MEGGS

Sixth Edition

Philip B. Meggs
Alston W. Purvis

History of Graphic Design

WILEY

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Contents

Preface

As early as 1922 the Massachusetts-based type designer, calligrapher, and book designer William Addison Dwiggins coined the term *graphic design*, but it was seldom used before 1945. Until that time graphic designers were mainly referred to as commercial artists. The profession grew extensively during the second half of the twentieth century and early twenty-first century. As we move deeper into the digital age it is undergoing more dramatic changes. It is only natural that the new generations of graphic designers have provocative ideas and question existing viewpoints and established notions of aesthetics. Each time we think we are at the forefront, we find that we are only at a new beginning with the future an open panorama.

Numerous methods are utilized to explore the evolution of graphic design history. These include investigating purely visual aspects, studying its economic associations, and considering the effects of new technology. Clearly, the visual aspects of graphic design are of foremost importance, but we must also reflect upon the designers' principles, the influence of their work on viewers, and the meaning of forms and their syntactic associations. Established methods of art history inquiry are often inadequate for approaching the relatively fresh and intricate history of graphic design. Focusing solely on specific designers and their major works or consigning them methodically to specific groups or movements does not fully serve our requirements. New industrial and technological developments such as the introduction of movable type, lithography, and the computer have played, and continue to play, a vital role. Also, creative interactions between designers have become important, especially today with global communications being almost unlimited.

Meggs' History of Graphic Design was never intended to be an all-encompassing historical graphic design encyclopedia, as this would require far more than a single volume. Still, we have attempted to provide a broad survey of notable stages and achievements in graphic design history. In determining what to include, a primary consideration was how particular cultures and individuals affected the contemporary state of the graphic design profession. Today, the graphic design field is much more extensive than in the past, encompassing areas such as motion graphics, design for the built environment, digital type design, design for portable devices, and interactive media.

While personal predilections and those of Philip Meggs were significant factors in the selection of designers and images, it was our objective to make such decisions based on reasons that transcended our own aesthetic perceptions. Selections of designers and images were based as much as possible on how clearly they convey ideas, significant design concepts, or particular graphic forms. Obstacles in obtaining publication rights or adequate reproductions also influenced the selection. Thus, some important designers were regrettably excluded.

In graphic design history there have been times when collective visions emerged that cannot be ascribed to one designer. However, there have also been individual designers who clearly created new routes with innovative typographic and expressive forms and unique methods for communicating information. One objective of *Meggs' History of Graphic Design* has been to document graphic design modernization and those designers who have influenced its ongoing evolution. Attempting to single out particularly consequential designers, especially from the past three decades, has proved to be a challenging task. By "consequential" I am referring to those who not only produced significant work but also made lasting contributions to the development of the field. For me, the question of what distinguishes a master graphic designer from his or her talented colleagues is both exasperating and difficult. Such a person must have a distinctive artistic vision, an instantly recognizable visual vocabulary, and a unique approach that transcends the standard problem-solving process. The innovative ideas and achievements of master designers from the past have remained at the forefront and continue to enlighten and motivate us today. The graphic design of the last twenty years, though, is a more complex arena. The perimeters separating various graphic design fields have become increasingly blurred, and attribution has become more problematic. Today, many graphic designers produce work together with a revolving team of colleagues and with the fresh insight of interns. Such designs are the products of a number of individuals, and crediting everyone involved not always feasible.

Offering a definitive account of contemporary graphic design will always be a vexing task, and the final chapters of this book have no definitive ending. The English philosopher and historian R. G. Collingwood succinctly summed up this

dilemma in 1924: "Contemporary history embarrasses a writer not only because he knows too much, but also because what he knows is too undigested, too unconnected, too atomic. It is only after close and prolonged reflection that we begin to see what was essential and what was important, to see why things happened as they did, and to write history instead of newspapers."

Most works included in *Meggs' History of Graphic Design* exemplify only a segment of what was produced in any specific era. The images represent numerous schools, movements, styles, and individual approaches, and there are seldom examples that show the crowning achievements of any one designer. A survey such as this is limited to presenting the work of designers at particular stages in their careers, and not their overall contribution. Those seeking a fuller account of a particular aspect should begin by referring to the bibliography for further information.

