

AMALIA E. GNANDESIKAN 2009. *The writing revolution: Cuneiform to the Internet*. Malden, MA: Wiley-Blackwell. 328 pp. ISBN: 978-1-4051-5407-9.

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The writing revolution: Cuneiform to the internet is an extremely readable and informative book about the history of written language. Gnanadesikan's presentation of the world's major writing systems is informed by solid linguistic training, but this is not a book that only linguists will understand. On the contrary, anyone interested in the development of writing, even without a background in linguistics, will find the book accessible, while linguists will appreciate the well chosen technical information that is included in the description of each individual system. The reader will find useful illustrations of different systems throughout the text and an appendix with reference maps. There is also a section with further reading references for each of the writing systems explored, and a thorough index.

In the introductory pages, the author states that "[w]riting is one of the most important inventions of all time," (2) and indeed, throughout the book, the reader is repeatedly reminded not only of the utility of writing as a particularly powerful means of communication, but also of the incredible diversity and beauty of different scripts. The author also highlights the extra-linguistic nature of writing, the role written language has played in changing political and historical scenarios, and the motives behind the rise, fall, and mutation of scripts over time.

Writing today permeates the daily lives of much of the world's population, and speakers of the world's dominant languages are surrounded by written material. But Gnanadesikan is careful to point out that writing is not language itself, nor is it necessary to language, which is in its essence oral. Indeed, a great number of the minority languages spoken in the world today have no writing systems, and for those of us who work with speakers of these languages, endeavoring with them to strengthen their oral traditions, as well as, in many cases, to develop working orthographies for their languages, this book is a reminder that writing is both a technical and symbolic act. More than just the representation of concepts, syllables, or phonemes, writing reflects history, culture, and identities.

Following the introductory chapter, there are four chapters dedicated to the logographic writing systems developed by ancient Mesopotamian, Egyptian, Chinese, and Mayan civilizations. Writing came into use in the ancient world as a pragmatic response to the administrative and accounting needs of expanding civilizations, and the systematic use of written symbols to record information related to commerce constituted, in the author's words, the first "information technology revolution." (14).

Chapter 2 tells the story of the world's oldest writing system: Mesopotamian cuneiform, which came into being around 3400–3300 BC. Early cuneiform was comprised of some eight hundred logographic signs, of which nearly ten percent were numerical representations of different types of quantified entities. The rest were largely iconic symbols semantically related to commodities and trade. Early cuneiform efficiently represented information from this restricted semantic sphere, but it did not represent the grammati-

cal or phonological features of the spoken language. Such features were only to appear in the writing system some six hundred years later, and with increasing sophistication were gradually incorporated into the script as it expanded into new contexts of use. Over the next three millennia, cuneiform symbols became increasingly less iconic in nature. “Rebus writing”—the use of a single logogram to represent different words that *sounded* the same—and later syllabograms, or logosyllabic signs—used to represent individual syllables—became more common. Cuneiform script was borrowed and adapted by peoples in neighboring regions, with logograms giving way to syllabic, and later alphabetic, representations of languages from five different linguistic families. Yet despite the success of cuneiform, after more than three thousand years of use, it eventually died out and it was not until some eighteen hundred years later that cuneiform inscriptions were again deciphered, bringing us knowledge, albeit incomplete, of ancient languages long since silenced.

While writing developed in Mesopotamia primarily to aid state administration and to facilitate trade, we learn in chapter 3 that writing developed almost simultaneously in ancient Egypt with a third function: as a unique means of expressing religious devotion. Early Egyptian hieroglyphs, like cuneiform, consisted mainly of highly iconic logograms, the inventory of iconic symbols supplemented by phonograms of different types as well as unpronounceable signs for semantic determinatives. As was the case in the development of Mesopotamian script, the rebus principle applied early in hieroglyphic writing, and a single pictorial logogram came to be used for homophonous (though not synonymous) words. However, unlike cuneiform, for which early logograms represented entire words, the seventy or so basic hieroglyphic symbols represented a three-consonant semantic core (characteristic of Afro-Asiatic languages) rather than the individual words derived from them. In addition to the signs representing these tri-consonantal word cores, hieroglyphic script also contained some eighty signs representing bi-consonantal roots, and it was these signs to which the rebus principle first applied. From these, twenty-five more signs representing individual consonants evolved, forming what would be called the “hieroglyphic alphabet.” These signs could be added to bi- or tri-consonantal representations and functioned either as affixes or as phonetic complements emphasizing phonological readings.

