysis. Print out and
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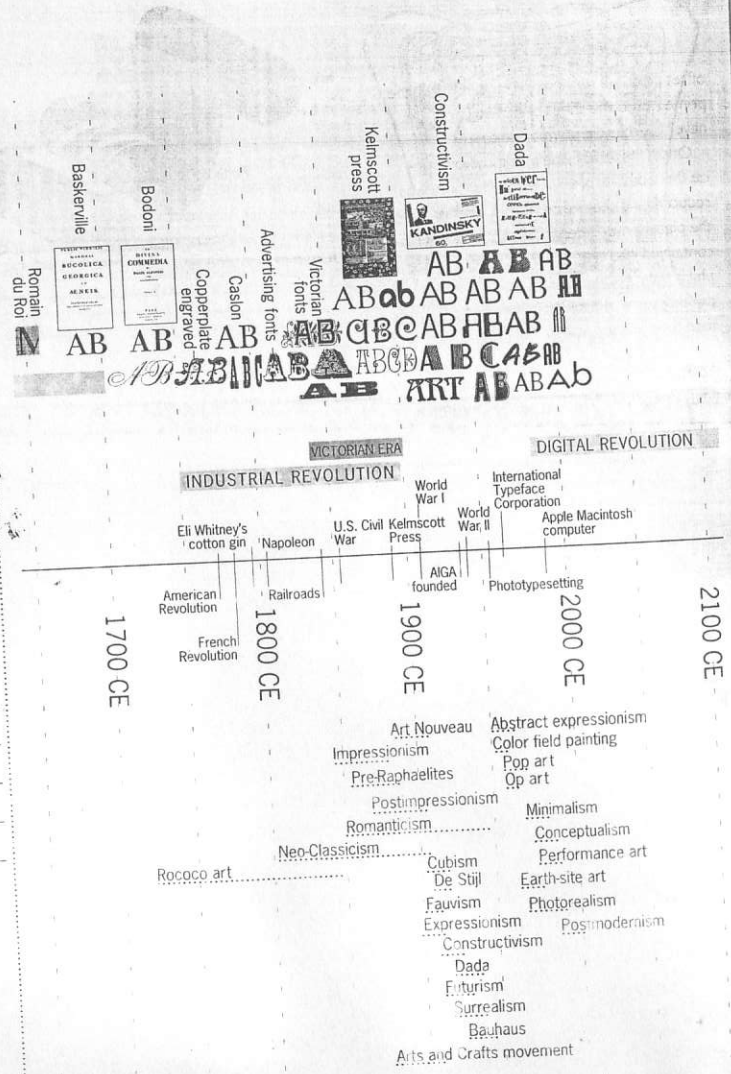
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Date visited:



5.13 Facing page: Timeline illustrating the context of typographic styles and trends during the twentieth century.

Futurism began with the distribution of a manifesto by *Filippo Marinetti*, out of rebellion against the corrupt and confused Italian government. The Futurist movement was at its height from 1909 until 1918. Futuristic painters Giacomo Balla, Carlo Carra, and Gino Severini also drew on the use of typographic materials by incorporating newspapers and other print in their work.

The Italian Futurists Ardengo Soffici and Filippo Marinetti created typographical experiments using found and constructed type, reinventing literary communication. Marinetti explored the interconnectedness of the meaning of the written word and the aesthetic associated with it; his free-form layouts are typographic puns and wordplays that challenge the linear nature of reading.

Post-War Typographer: Rudolf Koch

Rudolf Koch, a teacher of calligraphy at the Arts and Crafts School in Offenbach, was inspired by William Morris' books. Koch was a deeply reverent Christian with distinctly medieval preferences in type. He developed personal variations of some of the traditional medieval faces.

After he returned from serving during World War I, he continued designing typefaces for the Klingspor type foundry. In 1923 he designed the heavy face Neuland, chiseling the all-caps font from the metal punches without preliminary drawings. This experimental face has been copied and revived many times by a number of different foundries.

Eva Antiqua, Kabel, Koch Antiqua, Locarno, Neuland Star, Stempel Kabel, and Wilhelm Klingspor Gotisch are other fonts designed by Koch. The sans serif face Kabel, is frequently used today. It is a beautiful, legible face that conveys a carefree playfulness. The angled terminals make the characters appear to dance and skip along the baseline.

Frederic Goudy's Inspired Private Press in the United States

Frederic Goudy was inspired by the books produced by William Morris, as were many other American printers. The emphasis on excellent-quality paper and impeccable press-work exemplified by the Kelmscott Press raised the overall standards in the printing industry. Goudy is credited as being

5.14 Rudolph Koch's Neuland font has been revived countless times by numerous foundries over the last six decades.



The War to End All Wars

With the outbreak of World War I, on August 14, 1914, the atmosphere of innovation and improvement suddenly changed. The war produced more casualties than the total sum of every war since. Worldwide, ten million lives were lost by the time Germany surrendered on November 18, 1918. Estimates on record show that approximately one-quarter of the male population of this generation was lost in warfare. The devastation and loss from the war were so significant that it was believed society had learned its lesson, hence the notion that there would never be another global conflict of this magnitude.

Also in 1917, the Bolsheviks overthrew Czar Nicholas II and started a Communist society under Lenin. The Bolshevik Revolution caused the loss of approximately five million lives in Russia. Stalin later annihilated millions of farmers and property owners in the process of instituting state ownership and control.

The horrible devastation and repercussions that resulted sparked a number of changes in philosophy that fueled new art movements and aesthetic styles.

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.15 Kabel Light

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.16 Kabel Book

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.17 Kabel Heavy

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.18 Kabel Black

ABCDEFGHIJKLMNOPQRSTUVWXYZ 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.19 Goudy Old Style Small Caps and Old Style Figures

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.20 Goudy Sans Regular

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.21 Goudy Old Style Regular

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.22 Goudy Old Style Italic

the first full-time American type designer, running his own Village Press until it was destroyed in a fire.

During his career Goudy cut 122 beautiful, functional faces, often based on inspiration from the Renaissance and from the humanist movement in typography. He cut the face Goudy Old Style, which reveals a visual relationship to the calligraphic pen. He wrote a number of books on lettering and edited journals that dealt specifically with book design and layout.

Edward Johnston and Eric Gill: Classic Letters

The whimsical embellishments characteristic of Victorian-era type in previous decades precipitated a desire for simpler, streamlined typefaces. While some looked to the Roman classics for inspiration, others referred to the original sans serif face introduced in 1816. *Edward Johnston*, a central figure in the English revival of fine calligraphy and the study of letters, devoted most of his life to teaching the art of lettering. In some historical accounts, Johnston is considered the primary mover in England's resurgence in handcrafted lettering. In his classes he trained a generation of fine calligraphers in many different lettering, calligraphic, and script faces while encouraging high-quality craft through disciplined dedication and inspired teaching.

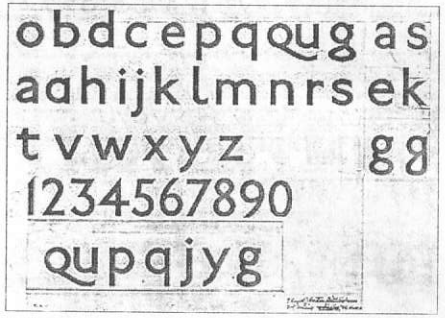
In 1915 Frank Pick, then the director of London Transport, commissioned Johnston to design a typeface for the London Underground corporate identity. This font, now known as Johnston Sans, is a creative departure from earlier sans serif faces, and illustrates a tremendous amount of innovative exploration of individually character forms. Some of the lowercase



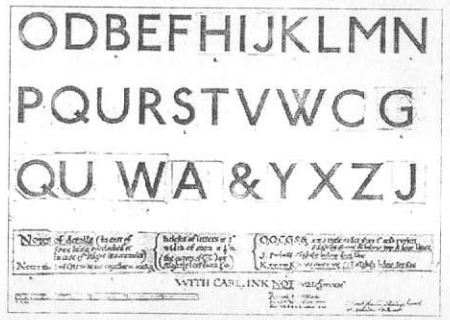
5.23 Above: General Bullseyes, 1916–19, drawn by Johnston, or more likely one of the London Transport printers, was bolder than the normal Johnston Sans.

letterforms take on characteristics of traditional uppercase letterforms, as seen in the decorative tail of the letter *q*. Although classified as a sans serif font, there are slight variations in the angular nature of the terminals that add character and visual interest. Alternate forms of the letters *a* and *g* are offered in the original drawings of the font, possibly to bring variety to the signage and allow a range of possible combinations.

Johnston wrote a number of books on lettering to further interest in the field, and is considered one of the definitive sources on typography from this period. Publications



5.24 The final design for Johnston Sans lowercase, dated July 1916.



5.25 The final design for Johnston Sans uppercase, dated June 1916.

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.26 Perpetua Regular

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.27 Perpetua Italic

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.28 Perpetua Bold

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.29 Gill Sans Light

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.30 Gill Sans Light Italic

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.31 Gill Sans

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.32 Gill Sans Italic

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.33 Gill Sans Bold

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ
5.34 Gill Sans Bold Italic



5.35 A visual comparison between Kabel Light by Rudolph Koch (gray) and Gill Sans Light by Eric Gill (outline), one of Edward Johnston's protégés. At first glance the text sizes of these fonts appear similar, but in reality they have significant differences in structure and shape.

include *Writing and Illuminating and Lettering*, London 1906, and *Manuscript and Inscription Letters for Schools and Classes and for Use of Craftsmen*, London, 1909.

Eric Gill, one of Edward Johnston's students, began a career as a letterer and a stonecutter. The first typeface he designed, Perpetua, was a traditional serif face inspired by classical models. He made a break with classic faces in 1928 with his design Gill Sans. Although this is a sans serif face, many of the letters have beautiful calligraphic details. Once introduced in England, it received rave reviews. It has stylistic characteristics in common with Johnston's Railway type. Other well-known faces by Eric Gill include Joanna and Bunyan.

The Roaring Twenties

The 1920s, known as the Roaring Twenties, were a time of celebration and freedom, a societal rebound from the shock and devastation of World War I. Although the world was at peace, Europe was struggling to recover from the war, with Germany suffering the most. The German mark was so devalued that baskets of money were required to purchase a single loaf of bread. Many resorted to using the worthless currency as fuel, burning it in their furnaces when winter set in.