As with any work of this magnitude, some pivotal figures and areas were omitted in previous editions. Clearly, in this edition one of the most pressing matters was to examine developments since 2012, the publication date of the fifth edition. Although the structure of *Meggs' History of Graphic Design* is essentially chronological, there are instances where periods intermingle and overlap.

For the sixth edition, we have added many fresh illustrations, and some of the earlier text and illustrations have been removed to make room for new content. Many designers who deserve to be in this book could not be included because of space limitations, and to these I extend my apologies.

We are constantly confronted by new visual messages and forms, and those that remain relevant must be visually arresting and intellectually challenging. Although contemporary graphic design is to a large extent defined by technology, there are still strong ties binding it to crafts and aesthetics of the past. The computer allows designers to work more quickly and efficiently, increasing the speed with which graphic design problems are resolved. Design projects that in the past would have taken months are now solved in a matter of days or even hours. Yet in spite of the exciting developments in electronic media, printed works remain almost as vital today as in previous years. The revival of letterpress printing over the past decades is indicative of this trend.

Graphic design is built firmly upon historical foundations, and its history now occupies a central place in graphic design education. In a time when traditional notions of graphic design are constantly being tested, it is important that young graphic designers have a historical understanding of their profession. In finding inspiration from the work that came before, they should acknowledge the evolution that, as so aptly stated by Philip B. Meggs, "enabled designers to achieve a gradual transition from Renaissance design to the modern epoch."

Since it was first published in 1983 as *A History of Graphic Design*, *Meggs' History of Graphic Design* has remained one of the most thorough, authoritative, and enlightened books in its field. It is my objective that it maintain its position while being updated and refined. It has been an honor to serve as reviser for the last three editions. I hope that the sixth edition will continue to enlighten and nourish both students and professionals in this ever-evolving field.

A note on editorial conventions
With this edition, for the first time, dimensions are given for the original artifact illustrated, whenever such were obtainable. Dimensions appear at the end of figure legends, as height (cm) x width (cm). Note that where a two-page spread from a book or periodical is shown, the dimensions given are for a single page only.

Foreign-language titles of works of art (visual, literary, musical) are styled as they would be in their native context. For the most part, that means an initial capital letter only—or "sentence style," rather than English "title style," capitalization. Title style is employed for Medieval Latin titles, following common practice. English glosses of foreign-language titles follow the original, in parentheses, set in roman type. If, however, there is (to our knowledge) a published English translation of the work, the title of that translation follows, in parentheses, set in *italic* type.

The graphic design world is cosmopolitan. The post–World War II European émigrés to the United States who had such an impact on the profession, for example, led complicated lives, straddled contexts, and may have anglicized their names along the way. For historical figures we have endeavored to use the form of the personal name most common within the profession or the scholarship. For contemporary figures, our preference has been for forms that reflect the original language, though we are aware that some in the profession (from China and the rest of East Asia, especially) may use a different form of their name in a Western context than at home. Any errors or oversights concerning such details are entirely our own, and we welcome your feedback.

Alston W. Purvis

Preface to the First Edition

There is a German word, *Zeitgeist*, that does not have an English equivalent. It means "the spirit of the times" and refers to the cultural trends and tastes that are characteristic of a given era. The immediacy and ephemeral nature of graphic design, combined with its link with the social, political, and economic life of its culture, enable it to more closely express the zeitgeist of an epoch than many other forms of human expression. Ivan Chermayeff, a noted designer, has said: the design of history is the history of design.

Since prehistoric times, people have searched for ways to give visual form to ideas and concepts, to store knowledge in graphic form, and to bring order and clarity to information. Over the course of history, these needs have been filled by various people, including scribes, printers, and artists. It was not until 1922, when the outstanding book designer William Addison Dwiggins coined the term *graphic design* to describe his activities as an individual who brought structural order and more visual form to printed communications, that an emerging profession received an appropriate name. However, the contemporary graphic designer is heir to a distinguished ancestry. Sumerian scribes who invented writing, Egyptian artisans who combined words and images on papyrus manuscripts, Chinese block printers, medieval illuminators, and fifteenth-century printers and compositors who designed early European books all became part of the rich heritage and history of graphic design. By and large, this is an anonymous tradition, for the social value and aesthetic accomplishments of graphic designers, many of whom have been creative artists of extraordinary intelligence and vision, have not been sufficiently recognized.

