

The Development of Writing and the Turks

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Abstract

People who learned to speak struggled to put their words, thoughts, and feelings into writing, and as a result, they developed writing. Initially, they succeeded in transcribing their words through murals, then figurative writing, and finally the alphabet. This article briefly touches upon the history of writing, followed by an explanation of the development of the alphabet and printing press. The introduction of the printing press in the Ottoman Empire revealed the inadequacy of the Arabic elifba for Turkish. The alphabet debates that arose as a result continued from political and technical perspectives, and the Turkish abece came into use with the letter reform in 1928. This article evaluates the necessity of the letter reform from a technical perspective.

Keywords: Picture writing, Mural, Hieroglyph, Abjad, Elifba, Alphabet, Abece, Sumerians

Introduction

People who could speak sought a solution to make their words, thoughts, and feelings permanent. Initially, they attempted this with wall paintings, and later, they developed writing. It is known that the Sumerians developed cuneiform to keep tax and financial records around 3200 BC. Cuneiform was also used by societies living in the Middle East and Anatolia. Egyptian hieroglyphs and later the Phoenician alphabet (abjad) followed. The Phoenicians taught the abjad to the Greeks, who adapted the abjad to their own language, creating the Greek alphabet. The Göktürk alphabet is said to have been inspired by the Phoenician alphabet.

It's clear that the alphabet is the cornerstone of writing and facilitates communication between societies. Some societies view their alphabets as a tool and symbol of maintaining national unity, such as Koreans, Indians, Greeks, Armenians, Georgians, Arabs, and Hebrews. Some rulers developed new alphabets to sever ties between the societies they ruled and other communities, or forced the use of a different alphabet than the one used by the communities they sought to prevent communication with. The reason for Cyrillic in the Iron Curtain countries and Arabic for the Uyghurs is clear.

It is known that some communities made changes to their alphabets. With the 1928 Letter Revolution, Turkey abandoned the Arabic elifba and adopted the Turkish abece, based on the Latin alphabet. The driving forces behind this revolution can be considered political and technical. The aim of this article is to evaluate the transition to the Turkish abece from a technical perspective. To contextualize this issue, it was deemed necessary to first introduce writing, then the abece, and then the printing press.

Development of Writing

It is believed that humans began speaking approximately 150.000 years ago. People who began speaking attempted to make their words or thoughts permanent and to convey them to others. In their earliest attempts, they attempted to express their words or thoughts through images. Paintings drawn on cave walls during the Paleolithic period, 50.000-12.000 years ago, provide evidence for these ideas. A mural dated between 17.000



Figure-1: A wall painting from the Lascaux cave

and 15.000 BC, found in the Lascaux cave in southwestern France, is shown in Figure-1 [1,2]. This mural depicts a wounded bull, a human, and a bird.

Similar wall paintings were also seen on the walls of caves dating back to the Neolithic period (Polished Stone Age: 10.000-6.000 BC) during archaeological excavations at Pessejik Tepe, near Ashgabat, the capital of Turkmenistan. The wall painting, using red and black colors (Figure-2), depicts hunting, animals fleeing from a hideous creature, and a hunter in front of them [3].

Until recently, it was said that the history of writing dates back 6.000 years, but M. Ercan, the director of the Göbeklitepe excavations, stated that the scene on a stela found during the excavations at Göbeklitepe (Figure-3) could be the "first pictogram" because it describes an event thematically [4]. It is estimated that Göbeklitepe was built 12.000 years ago.



Figure-2: Wall painting on Pessejik Hill

Sumerian Writing

The first example of writing was discovered around 4.000 BC in the Sumerian city of Uruk, on the banks of the Euphrates River in Mesopotamia. A poem found there tells the story of its invention as follows [5]:

(Enmerkan and the Lord of Aratta)

*Because the messenger's mouth was tired and he could not repeat (the message),
the Lord of Kulaba rubbed some clay and placed words on it like tablets.*

Until then, writing had not been written on clay.

The Sumerians developed cuneiform, writing shapes representing words (logograms), syllables, and numbers on clay tablets, as paper was not yet available. Written with a reed pen, the Sumerian script is named cuneiform because of its resemblance to a woodcutter's dagger. Sumerian script is considered the first form of writing in history and is believed to have spread from this region to the world through trade, treaties, and culture. Beginning in the 26th century BC, Sumerian script was adapted into Akkadian, then Hurrian, and Hittite. While Ugaritic and Old Persian cuneiforms are similar in appearance to Sumerian cuneiform, they differ from it.

In addition to writing, the Sumerians made significant contributions in mathematics, astronomy, and medicine. The base-60 number system, used today as a time measurement, was created by the Sumerians. The Sumerian invention of assigning values into numbers based on their position within the number. The number base they used was 60, so the weights of the digits, from right to left, are 60^0 , 60^1 , and 60^2 . This method of assigning values based on the position of numbers within the number is not seen even in the Ionian, Phoenician, and



Figure-3: Göbeklitepe

Roman numeral systems [6]. Although the base 60 is said to be the number assigned to God, 60 must have been chosen because it is the smallest number with the most divisors (it can be divided by 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, and 60). The concepts of an hour being 60 minutes, a minute being 60 seconds, and a circle being 360 degrees are all inherited from the Sumerians. The number 12 has a similar property. For this reason, the length of the day is divided by 12.

Historians maintain that the Sumerians were definitely not a Middle Eastern nation and migrated to this region from elsewhere. Archaeological studies in the Anau (or Anav) region (near present-day Ashgabat, Turkmenistan) suggest that the Sumerians may have originated in this region. Objects found in archaeological excavations at the Anau region support this view. While S. N. Kramer claims that history began in Sumer [7], R. Pumpelly suggests that an earlier or contemporaneous civilization existed in the Anau region [8].

It has been determined that Sumerian was an agglutinative language and that its lexicon contains 168 Turkish words [9]. Assuming that they arrived in Mesopotamia from the Anau region, it can be said that the Sumerians and the Turks were at least neighbors or relatives in the past.

Efforts to decipher cuneiform began with the Achaemenid royal inscriptions, written in three languages, and in 1836, the Sumerian inscriptions, following the Old Persian cuneiform, were deciphered. G. Smith, R. E. Hincks, J. Oppert, and Rawlinson contributed to the decipherment of cuneiform.