Design in the decade between the World Wars is varied, and many different influences in the art world have resulted in typographic counterparts. Art Deco, Futurist, Constructivist, Art Nouveau, Suprematist, Impressionist, Expressionist, Cubist, De Stijl, Surrealist, Jugendstil, Dadaist, Social Realist, and Bauhaus ideas coexisted in art and design circles throughout Europe. It is difficult to establish a linear timeline, as so many of them were simultaneously in vogue.

Dada Rejects Typographic Messages

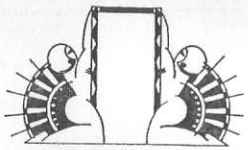
Dada rejected the organization of type on the page and instead encouraged its use as an expressive medium. The Dadaists created layouts by intuitive placement of type and abstract elements that appeared random. They rejected the rigid horizontal and vertical format that had straitjacketed printing of the past, and introduced a new typographic sense. They composed on the press bed using an assortment of letters in various sizes. Boxes, bars, and rules were incorporated in ways that represented letterforms. They felt that the chaos they created in their compositions justifiably represented the sense of the era. The philosophical nihilism and angst among survivors of war was compounded by the physical and psychological scars left by the conflict. The confusing, sometimes offensive, sometimes poetic Dada compositions were widely rejected, although their work liberated printing practices and expressed incredible energy and innovative exploration.



5.36 Left: Typographic composition in the Dadaist style.

Art Deco

Art Deco is characterized by its technically elaborate, geometrically linear designs, which usually incorporated the use of bilateral symmetry. Decorative frames are often included as part of the composition, along with dark areas of tone or color, geometric shapes, and multiple, thin parallel lines.



5.37 Art Deco–style frame, illustrating the strong contrast in line work, the symmetrical composition and the decorative borders, indicative of this style.

abcedfghi
jklmnopq
rstuvwxyz
1234567890
ABCEDFGHI
JKLMNOPQR
STUVWXYZ

5.38 Broadway, designed by Morris Fuller-Benton in 1925 is characteristic of the Art Deco style. Considered somewhat whimsical today, it is commonly found on theater advertisements and marquees.



5.43 Constructivist typographic layout.

abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.39 Peignot Light

abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.40 Peignot Demi

abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.41 Peignot Bold

abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.42 Bauhaus 93

A. M. Cassandre (Adolphe Jean-Marie Mouron) was a type and graphic designer of the Art Deco period, known for his design of the typeface Peignot. In addition to the Art Deco influence, Cassandre was influenced by the Cubist style, in which the artists attempted to represent multiple views of the subject in one composition. He struggled for simplicity; his typefaces explore contrast in weight while introducing innovative interpretations of letterforms. Fonts by Cassandre include Bifur, Acier, Acier Noir, Peignot, Touraine (with Charles Peignot), and Cassandre, created over four decades.

The Bauhaus Aesthetic: Kandinsky and Bayer

The *Bauhaus*, a German school of design was founded after World War I. Das Staatliches Bauhaus emerged from a prewar school run by the Belgian architect and designer *Henry Van de Velde*, who had made a mark with his work in the Art Nouveau style. The emergence of a new typographic sense is seen in the work of the faculty and students which is based on new ideas in composition from the aesthetic and technological influences of the time.

The postwar "form follows function" and "less is more" design ideologies originated from their philosophy. Architect *Walter Gropius* (formerly an assistant to Peter Behrens) founded the school in 1919, soon recruiting *Laszlo Moholy-Nagy*, *Wassily Kandinsky*, *Paul Klee*, *Lyonel Feininger*, and *Josef Albers*. Their form of modern art was seen as contrary to traditional German ideals, and first the Nazis forced the school to move and then to close completely in 1933. Although the original Bauhaus existed for only fourteen years, the philosophical foundation set here continues to have strong repercussions in visual style and visual education today.



5.44 A Kandinsky poster designed by Herbert Bayer follows the Constructivist ideas of composition, with angled bars supporting and clarifying the typographic hierarchy.

abcdefghi
jklmnopqr
stuvwxyz

5.45 Herbert Bayer's Universal font in which he attempted to eliminate the need for different uppercase and lowercase letterforms.

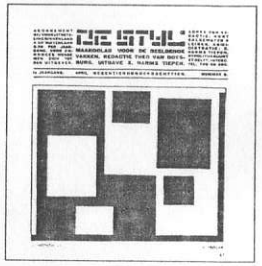
In his 1925 essay "Contemporary Typography — Aims, Practice, Criticism," Moholy-Nagy predicted that a great deal of typographic communication would be replaced by sound recordings and film images. He asserted that the practice of typography needed to be raised to a more expressive and powerful visual aesthetic that would embrace the machine-print production technology. He taught that the idea of tension and contrasting visual elements could be achieved through the disposition of type. Typographic signs were moved from their primary use as borders and decorative elements into positions of emphasis and meaning. He encouraged students to attempt the design of a functional typeface of "correct proportions" without individual, extraneous decoration.

A student of the Bauhaus, *Herbert Bayer*, devoted a great deal of his studies to typography. In 1925, when the school moved to Dessau, Bayer became the first head of a new typography workshop, where he remained until 1928. He explored the idea of taking a sans serif font to a logical extreme as his "universal type," wherein he attempted to serve all typographic needs by reducing the letters to their most basic forms; he discarded capitals, claiming them unnecessary. This typographic innovation was considered successful at the time, but it was not widely reproduced. Bayer continued his creative work throughout his lengthy career.

The Bauhaus taught that "clean" design and the use of good-quality materials resulted in "good design." The goal was to achieve a well-designed object or space that could be manufactured using industrial technology of the time, which was in direct opposition to the philosophy of the Arts and Crafts movement. Once the school was closed, many of the instructors immigrated to the United States and continued to teach, where they influenced several generations of artists, designers, and architects.

De Stijl Movement in the Netherlands

The *De Stijl* movement appeared in the Netherlands around 1917. *Piet Mondrian's* paintings commonly are touted as the typical example of this style, characterized by the abstract geometric forms arranged according to universal principles of compositional balance. Generally, heavy black bars, placed at right



5.46 De Stijl layout incorporates geometric forms with compositional balance.



5.47 Cover of *The Isms of Art* by El Lissitzky from 1924 uses dark horizontal rules to create the compositional repetition while organizing the information within the format.

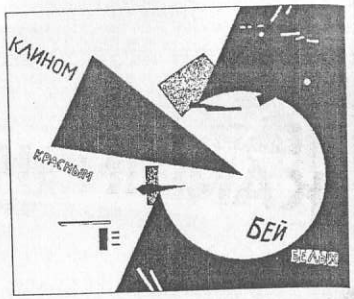
angles, separated typographic information from the rest of the composition. Like other movements, De Stijl attempted to reject the values of the former economic and philosophical basis for composition as it moved away from representational imagery.

Theo van Doesburg (born Christian Emil Marie Küpper) applied De Stijl ideology to many of his creative endeavors and in 1919 developed a typeface called An Alphabet, based exclusively on a square. Curves and diagonals are completely omitted in favor of a modern, geometric aesthetic. Although never a commercial success, the face still resonates with a contemporary feeling.

Russian Constructivism: El Lissitzky and Kurt Schwitters

Following the spread of the Bauhaus philosophy and the rise of Bolshevism in the 1920s, an increasing number of fine artists transitioned from the canvas to the study of design in other media. In Russia, the ideas of De Stijl, Cubism and Futurism gave way to *Constructivism* and *Suprematism*. Soviet art, much like the art of the rest of the Western world at the time, was an attempt to express meaning through the simplest possible means with basic color and shape. The distinguishing feature of the Soviet Constructivism and Suprematism movements arose from the Communist and utilitarian ideology of Soviet culture at the time. "Art for art's sake" was renounced, as those practicing turned their attention to book, magazine, exhibit, and type design, in which Soviet artists of the early twentieth century sought to create the utilitarian art for the new Soviet state.

The Constructivist style is characterized by the use of simple, bold, angled planes, linear angled elements, and a strong use of the



5.48 *Beat the White with the Red Wedge*, 1919, by El Lissitzky, is exemplary of the Constructivist style, which combines angular shapes and asymmetrical balance.

diagonal. Constructivist designer *El Lissitzky* created innovative typographic layouts, breaking from the restraints of vertical and horizontal stress in his compositions. He incorporated techniques of photomontage, letterforms constructed of geometric shapes, and rules in red, white, and black. Lissitzky lectured widely on Constructivism, spreading the philosophy and practice in the creative communities. His ideas evolved and were propagated through progressive art schools in the newly established Soviet Union such as Vkhutemas (Higher State Artistic-Technical Workshops) and Vitebsk (A Public Higher School of Art), where Kandinsky and Chagall practiced and taught.

Another innovative designer, *Kurt Schwitters* was close to El Lissitzky in the 1920s, although his work is a different synthesis of Dadaism, Constructivism, and De Stijl. He often worked in conjunction with Lissitzky and Theo van Doesburg to create innovative typographic solutions. Schwitters' methods of laying type over bold rules establishes a visual grid while interrupting blocks of type, rules and images contrast to create asymmetrical layouts. Schwitters experimented with the development of an alphabet that linked the sounds of the letterforms to the visual characteristics,



5.49 Jan Tschichold's cover for an insert on typographic design from 1925 that revolutionized German typesetting.

altering the weight so that heavier forms represented vowels.

Minimal Typographic Design: Jan Tschichold

Jan Tschichold's early typographic compositions revolved around this need for clear communication of the message. Although not formally trained in art or design, Tschichold is considered one of the most important practitioners of die *neue typographie* which developed in Europe between the World Wars. As well as redesigning Penguin Books typefaces and layouts around these principles of simplicity, he also produced a small number of critically important typefaces.

Influenced by the Bauhaus and Constructivist ideals of minimalism, Tschichold explored the use of asymmetrical layouts, diagonals and sans serif geometric typefaces, clearly organized within a grid structure. While teaching in Munich under the direction of Paul Renner, in 1928 he codified his typographic principles in *The New Typography*, for a wider audience of designers, printers, and letterers. Decoration was deemed unnecessary, and the idea that clear communication should dictate all layout decisions was set forth. Color within the composition was achieved by balancing light, bold, condensed, and extended sans serif typefaces. White space was viewed as an integral and essential element of any layout. Just prior to World War II, he began to revise these views and reassess the value of classical type and layout.