History is in large measure a myth, because the historian looks back over the great sprawling network of human struggle and attempts to construct a web of meaning. Oversimplification, ignorance of causes and their effects, and the lack of an objective vantage point are grave risks for the historian. When we attempt to record the accomplishments of the past, we do so from the vantage point of our own time. History becomes a reflection of the needs, sensibilities, and attitudes of the chronicler's time as surely as it represents the accomplishments of bygone eras. As much as one might strive for objectivity, the limitations of individual knowledge and insights ultimately intrude.

The concept of art for art's sake, a beautiful object that exists solely for its aesthetic value, did not develop until the nineteenth century. Before the Industrial Revolution, the beauty of forms and images that people made were linked to their function in human society. The aesthetic qualities of Greek pottery, Egyptian hieroglyphics, and medieval manuscripts were totally integrated with useful values; art and life were unified into a cohesive whole. The din and thunder of the Industrial Revolution turned the world upside down in a process of upheaval and technological progress that continues to accelerate at an ever-quickening pace. By jolting the arts and crafts from their social and economic roles, the machine age created a gulf between people's material life and their sensory and spiritual needs. Just as voices call for a restoration of humanity's unity with the natural environment, there is a growing awareness of the need to restore human and aesthetic values to the man-made environment and mass communications. The design arts—architecture and product, fashion, interior, and graphic design—offer one means for this restoration. Once more a society's shelter, artifacts, and communications might bind a people together. The endangered aesthetic and spiritual values might be restored. A wholeness of need and spirit, reunited through the process of design, can contribute in great measure to the quality and raison d'être of life in urban societies.

This chronicle of graphic design is written in the belief that if we understand the past, we will be better able to continue a culture legacy of beautiful form and effective communication. If we ignore this legacy, we run the risk of becoming buried in a mindless morass of a commercialism whose mole-like vision ignores human values and needs as it burrows forward into darkness.

Philip B. Meggs

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In completing the sixth edition of *Meggs' History of Graphic Design,* numerous specialists, collectors, associates, graphic designer colleagues, and students provided fresh suggestions and valuable expertise, and it is impossible to adequately express my gratitude to all of them.

I am especially indebted to Libby and Elizabeth Meggs for their support and confidence throughout the production of the last three editions.

I would like to extend my appreciation to June and the late Robert Leibowits for their kindness and backing of this and all my writing endeavors. Wilma Schuhmacher continued to generously share her unique knowledge of Dutch graphic design history. Michael Hearne's expertise regarding Russian graphic design was always informative and immediately available. In addition, grateful acknowledgement is made to the following people whose contributions have greatly enriched this publication: Anthon Beeke, James Lapides, Steven Heller, John Kristensen, Ernst H. von Metzsch, Stephen Pekich, Erik Voorrips, and James M. Storey. I am indebted to Roger Remington for sharing his knowledge and making available important new images for both this edition and the previous one. Also, I have been fortunate in having the learned advice of Earle Havens, curator of rare books and manuscripts, Department of Special Collections, The Sheridan Libraries, at Johns Hopkins University.

The late Jan van Loenen Martinet, after only a brief acquaintance, generously made available his extensive archives on the Dutch printer and designer H. N. Werkman. For both the fifth and the sixth editions, Emilio Gill was supportive in procuring images and material on contemporary Spanish graphic design, and the assistance and knowledge of Sónia Teixeira made possible the inclusion of Portuguese graphic design. Having Majid Abbasi share his knowledge regarding the richness of Iranian graphic design contributed an important feature to chapter 23. Martijn Le Coultre, with whom I have collaborated on numerous publications, provided incisive advice and many fresh images for this and the previous edition. Many members of the staff at the Yale Beinecke Library were helpful, and Ulla Kasten of the Yale Babylonian Collection opened worlds of information and generously provided unique cuneiform images from their collection.