The Epic of Gilgamesh, which recounts the evolution of Gilgamesh, king of Uruk, from cruelty to humanity, from fear to salvation, and from immortality to mortal life, was written in cuneiform in Sumerian, Akkadian, and Assyrian. A copy of the Epic of Gilgamesh is currently on display in the Süleymaniye Museum in Baghdad (Figure-4).

The Kadesh Peace Treaty, signed between the Hittite king Hattusili III and the Egyptian pharaoh Ramses II (in 1280 or 1286 BC), concerning the division of Syrian lands between the two states, was written in cuneiform. The **Kadesh Treaty** is currently in the Istanbul Archaeological Museum (Figure-5), and a replica of it is on display at the entrance to the United Nations building in New York.

M. İ. Çığ and H. Kızılyay report that there are approximately 70.000 cuneiform tablets in the Istanbul Archaeological Museum [10]. These tablets were collected from excavations conducted between 1883 and 1937 in the Mesopotamian cities of Adab, Assur, Kiş, Lagaş, Nippur, Puzrişdagan, Sippar, Şuruppak, Umma, Uruk, and the Anatolian cities of Hattusa and Kaniş. The tablets were preserved and classified under the direction of Dr. Kraus.



Figure-4: Epic of Gilgamesh



Figure-5: Treaty of Kadesh

Egyptian Hieroglyphics

Writing was an important tool in Egyptian life, with exclusive use granted to administrators, temple officials, and soldiers. Although S. Geffrey and some researchers claim that Egyptian hieroglyphs were inspired by Sumerian script [11], N. Simson disagrees with this view and argues that Egyptian hieroglyphs developed independently [12].

Egyptian hieroglyphs, which had fallen out of use after the 7th century, were later deciphered. In 1798, Napoleon Bonaparte launched an expedition to conquer Egypt, but he was unsuccessful. In 1799, engineer Captain Bouchard, who participated in this expedition, discovered an inscribed stone near the town of Rosetta. Known as the Rosetta Stone, the inscription, which featured hieroglyphs at the top, Demotic in the middle, and Ancient Greek at the bottom, caught Bouchard's attention. The British army, arriving in Egypt after the French, forcibly seized the stone from Bouchard and sent it to London (the Rosetta Stone is currently on display in the British Museum). The French commander, believing the stone's inscription to be significant, made an ink copy before handing it over. The stone's inscription was deciphered after extensive research by the French linguist J. F. Champollion, who correlated the Greek and hieroglyphs (1824). As a result of these studies, it was understood that the shapes in hieroglyphic writing corresponded to letters and phonemes and that the writing was phonetic.

Egyptian hieroglyphs, as previously defined, are considered a form of figurative writing. In hieroglyphic writing, literally meaning *sacred carving*, images represent the objects they depict, but they generally correspond to specific sounds or sound clusters. Although hieroglyphs are perceived as Egyptian, there are also Hittite hieroglyphs and Mayan hieroglyphs, which have no connection to Egyptian hieroglyphs.



Figure-6: An example of Egyptian hieroglyphic writing

Early Semitic Alphabet

Since Semitic workers working in Egypt were prohibited from using hieroglyphs, they developed the Abjad alphabet (the name of the alphabet comes from its first letters: *elif, be, cim, dal*) أبجد around 1800 BC, inspired by Egyptian hieroglyphs. This writing method is considered the predecessor of today's alphabets. In Abjad, an attempt was made to write a letter for each sound. Abjad consists only of consonants, and the vowels between consonants are expected to be formed by the speaker. For this reason, Abjad was called the Consonantal Alphabet by P. T. Daniels (1990) [5].

Phoenician Alphabet

The Phoenician alphabet is thought to have emerged around 1200 BC and was developed by the Phoenicians, who called themselves Canaanites, for the Phoenician language. The Phoenician alphabet is thought to have been inspired by the Early Semitic alphabet. Many modern alphabets in use today, such as the Arabic, Aramaic, Hebrew, and Greek alphabets, are derived from the Phoenician alphabet. The Phoenician alphabet is considered an alphabet because it assigns a letter to each sound. However, because it lacks vowels, some linguists describe it as a *consonantal alphabet* [11].

Archaeological remains related to the Phoenician alphabet are naturally found in modern-day Egypt and Lebanon. One inscription written in the Phoenician alphabet is the Marseilles Inscription, found in Tuscany, Italy. This inscription, read in Turkish by Kazım Mirşan, refers to "*letters that enable the reading of the writings that enable the people to understand the victories achieved in the name of God.*"

The Phoenician alphabet, written from right to left, is shown in Figure-7. The Phoenician alphabet was transmitted by a seafaring nation to the nations bordering the Mediterranean. Following these

transmissions, the Arabic, Greek, and later Latin alphabets emerged. The names of the letters in the Arabic alphabet, developed between the 2nd and 4th centuries, are identical to those of the Phoenician alphabet and are called *elifba*. Like the Phoenician script, the Arabic script is written from right to left. The Phoenician alphabet was the first alphabet used by the Hebrews. After the Babylonian exile (6th century BC), they began using the Aramaic alphabet, derived from the Phoenician alphabet. The letter names of the alphabet are the same, and the writing direction is from right to left. There is no distinction between uppercase and lowercase letters in the Phoenician alphabet [13,14,15]. This same feature is also seen in the Arabic and Hebrew alphabets.

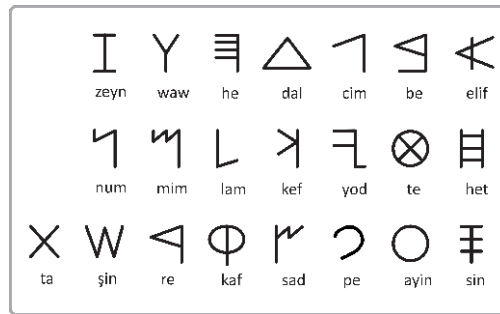


Figure-7: Phoenician alphabet

The historian Herodotus (499-449 BC), born in what is now Bodrum (Türkiye), wrote that the Phoenicians were the nation that taught writing and civilization to the Greeks. The Greeks changed the shapes and writing direction of the Phoenician alphabet; they also began using consonants that had no equivalent in Greek for Greek vowels. Thus, they derived the vowels **A** from *elif*, **E** from *he*, **I** from *yod*, **O** from *ayin*, and **U** from *vaw*; in other words, they used these letters as their own vowels [16]. Historical records indicate that these studies were carried out in the 9th century BC. The shapes of the letters in the Greek alphabet, which became the alphabet, evolved over time, creating the concepts of lowercase and uppercase letters, and changing the writing direction from left to right.