A Geometric Typeface: Paul Renner's Futura

Artist, teacher, painter, typographer, and author *Paul Renner* was a central figure in the German artistic movements of the 1920s and 1930s, becoming an early and prominent member of the Deutscher Werkbund while creating his first book designs for various Munich-based publishers. Renner taught with Jan Tschichold at the Bauhaus in the 1930s and was a key participant in the heated ideological and artistic debates of that time. Like others from the Bauhaus, Renner was arrested and dismissed from his post by the Nazis.

Renner designed Futura in 1927. This font is based on simplified, geometrically shaped letterforms. Early exploratory versions of this face show the designer's innovative approach, as many alternate characters were unusual interpretations of traditional letterforms that aided



5.50 Examples of Paul Renner's Futura in a variety of weights and sizes.

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.51 Futura Light

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.52 Futura Book

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.53 Futura Bold

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.54 Futura Condensed Regular

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.55 Futura Condensed Demi

abcdefghijklmnopqrstuvwxyz 1234567890
ABCDEFGHIJKLMNOPQRSTUVWXYZ

5.56 Futura Condensed Extra Bold

an irregular syncopation to the page. Even though the bowls varied in height, the stark geometry of the sans serif face was a departure from the classical approach to type design.

In the final type design, the round characters were based on a perfectly geometric circle, and the angled characters on triangles. Eventually the collection was broadened to include a whole family of faces, including thirteen variations in weight. Futura is still frequently used, as it has a beautiful economy of form and a strong sense of balance and functionality.

The Great Depression

The decade of economic depression in the United States began with the Wall Street crash of 1929. International trade had screeched to a halt with the passage of the Hawley-Smoot Tariff Act, which placed high taxes on imported goods. Now, with the onset of the depression, banks closed and businesses failed. Soup lines in cities became a common sight as unemployment sky rocketed. Food was scarce in metropolitan areas because the cost of shipping crops and livestock to market was more than what Midwestern farmers could charge for their products.

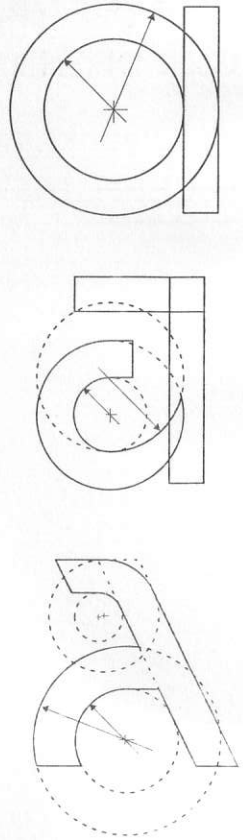
By 1934, fascist dictator Adolf Hitler had come to power in Germany. Benito Mussolini ruled in Italy, Francisco Franco headed Spain, and Joseph Stalin ran the Soviet Union. The demoralized public looked to these extremist leaders to vanquish the difficult conditions of their daily lives through idealistic ideologies. Unfortunately, they had traded their freedom for a promise of stability and a comfortable future that turned out to be fiction.

Franklin D. Roosevelt was elected to the White House in 1932 by a clear majority, and presidential manipulation of the U.S. Supreme Court allowed the policies of the New Deal to be implemented. Roosevelt instituted the most extensive public-spending policies the country had ever known, and today many economic historians believe this action deepened and extended the Depression, though it provided a safety net for many.

Type for Daily Newspapers

During the Depression, daily newspapers were a consistent source of information both on the economic state of the country and on possible employment. Eventually typefaces were developed specifically for Linotype technology and the demands of the newspaper industry, which had to withstand wear on high-speed printing presses, avoid the possibility of the ink filling in the eye of the lowercase *e*, and allow the greatest number of letters to the inch while maintaining clear legibility. Not since the days of Baskerville had printing technology had such an impact on the design of typefaces. These very practical considerations caused those in the newspaper industry to realize the interdependence of the different phases of production, and to better address the design of type to ensure a viable solution for their typographic dilemma.

A contemporary study conducted by the font design firm Ascender Corporation found that the ten most popular typeface families used by today's newspapers are Poynter, Franklin Gothic, Helvetica, Utopia, Times, Nimrod, Century Old Style, Interstate, Bureau Grotesque, and Miller. Many of these typefaces were designed to accommodate the special constraints newspaper production poses.



5.57 An analysis of Paul Renner's alternate designs for his Futura font.

abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.58 Times New Roman

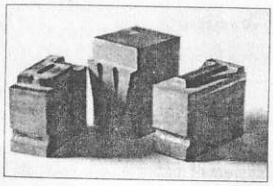
abcedfghijklmnopqrstuvwxyz 1234567890
ABCEDFGHIJKLMNOPQRSTUVWXYZ

5.59 Times New Roman Bold

Times New Roman was designed by Stanley Morrison, with Victor Lardent in 1932. The constraints of the printing presses were considered in the design of this type family in order to achieve an optimal number of characters per line with maximum readability.

Character Characteristics

The nomenclature and morphology of type used today evolved primarily from the technological development of writing substrates, writing tools and printing technologies. A complete knowledge of this typographic anatomy provides a foundation for concise and consistent communication with service bureaus, clients, and other designers or art directors. The ability to distinguish one face, font, or family from another is essential to the development of a designer's aesthetic sense. As this typographic lexicon is mastered, the selection of a typeface to communicate meaning and enhance the visual message becomes easier.

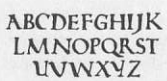


8.1 Pieces of type.

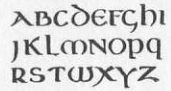
Key Concepts
base
centered
cicero
concave
convex
descender line
didot
dingbats
display type
em
en
family
flush left
flush right
font
force-justified
italic
justified
kerning
leading
lining figures
lowercase numerals
negative leading
oblique
Old Style figures
phrasing
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uppercase numerals
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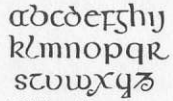
Upper- and Lowercase Letterforms

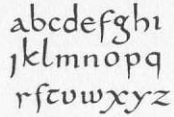
Although writing itself can be traced back to several millennia BCE, to Egyptian hieroglyphics and Sumerian cuneiform inscriptions, modern letterforms have their most immediate heritage in Roman inscriptions from around 50–120 CE, such as the one on the base of Trajan's column in the Roman forum. Early Latin writing was heavily influenced by these chiseled-in-stone letterforms, and over the centuries it evolved into a variety of other shapes, including uncials and the related Carolingian script. It is through this period of the

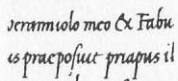

8.2 Square capitals.

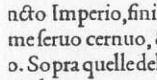

8.3 Rustic capitals.


8.4 Uncials.


8.5 Half uncials.


8.6 Carolingian minuscules.


8.7 Humanist script.


8.8 Griffo's humanist type.

sixth to tenth centuries that we see the development of the lowercase (minuscule) letter as different from the uppercase (capital or majuscule).

Handwritten articles resembled printed letters until scholars changed the form of writing, using capitals and small letters and writing with more slanted, connecting letters. Gradually writing became more suited to the speed the new writing instruments permitted. The credit for inventing Italian "running hand" or cursive handwriting with its capital and small letters goes to Aldus Mantius of Venice, who departed from the old set forms in 1495. By the end of the sixteenth century, the old Roman capitals and Greek letterforms had been transformed into the twenty-six letters we know today, both upper- and lowercase.

There are stages that can be identified in the evolution from capital or uppercase letters to their lowercase counterparts: square capitals (fourth to eighth centuries), rustic capitals (sixth century), uncials (fifth century), half-uncials (eighth and ninth centuries), Carolingian minuscules (ninth century), black letter (twelfth century), humanist (fifteenth century) and chancery.

The modern Latin alphabet consists of fifty two letters, including upper- and lowercase, plus ten numerals, punctuation marks, and a variety of other symbols such as &, %, and @. Many languages add a variety of accents to the basic letters, and a few also use extra letters and ligatures.

These accented letters can have a number of different functions:

- Modifying the pronunciation of a letter
- Indicating where the stress should fall in a word
- Indicating emphasis in a sentence

abcdefghijklmnopqrstuvwxyz
àáâãäåçèéêëìíîïñðòóôõöøšùúûüýþÿž

ABCDEFGHIJKLMNOPQRSTUVWXYZ
ÀÁÂÃÄÅÆÇÈÉÊËÌÍÎÏÐÑÒÓÔÕÖØŠÙÚ
ÛÜÝÞŽ

1234567890!@#$%^&*()_+=[]\{}|;':",./
<>?¡¢£¤¥¦§¨©ª«¬ ¯°±²³µ¶·¹º»¼½¾¿ß÷ıŁ
łœ‘’‚“”„†‡•…‰‹›™—

8.9 Examples of upper- and lowercase characters, numerals, special characters, and accented characters are shown.

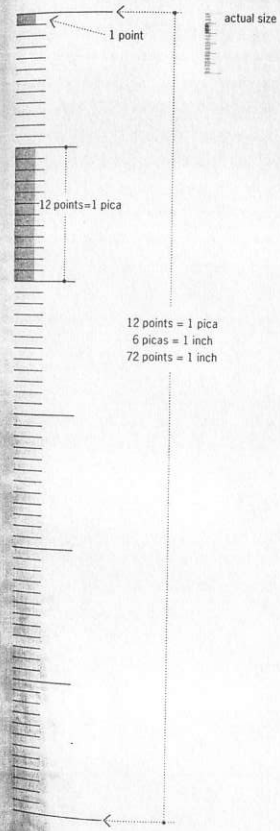
- Indicating pitch or intonation of a word or syllable
- Indicating vowel length
- Distinguishing homophones

Measuring Type

For three hundred years after Gutenberg, no standard system of measurement existed. Type foundries used their own systems of dimension. This meant that type from one house often could not be used successfully by other foundries or printers. Sometimes the name given to a size of type from one foundry was the same as that given to a different type size from another foundry.

Typographic units are different from common measurement units such as centimeters and inches, as the typographic measurements were established before these other systems existed. The first attempt at a standard system of measurement was devised in 1737 by a French type designer, *Pierre Fournier Le Jeune*. His *Table of Proportions* named different sizes of type. Later editions of this book introduced the idea of a family of type, and the use of visually compatible type that could be combined in one printed piece for consistency. He divided one pre-metric French foot into 144 equal parts and called each of these parts a *point*. One of Fournier's

8.10 A pica is divided into 12 points; approximately 6 picas equal 1 inch.



points was equivalent to 0.0137 inch. After Fournier's death, another type designer, *Françoise Ambroise Didot* advocated that Fournier's systems should be based on the legal foot measure of France. The *didot* point equals 0.0148 English inch, and the *cicero*, Didot's equivalent of the pica, measures 0.1776 inch. The Didot system is still used in continental Europe.