The administration at Boston University has been constantly supportive, especially in assigning graduate students as research assistants. Jeannette Guillemin, director ad interim of visual arts, has always given me encouragement whenever needed. Others who were helpful include Lynne Allen, dean ad interim; former dean Walt Meissner; Logen Zimmerman, fiscal coordinator of visual arts; former dean Benjamin Juarez; and John Amend, assistant dean. My colleagues Yael Ort-Dinoor, Bryce Ambo, Kristen Coogen, Laura Giannitrapani, Laura Grey, and Nick Rock were consistently available for discussions regarding contemporary design topics. To the staff at the Gotlieb Archival Research Center at Boston University I offer my gratitude; these include Vita Paladino, director; Sean Noel, associate director; Katherine Kominis, assistant director, rare books; and Perry Barton, exhibition and publication coordinator.

Stephen Goldstein's writing in the section on contemporary Chinese graphic design was both illuminating and invaluable, and he was also instrumental in securing many new and exciting images from China. Special thanks are due to Wang Yun of the China Design Museum at China Academy of Art (CAA) in Hangzhou, for her tireless research on Chinese designers and her translation support when communicating with the designers.

I am grateful to Robert Burns for sharing intimate knowledge of his close friend and mentor Paul Rand. Kristen Coogen made contributions on Spanish Civil War posters, Corita Kent, and Raymond Loewy. The late Alvin Eisenman, John T. Hill, and Bonnie Scranton kindly provided extensive material pertaining to the rich history of the graphic design program at Yale University.

Both my undergraduate and graduate assistants at Boston University approached their tasks with unwavering diligence, and their loyal, professional, and tireless support was essential. Their patience and perseverance in finding sizes for the images in this edition was often a tedious and difficult task. Most especially, Katie Leeche's untiring efforts in procuring images and editing and revising texts were not only helpful but vital in bringing this edition to a conclusion. Elizabeth Ryan's diligent reviews of all final texts and art logs were crucial in avoiding errors that might have otherwise passed unnoticed.

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History of Graphic Design

Part I
The Prologue to Graphic Design

The visual message from prehistory through the medieval era

1 2 3 4

The Invention
of Writing

c 15,000–
10,000 BCE   Cave paintings at Lascaux

c 3600 BCE   Blau monument combines images and early writing
c 3500 BCE   Sumerians settle in Mesopotamia
c 3200 BCE   Menes, first pharaoh, unites Egypt
c 3100 BCE   Early Sumerian pictographic scripts on clay tablets
c 3100 BCE   King Zet's ivory tablet, earliest Egyptian pictographic
writing

c 2900 BCE   Early cylinder seals
c 2750 BCE   Formal land-sale contracts written in cuneiform
c 2600 BCE   Early surviving papyrus manuscripts
c 2500 BCE   Wedge-shaped cuneiform
c 2345 BCE   Pyramid texts in tomb of Unas

c 1792–
1750 BCE   Law Code of Hammurabi
c 1739 BCE   Scarab of Ikhnaton and Nefertiti
c 1500 BCE   Hieratic scripts
c 1420 BCE   Papyrus of Ani
c 1300 BCE   Early Book of the Dead papyrus scrolls
c 1100 BCE   Iron widely used for weapons and tools

c 600 BCE   Nebuchadnezzar builds the Tower of Babel
c 400 BCE   Demotic script
332–330 BCE   Alexander the Great conquers Egypt
c 197 BCE   Rosetta Stone

Alphabets

c 2000 BCE   Early Cretan pictographs, Phaistos Disk

c 1500 BCE   Ras Shamra script
c 1000 BCE   Early Greek alphabet

c 850 BCE   Aramaic alphabet
516 BCE   Israelites return from Babylonian exile
447–432 BCE   Parthenon built in Athens
429 BCE   Sophocles' tragedy *Oedipus Rex*
323 BCE   Alexander the Great dies in Babylon
300 BCE   Euclid's geometry
c 190 BCE   Parchment used for manuscripts
44 BCE   Julius Caesar assassinated
29 BCE   Vergil's *Georgics*

c 100 CE   Pompeian wall writing
c 114 CE   Trajan's Column
c 250 CE   Greek uncials
c 200–500 CE Roman square capitals and rustic capitals
c 500 CE   Early Arabic alphabet

c 1000 CE   Naskhi becomes dominant Arabic alphabet
1446 CE   Hangul, Korean alphabet

