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Chapter 11

Cuneiform and Hieroglyphs

The following scripts are described in this chapter:

Sumero-Akkadian Cuneiform	*Old Persian*	*Meroitic*
Ugaritic	*Egyptian Hieroglyphs*	

Three ancient cuneiform scripts are described in this chapter: Ugaritic, Old Persian, and Sumero-Akkadian. The largest and oldest of these is Sumero-Akkadian. The other two scripts are not derived directly from the Sumero-Akkadian tradition but had common writing technology, consisting of wedges indented into clay tablets with reed styluses. Ugaritic texts are about as old as the earliest extant Biblical texts. Old Persian texts are newer, dating from the fifth century BCE.

Egyptian Hieroglyphs were used for more than 3,000 years from the end of the fourth millennium BCE.

Meroitic hieroglyphs and Meroitic cursive were used from around the second century BCE to the fourth century CE to write the Meroitic language of the Nile valley kingdom known as Kush or Meroë. Meroitic cursive was for general use, and its appearance was based on Egyptian demotic. Meroitic hieroglyphs were used for inscriptions, and their appearance was based on Egyptian hieroglyphs.

11.1 Sumero-Akkadian

Cuneiform: U+12000–U+123FF

Sumero-Akkadian Cuneiform is a logographic writing system with a strong syllabic component. It was written from left to right on clay tablets.

Early History of Cuneiform. The earliest stage of Mesopotamian Cuneiform as a complete system of writing is first attested in Uruk during the so-called Uruk IV period (circa 3500–3200 BCE) with an initial repertoire of about 700 characters or "signs" as Cuneiform scholars customarily call them.

Late fourth millennium ideographic tablets were also found at Susa and several other sites in western Iran, in Assyria at Nineveh (northern Iraq), at Tell Brak (northwestern Syria), and at Habuba Kabira in Syria. The writing system developed in Sumer (southeastern Iraq) was repeatedly exported to peripheral regions in the third, second, and first millennia BCE. Local variations in usage are attested, but the core of the system is the Sumero-Akkadian writing system.

Writing emerged in Sumer simultaneously with a sudden growth in urbanization and an attendant increase in the scope and scale of administrative needs. A large proportion of the elements of the early writing system repertoire was devised to represent quantities and commodities for bureaucratic purposes.

At this earliest stage, signs were mainly pictographic, in that a relatively faithful facsimile of the thing signified was traced, although some items were strictly ideographic and represented by completely arbitrary abstractions, such as the symbol for sheep ⊕. Some scholars believe that the abstract symbols were derived from an earlier "token" system of accounting, but there is no general agreement on this point. Where the pictographs are concerned, interpretation was relatively straightforward. The head of a bull was used to denote "cattle"; an ear of barley was used to denote "barley." In some cases, pictographs were also interpreted logographically, so that meaning was derived from the symbol by close conceptual association. For example, the representation of a bowl might mean "bowl," but it could indicate concepts associated with bowls, such as "food." Renditions of a leg might variously suggest "leg," "stand," or "walk."

By the next chronological period of south Mesopotamian history (the Uruk III period, 3200–2900 BCE), logographic usage seems to have become much more widespread. In addition, individual signs were combined into more complex designs to express other concepts. For example, a head with a bowl next to it was used to denote "eat" or "drink." This is the point during script development at which one can truly speak of the first Sumerian texts. In due course, the early graphs underwent change, conditioned by factors such as the most widely available writing medium and writing tools, and the need to record information more quickly and efficiently from the standpoint of the bureaucracy that spawned the system.

Clay was the obvious writing medium in Sumer because it was widely available and easily molded into cushion- or pillow-shaped tablets. Writing utensils were easily made for it by sharpening pieces of reed. Because it was awkward and slow to inscribe curvilinear lines in a piece of clay with a sharpened reed (called a *stylus*), scribes tended to approximate the pictographs by means of short, wedge-shaped impressions made with the edge of the stylus. These short, mainly straight shapes gave rise to the modern word "cuneiform" from the Latin *cuneus*, meaning "wedge." Cuneiform proper was common from about 2700 BCE, although experts use the term "cuneiform" to include the earlier forms as well.