Other attempts by English-speaking designers followed the French example, but no consensus of opinion was reached until the late nineteenth century. In 1871, the great fire of Chicago destroyed the premises of Marder, Luse, and Co., one of America's leading type foundries. As a result, a new system was devised to replace the lost matrixes. It was decided to use the *pica* as the main measurement system. This pica was divided into 12 parts called points. In 1898, British type founders adopted the American measurement, and the system became the international standard for English-speaking countries.

Points are used to measure all manner of typographical elements, including the thickness of spaces, the height of type, leading, and the size of rules and borders.

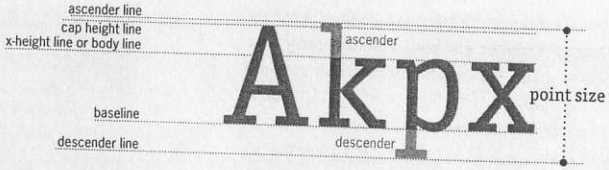
A pica is equivalent to 0.166044 inch, and is divided into twelve points. Although not mathematically precise, 72-point sizes are specified as being equivalent to one inch, and 36-point sizes are half an inch.

The point size measurement of type is determined by the distance from the top of the ascender or the top of the capital letter (whichever is higher) to the bottom of the descender. This area of measurement evolved from the piece of the cast lead type called the *base* or *platform*. Each letterform, regardless of actual size, was cast on the same

Typographic Measurement Systems Over Time
1 point (Truchet) = 0.188 mm (obsolete today)
1 point (Didot) = 0.3759 mm = 1/72 of a French Royal inch (27.07 mm) = about 1/68 inch
1 point (ATA) = 0.3514598 mm = 0.0138366 inch
1 point (TeX) = 0.3514598035 mm = 1/72.27 inch
1 point (PostScript) = 0.3527777778 mm = 1/72 inch
1 point (l'Imprimérie nationale, IN) = 0.4 mm

Key Players
Françoise Ambroise Didot
Pierre Fournier Le Jeune

Key Type Anatomy Concepts
apex
arm
ascender
ascender line
baseline
body line
bowl
bracketing
cap height
cap line
counter
cross bar
cross stroke
crotch
descender
descender line
ear
eye
fillet
finial
flag
hairline stroke
leg
ligature
link
loop
serif
shoulder
spine
stem stroke
swash
tail
terminal
vertex
x-height
x-height line



8.11 Depending on the specific design of a font, the *ascender line* may be above or below the *cap height line*. Although the point size of a font is estimated by measuring from the tip of the *ascender* to the bottom edge of the *descender*, this is not wholly accurate due to wide variation in the design.

Some of the Languages Written with the Latin Alphabet

Afaan, Afrikaans, Albanian, Aymara, Azeri, Basque, Breton, Catalan, Cheyenne, Cimbrian, Comanche, Cornish, Corsican, Croatian, Czech, Danish, Dutch, English, Esperanto, Estonian, Faroese, Finnish, French, Galician, German, Hausa, Hawaiian, Hungarian, Icelandic, Ido, Indonesian, Interlingua, Irish, Italian, Jèrriais, Kiribati, Kurdish, Latin, Latvian, Lingua Franca Nova, Lithuanian, Lojban, Lombard, Luxembourgish, Malay, Maltese, Manx, Mori, Nahuatl, Navajo, Naxi, Norwegian, Occitan, Oromo, Piedmontese, Polish, Portuguese, Quechua, Romanian, Samoan, Scots, Scottish Gaelic, Slovak, Slovene, Slovio, Spanish, Swahili, Swedish, Tagalog, Tatar, Taiwanese, Turkish, Turkmen, Vietnamese, Volapük, Welsh, Yoruba, Zulu

size base so that all of the letters could fit into the composing stick and neatly align on both the top and bottom.

Type can have different apparent sizes but still be set as the same point size. Different typefaces appear to be larger or smaller than other typefaces of the same point size because of differences in the body height and body width of the individual characters. This dimension is identified by the body line, mean line, or more commonly the *x-height*. Because the legs of the lowercase letter *x* are easy to accurately align with both the mean line (or body line) and the baseline of the set type, it is used as a standard reference.

In order to maintain the same point size, the flexibility in the proportions is in the ascenders and descenders. That is, faces with large x-heights may have shorter ascenders and descenders, while faces with smaller x-heights may have proportionately longer ascenders and descenders.

Distinguishing Font Styles

There are two easily distinguishable styles of font: roman and italic. The *roman* version of a font is based on the perpendicular relationship, or a 90° angle, between the baseline and the strokes of the letterforms. The stress or bias of a roman font is the angle determined by the direction of the thicker stem strokes. Angled or oblique stress in the letterform developed when a flat-tipped pen or chisel was held at an angle as the letter was drawn or carved. The thickest area of the stroke is the area of maximum stress, and is not always parallel to the main stroke in serif fonts. Many sans serif fonts have stress, although it is less pronounced.

The *italic* version of a font is slanted to the right, often at an angle between 12° and 15°. Although the italic version maintains many visual characteristics of its roman counterpart, it often incorporates additional embellishment such as hooked finials or terminals.

There is a difference between a true italic font and an oblique font. A true italic font is developed by the designer as such, and the letter design refers back to fifteenth-century Italian cursive handwriting. An *oblique* font is a slanted version of its roman counterpart, most commonly seen in sans serif type and in computer-generated variations of popular software applications.



8.12 The roman version of a font is characterized by the vertical and horizontal strokes. A true italic is a separate but complementary design, while the oblique variation can be generated by altering settings in the computer.

Other font variations are based on the width and weight of the letterforms. The *width* of a character or face is referred to with terms such as *condensed*, *extended* or *expanded*. The width or set determines how many characters will fit in one line of typeset copy. The same line of type set in a condensed font will take less space than if it were set in a regular or extended font. The variation of width is most common in roman serif fonts and in both roman and italic versions of sans serif fonts. Seldom has a condensed or extended italic font been designed as part of a type family.

The term *weight* refers to the relative blackness of a particular font. The terminology for this changes from one typeface to another, though terms such as *light*, *book*, *heavy*, *bold*, and *extra bold* are often applied. Weight variations appear in both roman and italic serif and sans serif fonts.

Fonts, Faces, and Families

The term *typeface* refers to the upper- and lowercase letters of a given design. The term *font*, however, is a formal term that includes all of the upper- and lowercase letterforms, numerals, symbols, punctuation, accented characters, and small caps that comprise a particular size, style, and weight. The font is a complete selection of all the characters in a specific point size and design, ready for use in a composition or printing project.

A *family* of type includes all of the variations of a type design in all sizes. A family of fonts may include different weight versions of the original face—extra light, light, book, demi, bold, extra bold, heavy, and ultra. A family of fonts may include variations on width as well—condensed, regular, and extended or expanded. The most comprehensive font family may include sets of fonts based on combinations of weight, width, roman, and italic variations.

Typeface Design

The way that the human eye and brain perceive, process, and interpret visual information provides a sound basis for the foundation of type design. Traditional type designers must explore and understand both aesthetic and technological constraints when designing or altering a font design.

Horizontal and Vertical Proportions of Type

The human brain interprets linear elements positioned horizontally in a composition differently than linear elements positioned vertically. Given the same weight, the vertically oriented line appears thinner than the horizontal line. Since this is a universal phenomenon among human beings, type designers take this into consideration by reducing the thickness of the horizontal strokes of letters, in order to create the appearance of balance and even weight.

Designing Optically Correct Circles, Triangles, and Squares

The basic geometric shapes of circle, triangle, and square are perceived differently by the human eye and brain than one might



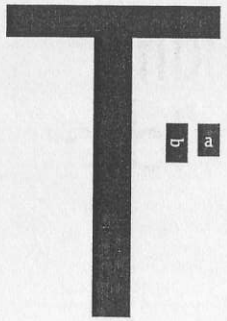
Width
Width

8.13 Condensed and regular width variations within the Futura family of type.

Weight
Weight
Weight
Weight
Weight

8.14 Weight variations from Futura Book, Futura, Futura Demi, Futura Bold, and Futura Extra Bold. The heavier the stroke, the more width a letterform occupies.

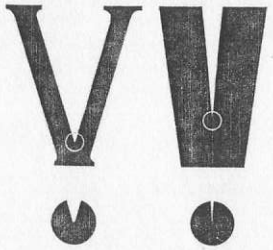
8.15 Letterform proportions are not always what they seem at first glance. In the letter *T* on the left, Futura Book, the lengths of the two bars are different. The horizontal naturally appears longer to the human eye than the equivalent vertical, so it must be adjusted visually. The *T* on the right is constructed from two equal bars, and the letterform appears top-heavy and unstable.



8.16 The weight of the horizontal and vertical strokes often appears equal, but closer inspection reveals the differences used to create visual balance.



8.17 Notice that the curved letterforms extend beyond the baseline and the x-height line to create the illusion of equal height.



8.18 The intersection of two strokes is often designed to accomodate printing practices. The *vertex* is either opened by spreading the strokes apart, or by extending the white space into the black area so that it does not appear "chunky" or clogged.

think. The four points of an invisible square align along the *baseline* and *cap line* of a font and provide a foundation for uppercase letterforms such as *T*, *E*, and *L*. The square always appears larger than an equivalent triangle or circle. Because of this, characters that are round, such as an *O* or *C* extend slightly below the baseline and slightly above the cap line. Pointed or triangular letters such as the letter *A* extend slightly above the cap line, and those such as the *V* and *W* extend slightly below the baseline. An understanding of these design concepts affects how the type aligns when it is set or comped correctly, especially in headline type or logotype designs.

Designing Joined Strokes

Where two lines intersect in a letterform, the junction is perceived as heavier than the weights of the two individual strokes. To minimize this effect, which causes the appearance of dark and uneven areas in the character design and subsequent typeset text, the area of the intersection is tapered to adjust the visual amount of the strokes.