5000 BCE–100 BCE

2000 BCE–1500 CE

World events/**Graphic design events**

The Asian Contribution

c 1800 BCE	**Legendary Cangjie invents writing**
c 1500 BCE	**Oracle bone writing**
551 BCE	Confucius is born
c 528 BCE	Siddhartha Gautama becomes the Buddha
c 221 BCE	Shihuangdi unites China: the Great Wall underway
c 250 BCE	**Small-seal calligraphy**
105 CE	**Cai Lun invents paper**
c 165 CE	**Confucian classics carved in stone**
c 200 CE	**Regular-style calligraphy**
c 300 CE	**Chops are used as identifying seals; chops used in Han dynasty**
c 770 CE	**Early datable Chinese relief printing; printed Buddhist charms**
868 CE	**Diamond Sutra**
c 1000 CE	**Chinese calligraphy printed with perfection**
c 1000 CE	Gunpowder in use in China
c 1040 CE	**Pi Sheng invents movable type in China**
c 1150 CE	Compass is invented

2000 BCE–1200 CE

Illuminated Manuscripts

330 CE	Constantine moves Roman capital to Constantinople
c 425 CE	**Vatican Vergil**
c 500 CE	**Uncial lettering flourishes**
570 CE	Birth of Muhammad
c 600 CE	**Insular script**
c 680 CE	**Book of Durrow**
c 698 CE	**Lindisfarne Gospels**
c 751 CE	**Arabs learn papermaking from Chinese prisoners**
781 CE	**Alcuin establishes school at Aachen; Caroline minuscules are developed**
c 800 CE	**Book of Kells, Coronation Gospels**
800 CE	Charlemagne crowned emperor
1095–99 CE	First Crusade
1163 CE	Notre Dame Cathedral begun in Paris
1209 CE	Cambridge University founded
c 1265 CE	**Douce Apocalypse**
c 1265 CE	Marco Polo travels to China
1215 CE	King John signs Magna Carta
c 1300 CE	**Ormesby Psalter**
c 1320 CE	Firearms used in Europe
c 1387 CE	Chaucer begins *The Canterbury Tales*
c 1413–16 CE	***Les très riches heures du duc de Berry***
c 1450 CE	**Printing with movable type in Germany**
c 1478 CE	**Washington Haggadah**

300 CE–1500 CE

The Invention of Writing

1–1

1–1. Cave painting from Lascaux, c. 15,000–10,000 BCE. Random placement and shifting scale signify prehistoric people's lack of structure and sequence in recording their experiences.

1

It is not known precisely when or where *Homo sapiens,* our modern species of the lineage of conscious, thinking creatures, emerged. As the search for our prehistoric origins continues, the early innovations of our ancestors have been pushed back further in time. It is believed that we evolved from a species that lived in the southern part of Africa. These early hominids ventured out onto the grassy plains and into caves as the forests in that part of the world slowly disappeared. In the tall grass, the hominids began to stand erect. Perhaps this adaptation was a result of the need to watch for predators, to help discourage enemies by increasing the hominids' apparent size, or to hold branches as weapons.

In any event, the hand developed an ability to carry food and hold objects. Found near Lake Turkana in Kenya, a nearly three-million-year-old stone that had been sharpened into an implement proves the thoughtful and deliberate development of a technology—a tool. Early shaped stones may have been used to dig for roots or to cut away flesh from dead animals for food. While we can only speculate about the use of early tools, we know that they mark a major step in the human species' immense journey from primitive origins toward a civilized state.