Egyptian writing was thus linguistically sophisticated in its representation of semantic, phonological, and grammatical information. It was also aesthetically beautiful, and in its formal religious use in carved inscriptions and funerary texts, was highly conservative, and designed to be eternal. Writing for bureaucratic purposes, on the other hand, was more pragmatic and flexible, evolving into different hieratic and demotic scripts that reflected changes in the spoken language over time but which faded from use around 450 AD. From the third to seventh centuries, Coptic script, adapted from Greek alphabetic writing (the focus of chapter 12), came to be used to represent spoken Egyptian. For many centuries, knowledge of the meaning of ancient hieroglyphic writing was lost, and it was not until the 1820s, when Champollion deciphered the hieroglyphic, demotic, and Greek inscriptions on the Rosetta Stone, that ancient Egyptian script would once again be read.

Writing developed independently in two additional ancient civilizations: China (the topic of chapter 4), during the Shang dynasty between 1200 and 1040 BC, and Mayan Mesoamerica (addressed in chapter 5), around 400 BC. Following a path parallel to early Mesopotamian and Egyptian writing, Chinese writing began with iconographic logograms to which the phonologically-based rebus principle soon applied. However, rather than “af-

fixing” phonological and semantic determinative signs to core logograms, Chinese writing compounded these additional elements into complex characters. The practice of writing for bureaucratic purposes caught on quickly, and with the unification of the Chinese States around 210 BC came the unification of written characters first into an “official” set, and later into a more economical “clerical” script that formed the base for modern Chinese characters. Because of its essentially logographic (in other words semantic, rather than phonological) nature, standard Chinese script has come to be used to represent languages that, while similar in grammatical structure, vary widely in their spoken forms. It has thus served an important political function as a badge of national identity, symbolically unifying speakers of at least seven distinct languages into a single Chinese civilization. In addition to the development of a unique script, the Chinese also advanced the spread of literacy to the masses by inventing an accessible material on which things could be written: paper, this innovation representing what Gnanadesikan considers the “second information technology revolution.”(69).

In faraway ancient Mesoamerica, several different graphical record-keeping systems also independently arose, but it was only the Mayan hieroglyphic script that developed into a true writing system representative of spoken language. The origin of Mayan glyphs goes back to the Mayans’ cultural predecessors, the Olmecs, whose complex calendar graphically recorded historical information related to Olmec kings and the dates of their important feats. Beginning in the Classic period of Mayan civilization (AD 200 to 900) and continuing until the Spanish Conquest in the 1500s, writing flourished and a significant number of codices were produced, of which only four survived the Spanish conquest.

One of the most striking features of Mayan glyphs is that they are highly pictorial, and for many centuries, the phonological aspects of the script were not recognized as such. Analysis of Mayan script is indeed still incomplete, partly due to the small number of surviving texts available for analysis, and partly due to variation used in “spelling” representations. It is now known that the seven hundred or so glyphs actually form a logosyllabary functionally similar in many respects to cuneiform. Glyphs generally represent CV sequences arranged in a block. Each block contains a larger main sign, often a root, surrounded by smaller affixal signs contributing phonetic detail as well as grammatical information. Mayan script contains a rich variety of spelling representations, and there are, moreover, certain subsets of glyphs that are substitutable in similar contexts if they represent the same sound, the same meaning, or are members of categorial paradigms (much like paradigms of inflectional morphemes). Such variation adds to the complexity of the script and the difficulty of decipherment.

Chapters 6 through 8 direct the reader’s attention to syllabic scripts, specifically to the ancient Greek syllabary known as Linear B, the two syllabaries used for Japanese, and the syllabary developed to represent Cherokee. Like other ancient peoples who developed writing systems for record-keeping, the Bronze Age Mycenaean Greeks (1600 to 1100 BC) graphically recorded bureaucratic information with a mixture of numeric symbols, pictorial ideograms representing specific entities, and stylized lines forming a set of some ninety signs representing the CV syllables of the oral language. After the fall of the Mycenaean regime and the destruction of its representative city-states, Greece entered into a Dark Age in which the Linear B script, never employed for cultural or historical information, was eventually lost. Decipherment of Linear B and its recognition as a representation of

ancient spoken Greek was long in coming, mostly because it indicated a language so phonologically and grammatically different from modern Greek that it was long supposed to represent a completely different spoken language.