When type was produced photographically employing the use of a negative and projected light source, additional considerations made the design of type more complicated. The distortions inherent to the photographic process caused vertices of letters such as *W* and *M* to fill slightly and appear rounded, since it was difficult to accurately project light into the tiny, angled spaces. Those who designed type during the era of phototypesetting learned to extend a thin white line into the areas where the letter strokes joined. This exaggeration of the



8.19 Phototypeset letterforms were extended slightly at the corners in order to appear crisp and clear.

pointed areas allowed the exposed letterform to appear clear, sharp, and pointed, as desired.

The opposite design was required for letterforms with squared-off terminals. When the flash of light exposed a letterform such as an *F* or *E*, the negative required the extension of a small line from the outside corner so that it would appear crisp and sharp instead of rounded.

Type for Use in Different Sizes

Historically, type designers refined three different versions of one font in three slightly different weights to accommodate the variation in point sizes. Four-point type has very different legibility concerns than 36-point headline sizes or 100-point and larger display sizes. To maintain the visual consistency, legibility, and the aesthetic personality of the font, variations on the original design were required. The first was used for 4-point through 14-point sizes, the second was used for 16-point through 36-point sizes, and a third weight was used for sizes larger than 36 points, all of which were separately refined.



8.20 Outline indicates Officina Sans Book set in small caps using the computer software application, while the solid gray area is Officina Sans Book small caps; notice the difference in the stroke weight and letter spacing.

8.21 Outline indicates Minion Pro caption while the solid gray area is Minion Pro Regular. The caption variation is designed for greater legibility at smaller sizes.

8.22 Outline indicates Minion Pro Display while the solid gray area is Minion Pro Regular. Again, notice the difference in stroke weight and in the default letter space designed for use at larger sizes.

The smallest version often utilized a slightly larger x-height than the version used for larger sizes. This larger x-height improved legibility and allowed for greater detail at the small size. Counterforms, such as the eye on the lowercase *e* were enlarged so that they would not clog or close up on the press. The medium size, ranging from 12 to 36 points, most resembled the original design, since the counters did not require enlarging and the height of the lowercase letterforms could hold the subtle details of the original design without enlarging the x-height. The third variation of the font design requires a great deal of attention in the refinement process, including subtleties in the bracketing of the serifs, weights of the strokes, and optical adjustments to ensure crisp corners and stroke intersections in sizes for wall posters as well as billboards.

Design of an Italic Font

Italic fonts are not merely slanted variations of a roman counterpart. Careful inspection of a true italic font reveals a new translation of the letterforms that incorporates the visual resemblance to a roman variation with the addition of hand-lettered qualities. Many lowercase letters, such as the letter *f*, incorporate a descender while others include swashes and other decorative details not seen in a roman version of the same family. Teardrop terminals are popular in italic fonts, as are the use of Old Style figures.

Other common variations in the letterforms include changes in the shape of the loop on the lowercase *g*, the lowercase *a* appearing as a single bowl form, the lowercase *k* incorporating a loop to replace the arm, lowercase letters *m*, *l*, *i*, and *n* with hooked finials, and lowercase *v*, *x*, *w*, and *y* with teardrop terminals.

Designing Font Variations of Weight and Proportion

The subtleties of each character are reviewed and refined at both lighter and heavier weight variations. Different stroke weights require that the characters be drawn in slightly different proportions than the original to maintain visual harmony and balance, as well as the visual aesthetic relating the fonts to a family. Commonly the counterforms in bolder weights are opened up to maintain legibility in smaller sizes.

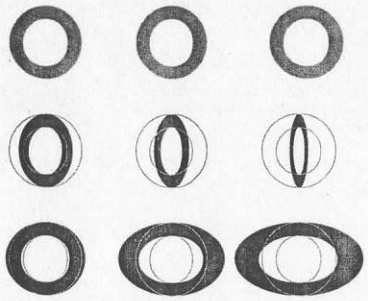
At times designers explore the option of adding a stroke (outline) to a letterform to



8.23 Garmond is a classic face in both the roman and italic styles.



8.24 The top two examples compare Garamond (outline) to Garamond bold, while the bottom two examples compare Garamond semibold (outline) to Garamond bold.



8.25 Artificially changing a standard font design to condensed or extended by stretching and squeezing the letter ruins the stroke weight and proportions of the form as designed. Select a true condensed or extended font instead.

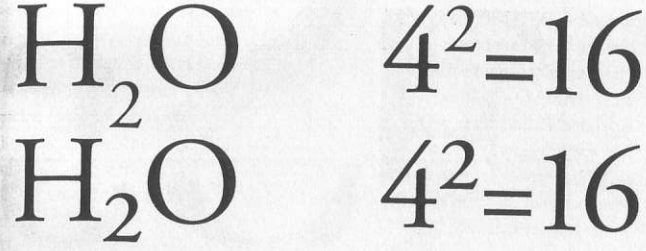
create a bold version when one is not readily available. This is not recommended because it changes the designed proportions of the letterforms, altering the legibility (especially at smaller sizes) and covering up the subtle details in the apices, vertices, and corners of the form. The added stroke often destroys the proportions of the serifs and the bracketing as well, resulting in an undesirable aesthetic.

Just as the regular or book proportions of a font are designed with specific considerations, so are condensed and extended fonts. The condensed and extended variations are changed structurally to accommodate the exaggerated proportions of height to width, to maintain the visual personality of the type family. Designers should be discouraged from stretching type on the computer to create the illusion of a condensed or extended font, as this destroys the subtle design of the typeface.

When a font is mechanically condensed on the computer, the letters are squished, which destroys the optical adjustments and subtlety in the design. The horizontal strokes of the letterforms, originally designed to be thinner than vertical strokes, become thicker, while the vertical strokes become thinner. The bracketing of serifs as well as the length of the serifs are pushed and pulled, just as are the strokes. When a font is mechanically extended on the computer, the thin horizontal strokes become much thinner than originally designed and the weight of the vertical strokes is increased, causing an awkward, uneven appearance. The visual harmony and balance are destroyed.



8.26 At top, the original letterform. In the middle is visual comparison between the original letterform with the bold style of the letterform. At bottom, notice the change in the proportions of the letterform between a true bold variation of the font (outline) as compared to a normal setting with a stroke applied.



8.27 (Left) A visual comparison of a computer-generated subscript (top) and a true subscript font (bottom); notice the diference in weight and proportion between them.

8.28 (Right) A visual comparison of a computer generated superscript (top) and a true superscript font (bottom).

Lining Figures, Small Caps, Superscript, Subscript, and Dingbats

Uppercase numerals, also called *lining figures*, are numbers within a particular font that match the cap height of the uppercase letters. In addition to the comparable height, these numbers are kerned to match the width of the uppercase letters. *Old Style figures* or *lowercase numerals* are set to the x-height of the font, with ascenders and descenders extending above and below. Lowercase numerals are more widely available in serif fonts than in sans serif fonts.

Small caps are uppercase letterforms set to the dimension of the x-height of any given font. True small caps may be found as part of an expert font set; most popular software applications include a command that allows the generation of a small cap lookalike using the standard uppercase letterform of the selected font. Artificially generated small caps are not of the same weight and proportion of a true small cap.

A *superscript* is a small character written near the cap line of a particular font. Superscripts are used to denote exponents in a scientific or mathematical equation, or the numerators in fractions. A *subscript* is a small character set near the baseline. They are often used to denote molecular combinations of chemical substances or to represent denominators in fraction sets.

Dingbats are sets of decorative swashes, special characters, and symbols. Although some of these symbols are offered in a font set, most dingbat sets are sold as a separate font based on a particular theme or subject area.

Type Anatomy

Just as the human body consists of numerous individually identifiable components, so are letterforms. The primary anatomy of a letterform includes the strokes and cross strokes, the terminals and serifs (or lack thereof), shoulders, arms and legs, links and tails, and so on. Many of these parts are named according to their similarities to their counterparts on the bodies of humans and animals.

Stroke

The weight of the font depends on the type and weight of the stroke. The *hairline stroke* refers to the lighter weight, and the *stem stroke* refers to the heavier weight or main stroke of the letterform. In most sans serif fonts there is a single stroke weight that determines the unique appearance of the

8.29 The crossbar or cross stroke is a horizontal portion of the letterform that connects two main strokes, or extends from a main stroke of the letter.





8.30 The link is a portion of the main stroke that connects the two main parts of the lowercase *g*.



8.31 The arms are horizontal or angled strokes that extend in an upward direction at 90° or less from the main stroke.



8.32 The legs are horizontal or angled strokes that extend from the main stroke in a downward direction at 90° or less as seen on the *R* and *K*. The tail is the angled stroke that extends from the *Q*.



8.33 The shoulder is the curvilinear transitional portion of the stroke that connects a somewhat horizontal stroke and a vertical stroke.

particular font, so all strokes that compose the letterform are light or all are heavy.

The *cross bar* is a horizontal stroke that connects two other strokes in a character, as seen in the letters *A* and *H*. Both ends of the crossbar meet and are joined by a stem or hairline stroke. The *cross stroke* is a horizontal stroke that intersects one of the main strokes of a character, but remains free on one end as seen in the *f*, or both ends, as seen in the *t*. Both crossbars and cross strokes are the same width as the hairline stroke of the font, and can be curved, angled, or stepped, depending on the design of the type.

Link

Link is the term for the stroke that connects the bowl and the loop on a lowercase *g*.

Arms and Tails

Arm and *leg* refer to the parts of a letter that extend out from the main stroke that are free on the terminal end. Strokes that extend sideways straight out at a 90° angle or extend upward at less than a 90° angle are arms, as seen on the letters *E* and *Y*. A stroke that extends downward at less than 90° is a *leg*, as seen on the letters *R* and *K*. The capital letter *K* has both an arm and a leg, while the capital letter *Q* has a *tail*.

The Spine and Shoulder

Spine is a term that refers to the double curve found in the main stroke of the uppercase and lowercase *S*. Often the thickest part of the letterform, the term is easy to remember because of its reference to the backbone in human anatomy.

The *shoulder* is the transition area in lowercase letters between the curved part of a

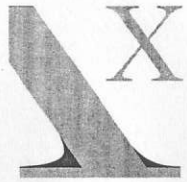


8.34 The spine is the portion of the curved stroke on a letter *S* that reverses from one direction to the opposite direction.

stroke and the vertical part of the same stroke. Shoulders are found on the letters *f*, *h*, *j*, *m*, *n*, and *u*. The weight of this area of the stroke is carefully refined to create a subtle change, and the shape of the shoulder determines the round, oval, or squared-off appearance of the font.