A number of quantum leaps provided the capacity to organize a community and gain some measure of control over human destiny. Speech—the ability to make sounds in order to communicate—was an early skill developed by the species on the long evolutionary trail from its archaic beginnings. Writing is the visual counterpart of speech. Marks, symbols, pictures, or letters drawn or written upon a surface or substrate became a graphic counterpart of the spoken word or unspoken thought. The limitations of speech include the fallibility of human memory and an immediacy of expression that cannot transcend time and place. Until the electronic age, spoken words vanished without a trace, while written words remained. The invention of writing brought people the luster of civilization and made it possible to preserve hard-won knowledge, experiences, and thoughts.

The development of writing and visible language had its earliest origins in simple pictures, for a close connection exists between the drawing of pictures and the marking of writing.

Both are natural ways of communicating ideas, and early people used pictures as an elementary way to record and transmit information.

Prehistoric visual communications

Early human markings found in Africa are over two hundred thousand years old. From the early Paleolithic to the Neolithic period (35,000 to 4000 BCE), early Africans and Europeans left paintings in caves, including the Lascaux caves in southern France (Fig. **1–1**) and Altamira in Spain. Black was made from charcoal, and a range of warm tones, from light yellows through red-browns, were made from red and yellow iron oxides. This palette of pigments was mixed with fat as a medium. Images of animals were drawn and painted upon the walls of these former subterranean water channels occupied as a refuge by prehistoric men and women. Perhaps the pigment was smeared onto the walls with a finger, or a brush was fabricated from bristles or reeds. This was not the beginning of art as we know it. Rather, it was the dawning of visual communications, because these early pictures were made for survival and for utilitarian and ritualistic purposes. The presence of what appear to be spear marks in the sides of some of these animal images indicates that they were used in rites designed to gain power over animals and success in the hunt.

Abstract geometric signs, including dots, squares, and other configurations, are intermingled with the animals in many cave paintings. Whether they represent fabricated objects or are protowriting is not known, and never will be, because they were made before the beginning of recorded history (the five-thousand-year period during which people have recorded in writing a chronicle of their knowledge of facts and events). The animals painted in the caves are pictographs—elementary pictures or sketches that represent the things depicted.

Throughout the world, from Africa to North America to the islands of New Zealand, prehistoric people left numerous petroglyphs (Fig. **1–2**), which are carved or scratched signs or simple figures on rock. Many of the petroglyphs are pictographs, and some may be ideographs, or symbols to represent ideas or concepts (Fig. **1–3**). A high level of observation and memory is evidenced in many prehistoric drawings. In an engraved reindeer antler found in the cave of Lorthet in southern

1–2

1–3

1–4

The Paleolithic artist developed a tendency toward simplification and stylization. Figures became increasingly abbreviated and were expressed with a minimum number of lines. By the late Paleolithic period, some petroglyphs and pictographs had been reduced to the point of almost resembling letters.

The cradle of civilization

Until recent discoveries indicated that early peoples in Thailand may have practiced agriculture and manufactured pottery at an even earlier date, archaeologists had long believed that the ancient land of Mesopotamia, "the land between rivers," was the cradle of civilization. Between the Tigris and Euphrates Rivers, which flow from the mountains of eastern Turkey across the land that is now Iraq and into the Persian Gulf, there lies a flat, once-fertile plain whose wet winters and hot, dry summers proved very attractive to early human culture. Here, early humans ceased their restless nomadic wanderings and established a village society. Around 8000 BCE, wild grain was planted, animals were domesticated, and agriculture began. By the year 6000 BCE, objects were being hammered from copper; the Bronze Age was ushered in about 3000 BCE, when copper was alloyed with tin to make durable tools and weapons. The invention of the wheel followed.