The Old Latin alphabet is said to have been derived from the alphabet of the Etruscans [15], who formed in Italy in the 6th century BC from the fusion of Trojans and Scythians (Sakas) of Turkish origin. The letters Y and Z were taken from the Greek alphabet into this alphabet. Later, letters from other alphabets were added, and it acquired its current form [17].

Gokturk Alphabet

The Gokturk alphabet was used in the inscriptions on the Orkhon monuments. This alphabet contains 26 consonants, 4 vowels, and 8 compound letters (we can call them vowels). The letters are written separately from right to left. Words are separated by placing a ":" between them. Some call the Gokturk alphabet the Runic alphabet because the shapes of the letters are similar to those in the Scandinavian Runic alphabet. The existence of a relationship between the Scandinavian and Gokturk alphabets is being investigated. In the Gokturk alphabet, phonemes correspond to a letter or a vowel. For example, a downward arrow-shaped symbol is used for the vowels *ko* and *ku*, and double-ended symbols are used for the sounds *a* and *e*. Incidentally, it is said that the Gokturk alphabet is derived from the Aramaic alphabet, which itself was derived from the Phoenician alphabet, and that it was transmitted to the Gokturks by the Sogdians. The Gokturk alphabet is shown in Figure-8 [17,18,19].

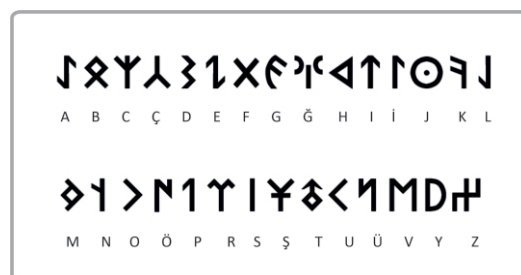


Figure-8: Gokturk alphabet

Other Alphabets

The Cyrillic alphabet, used in Russia and neighboring countries, was developed for the Slavs by the brothers Cyril and Methodius in the 9th century. During the Soviet era, the Russians mandated the use of the Cyrillic alphabet for nations under their rule. Today, countries that have achieved independence have begun to abandon this alphabet.

It was prepared in 1444 at the request of King Sejong of Korea and named the Hangeul alphabet. It is a phoneme-based alphabet and is today the official alphabet of Korea. It contains 14 consonants and 10 or 11 semi-vowels (diphongs). In addition, there are five double consonants, but these are not included in the alphabet. Each phoneme consists of a vertical, horizontal, and rounded element. Figure-9 shows the phoneme structure in the Hangeul alphabet.

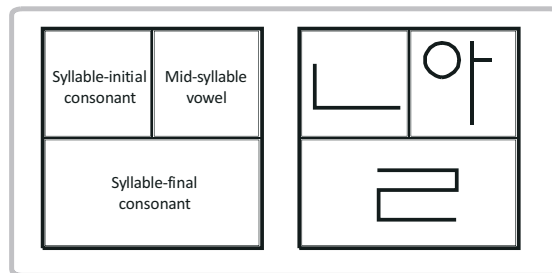


Figure 9: Hangeul alphabet

Chinese, a monosyllabic language, uses symbols corresponding to each phoneme for writing, so it's not considered an alphabet. To achieve alphabetic characteristics, corresponding graphemes are added to each phoneme.

Written texts are one of the most powerful means of communication between people. Therefore, some rulers, seeking to prevent their societies from communicating with other societies, have resorted to alphabetic changes.

Figure-10 shows the alphabets derived from the Phoenician alphabet in time. The evolution of the letters in the Phoenician alphabet into the Arabic alphabet, the Greek alphabet, the Latin alphabet, and the Turkish alphabet is shown in Table-1.

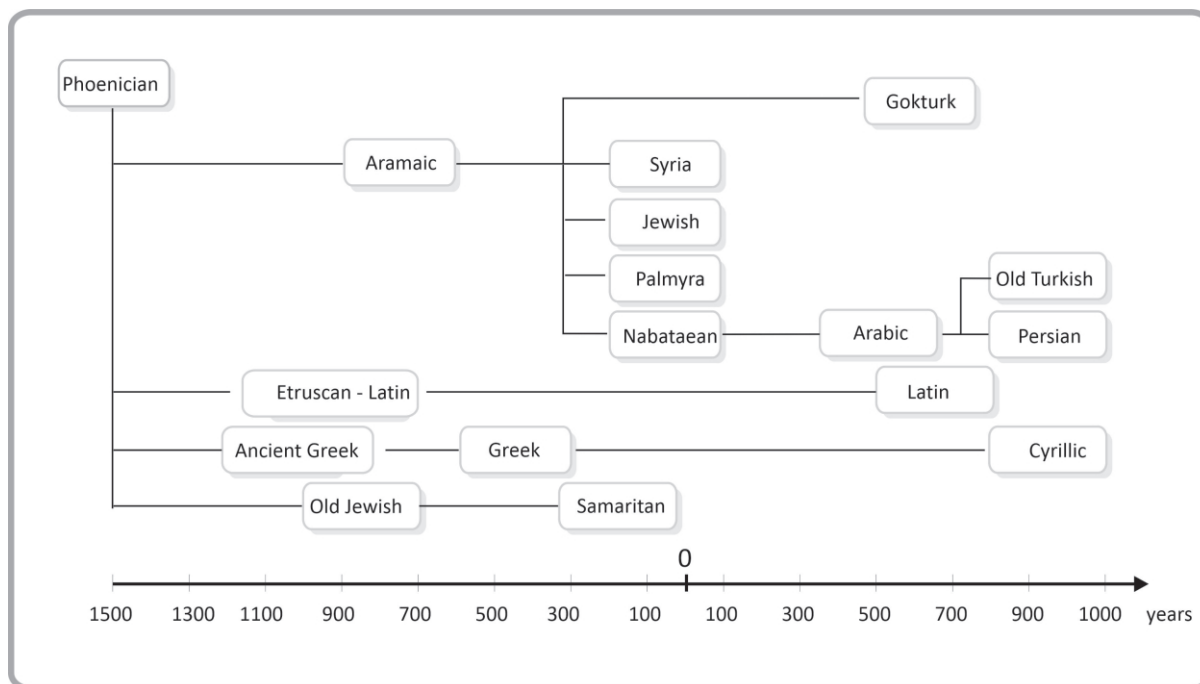


Figure-10: Development of the alphabet over time

What is the Alphabet?