Serifs, Brackets, Terminals, and Finials

A *serif* is the slight extension at the beginning and end of the letter stroke, drawn at a right angle or obliquely across the arm, stem, or tail of a letter. Serifs are thought to have been retained from the days when type was cut into stone with a chisel, although this is debated. Serifs are categorized according to their physical shape. Again, there is great variation in the names and variation of serif shapes among historical examples.



8.35 *Bracketing* (also called the *fillet*). This transitional curve between the stroke and the serif on a letterform is a smooth addition based on the tangents of each of those elements.

Bracketing refers to the curved connecting area between the stroke of the letter and the serif. Bracketing is not essential, but rather is included or left out based on the aesthetic decision of the type designer. The bracket may have differing degrees of weight or thickness. The inclusion or absence of a bracketed serif is one clue to the identification of a face or font. The less common term *fillet* is synonymous with the term *bracket*.

The *terminal* is the ending of a stroke with some sort of self-contained treatment instead of a serif or finial. Author J. Ben Lieberman identifies straight, sheared, acute, grave, convex, concave, flared, hook, tapered, and pointed terminals. The variety of labeling and identification is dependent upon the historical source.

The *finial* is a non-serif ending to the stroke of a letter—for example, a ball, swash, ear, spur, or hook.

Counters and Bowls

The *bowl* is a round stroke that encloses a space and the *counter* is the enclosed space. If the bowl touches a stem stroke, it creates a closed counter as often seen in the letters *a*, *b*, *d*, *g*, *o*, *p*, and *q*. If the bowl does not touch the stem stroke, an open counter



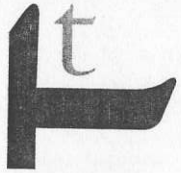
8.36 Beaked serif. The serif terminal of the arm of a letter in the shape of a bird's beak, occurring in such capital letters as *E*, *F*, *K*, and *L*. Sometimes referred to as a half-serif, the beak may extend in two directions from the arm of the letter but only appears at the end of straight strokes.



8.37 Barbed serif. The beaked serif is referred to as a barb when it appears at the end of a curved stroke, as seen on the capital letters *C* and *S*. Like their beaked counterparts, barbs sometimes extend in both directions from the curved stroke.



8.38 Hairline serif. A light stoke that is generally unbracketed. This type of serif is common to the modern class of types.



8.39 Spur serif. A serif in certain types of Dutch original (Janson) and on the crossbar of the lowercase *f* or *t* as seen in Goudy Old Style and Erasmus Mediæval.



8.40 Hooked serif. Common in lowercase italic fonts, in such letters as *m*, *n*, and *u*.



8.41 Wedge serif. A wedge-shaped serif seen in fonts such as the Latin Series (Latin Bold, Wide Latin, and Chisel) and in many of the Dutch-English Old Styles on lowercase letters such as *b*, *d*, *h*, and *i*.



8.42 Slab serif. A monotone serif of equal weight as the stem is considered a feature of Egyptian or square serif fonts.



8.43 The lowercase *r* is an interesting form for studying and comparing finials. This is Bodoni, with a ball.



8.44 The lowercase Caslon italic *r* is an example of a teardrop shape. This portion of the letter *r* is sometimes called an ear.



8.45 The *bowl* is the round stroke that encloses the counter.



8.46 The *counter* (sometimes called a counterform) is the internal enclosed or semienclosed space within a letterform.



8.47 The *eye* is the specific name of the counter of a lowercase *e*.



8.48 The *swash* and the *flag* are decorative extensions of an arm or stroke that bring attention to a particular character within its typeset context.

results. An open counter may be recognized in many versions of the letters *a*, *c*, *h*, *v*, and *u* regardless of the curved or angled stroke enclosing the space. The term *loop* is the name used to refer to the bowl created in the descender of the lowercase *g* in some fonts.

The term *eye* refers to the counter on the lowercase *e* regardless of whether it is open or closed. The eye is given important consideration in the design and the selection of type for specific applications, since it is often the first area to fill in, or clog, with ink on press.

Apices, Crotches, and Vertices

The *apex* of a letter is formed when two angled strokes come together. The apex usually extends slightly past the cap height so that it appears to be the same height as the other letters. There are pointed, rounded, sheared, hollowed, and flat apices.

Crotch refers to the interior space created by the juncture of two angled strokes as in the *K*, *M*, *N*, *W*, *X*, and *Z*. An acute crotch is based on an angle less than 90°, while an obtuse crotch is created when the strokes meet at an angle greater than 90°.

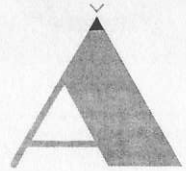
The *vertex* of a letter is the inverse of the apex; it is the juncture of two downward-slanting strokes. The vertex variations include flat, sheared, pointed, and rounded versions.

Swashes and Flags

A *swash* is a decorative extension of an arm or tail that accents characters, particularly in script fonts such as Bickham Script (designed by Richard Lipton), Arcana Script (Gabriel Martínez Meave), and Balmoral (Martin Wait). Swashes can be twisted or



8.49 Flat apex



8.50 Pointed apex



8.51 Extended apex



8.52 Hollowed apex



8.53 Rounded apex



8.54 A visual comparison of the word took as set in default mode (gray outline), and as tightly kerned by hand (solid black).

Kerning Pairs: Combinations of Capital and Lowercase Letters

Ac Ad Ae Ag Ao Ap Aq At Au Av Aw Ay
Bb Bi Bk Bl Br Bu By B. B,
Ca Cr C. C,
Da D. D,
Eu Ev
Fa Fe Fi Fo Fr Ft Fu Fy F. F, F; F: Gu
He Ho Hu Hy
Ic Id Iq Io It
Ja Je Jo Ju J. J,
Ke Ko Ku
Lu Ly
Ma Mc Md Me Mo Nu Na Ne Ni No Nu N. N,
Oa Ob Oh Ok Ol O. O,
Pa Pe Po
Rd Re Ro Rt Ru
Si Sp Su S. S,
Ta Tc Te Ti To Tr Ts Tu Tw Ty T. T, T; T:
Ua Ug Um Un Up Us U. U,
Va Ve Vi Vo Vr Vu V. V, V; V:
Wd Wi Wm Wr Wt Wu Wy W. W, W; W:
Xa Xe Xo Xu Xy
Yd Ye Yi Yp Yu Yv Y. Y, Y; Y:

curled and are considered elegant additions. Some decorative fonts offer alternate swash characters, which may be used to draw attention to the beginning of an article or story. Families such as Adobe Garamond Pro (Robert Slimbach) include alternate Latin capitals with swashes.

A *flag* is a small swashlike stroke that appears in a calligraphic font such as black letter. These small flourishes add decoration to the end of the horizontal stokes.

Horizontal Spacing and Measurement

There are two dimensions used to measure horizontal spaces and dashes in typesetting: the em and the en. An *em* is the square of a type size. In 8-point type this dimension equals 8 points. This term is not synonymous with pica; only the em in a 12-point type size measures 12 points. The name for this measurement may stem from the fact that the letter *M* in the Roman alphabet did have a width that filled the full width of a square based on the height. This is not true with condensed fonts, extended fonts, and many contemporary type designs.

In traditional typesetting, an *em quad* is a space the size of an em, used to indent the first line of a paragraph. An *em dash* is used to join two phrases together into one sentence instead of using a conjunction, to insert information that could have been included in parentheses, or to add a final thought or emphasis at the end of a sentence. Occasionally an em dash is used as a replacement for the colon when introducing a list as part of the text.

An *en* measurement is equivalent to one half of the em, and again is named after the space commonly occupied by the width of a



8.55 A visual comparison of the hyphen, en or nut dash, and an em or mutt dash.

Kerning Pairs: Capital Letter Combinations

A' AC AG AO AQ AT AU AV AW AY
BA BE BL BP BR BU BV BW BY
CA CO CR
DA DD DE DI DL DM DN DO DP DR DU DV DW DY
EC EO
FA FC FG FO F. F,
GE GO GR GU
HO
IC IG IO
JA JO
KO
L' LC LT LV LW LY LG LO LU
M MG MO
NC NG NO
OA OB OD OE OF OH OI OK OL OM ON OP OR OT OU OV OW OX OY
PA PE PL PO PP PU PY P. P, P; P: QU
RC RG RY RT RU RV RW RY
SI SM ST SU
TA TC TO
UA UC UG UO US
VA VC VG VO VS
WA WC WG WO
YA YC YO YS
ZO

Kerning Pairs: Lowercase Letter Combinations

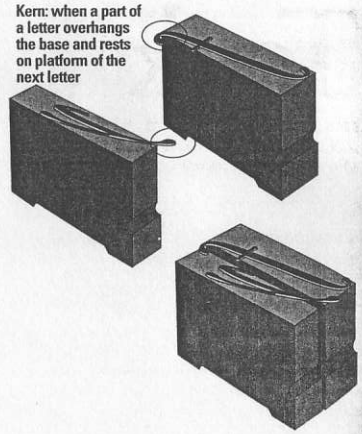
ac ad ae ag ap af at au av
aw ay ap
bl br bu by b. b,
ca ch ck
da dc de dg do dt du dv dw
dy d. d,
ea ei el em en ep er et eu ev
ew ey e. e,
fa fe ff fi fl fo f. f,
ga ge gh gl go gg g. g,
hc hd he hg ho hp ht hu hv hw hy
ic id ie ig io ip it iu iv
ja je jo ju j. j,
ka kc kd ke kg ko
la lc ld le lf lg lo lp lq lu lv lw ly
ma mc md me mg mn mo mp
mt mu mv my
nc nd ne ng no np nt nu nv nw ny
ob of oh oj ok ol om on op or ou
ov ow ox oy o. o,
pa ph pi pl pp pu p. p,
qu t.
ra rd re rg rk rl rm rn ro rq rr
rt rv ry r. r,
sh st su s. s,
td ta te to t. t,
ua uc ud ue ug uo up uq ut
uv uw uy
va vb vc vd ve vg vo vv vy v. v,
wa wx wd we wg wh wo w. w,
xa xe xo
y. y, ya yc yd ye yo

capital letter *N*. An *en dash* is most often used to indicate a range of numbers, such as "pages 17–44." It is also used in dates (December 2002–March 2003), to connect words in a few cases (the London–Paris train), with open compounds (post–World War II), and dates to indicate that something continues (Jane Doe [1950–]). An *en quad* is the white space that measures the same as an en. This white space is also sometimes referred to as a *nut*. This term was used in noisy print shops so that it would not be confused with the em when spoken.