Geographic Range. The Sumerians did not live in complete isolation, and there is very early evidence of another significant linguistic group in the area immediately north of Sumer known as Agade or Akkad. Those peoples spoke a Semitic language whose dialects are subsumed by scholars under the heading "Akkadian." In the long run, the Akkadian speakers became the primary users and promulgators of Cuneiform script. Because of their trade involvement with their neighbors, Cuneiform spread through Babylonia (the umbrella term for Sumer and Akkad) to Elam, Assyria, eastern Syria, southern Anatolia, and even Egypt. Ultimately, many languages came to be written in Cuneiform script, the most notable being Sumerian, Akkadian (including Babylonian, Assyrian, Eblaite), Elamite, Hittite, and Hurrian.

Periods of script usage are defined according to geography and primary linguistic representation, as shown in *Table 11-1*.

Table 11-1. Cuneiform Script Usage

<table>
<tr><td colspan="2">Archaic Period
(to 2901 BCE)</td></tr>
<tr><td colspan="2">Early Dynastic
(2900–2335 BCE)</td></tr>
<tr><td colspan="2">Old Akkadian
(2334–2154 BCE)</td></tr>
<tr><td colspan="2">Ur III (NeoSumerian)
(2112–2095 BCE)</td><td rowspan="6">Elamite
(2100–360 BCE)</td></tr>
<tr><td>Old Assyrian
(1900–1750 BCE)</td><td>Old Babylonian
(2004–1595 BCE)</td></tr>
<tr><td>Middle Assyrian
(1500-1000 BCE)</td><td rowspan="2">Middle Babylonian
(1595–627 BCE)</td></tr>
<tr><td>Neo-Assyrian
(1000-609 BCE)</td></tr>
<tr><td></td><td>Neo-Babylonian
(626–539 BCE)</td></tr>
<tr><td colspan="2">Hittite
(1570-1220 BCE)</td></tr>
</table>

Sources and Coverage. The base character repertoire for the Cuneiform block was distilled from the list of Ur III signs compiled by the Cuneiform Digital Library Initiative (UCLA) in union with the list constructed independently by Miguel Civil. This repertoire is compre-

hensive from the Ur III period onward. Old Akkadian, Early Dynastic, and Archiac Cuneiform are not covered by this repertoire.

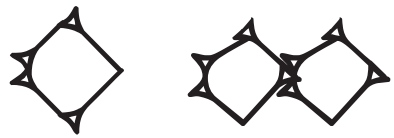
Simple Signs. Most Cuneiform signs are simple units; each sign of this type is represented by a single character in the standard.

Complex and Compound Signs. Some Cuneiform signs are categorized as either complex or compound signs. Complex signs are made up of a primary sign with one of more secondary signs written within it or conjoined to it, such that the whole is generally treated by scholars as a unit; this includes linear sequences of two or more signs or wedge-clusters where one or more of those clusters have not been clearly identified as characters in their own right. Complex signs, which present a relative visual unity, are assigned single individual code points irrespective of their components.

Compound signs are linear sequences of two or more signs or wedge-clusters generally treated by scholars as a single unit, when each and every such wedge-cluster exists as a clearly identified character in its own right. Compound signs are encoded as sequences of their component characters. Signs that shift from compound to complex, or vice versa, generally have been treated according to their Ur III manifestation.

Mergers and Splits. Over the long history of Cuneiform, a number of signs have simplified and merged; in other cases, a single sign has diverged and developed into more than one distinct sign. The choice of signs for encoding as characters was made at the point of maximum differentiation in the case of either mergers or splits to enable the most comprehensive set for the representation of text in any period.