The leap from village culture to high civilization occurred after the Sumerian people arrived in Mesopotamia near the end of the fourth millennium BCE. The origin of the Sumerians—who settled in the lower part of the Fertile Crescent before 3000 BCE—remains a great mystery. As vital as the technologies developed in Mesopotamia were for the future of the human race, the Sumerians' contribution to social and intellectual progress had even more impact upon the future. The Sumerians invented a system of gods headed by a supreme deity named Anu, who was the god of the heavens. An intricate system of god-human relationships was developed. The city emerged, with the necessary social order for large numbers of people to live together. But of the numerous inventions in Sumer that launched people onto the

France (Fig. **1–4**), the scratched drawings of deer and salmon are remarkably accurate. Even more important, however, are two diamond-shaped forms with interior marks, which imply an early symbol-making ability. The early pictographs evolved in two ways: first, they were the beginning of pictorial art—the objects and events of the world were recorded with increasing fidelity and exactitude as the centuries passed; second, they formed the basis of writing. The images, regardless of whether the original pictorial form was retained, ultimately became symbols for spoken-language sounds.

path of civilization, the invention of writing was perhaps the most significant, bringing about an intellectual revolution that had a vast impact upon social order, economic progress, and technological and future cultural developments.

The history of Mesopotamia records waves of invaders who conquered the peoples living there. The culture established by the Sumerians conquered the invaders in turn, and the sequence of ruling peoples who dominated Mesopotamia during its long history include Akkadians, Assyrians, Babylonians, and Chaldeans. Persians from the west and Hittites from the north also conquered the area and spread Mesopotamian civilization beyond the Fertile Crescent.

1–5

1–6

The earliest writing

Religion dominated life in the Mesopotamian city-state, just as the massive ziggurat, a stepped temple compound, dominated the city. Its vast, multistory brick temples were constructed as a series of recessed levels, becoming smaller toward the top of the shrine. Inside, priests and scribes wielded enormous power, as they controlled the inventories of the gods and the king and ministered to the magical and religious needs of the people. Writing may have evolved because this temple economy had an increasing need for record keeping. The temple chiefs consciously sought a system for recording information.

In human memory, time can become a blur, and important facts are often forgotten. In Mesopotamian terms, such important facts might include the answers to questions like: Who delivered their taxes in the form of crops? How much food was stored, and was it adequate to meet community needs before the next harvest? As even these relatively simple questions show, an accurate continuum of knowledge became imperative if the temple priests were to be able to maintain the order and stability necessary in the city-state. One theory holds that the origin of visible language evolved from the need to identify the contents of sacks and pottery containers used to store food. Small clay tags were made that identified the contents with a pictograph, and the amount with an elementary decimal numbering system based on the ten human fingers.

The earliest written records are tablets that apparently list commodities by pictographic drawings of objects accompanied by numerals and personal names inscribed in orderly columns (Figs. **1–5** and **1–6**). An abundance of clay in Sumer made it the logical material for record keeping, and a reed stylus sharpened to a point was used to draw the fine, curved lines of the early pictographs. The clay mud tablet was held in the left hand, and pictographs were scratched in the surface with the wooden stylus. Beginning in the top right corner of the tablet, the lines were written in careful vertical columns. The inscribed tablet was then dried in the hot sun or baked rock-hard in a kiln.

1–5. Early Sumerian proto-cuneiform using a mnemonic or ideographic writing system where signs resemble concrete objects, pictographic tablet, c. 3100 BCE. This archaic pictographic script contained the seeds for the development of writing. Information is structured into grid zones by horizontal and vertical division. 4.5 x 4.3 cm

1–6. Archaic tablet fragment from the late fourth millennium BCE. The drilled hole denotes a number, and the pictographs represent animals in this transaction of sheep and goats. 4 x 4 cm
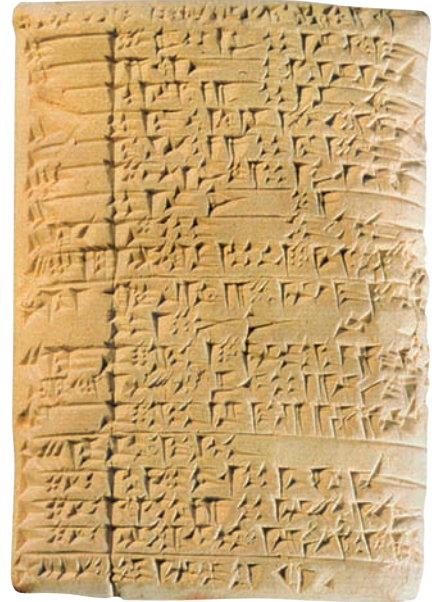
1–7