People invented writing to make their words and thoughts permanent, and the alphabet to create it. Writing also enables the transformation of writing into speech. Therefore, we can say that "the alphabet is a tool for transforming words into writing and writing into speech."

Before discussing the characteristics and capabilities of the alphabet, it's helpful to remember some definitions:

Phoneme: The smallest unit of meaning in a language.

Grapheme: A letter or combination of letters representing a phoneme.

Homography: Words with the same spelling but different meanings.

Allomorph: An allomorph is a variant phonetic form of a morpheme, or in other words, a unit of meaning that varies in sound and spelling without changing the meaning.

Transparent alphabetic languages: Languages in which the phoneme and grapheme correspond are called transparent languages. For example, Turkish, Italian, Finnish, and Hungarian.

Opaque alphabetic languages: Languages in which the phoneme and grapheme do not correspond are called opaque languages. For example, German, English, and French.

In languages with transparent alphabets, each grapheme corresponds to a ser. This can be called a one-to-one relationship. In languages with opaque alphabets, a phoneme is written with multiple letters, or a grapheme forms a different phoneme. For example, in English, the words *mine*, *my*, and *pie*, which contain the same phoneme /aɪ/, are written with different graphemes. The reverse is also true. For example, the phoneme equivalents of the letter **a** in the words *fate*, *pat*, and *wash* differ.

English has three morphemes /s/, /z/, and /éz/ to make a word plural: *kicks (-z)*, *cats (-s)*, and *sizes*.

In English, which uses the opaque alphabet, a phoneme can be written with multiple phonemes. For example, the word *thought* has seven letters but only three graphemes: *th-ough-t*. The word *vehicle*, which has seven letters, has two phonemes: *vi-híkl*.

In English, the same phoneme can be written as different graphemes: *to*, *too*, *two*, *write*, *right*; the same grapheme can be pronounced as the same phoneme, but the meaning of the word is different: (past tense of leave); the same grapheme can be pronounced as different phonemes: *bear* (animal), *bear* (to carry).

Table-1: Abjad - Elifba - Alphabet - Abece Transition

Phoenician	Arabic	Greek	Latin	Türk
𐤀	ا	α	ā	■
𐤁	ع	■	a	a
𐤂	ب	β	b	b
𐤃	ج	χ	c	c
■	■	■	■	ç
𐤄	ذ د	δ	d	d
■	■	ε	e	e
𐤅	ف	φ	f	f
𐤆	■	γ	g	g
■	غ	■	■	ğ
𐤇	ه	η	h	h
𐤈	ح	■	■	■
■	■	■	■	ı
■	■	ι	i	i
𐤉	ي	φ	j	j
𐤊	ك	κ	k	k
𐤋	ل	λ	l	l
𐤌	م	μ	m	m
𐤍	ن	ν	n	n
𐤎	■	ο	o	o
■	■	■	■	ö
𐤏	پ	π	p	p
𐤐	ق	θ	q	■
𐤑	ر	ρ	r	r
W	ص	σ	s	s
■	س ش	■	■	ş
X	ط ت	τ	t	t
Υ	■	υ	u	u
■	■	■	■	ü
■	■	ϖ	v	v
■	و	ω	w	■
𐤒	■	ξ	x	■
𐤓	ي	ψ	y	y
I	ز	ζ	z	z

As can be seen from the above, English, which uses a opaque alphabet, presents difficulties in writing and reading. To address the ambiguities in English spelling rules, French and English language teachers, led by French linguist Paul Passy, founded the International Phonetic Association (IPA) in 1887 [20]. Their goal was to develop an alphabet for English, in accordance with the rule of "using a letter for each sound," suggested by the Roman alphabet. The IPA failed to achieve its goal, but the IPA alphabet, or phonetic alphabet, developed with this in mind, later became a standard for other languages. Such problems, encountered in languages that use opaque alphabets, are rarely encountered in transparent languages.

In Turkish, a transparent language, the word "yar" has two meanings: "cliff" and "beloved." When used in the sense of "cliff," the letter "a" is pronounced short, while when used in the sense of "lover," it is pronounced long. Given that the word for "cliff" is Turkish and the word for "lover" is Persian, it can be argued that there are no homonyms in Turkish words, or the problem can be solved by writing the second word as "yâr." It's natural that there were many homonyms in the period when Arabic letters with vowel points were used. Some of these are shown in Table-2. The names of the Arabic letters are listed for clarity:

Table-2: Homonyms Written in Arabic Alphabet

With Arabic alphabet	Arabic alphabet letters from right to left	Different pronunciations
كل	kef + lam	gel, kel, gül
او	elf + vav	ev, av, o
ات	elif + te	et, at
اوت	elif + vav + te	ot, evet
اون	elif + vav + nun	on, ön, un
دول	dal + vav + lam	dol, dul, döl, düvel
كورك	kef + vav + re + kef	kürk, kürek, körük, gevrek, görk, görün

When developing an alphabet for a language, care is taken to ensure it covers all the sounds of that language. However, it's difficult to claim that this is fully achieved. The same language is spoken differently depending on the region in which it is spoken. Therefore, the most eloquent spoken form of a language is assumed to be its standard form, and the alphabet is compiled accordingly. However, changes can occur over time. Alphabets do not reflect the rich variety of sounds in spoken language, nor do they reveal specific aspects such as stress and intonation.

The Kananis adapted the Phoenician Abjad alphabet to their own language. Because the Arabs were of Semitic origin, they easily adapted the Phoenician Abjad to their own language and named it Elifba (Elif+be). As previously described, the Greeks added vowels to the Phoenician Abjad and, by clipping and pasting the first two letters, named their alphabet "Alpha" (Alpha and Beta). For the Turkish abece, the Turkish spoken in Istanbul was accepted as the standard language, and special attention was paid to ensuring its transparency. Because the Arabic Abjad, which had only three vowels, was used before the Turkish alphabet, it was necessary to add vowels to the Turkish alphabet. Because the initial consonants in the Arabic alphabet were not used in Turkish words, they were not incorporated into the Turkish abece. For example, the letters **d** were used for *dal* and *dat*, **h** were used for *ha*, *ğhı*, **s** were used for *se*, *sin*, *sad* and **t** were used for *t* and *te*.