Fonts. Fonts for the representation of Cuneiform text may need to be designed distinctly for optimal use for different historic periods. For example, in the late third millennium BCE, the head of the glyph of the lower right-hand stroke in a ring of four strokes changed its orientation. In earlier times it sloped down to the left, as shown in the glyph for U+1212D, but was later replaced by a stroke in which the head sloped up to the right, as shown in the glyph for U+12423. The glyphs in the code charts do not use a consistent style for these kinds of historic features.



U+1212D U+12423

Fonts for some periods will contain duplicate glyphs depending on the status of merged or split signs at that point of the development of the writing system.

Glyph Variants Acquiring Independent Semantic Status. Glyph variants such as U+122EC 𒎬 CUNEIFORM SIGN TA ASTERISK, a Middle Assyrian form of the sign U+122EB 𒌫 CUNEIFORM SIGN TA, which in Neo-Assyrian usage has its own logographic interpretation, have been assigned separate code positions. They are to be used only when the new interpretation applies.

Formatting. Cuneiform was often written between incised lines or in blocks surrounded by drawn boxes known as *case rules*. These boxes and lines are considered formatting and are not part of the script. Case ruling and the like are not to be treated as punctuation.

Ordering. The characters are encoded in the Unicode Standard in Latin alphabetical order by primary sign name. Complex signs based on the primary sign are organized according to graphic principles; in some cases, these correspond to the native analyses.

Other Standards. There is no standard legacy encoding of Cuneiform primarily because it was not possible to encode the huge number of characters in the pre-Unicode world of 8-bit fonts.

Cuneiform Numbers and Punctuation: U+12400–U+1247F

Cuneiform Punctuation. A small number of signs are occasionally used in Cuneiform to indicate word division, repetition, or phrase separation.

Cuneiform Numerals. In general, numerals have been encoded separately from signs that are visually identical but semantically different (for example, U+1244F 𒑏 CUNEIFORM NUMERIC SIGN ONE BAN2, U+12450 𒑐 CUNEIFORM NUMERIC SIGN TWO BAN2, and so on, versus U+12226 𒈦 CUNEIFORM SIGN MASH, U+1227A 𒉺 CUNEIFORM SIGN PA, and so on).

11.2 Ugaritic

Ugaritic: U+10380–U+1039F

The city state of Ugarit was an important seaport on the Phoenician coast (directly east of Cyprus, north of the modern town of Minet el-Beida) from about 1400 BCE until it was completely destroyed in the twelfth century BCE. The site of Ugarit, now called Ras Shamra (south of Latakia on the Syrian coast), was apparently continuously occupied from Neolithic times (circa 5000 BCE). It was first uncovered by a local inhabitant while plowing a field in 1928 and subsequently excavated by Claude Schaeffer and Georges Chenet beginning in 1929, in which year the first of many tablets written in the Ugaritic script were discovered. They later proved to contain extensive portions of an important Canaanite mythological and religious literature that had long been sought and that revolutionized Biblical studies. The script was first deciphered in a remarkably short time jointly by Hans Bauer, Edouard Dhorme, and Charles Virolleaud.

The Ugaritic language is Semitic, variously regarded by scholars as being a distinct language related to Akkadian and Canaanite, or a Canaanite dialect. Ugaritic is generally written from left to right horizontally, sometimes using U+1039F 𐎟 UGARITIC WORD DIVIDER. In the city of Ugarit, this script was also used to write the Hurrian language. The letters U+1039B 𐎛 UGARITIC LETTER I, U+1039C 𐎜 UGARITIC LETTER U, and U+1039D 𐎝 UGARITIC LETTER SSU are used for Hurrian.