Chapter 7 describes the simultaneous use of three different scripts—two syllabaries as well as Chinese ideograms—to represent the Japanese language. The first script to be used was Chinese, which was introduced into Japanese culture between the third and fifth centuries AD. Because it was the first writing system with which the Japanese had contact, initial efforts to write Japanese involved direct adaptation of this known script. However, given the vast differences between Chinese and Japanese grammatical structures, it soon became clear that further adaptations of the script would be required. A set of over five hundred Chinese characters, *kanji*, came to be used exclusively as representations of phonological, rather than semantic, values, resulting in the rather cumbersome *man'yōgana* syllabary employed between the eighth and twelfth centuries. In the ninth century, *hiragana*, the first of two native syllabaries for Japanese, evolved from cursive *man'yōgana*, and was comprised of a smaller set of fifty much simplified curved signs. Parallel to the development of *hiragana*, an abbreviated form of *man'yōgana* came into use in religious contexts, and was systematized into a second Japanese syllabary with fifty angular signs known as *katakana*. These two native syllabaries occupied different literary environments: *katakana* was employed primarily in the world of male Buddhist scholarship, while *hiragana* was used by literate women for fictional writing. Nowadays, all three scripts are used simultaneously in Japanese texts, occupying different functional spaces. Generally, *kanji* represents the more open lexical classes—nouns, verbs, and adjectives, *hiragana* is used for more functional classes of morphemes such as auxiliary verbs, adverbs, particles, and inflectional suffixes, and *katakana* is reserved for emphasis or to signal that a word is a lexical borrowing.

Chapter 8 tells of the creation of the Cherokee syllabary, by the undoubtedly enlightened (though himself illiterate) speaker of the language, Sequoyah, in the early 1800s. Sequoyah's remarkable invention came about as the result, on the one hand, of his observations that the writing used by whites was both a powerful political tool and a pragmatic means of communication over long distances. He realized that the Cherokee people, who were undergoing forcible removal to a number of different geographic locations, could benefit from such a tool, and he set himself the task of creating one. Sequoyah's success in this endeavor came from his recognition of the phonological structure of words in general—that they are comprised of smaller syllables recurring in different contexts—and his understanding of the fairly simple structure of syllables in Cherokee. This led him to elaborate an eighty-five sign syllabary, that, although not perfectly representative of all the phonological features of the language, nevertheless proved to be simple for native speakers to learn and memorize. Sequoyah's syllabary was wildly successful throughout most of the nineteenth century, but its use declined in the early twentieth century, when policies promoting native-American "assimilation" were at their peak. Cherokee script was later revived in the 1970s alongside the movement for indigenous civil rights and policies promoting bilingual education. By this time, however, many Cherokee spoke English as their first language and were attaining literacy in its alphabetic script. For these primarily second-language learners of Cherokee, the native syllabary was viewed as rather hard to master and as lacking in essential phonetic information. Nevertheless, it is still used in

certain significant contexts among the Cherokee, and stands as an example of autonomous development and extraordinary linguistic insight.

Alphabetic writing systems, the focus of chapters 9 through 13, come in various forms, but all share a common feature in that each symbol (ideally, though not always in practice) represents an individual phoneme or distinct sound within the phonological system of the spoken language. The earliest alphabetic writing systems, from the Wadi el-Hol valley in Egypt and from West Semitic languages, represented only consonantal phonemes and are known as *abjad* alphabets. Such systems follow logically from the basic structure of these languages, in which sets of words are derived from consonantal cores expressing a basic semantic concept, with vowels serving inflectional functions. Early Semitic scripts—Ugaritic, Phoenician, Aramaic, and Hebrew—followed these principles, though they added, over time, innovations such as a fixed alphabetical order, additional letters representing long vowel sounds (short vowels generally remained un- or optionally represented by diacritics), and spaces between words.

Despite the fact that the spoken languages of the Middle East come from a number of different language families, most systems of writing throughout the region derived from old Aramaic, a popular and practical script comprised of twenty-two symbols, which spread alongside spoken Aramaic while it was still a regional lingua franca. In the end, however, Aramaic script outlasted the spoken language and was adapted and adopted into Arabic, Persian, and Iranian scripts. It further made its way east and was used in the writing systems for Altaic Uighur, Mongolian, and Manchu languages. Of these many systems, Arabic is today the most widely used Aramaic-derived script, though it has added six new consonant letters and additional layers of symbolic representation of short vowels, geminate consonants, and the glottal stop.

Chapter 10 focuses on the traditional scripts of India—some twenty-five in all—of which twenty-two derive from a common source. The earliest scripts date from around 250 BC and show some similarities to Aramaic, though it is believed that while Aramaic writing may have been an inspiring influence in their development, it was not borrowed in this case. Unlike Semitic consonant scripts, early Indian scripts represented both the consonant and vowel phonemes of spoken language, though in contrast to Western alphabets, vowels were represented as appendages to consonant symbols rather than elements occurring in linear sequence.

Early Indian writing was used primarily for administrative tasks, but it found a new, and more exalted, function with the development and spread of Sanskrit literature. The ancient *brāhmī* script was adapted to Sanskrit literary use and spread throughout the subcontinent, growing in status and remaining as the written language of culture long after the death of spoken Sanskrit. In contrast to the consistency of literary Sanskrit, scripts derived from *brāhmī*, but representing different vernacular languages, diverged greatly, resulting in a multiplicity of regional Indian writing systems. Sanskrit scripts were moreover adapted to represent a number of Southeast Asian languages from the Austro-Asiatic, Tai, and Tibeto-Burman families, as well as some Austronesian languages.