In the Turkish abece, all letters except **ğ** correspond to a phoneme. The letter **ğ** is used in three ways:

- 1 - At the end of a vowel, it causes the preceding vowel to be pronounced longer: for example, *sağlamak: sa:lamak, doğanmak: do:mak*
- 2 - If it occurs between two identical vowels, it causes the preceding vowel to be pronounced longer: *sağnak: sa:nak, yığit: yi:t, düğün: dü:n*
- 3 - Between different vowels, the vowels are not prolonged but merge: *Sağuk: souk, doğan: doa*

Problems with spelling rules are a common problem encountered when writing words borrowed from other languages. It is known that there was much debate on this issue during the Turkish Language Revolution. Some even argued that loanwords from Arabic into Turkish could not be written in the Turkish abece. Their claim may be true; the solution lies in using Turkish words for the loanword.

The transparency or opacity of a language's alphabet is considered a significant factor in teaching that language. According to the 1897 Ottoman Statistical Yearbook, the literacy rate at that time was 10,5%. The census conducted in 1927, the last year in which Arabic letters were used, found the literacy rate to be 10,7%. The fact that the literacy rate rose to 19,25% in the 1935 census can be considered a success of the transparent alphabet [21]. The magnitude of this success can be better understood when one considers that the literacy rate reached zero in 1928.

Printing Press

Th Bossert says that for the idea of the printing press to come to mind, the following three conditions must be met.

- 1 - An alphabet with few letters
- 2 - Society's desire to read
- 3 - Paper

Bosset continues: It has been assumed that the printing press was also invented in China because paper was invented in China. However, since it is known that Chinese writing is a pictogram and requires at least 1.000 characters, it is difficult to say that the printing press was invented in China. In the 7th century, the Uyghurs, neighbors of the Chinese, had reached a high level of civilization, had a very simple alphabet, and a large number of educated people. During archaeological excavations in the Tun-Huang region, where the Uyghurs lived, wooden printing letters (hurufat) were found in a cave before 1209. These finds prove that the Chinese adopted the printing press from the Uyghurs [22].

The One-Piece Mold Era

It is known that the inlaid seal method was used in ancient times as proof of identity. The desired images were created by scraping a flat or cylindrical surface with a cutter, thus creating a seal. The images on the seal were then pressed onto wax, clay, or paper, which was then melted into the seal, thus providing documented identity proof. Figure-11. Based on findings, it is said that printed fabrics were produced by the Hittites around 7000 BC by imprinting a pattern onto fabric [23].

The printing technique first used in China in the 7th century is called woodblock printing. The single piece of wood used for printing blocks was usually obtained from a palm or pear tree. The text to be printed was first written on a sheet of paper. The paper was glued to the wooden frame, with the written side facing the wood. Then, using a chisel, the shapes on the paper were carved into the wooden block (Figure-12). Thus, the single-piece block was prepared. During the printing process, ink was applied to the surface of the block, the paper was laid on the block, and a soft mallet was moved over the paper to transfer the ink to the paper, thus imprinting the text on the block onto the paper.

While woodblock printing played a significant role in the dissemination of knowledge and commercial transactions in China, it was a technology that took a long time to implement. For example, in 971, the monk Zhang Tuxin



Figure-11: Seal samples

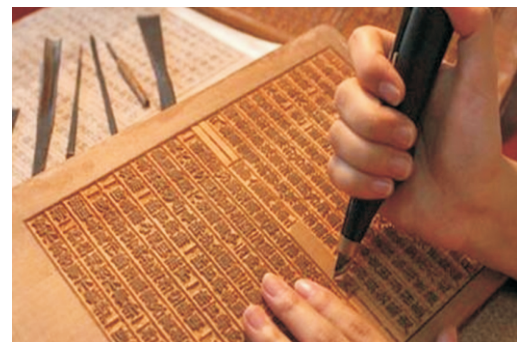


Figure-12: Preparation of a single-piece mold

began printing the Tripitaka (a collection of core Buddhist scriptures) using woodblocks, completing the printing of Tuxin's 1.076 volumes in twelve years.

The earliest works printed using woodblocks include the "Buddhist Spells" (765-771) printed by the Japanese Empress Shotoku, the "Diamond Sutra" (868), thought to be the first book printed in China, and the 130-volume classic "Chinese Artworks" (933) [24].

The limitations and difficulties of woodblock printing led to the adoption of movable type printing. Woodblock printing was also used in Japan and Korea.

Movable or Repeatable Font

It's clear that single-piece molds, prepared for one page, couldn't be used for any other. To solve this problem, efforts were made to create molds for each letter or image, and to arrange them side by side for printing. Individual wooden blocks were carved to create relief molds for each letter and symbol. These molds, which we might call letterforms, were arranged side by side and used in printing. After the letterforms for each letter were arranged side by side, their tops were inked, making them ready for printing, just like a single wooden block. When the printing of the relevant page was completed, the letters were removed and stored for the next printing.

The movable type printing process reduced printing time from several days to a few hours. However, it was not as efficient as Gutenberg's printing press because of the thousands of symbols (ideograms) required to write Chinese.

In the 9th century, the Mongols put an end to the Uyghur civilization and spread throughout Europe. Meanwhile, they took the printing press they had obtained from the Uyghurs to Germany, which they occupied in 1241. German archaeologist Albert von Le Coq, who conducted studies in Turkestan, supports this view [25].

In 1440, goldsmith Johannes Gutenberg made a significant invention in printing technology. Gutenberg conceived of preparing individual metal molds for each letter of the alphabet (these molds were called *hurufat* in printing), and arranging these letters side by side in a frame to create a printing plate. It is known that the inspiration for this idea was the printing press brought by the Mongols from Asia. The small number of letters in the German alphabet and the fact that texts were written in discrete letters were also a stroke of luck for Gutenberg. In the printing system Gutenberg developed, sufficient metal pieces of type were carved for each letter, punctuation mark, and space, and these were stored in designated compartments. To prepare the printing plate for a page, individual letters were placed side by side, spacers were placed between words, and flat strips were placed between lines. Once the typesetting process was completed, the entire type was then framed by wrapping it with string or using a vise. A sample type cabinet and a small typesetting machine are shown in Figure-13. Gutenberg developed his envisioned printing press