The term *set width* refers to the total width of a letter and its surrounding space. Letter spacing allows the designer to optically space letters in a word or phrase so that the visual texture changes and a different line spacing results. Too much letter space will cause the word or phrase to become illegible. Negative letter space can be used to more effectively communicate a message, but once again, too much causes the word or phrase to become unreadable. In contemporary software applications, letter spacing is referred to as *tracking*.

Tightening the space between letters in a word is called *kerning*. The term comes from the German word "kern" meaning "corner." When a typesetter had to kern lead type, both letters had to be filed down manually, or "cornered," to remove part of the cast lead platform. The letters were then fit into the composing stick and checked for proper letter spacing.

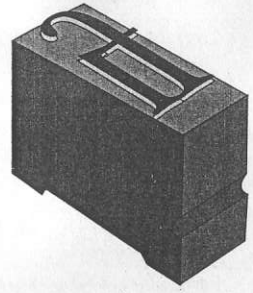
There are certain combinations of letters that should always be kerned. As a general rule, tighter kerning makes it easier for the brain to recognize the letter groups as words, which results in faster and easier reading. The



8.56 The term *kerning* originates from the cornering, or removal, of the lead base from behind the typeform so that the letters can overlap onto another letter's base for less space between each.

refinement of the letter spacing within words affects the density of the type on the page. The designer or typesetter strives to create an even tone of gray; if one area becomes significantly darker or lighter, then the blocks of text are set too tightly or too loosely. The general rule for spacing is the tight-not-touching (TNT) approach.

The same combination of characters that require kerning in the uppercase version of a font may not be the same as the lowercase combinations, since the shapes are not similar. Type designers know that some character combinations automatically require kerning—for example, any letter set next to an uppercase *F, W, T, V,* or *Y*. It is undesirable to allow letters to actually touch, since this often creates a dark area that attracts too much visual attention, especially in the case of two rounded characters.



8.57 Originally ligature forms were cast on one piece of lead (called the body) together with the proper amount of letter space. This avoided the time-consuming practice of trying to hand-kern the delicate letters in the soft lead substrate.

Most software applications intended for publishing include preset kerning tables that automatically correct letter spacing whenever kerning pairs appear in the body text of an article. One of these contemporary applications may have two hundred to five hundred sets of kerned characters for each font, depending on the character forms in both uppercase and lowercase, the fastidiousness of the type designer, and the software manufacturer.

The refinement that is now available using popular publishing software is more precise than was possible with traditional hand-set type. Unfortunately, this has created a couple of generations of computer users who do not always understand the details of correct typography well enough to correctly refine the appearance of type on the page. The craft of typesetting has been watered down and the standards lowered with the proliferation of poor-quality typography set by untrained typists. Mastering correct kerning and tracking techniques results in more legible and attractive type solutions.

Ligatures

A ligature is when two or more characters are joined on a single *body* (one piece of lead) of type. The development of ligatures was based on the need to maintain legibility and readability in the closely spaced, hand-lettered manuscripts; ligatures were referred to as *tied letters* in the manuscript era. Although the need to maintain the ligature sequence in some combinations remains, the use of most pairs has been eliminated.

Common ligatures include *f* combinations originally intended to protect the kern of the letter from contact with an ascending character in a line below, as well as the *st* and *ct* combinations. All type that is connected, such as most scripts, is said to be ligated.

Word Space

In addition to the space between letters within each word, the designer must pay

Alice laughed so much at this, that she had to run back into the wood for fear of their hearing her; and when she next peeped out the Fish-Footman was gone, and the other was sitting on the ground near the door, staring stupidly up into the sky.

8.58 A typical practice is to imagine a lowercase *i* between each word in a sentence, phrase, or paragraph for greatest readability. Today's software applications calculate optical word spacing based on the beginning and ending letters of each word.

Ligatures

In some fonts the ligature version of a letter combination may be available by using a key command on the keyboard for special characters, or sometimes is automatically inserted by the software application. On occasion it requires the expert version of a font or appears only in the italic version of a font.

fi fl ff ffi ffl
ſi ſſi Th ct
fi fl ff ffi ffl ſi
ſſi ct st Th Th

Although it is possible to create ligatures by closely spacing letters in the set type, this often appears crowded and muddy when the dark area of the touching letters is contrasted with the rest of the set type. This practice is an aesthetic decision that is recommended for professionals who have been practicing for a period of time, who have developed a sense of proportion, and who have mastered the basics of setting type well.



8.59 Wood type with strips of lead used to alter the vertical space between hand-set compositions.

attention to the space between words, called *word spacing*. The general rule of thumb for word spacing is to visualize the width of a lowercase *i* in the space between each word. This means that the word spacing changes with the use of different fonts and different sizes of fonts.

Spacing type correctly for optimal legibility is one of the most important tasks. Poorly spaced type renders even the best design unreadable, defeating the purpose of the communication. Correct spacing involves aesthetic training and practice, in addition to an acquired intuitive sense that is best developed over time by critiquing and refining your designs. Evaluation of the type you see in your environment leads to a refined typographic sense more quickly.

Alice went timidly up to the door, and knocked.

8.60 The vertical space between lines of text is determined by measuring from one baseline to the subsequent baseline.

Vertical Spacing

Leading or *line spacing* refers to the vertical space between stacked lines of type. This term originated with hand-set lead type when a compositor would place thin strips of lead between the lines of type to open the space. This extra space makes it easier for readers to maintain the horizontal movement and flow of their eyes as they read across a page of type, then jump effortlessly to the next line below.

Today, typeset copy is measured from the baseline of one line to the baseline of the next line above or below. This convention is used because it is consistent. Remember that the body height or x-height, the ascender length, and the descender length may vary from font to font and would not provide consistent results.

Some computer software provides the choice between traditional measurement from baseline to baseline and digital measurement

Alice went timidly up to the door, and knocked.
There's no sort of use in knocking, said the Footman, "and that for two reasons. First, because I'm on the same side of the door as you are; secondly, because they're making such a noise inside, no one could possibly hear you." And certainly there was a most extraordinary noise going on within—a constant howling and sneezing, and every now and then a great crash, as if a dish or kettle had been broken to pieces.

8.61 Garamond 10/6 (negative 4 points of vertical space per line).

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8.62 Garamond 10/10.

Alice went timidly up to the door, and knocked.
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8.63 Garamond 10/14.

from the center of one line of text to the center of the following line of text. Choosing the digital measurement for leading will cause the paragraph to appear more vertically centered in the type box than choosing the traditional measurement.

In type specification, the first number refers to the point size of the font, while the second number refers to the size of the leading. Ten-point type with two points of vertical space or leading added would be written as 10/12.

Type Alignment

Flush Left

Flush left refers to the alignment of type along an invisible vertical line or margin on the left side of a composition. The term implies that the type is allowed to remain misaligned, or ragged, on the right side. Some people believe that the flush left/ragged right composition is more inviting to the reader, that its somewhat casual appearance encourages reader involvement. Unless there is excessive white space between words, readers don't seem to care, or even to notice, whether they are reading justified or ragged right columns of text. Numerous studies, under a variety of conditions, continue to prove this.

The biggest advantage of unjustified typesetting is the ability to control word spacing. You can have tight, even word spacing in any length line. Not only does consistently tight word spacing look better, it's also an important aspect of efficient and legible typography. Tight word spaces speed up the reading process and allow the reader to absorb thoughts and phrases rather than individual words, which helps to maintain high levels of comprehension.

The disadvantage of unjustified typesetting is that it can be difficult to

Flush left begins at the left margin and ends at a comfortable distance from the right margin.

Centered begins in the middle of the column and ends at a word break near the edges of the column on both the right and left.

Flush right begins at right margin and ends at a word break near the left margin.

Justified aligns the words along the left and right columns by adjusting the word space to accommodate the alignment.

8.64 Explanation of the alignment of type according to standard settings.

"Please, then," said Alice, "how am I to get in?"
"There might be some sense in your knocking," the Footman went on without attending to her, "if we had the door between us. For instance, if you were INSIDE, you might knock, and I could let you out, you know." He was looking up into the sky all the time he was speaking, and this Alice thought decidedly uncivil. "But perhaps he can't help it," she said to herself; "his eyes are so VERY nearly at the top of his head. But at any rate he might answer questions.—How am I to get in?" she repeated, aloud.

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8.65 Examples of flush left, centered, and flush right specifications within a column, set in Garamond 10/14.

8.66 Examples of justifed type specifications within a column, set in Garamond 10/14. Software applications provide the option of justification beginning and ending the paragraphs with flush left, centered, flush right, and force-justified.

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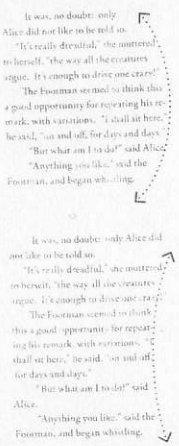
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8.67 *Convex* means curving or bulging outward, while *concave* is just the opposite.



produce it as high-quality typography. Very long lines followed by very short ones can cause awkward shapes that are not inviting to the eye. Ideally, unjustified composition should appear to be optically justified. If the right edge of a column describes a shape, it should be *convex* (curving outward)rather than *concave* (curving inward).

In most typesetting situations, the machine logic determines where a line ends. The problem is that logical decisions are not necessarily attractive aesthetic decisions. The person creating the graphic communication needs to carefully review the first set of production proofs and rebreak lines of copy to correct an unattractive set of line endings. If at all possible, copy should be rewritten to facilitate this process. Unfortunately, the real world rarely provides the graphic communicator the luxury of manually rebreaking lines, let alone the power to request that sentences be rewritten.

Flush Right

Flush right type aligns against the right side of the composition or column width. Just as with flush left text, the designer is able to control the word space for greater legibility. The difficulty is with reading large blocks of text set ragged left; as a reader's eyes scan from the beginning of a line on the left toward the right it is difficult to ascertain the beginning of the next line of type if it does not align under the first line or above the third. This causes breaks in the reader's mental flow and understanding of the information, slowing down the absorption of the message. Flush right/ragged left type should be used only for small areas of type used to accent a composition—perhaps as a few lines of an address and telephone number.