The remarkable story of the Korean writing system, *han'gŭl*, created by King Sejong in the fifteenth century, is the focus of chapter 11. Gnanadesikan dubs Sejong's creation the "paragon of scripts," (191) and with good reason: it is a script not only based on phonological properties, but one whose symbols actually *represent* features of phonetic articulation.

Consonant symbols are divided into five classes corresponding to the place of articulation of each consonant within the mouth, and the symbols represent these locations visually. The three basic vowel symbols also relate to the positions of the tongue in articulation. Consonant-vowel symbols are composed into syllabic blocks further marked for differences in pitch-accent. The script thus represents the phonology of the language with incredible clarity and is a tool easily learned by speakers. Although Chinese writing was widely employed and enjoyed prestige status in Korea at the time *han'gŭl* was introduced, the new system took root and over the next two centuries became increasingly more popular, eventually emerging in the late nineteenth century as the official script of Korean.

Chapters 12 and 13 discuss the Greek and Latin alphabets. The Greek alphabet derived from Phoenician consonantal script sometime in the eighth century BC, and was the first script to represent both vowels and consonants in linear sequence, though Gnanadesikan points out that it never achieved strict phoneme-symbol correspondence. Widespread Greek literacy was a byproduct of the Classical Period (480 to 323 BC) and the spread of Athenian democracy. However, it was the Greek alphabet reformed during the Ionian Enlightenment that eventually spread to lands conquered by Alexander, along the way undergoing further modifications, incorporating diacritics for phonological features such as pitch-accent and differences in laryngeal properties, and developing separate sets of capital and minuscule letters.

The Greek alphabet was widely borrowed, first by the Etruscans and later, in the sixth or seventh century BC, by their neighbors to the south, the Latin-speaking people of Rome. It was thus a derived version of the Greek alphabet, with some newly incorporated symbols, that accompanied the expansion of the Roman Empire and of Christianity, being further modified into local forms such as the Coptic alphabet of third-century BC Christian Egypt and the European Gothic and Cyrillic alphabets. With territorial expansion, the Roman alphabet underwent changes related to informal and formal contexts of use as well as adaptations brought on by contact with competing local scripts, one example being the incorporation of certain Anglo-Saxon runes into the script used for Old English and Nordic languages. The script used for the Latin language itself was standardized only much later, under Charlemagne in the eighth century AD, the result of this standardization being the common alphabet used for all of Latin's daughter languages, English, and a large number of orthographies newly-developed for minority languages.

In the final chapter of the book, Gnanadesikan discusses the history of the technology of printing, which she considers to be the third "information technology revolution" (71) and an essential element in the development of the modern world. Mass production of and widespread access to the written word was made possible by the concurrent inventions of cheap and accessible paper and the printing press. Printing turned writing into a form of communication directed to the masses; increasing access to printed writing led to the spread of literacy, the founding of universities, and the consolidation of vernacular literatures. It also eventually led to printing as a business and eventually to the development of modern means of "personal" printing such as the typewriter or the computer printer. The book ends with speculation as to what the impact of such direct "unmediated" production of writing will eventually be.

The wealth of historical and linguistic information in this book is particularly relevant for people developing orthographies for endangered or minority languages. In such

situations, linguists are often called upon to rather quickly propose orthographies that prioritize technical (phonological) features, and speakers of minority languages are often anxious to move quickly toward standardizing written forms. However, Gnanadesikan makes it clear throughout the book that all writing systems involve both technical and political symbolic features, the balance between the two depending on particular historical contexts that change over time. As the chapters on ancient writing systems show, the conservative nature of writing is such that scripts that may have closely reflected the linguistic features of a spoken language at a particular moment can persevere long after the spoken language has changed or even died out.

As orthographies are being developed, we should thus be mindful of the essential differences between oral and written forms of language and we should strive to help the populations we work with to evaluate thoughtfully the kinds of *purposes* they envision for each. Moreover, as the Japanese, Korean, and Cherokee cases clearly demonstrate, it is important to consider the particulars of whom the writing system is being developed *for*, as the features of orthographies developed for native speakers of a language may be quite different from orthographies directed toward second-language learners.

Although we tend to view writing as essentially a communicative tool—and it is undeniably powerful in this respect—this book also reminds us of the vast political force of writing systems: their ability to promote the inclusion of minority linguistic groups into wider social contexts, their roles as markers of unique ethno-linguistic identities, or as tools for aggregating diverse linguistic populations within a single symbolic system. Decisions related to orthography development must thus take political, historical, cultural, *and* linguistic information into consideration, and this book is an excellent resource for anyone involved in this complex endeavor.

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