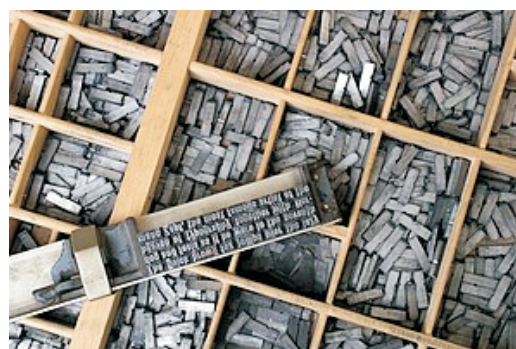
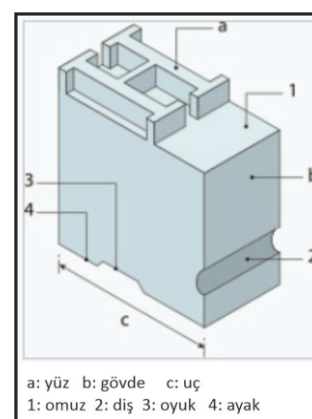


Figure-13: A font box and a frame consisting of four lines



Figure 14: An example of Gutenberg's printing press



a: yüz b: gövde c: uç
1: omuz 2: diş 3: oyuk 4: ayak

Figure-15: Letter H

into commercially usable form in 1454. This machine is shown in Figure-14, and the typeface for the letter H is shown in Figure-15.

In the movable typeface technique, each letter typeface was prepared in three stages:

Design: Each letter, number, and punctuation mark is worked on paper. This stage is considered the artistic stage. The typeface is given a name. For example, Calibri, Futura, Swiss, Araboğlu, Emin. Because typefaces (now called *fonts*) possess artistic qualities, they are considered copyrighted works, and copying is prohibited. Different sizes are used for each letter, number, and punctuation mark. The point unit is used to measure the vertical length of a typeface. One point is 1/72 inch, or 0,353 mm. Figure-16 shows how to scale a typeface for the Turkish alphabet, and Figure-17 shows how a similar process is performed for the Arabic alphabet.

Inlay and Mold: Each element of the typeface is carved onto a hard metal (steel) called papa. The papais pressed onto a soft plate, such as copper, to create a copper mold of the inlaid shape.

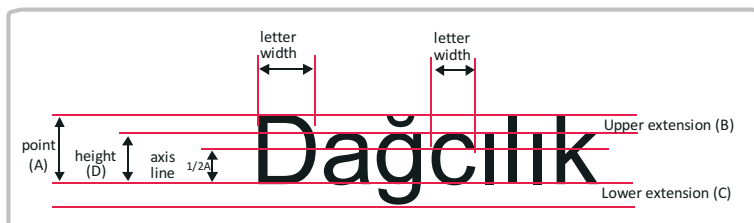


Figure-16: Scaled font design for the Turkish alphabet

Casting: Molten lead is poured into a mold to produce the desired number of typefaces.

In the printing press developed by Gutenberg, the printing plate was placed on a table. Ink was applied to the plate with rubber mallets. The paper to be printed was placed on a flap attached to the table by a hinge. The flap, which carried the paper, was then closed over the table. After this step, the table was pushed into the press, and a screw lever was pulled to press the paper against the plate with a certain amount of pressure. As can be seen from the description, this process was repeated for each page and required considerable physical effort.

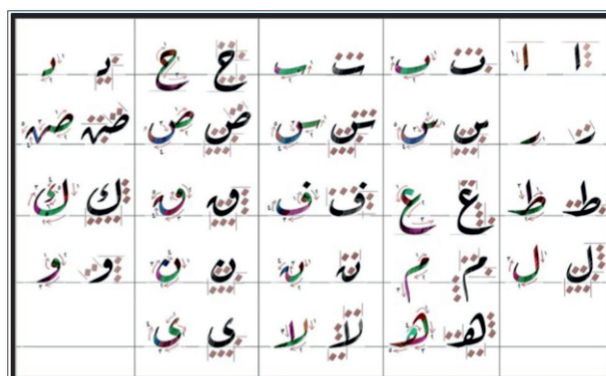


Figure-17: Scaled font design for Arabic letters (Rik'a)

Gutenberg's invention evolved over time, providing people with easy and affordable access to books. Therefore, it is considered an important invention. By 1500, more than 1.700 printing houses were operating in 300 European cities, and it is estimated that 40.000 books were printed in 15-20 million copies during this period, and that 1.5 million books were printed in 1.4 billion copies by the mid-17th century. Among the printed books, the Bible, translated from Latin into German by M. Lüter, held an important place. It is said that approximately 100.000 German Bibles were printed by 1500. As is known, this translation led to important developments in the Christian world. Regarding the printing press, invented by Gutenberg, Francis Bacon (1561-1626) said, "*The three elements that ushered in the modern age were the printing press, gunpowder, and the compass*" [26].

Jews who migrated from Spain to Ottoman lands in 1492 brought with them a printing press and began operating the first printing house in Istanbul in 1493 or 1945. Printing houses were subsequently opened in Thessaloniki, Edirne, and Izmir, where the Jewish population was large. These printing houses printed books in Hebrew, Spanish, Greek, and Latin, but Turkish and Arabic were not permitted. The printed books were predominantly religious. [27]

The establishment of a Turkish printing press in Ottoman lands emerged in the context of Westernization during the Tulip Era (1718-1730). Encouraged by these developments, İbrahim Müteferrika prepared a

report (*Vesilet-üt tıbâa*) explaining why the first Turkish printing house should be established (1726). The recommendations and opinions contained in this report, in modern Turkish, are as follows:

- 1 - Reproducing books considered important to society (dictionaries, history, geography, government affairs, etc.) will be beneficial for the public and intellectuals.
- 2 - Printing valuable works written since the early days of Islam will ensure their dissemination to Muslims.
- 3 - Printed books will be more readable, more beautiful, and more accurate than handwritten ones, and will also make life easier for both readers and those who teach them.
- 4 - Printing is a profitable business. Thousands of books can be printed with the labor required to produce a single volume. Because books will be cheaper, everyone can benefit from this.
- 5 - By including a table of contents at the beginning and an index at the end of books, access to relevant topics and information will be easy.
- 6 - Since printing press-printed books are cheaper to produce, they will also be accessible to those living in rural areas.
- 7 - The establishment of libraries in cities will ensure easy access to books for students.
- 8 - Ottoman sultans enhanced the honor of Islam through their wars. They will also serve Muslims through book publishing.
- 9 - Europeans recognize the value of Arabic, Persian, and Turkish books and are printing them. These books contain numerous errors and lack eloquence. They aim to sell these inaccurate books to Islamic countries. The Ottomans must do this before they do.
- 10 - Muslim communities are increasingly in need of books. The Ottomans possess the resources and skills necessary to establish a printing house. Allowing the establishment of a printing house would enhance the Ottoman Empire's prestige.