Variant Glyphs. There is substantial variation in glyph representation for Ugaritic. Glyphs for U+10398 𐎘 UGARITIC LETTER THANNA, U+10399 𐎙 UGARITIC LETTER GHAIN, and U+1038F 𐎏 UGARITIC LETTER DHAL differ somewhat between modern reference sources, as do some transliterations. U+10398 𐎘 UGARITIC LETTER THANNA is most often displayed with a glyph that looks like an occurrence of U+10393 𐎓 UGARITIC LETTER AIN overlaid with U+10382 𐎂 UGARITIC LETTER GAMLA.

Ordering. The ancient Ugaritic alphabetical order, which differs somewhat from the modern Hebrew order for similar characters, has been used to encode Ugaritic in the Unicode Standard.

Character Names. Some of the Ugaritic character names have been reconstructed; others appear in an early fragmentary document.

11.3 Old Persian

Old Persian: U+103A0–U+103DF

The Old Persian script is found in a number of inscriptions in the Old Persian language dating from the Achaemenid empire. Scholars today agree that the character inventory of Old Persian was invented for use in monumental inscriptions of the Achaemenid king, Darius I, by about 525 BCE. Old Persian is an alphabetic writing system with some syllabic aspects. While the shapes of some Old Persian letters look similar to signs in Sumero-Akkadian Cuneiform, it is clear that only one of them, U+103BE 𐎾 OLD PERSIAN SIGN LA, was actually borrowed. It was derived from the New Assyrian historic variant 𒇻 of Sumero-Akkadian U+121B7 𒆷 CUNEIFORM SIGN LA, because *la* is a foreign sound not used in the Old Persian language.

Directionality. Old Persian is written from left to right.

Repertoire. The repertoire contains 36 signs. These represent consonants, vowels, or consonant plus vowel syllables. There are also five numbers, one word divider, and eight ideograms. It is considered unlikely that any additional characters will be discovered.

Numerals. The attested numbers are built up by stringing the base numbers (1, 2, 10, 20, and 100) in sequences.

Variants. The signs U+103C8 OLD PERSIAN SIGN AURAMAZDAA and U+103C9 OLD PERSIAN SIGN AURAMAZDAA-2, and the signs U+103CC OLD PERSIAN SIGN DAHYAAUSH and U+103CD OLD PERSIAN SIGN DAHYAAUSH-2, have been encoded separately because their conventional attestation in the corpus of Old Persian texts is quite limited and scholars consider it advantageous to distinguish the forms in plain text representation.

11.4 Egyptian Hieroglyphs

Egyptian Hieroglyphs: U+13000–U+1342F

Hieroglyphic writing appeared in Egypt at the end of the fourth millennium BCE. The writing system is pictographic: the glyphs represent tangible objects, most of which modern scholars have been able to identify. A great many of the pictographs are easily recognizable even by nonspecialists. Egyptian hieroglyphs represent people and animals, parts of the bodies of people and animals, clothing, tools, vessels, and so on.

Hieroglyphs were used to write Egyptian for more than 3,000 years, retaining characteristic features such as use of color and detail in the more elaborated expositions. Throughout the Old Kingdom, the Middle Kingdom, and the New Kingdom, between 700 and 1,000 hieroglyphs were in regular use. During the Greco-Roman period, the number of variants, as distinguished by some modern scholars, grew to somewhere between 6,000 and 8,000.

Hieroglyphs were carved in stone, painted on frescos, and could also be written with a reed stylus, though this cursive writing eventually became standardized in what is called hieratic writing. The hieratic forms are not separately encoded; they are simply considered cursive forms of the hieroglyphs encoded in this block.

The Demotic script and then later the Coptic script replaced the earlier hieroglyphic and hieratic forms for much practical writing of Egyptian, but hieroglyphs and hieratic continued in use until the fourth century CE. An inscription dated August 24, 394 CE has been found on the Gateway of Hadrian in the temple complex at Philae; this is thought to be among the latest examples of Ancient Egyptian writing in hieroglyphs.