1–8

1–9

1–10

1–11

1–12

1–14

1–13

This writing system underwent an evolution over several centuries. Writing was structured on a grid of horizontal and vertical spatial divisions. Sometimes the scribe would smear the writing as his hand moved across the tablet. Around 2800 BCE scribes turned the pictographs on their sides and began to write in horizontal rows, from left to right and top to bottom. This made writing easier, and it made the pictographs less literal. About three hundred years later, writing speed was increased by replacing the sharp-pointed stylus with a triangular-tipped one. This stylus was pushed into the clay instead of being dragged through it.

The characters were now composed of a series of wedge-shaped strokes rather than a continuous line drawing (Figs. **1–7 through 1–13**). This innovation radically altered the nature of the writing; pictographs evolved into an abstract sign writing called cuneiform (from the Latin for "wedge-shaped").

While the graphic form of Sumerian writing was evolving, its ability to record information was expanding. From the first stage, when picture-symbols represented animate and inanimate objects, signs became ideographs and began to represent abstract ideas. The symbol for sun, for example, began to represent ideas such as "day" and "light." As early scribes developed their written language to function in the same way as their speech, the need to represent spoken sounds not easily depicted arose. Adverbs, prepositions, and personal names often could not be adapted to pictographic representation. Picture symbols began to represent the sounds of the objects depicted instead of the objects themselves. Cuneiform became rebus writing, which is pictures and/or pictographs representing words and syllables with the same or similar sound as the object depicted. Pictures were used as phonograms, or graphic symbols for sounds. The highest development of cuneiform was its use of abstract signs to represent syllables, which are sounds made by combining more elementary sounds.

Cuneiform was a difficult writing system to master, even after the Assyrians simplified it into only 560 signs. Youngsters selected to become scribes began their schooling at the *edubba*, the writing school or "tablet house," before the age of ten and worked from sunrise to sunset every day, with only six days off per month. Professional opportunities in the priesthood, estate management, accounting, medicine, and government were reserved for these select few. Writing took on important magical and ceremonial qualities. The general public held those who could write in awe, and it was believed that death occurred when a divine scribe etched one's name in a mythical Book of Fate.

Early Sumerian artisans mixed writing with relief images. The Blau monument (Fig. **1–14**) may be the oldest extant artifact combining words and pictures on the same surface. The knowledge explosion made possible by writing was remarkable. Mesopotamians organized libraries that contained thousands of tablets about religion, mathematics, history,

1–7. Cuneiform tablet from Umma, c. 2050 BCE. Three workers are paid three bundles a day. The total for six days is fifty-four bundles of reed. 3.8 x 3.2 cm

1–8. Cuneiform tablet from Drehem, 2040 BCE. Abbashaga, Shu-Ma, the governor of Kazulla, provides 198 sheep and 162 goats the first time and 41 sheep and 82 female goats the second time. 3.8 x 3.2 cm

1–9. Ur III period, dated to Amar-Sin (2039 BCE) in Sumerian. Balanced silver account of Ur-Dumuzi, the merchant. 15.1 x 10 cm

1–10. Old Babylonian (c. 1850 BCE) in Akkadian. A chapter of the Epic of Gilgamesh. Gilgamesh and his friend go to fell the cedars of Lebanon. 22.6 x 17 cm

1–11. Old Babylonian (c. 1850 BCE) in Akkadian. The world's oldest cookbook, a collection of recipes for dishes for the royal palace or the temple. 16.4 x 11.8 cm

1–12. Middle Babylonian, dated Shagarakti-Shunash (1245–1233 BCE). Balanced account of seed. 8.6 x 6 cm

1–13. Old Babylonian (ca. 1800 BCE). Mathematical school tablet showing how to calculate the diagonal of a square. This predates Pythagoras by 1,200 years. 7.2 cm diameter

1–14. The Blau monument, early Sumerian, third quarter, fourth millennium BCE. Etched writing and carved relief figures are combined on this early shale artifact. 7.6 x 16 cm