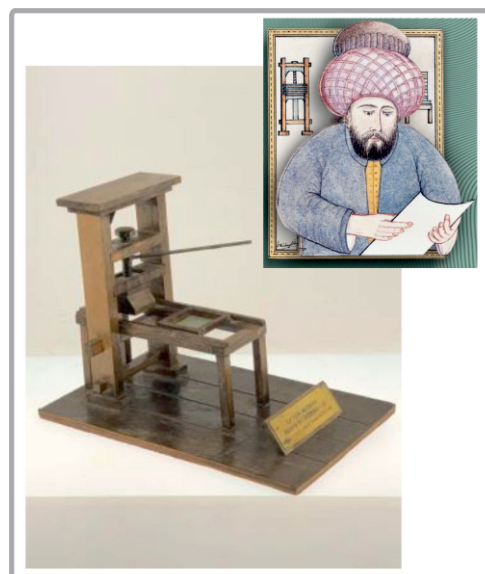


Figure-18: İbrahim Müteferrika and the printing machine he used

İbrahim Müteferrika presented his report to Grand Vizier Damat İbrahim Pasha and requested permission to establish a printing house. Sultan Ahmet III, with the approval of the Sheikh al-Islam, granted the necessary permission (1727). Calligraphers, fearing that the establishment of the printing house would reduce their business, objected to the permit. To overcome this resistance, they promised that religious books such as the Quran and Hadith would not be printed at the press. İbrahim Müteferrika formed a partnership with Mehmet Sait Efendi, son of Yirmisekiz Çelebi Mehmet Efendi, to establish the printing house.

During the period of Müteferrika's printing house (1728-1742), 23 volumes and 17 books were printed. Eleven of these were on history, three on languages, and the others on geography, magnetism, and military affairs.

The total number of books printed in the Arabic alphabet in the Ottoman Empire and Türkiye between 1729 and 1928 (approximately 200 years) is estimated to be 30.839. The number of books printed in the Turkish alphabet between 1929 and 1938 was 16.063 [28, 29].

The Process of Transition to the Turkish Alphabet

The Turks used the Göktürk and Uyghur alphabets in Central Asia. The Orkhon monuments are written in the Göktürk alphabet, the originals of the Divanu Lugâti't-Türk and Kutadgu Bilig are written in Uyghur, and the reproductions are written in Arabic. The Turks migrating westward interacted with the Persians, at which time they adopted Islam and began using the Arabic alphabet. At this time, they considered the letters *ç*, *j*, and *p*, which the Persians had added to the Arabic alphabet, appropriate for Turkish. They added the *lamelif*, a combination of the letters *lam* and *alif*, to form the 32-letter Arabic alphabet. In creating this alphabet, they disregarded the elimination of consonants that had no Turkish equivalent and the inclusion of existing vowels.

It is observed that in the 13th century, when the Arabic script was first applied to Turkish, the Turks did not pay attention to the rules of spelling, but towards the 15th century, they made efforts to make this script transparent. It can be said that the spelling rules were established to a certain extent towards the end of the 15th century [30]. Until the Tanzimat period, there were occasional opponents to the Arabic script. One of these opponents was Katip Çelebi. Çelebi stated that "*he had never seen a correctly written book in his lifetime*" and expressed the inadequacy of the Arabic alphabet and writing method [31]. Opposition to the Arabic alphabet and writing method increased during the Tanzimat period. We can attribute this to the experiences of Müteferrika when his printing house was established. Two problems were encountered:

The inadequacy of the Arabic alphabet for Turkish writing and the technical problems encountered in combining the letters of the Arabic alphabet written adjacently are explained below:

- The three vowels of the Arabic alphabet (*ä*, *i*, *u*) were insufficient for the vowel-rich Turkish language. This deficiency in the Arabic alphabet led to significant errors in writing. For example, the words *gel*, *kel*, and *gül* had to be written with the same letters. For all three words, only the letters *kef* and *lam* were used. Instead of *k*, *kef* was used for the sound *g*. Because there were no vowels in writing, any vowel could be placed between *k* and *l*; in other words, *gel* (*come*), *gül* (*rose*), *kel* (*bald head*) were written the same way. This situation was widely demonstrated during the celebrations of the Alphabet Revolution. Figure-19. The letter *vav* was used for the Turkish sounds *o*, *ö*, *u*, *ü*, and *vav*; *y* for the sounds *ı*, *i*, and *y*; and *kef* for the sounds *g*, *k*, *ñ*, and, in some cases, *n*.
- The Arabic alphabet may be considered sufficient for Turkish consonants, but it falls short of representing vowels. Some consonants are incompatible with Turkish consonants. For example, there are no Turkish consonant equivalents for the letters "*te*," "*zel*," and "*sad*."
- Since there was no distinction between uppercase and lowercase letters in the Arabic alphabet, proper names could not be written in a distinguishable way.
- Because the Arabic alphabet is a mat alphabet, there is no corresponding grapheme for each phoneme. For example, the phoneme *s* in the words *sene*, *tesir*, and *sabir* was represented by the letters *sad*, *se*, and *sin*, respectively; the phoneme *h* in the words *hal*, *halk*, and *hava* was represented by the letters *he*, *hi*, and lips letter *hi*, respectively; and the phoneme *z* in the words *zalim*, *ufak*, *lezzet*, and *zikir* was represented by the letters *cel*, *re*, *dat*, and lips letter *dat*, respectively.



Figure-19: A photo from the alphabet revolution celebrations

- There were no corresponding letters. For example, the letter *elif* was pronounced as *ä* or *e* at the beginning of a word, and as *ä* in the middle and end. The letter *vav* was used for the sounds *o*, *u*, *ü*, and *ö* in the middle and end of a word. In some cases, it only produced the sound *v*. The letter *he* was used to produce the sounds *e* or *h* within a word. If a word begins with *ı* or *i*, the letters *elif* and *ye* are placed side by side to form the sounds *ı* and *i*.
- In a study conducted on Turkish texts written in the Arabic alphabet (on 10.525 words), the phoneme-grapheme correlation was found to be 21,14%. When the same text was written in the Turkish alphabet, the same correlation was found to be 95,33% [21].