Structure. Egyptian hieroglyphs made use of 24 letters comprising a true alphabet. In addition to these phonetic characters, Egyptian hieroglyphs made use of a very large number of logographic characters (called "logograms" or "ideograms" by Egyptologists), some of which could be read as a word, and some of which had only a semantic determinative function, to enable the reader to distinguish between words which were otherwise written the same. Within a word, characters were arranged together to form an aesthetically-pleasing arrangement within a notional square.

Directionality. Characters may be written left-to-right or right-to-left, generally in horizontal lines, but often—especially in monumental texts—in vertical columns. Directionality of a text is usually easy to determine because one reads a line facing into the glyphs depicting the faces of people or animals.

Egyptian hieroglyphs are given strong left-to-right directionality in the Unicode Standard, because most Egyptian editions are published in English, French, or German, and left-to-right directionality is the conventional presentation mode. When left-to-right directionality is overridden to display Egyptian hieroglyphic text right to left, the glyphs should be mirrored from those shown in the code charts.

Rendering. The encoded characters for Egyptian hieroglyphs in the Unicode Standard simply represent basic text elements, or *signs*, of the writing system. A higher-level protocol is

required to represent the arrangement of signs into notional squares and for effects involving mirroring or rotation of signs within text. This approach to encoding the hieroglyphs works well in the context of pre-existing conventions for the representation of Egyptian text, which use simple markup schemes to indicate such formatting.

The most prominent example of such conventions in use since computers were introduced into Egyptology in the late 1970s and the early 1980s is called the *Manuel de Codage* (MdC), published in 1988. The MdC conventions make use of ASCII characters to separate hieroglyphic signs and to indicate the organization of the elements in space—that is, the position of each sign, as arranged in a block. For example, the hyphen-minus "-" is used to separate adjacent hieroglyphic blocks. The colon ":" indicates the superposition of one hieroglyphic sign over another. The asterisk "*" indicates the left-right juxtaposition of two hieroglyphic signs within a visual block.

For example, using the MdC conventions, the hieroglyphic representation of the name Amenhotep would be transliterated as <i-mn:n-R4:t*p>. The lowercase letters represent transliterations of alphabetic or other phonetic signs, whereas "R4" is the catalog label for one of the logograms in the standard Gardiner list. The "-", ":", and "*" characters provide the markup showing how the individual signs are visually arranged. The "<" and ">" bracket characters indicate a cartouche, often used for a king's name. The Unicode representation of the same hieroglyphic name, using MdC conventions, but substituting Unicode characters for the transliterations and catalog numbers is shown in *Table 11-2*.

Table 11-2. Hieroglyphic Character Sequence

U+003C	LESS-THAN SIGN
U+131CB	EGYPTIAN HIEROGLYPH M017 (= y, i)
U+002D	HYPHEN-MINUS
U+133E0	EGYPTIAN HIEROGLYPH Y005 (= mn)
U+003A	COLON
U+13216	EGYPTIAN HIEROGLYPH N035 (= n)
U+002D	HYPHEN-MINUS
U+132B5	EGYPTIAN HIEROGLYPH R004 (= R4)
U+003A	COLON
U+133CF	EGYPTIAN HIEROGLYPH X001 (= t)
U+002A	ASTERISK
U+132AA	EGYPTIAN HIEROGLYPH Q003 (= p)
U+003E	GREATER-THAN SIGN

The interpretation of these MdC markup conventions in text is not part of plain text. Ordinary word processors and plain text display would not be expected to be able to interpret those conventions to render sequences of Egyptian hieroglyphic signs stacked correctly into blocks. Instead, such display would require a specialized rendering process familiar with the layout of Egyptian hieroglyphs. This distinction is illustrated in *Figure 11-1*. The first line shows the marked-up MdC sequence for the name of the king, Amenhotep. The second line shows the Unicode hieroglyphic version of that sequence, as interpreted by an ordinary Unicode plain text rendering process. The third line shows a rendering by a spe-

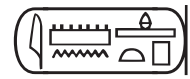
cialized hieroglyphic rendering process, which can interpret the markup and render a cartouche.