Justified

Justified type aligns on both the left and the right sides of the column. The major problem with setting justified copy is the risk of creating excessive word spacing inside the column. Many times the computer is presented with remaining space on the line, but not enough to set another word or a hyphenation of it. As a result, the word shifts down to next line, causing the previous line to be spaced out with too much space. Short line measures are especially difficult to set justified. A look at many newspaper columns will show you excessive word space and "rivers" of white running through the copy. The longer the line measure, the less often this problem occurs.

Most desktop publishing software applications provide the option of justification by beginning and ending the paragraphs flush right, flush left, centered, or *force-justified*. The latter is most likely to cause uncomfortable white spaces and be the most difficult to read.

Centered

Centered type aligns along a middle axis in the composition. Just as with flush right or flush left text, the designer is able to control the word space for greater legibility. However, just as with flush right paragraphs, it is difficult for the reader to find the beginning of the next line of text and continue reading. Centered alignment is most effectively used with small paragraphs, as in a formal invitation; with short lists as in a menu; or with large headlines and mastheads as in a poster, brochure, magazine, or newsletter.

"Please, then," said Alice, "how am I to get in?"

"There might be some sense in your knocking,' the Footman went on without attending to her, "if we had the door between us. For instance, if you were INSIDE, you might knock, and I could let you out, you know." He was looking up into the sky all the time he was speaking, and this Alice thought decidedly uncivil. "But perhaps he can't help it," she said to herself; "his eyes are so VERY nearly at the top of his head. But at any rate he might answer questions.—How am I to get in?" she repeated, aloud.

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8.68 Examples of *force-justified* specifications within a column, set in Garamond 10/14. Normally, a single lowercase *i* is the correct amount of space between words.

"Please, then," said Alice, "how am I to get in?"

Spacing Type and Punctuation in Display Sizes

Headline copy often is the most important typographic element in the composition, as it quickly draws the attention of the potential reader by summarizing the content of the ad, brochure, magazine article, or newspaper article. If the reader does not become engaged by the headline, chances are that the rest of the copy will go unread.

Display type is type that is 14 points or larger. Because headlines are set in display-sized fonts, they can be crowded, angled, turned upside down, mirrored, tinted, and decorated so long as a significant amount of legibility is maintained. Because of the larger size of headline type,

8.69 Although the term *display type* often refers t anything above 14 points in size, we often assume something much larger fo a headline. The contrast in size establishes the compositional importanc hierarchy that tells the vi where to look first.

"ARE you to get in at all?" said the Footman. "That's the first question, you know."

"ARE you to get in at all?" said the Footman. "That's the first question, you know."

8.70 Align the vertical edge of the text along the letterforms, and kick the punctuation or quotation marks out to the left for a stronger visual solution. The lines that appear indented due to quotation marks may lend a ragged, unprofessional finish to large text.

"ARE you to get in at all?" said the Footman.

"That's the first question, you know."

8.71 Some fonts have strong vertical strokes and lend themselves to the visual impact needed for display.

special consideration must be paid to the letter spacing, word spacing, leading or line spacing, and phrasing.

Usually headlines are kerned and tracked to a greater extent than body copy. This forces the letters to optically group into stronger visual statements, making them easier to read. Word spacing is also tighter in headlines for greater legibility and visual impact, so the spacing within words and that between words must complement each other. For example, if the word spacing is tight but the letter spacing is normal, then it would be difficult for readers to discern which letters belong to which words in a sentence; both the letter spacing and the word spacing must be changed proportionally to maintain the meaning of the message.

Word spacing is affected by the first and last letters of adjacent words. Because each character is a slightly different shape and proportion, it is necessary to use aesthetic judgment when altering the word spacing in a headline. Although the rule of using the area of a lowercase *i* works for spacing body copy, this cannot be applied universally in larger fonts since certain characters will have a tendency to appear larger or smaller depending on the font and the surrounding white space.

If one word ends with an *l* and the next word begins with an *i* then consider tightening the space between the words to a comfortable optical dimension. If one word ends in a rounded character such as an *e* and the next word begins with a rounded character such as *d* then the word space may be slightly larger to accommodate the protruding bowls.

Much experimentation and exploration are required to arrive at the perfect solution. In the past, letter and word spacing was handled by the typesetter, with the direction of the designer. Now that many designers set their own type in their layouts, they must learn to adjust the subtle differences on their own. The letter spacing and word spacing will vary depending on whether the text is all uppercase, small caps, or mixed upper- and lowercase letters. There are no absolute rules to assist the designer in correctly setting all possible combinations. This is complicated even further by the technology; some are fooled by the assumption that type on the computer screen appears exactly as it will on the printout. Screen fonts are only a close approximation of the printer fonts, so testing is required in the printing process as well.

Line spacing for headlines varies from that used for line spacing body copy. Remember that opening or enlarging the leading between lines of body copy often makes the text more readable, since the viewer's eye can more easily discern the separate lines. When setting headline type solid (the same size type set over the same size leading), often the words appear too far apart and are not grouped comfortably for easy reading and understanding; the words appear to float apart and the reader must assemble them in their mind. This is due to the vertical space automatically allowed for the ascenders and descenders.

Negative leading is the practice of setting type in a smaller vertical space. As an example, 48-point type with 6 additional points of leading would be indicated as 48/54; type set solid would be 48/48; type set with -12 points (negative) leading would be 48/36. Negative leading means that the space of the descenders share the space of the ascenders in

Spacing display text according to the default setting results in distracting spaces and less visual impact.

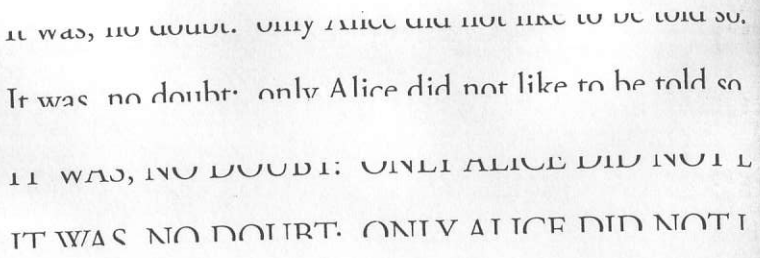
Spacing display text visually has pleasing results with greater visual impact.

8.72 Combinations of upper- and lowercase type in larger sizes require the designer to pay attention to line space and letter space. The auto-leading setting or solid setting cre a weaker visual statment (top) than the example that has been more tightly spaced (bottom).

SPACING DISPLAY TEXT ACCORDINC TO THE DEFAULT SETTING RESULTS IN DISTRACTING SPACES.

SPACING DISPLAY TEXT VISUALL HAS PLEASING RESULTS WITH GREATER VISUAL IMPACT.

8.73 Using all caps in larger sizes requires the designer to pay attention to line space and letter space. The auto-leading setting or solid setting creates a weaker visual statment (top) than the example that has been more tightly spaced (bottom). The addition of an initial or drop cap also directs the viewer's eye to an important starting position.



8.74 Mixed upper- and lowercase letterforms are easier to read than all caps. The ascenders and the descenders provide more information for the eye and brain to discern the forms and translate the meaning of the message.

It was, no doubt: only Alice did not like to be told so.
"It's really dreadful," she muttered to herself, "the way all the creatures argue. It's enough to drive one crazy!"

IT WAS, NO DOUBT: ONLY ALICE DID NOT LIKE TO BE TOLD SO.
"IT'S REALLY DREADFUL," SHE MUTTERED TO HERSELF, "THE WAY ALL THE CREATURES ARGUE. IT'S ENOUGH TO DRIVE ONE CRAZY!"

IT WAS, NO DOUBT: ONLY ALICE DID NOT LIKE TO BE TOLD SO.
"IT'S REALLY DREADFUL," SHE MUTTERED TO HERSELF, "THE WAY ALL THE CREATURES ARGUE. IT'S ENOUGH TO DRIVE ONE CRAZY!"

8.75 Upper- and lowercase letters are easier to read than all caps, even when there is slightly more leading to open the vertical spacing.

the line below, so the words must be carefully integrated to prevent overlapping.

Phrasing refers to the breaks in the lines of type according to the intended meaning. The phrases should make sense, so the goal is to group descriptive adjectives with the appropriate noun or pronoun; try to keep modifiers on the same line with the word they modify. Poorly phrased headlines may be difficult to read and may change the meaning of the message.

Line breaks must be in logical places, so change the font to support the correct phrasing by trying a condensed version within the same family, or switch from a round serif font to a regular or condensed sans serif font to make the correct fit. Read the phrases out loud with a slight pause at the end of each line to determine if the phrasing is logical and sensible.

Uppercase versus Mixed Upper- and Lowercase Type

Historical sources have proven that a combination of upper- and lowercase letters is more legible or easier to read than the same word or sentence set in all caps. This is due to the fact that uppercase letters are all the same height and a similar width, whereas lowercase letters vary greatly in shape with their ascenders and descenders. This rule holds true for both body copy and headline copy, with estimates of reading speed being up to 15 percent slower for all caps. The reader is forced to identify the individual letterforms before assembling them into words, whereas mixed upper- and lowercase type allows the brain to recognize entire words at once. This does not mean that all caps should never be used; rather, they work best in limited applications for special emphasis and visual excitement.

Optical Character Alignment in Headlines

The capital letters *A, C, G, J, O, S, T, V, W, X,* and *Y* represent special alignment challenges due to their inherent rounded or angled shapes. If these characters are set flush left, relying on the mechanical settings of the software application, more often than not they appear out of line. Commonly these characters must be set to the left of the alignment of the other letters above and below to make them appear in the correct position.

Different software applications have different ways of allowing optical alignment. One method is to use a soft return (Shift + Enter) at the end of each line of type. Add a space at the beginning of each line of type, then highlight the space and change the tracking of the space as necessary to optically align the characters. A negative number shifts the line of type to the left, and a positive number shifts the line of type to the right.

Optical alignment applies to punctuation in headlines. A common example is the inclusion of opening quotes at the beginning of a headline, which causes the type to appear indented from the subsequent lines below. To alleviate the visually irregular margin, use hanging punctuation to vertically align the rest of the lines of type. The quotes become less of a distraction.

Punctuation marks are set in a slightly smaller point size in headlines. This allows the type to remain dominant in the written message, with the punctuation remaining secondary in the visual hierarchy. When the size of quotation marks or apostrophes is reduced in size, the baseline must be shifted to match the baseline or cap line of the original headline copy.