Figure 11-1. Interpretion of Hieroglyphic Markup

Manuel de Codage: <i-mn:n-R4:t*p>

Unicode Plain Text:

Interpreted Markup:



Other markup schemes have been proposed, which attempt to provide greater flexibility than MdC by use of more elaborate encodings. XML has also been used to represent Egyptian texts. Such representations also require specialized rendering systems to lay out hieroglyphic text.

Hieratic Fonts. In the years since Champollion published his decipherment of Egyptian in 1824, Egyptologists have shown little interest in typesetting hieratic text. Consequently, there is no tradition of hieratic fonts in either lead or digital formats. Because hieratic is a cursive form of the underlying hieroglyphic characters, hieratic text is normally rendered using the more easily legible hieroglyphs. In principle a hieratic font could be devised for specialist applications, but as for fonts for other cursive writing systems, it would require very large ligature tables—even larger than usual, because of the great many hieroglyphic signs involved.

Repertoire. The set of hieroglyphic characters encoded in this block is loosely referred to as "the Gardiner set." However, the Gardiner set was not actually exhaustively described and enumerated by Gardiner, himself. The chief source of the repertoire is Gardiner's Middle Egyptian sign list as given in his *Egyptian Grammar* (Gardiner 1957). That list is supplemented by additional characters found in his font catalogues (Gardiner 1928, Gardiner 1929, Gardiner 1931, and Gardiner 1953), and by a collection of signs found in the Griffith Institute's *Topographical Bibliography*, which also used the Gardiner fonts.

A few other characters have been added to this set, such as entities to which Gardiner gave specific catalog numbers. They are retained in the encoding for completeness in representation of Gardiner's own materials. A number of positional variants without catalog numbers were listed in Gardiner 1957 and Gardiner 1928.

Character Names. Egyptian hieroglyphic characters have traditionally been designated in several ways:

- By complex description of the pictographs: GOD WITH HEAD OF IBIS, and so forth.

- By standardized sign number: C3, E34, G16, G17, G24.
- For a minority of characters, by transliterated sound.

The characters in the Unicode Standard make use of the standard Egyptological catalog numbers for the signs. Thus, the name for U+13049 EGYPTIAN HIEROGLYPH E034 refers uniquely and unambiguously to the Gardiner list sign E34, described as a "DESERT HARE" and used for the sound "wn". The catalog values are padded to three places with zeros.

Names for hieroglyphic characters identified explicitly in Gardiner 1953 or other sources as variants for other hieroglyphic characters are given names by appending "A", "B", ... to the sign number. In the sources these are often identified using asterisks. Thus Gardiner's G7, G7*, and G7** correspond to U+13146 EGYPTIAN SIGN G007, U+13147 EGYPTIAN SIGN G007A, and U+13148 EGYPTIAN SIGN G007B, respectively.

Sign Classification. In Gardiner's identification scheme, Egyptian hieroglyphs are classified according to letters of the alphabet, so A000 refers to "Man and his occupations," B000 to "Woman and her occupations," C000 to "Anthropomorphic deities," and so forth. The order of signs in the code charts reflects this classification. The Gardiner categories are shown in headers in the names list accompanying the code charts.

Some individual characters may have been identified as belonging to other classes since their original category was assigned, but the ordering in the Unicode Standard simply follows the original category and catalog values.

Enclosures. The two principal names of the king, the nomen and prenomen, were normally written inside a cartouche: a pictographic representation of a coil of rope, as shown in *Figure 11-1*.

In the Unicode representation of hieroglyphic text, the beginning and end of the cartouche are represented by separate paired characters, somewhat like parentheses. Rendering of a full cartouche surrounding a name requires specialized layout software.

There are a several characters for these start and end cartouche characters, reflecting various styles for the enclosures.

Numerals. Egyptian numbers are encoded following the same principles used for the encoding of Aegean and Cuneiform numbers. Gardiner does not supply a full set of numerals with catalog numbers in his *Egyptian Grammar*, but does describe the system of numerals in detail, so that it is possible to deduce the required set of numeric characters.

Two conventions of representing Egyptian numerals are supported in the Unicode Standard. The first relates to the way in which hieratic numerals are represented. Individual signs for each of the 1s, the 10s, the 100s, the 1000s, and the 10,000s are encoded, because in hieratic these are written as units, often quite distinct from the hieroglyphic shapes into which they are transliterated. The other convention is based on the practice of the *Manual de Codage*, and is comprised of five basic text elements used to build up Egyptian numerals. There is some overlap between these two systems.

11.5 Meroitic

Meroitic Hieroglyphs: U+10980–U+1099F
Meroitic Cursive: U+109A0–U+109FF

Meroitic hieroglyphs and Meroitic cursive were used from around the second century BCE to the fourth century CE to write the Meroitic language of the Nile valley kingdom known as Kush or Meroë. The kingdom originated south of Egypt around 850 BCE, with its capital at Napata, located in modern-day northern Sudan. At that time official inscriptions used the Egyptian language and script. Around 560 BCE the capital was relocated to Meroë, about 600 kilometers upriver. As the use of Egyptian language and script declined with the greater distance from Egypt, two native scripts developed for writing Meroitic:

- Meroitic cursive was for general use, and its appearance was based on Egyptian demotic.
- Meroitic hieroglyphs were used for inscriptions on royal monuments and temples, and their appearance was based on Egyptian hieroglyphs. (See *Section 11.4, Egyptian Hieroglyphs* for more information.)

After the fourth century CE, the Meroitic language was gradually replaced by Nubian, and by the sixth century the Meroitic scripts had been superseded by the Coptic script, which picked up three additional symbols from Meroitic cursive to represent Nubian.

Although the values of the script characters were deciphered around 1911 by the English Egyptologist F. L. Griffith, the Meroitic language is still not understood except for names and a few other words. It is not known to be related to any other language. It may be related to Nubian.

Structure. Unlike the Egyptian scripts, the Meroitic scripts are almost purely alphabetic. There are 15 basic consonants; if not followed by an explicit vowel letter, they are read with an inherent *a*. There are four vowels: *e*, *i*, *o*, and *a*. The *a* vowel is only used for initial *a*. In addition, for unknown reasons, there are explicit letters for the syllables *ne*, *te*, *se*, and *to*. This may have been due to dialect differences, or to the possible use of *n*, *t*, and *s* as final consonants in some cases.

Meroitic cursive also uses two logograms for *rmt* and *imn*, derived from Egyptian demotic.

Directionality. Horizontal writing is almost exclusively right-to-left, matching the direction in which the hieroglyphs depicting people and animals are looking. This is unlike Egyptian hieroglyphs, which are read into the faces of the glyphs for people and animals. Meroitic hieroglyphs are also written vertically in columns.

Shaping. In Meroitic cursive, the letter for *i* usually connects to a preceding consonant. There is no other connecting behavior.

Punctuation. The Meroitic scripts were among the earliest to use word division—not always consistently—to separate basic sentence elements, such as noun phrases, verb forms, and so on. For this purpose Meroitic hieroglyphs use three vertical dots, represented

by U+205D TRICOLON. When Meroitic hieroglyphs are presented in vertical columns, the orientation of the three dots shifts to become three horizontal dots. This can be represented either with U+2026 HORIZONTAL ELLIPSIS, or in more sophisticated rendering, by glyphic rotation of U+205D TRICOLON. Meroitic cursive uses two vertical dots, represented by U+003A COLON.

Symbols. Two ankh-like symbols are used with Meroitic hieroglyphs.