The technical problems encountered in combining Arabic alphabet letters are explained below.

- In Arabic script, letters are written continuously (cursively). The plain form of a letter changes at the beginning, middle, and end of a word. Figure-20 shows the four forms of the letter *be*.

Alone	At the end	In the middle	At the beginning
ب	ب	ب	ب

Figure-20: 4 forms of the letter *Be*

- Letters are divided into two groups: plural and inplural. The letters *elif*, *dal*, *zel*, *ra*, *ze*, *je*, and *vav* can be pluralized to the letter preceding them, but not to the letter following them. The other letters are plural.
- The way letters that can be added can be combined can vary. For example, the letter *h* did not connect at the same level as the letters before it. This problem was resolved in 20th-century letters. Figure-21 shows examples of these special combinations and their current application. Figure-22 shows an example of a page printed at the Mütefferrika Printing House, where the letters do not connect at the same level and shape.

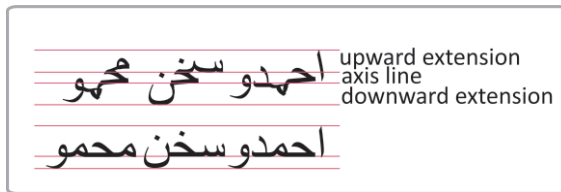


Figure-21: Special cases in adding letters

- As mentioned earlier, the first Turkish printing house was founded in Istanbul by İbrahim Mütefferrika, together with Sait Efendi, on December 16, 1727. It was observed that the different writing of Arabic letters at the beginning, middle, and end of words, as well as their being written in conjunction, made typesetting difficult. In the early stages, 720 types of typeface were prepared for typesetting. The casting of these types of typefaces was carried out in Italy. Figure-23 shows the types of typefaces for Neskhi script and their arrangement in the case, prepared by Mühendisyan in 1883 [32]. Examining the figure reveals that special types of typefaces were used to combine certain letters with others. İbrahim Şinasi combined the Arabic Neskhi and Kufic scripts, reducing the number of types to 112, and printed his works in this manner in his own printing house. Ebuzziya Tevfik reduced the number of types to 110 with the typeface he prepared in 1884.



Figure-22: Gülşen-i Hulefa printed in Mütefferrika Printing House

- Turkish calligraphers transformed Arabic script into an art form and developed various forms of writing within this framework. The most commonly used script in Quranic writing is called Nesk. The Nesk script was particularly used in religious and other texts. To ensure that non-Arabic speakers could read the Quran correctly, they employed vowel points (e) added above and below the letters. The "üşte" (e) and "ötrü" (ü) added above the letter served as the vowel point, while the "eşe" (i) added below served as the vowel point. Among the important calligraphers of Nesk script were Sheikh Hamdullah and Hafiz Osman. The designs of these calligraphers were utilized in the preparation of printing typefaces. Among the vowel points, the "şedde" (pronounced "single letter" read twice) was not used in Turkish texts. As seen in Figure-22, no vowel points were used in book script. It is clear that adding vowels would make the typeface more complex.

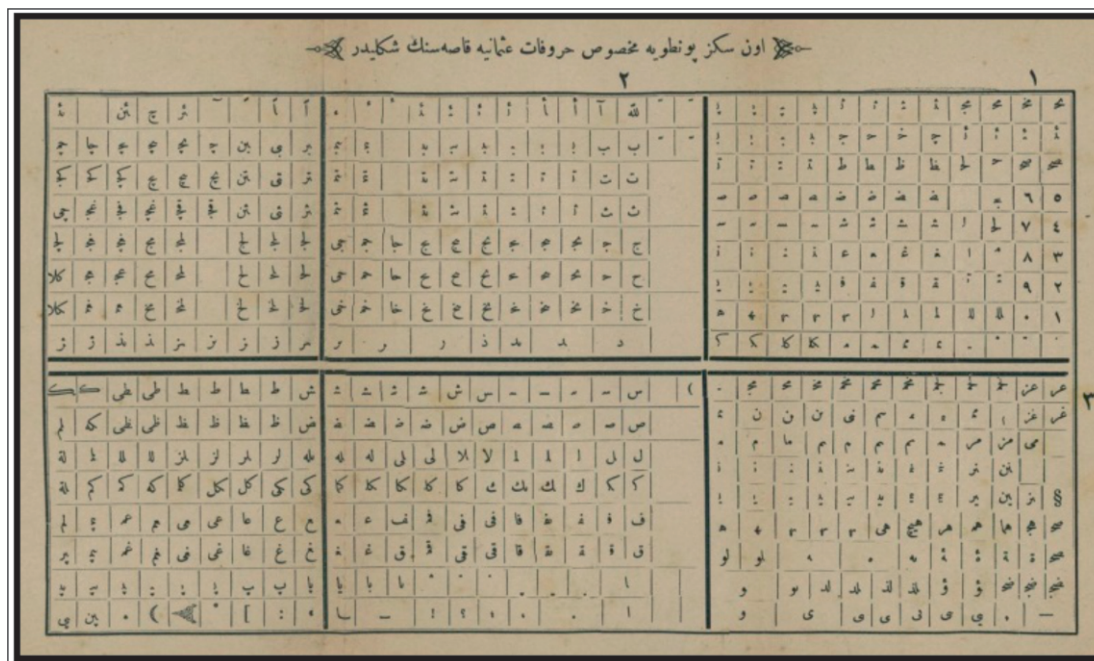


Figure 23: The layout of the 516-piece letter case of the Nesih typeface, produced by Mühendisyan in 1883. (Archives of Ömer Durmaz and Emin Nedret İşli).

- Thuluth is another type of script used primarily for artistic purposes. It is very similar to Naskh, but its letters are larger and its lines are thicker. Another type of script used in artistic works is Talik. These scripts are not suitable for printing. The script used primarily for everyday writing is called Rik'a and is not intended for artistic use.

Two conflicting views existed regarding the solution to the alphabet problem that arose from the printing press: the first argued for improving the Arabic alphabet for printing; the second argued for developing an alphabet based on the Latin alphabet for Turkish. These debates were driven by political as well as technical considerations.

In the late 19th century, Namık Kemal, Ali Suavi, and Şemsettin Sami argued for the need to improve the Arabic alphabet. While Namık Kemal advocated improving the Arabic alphabet, he opposed changes to the script, particularly the use of the Latin alphabet.

In a lecture given on May 12, 1862, at the Ottoman Scientific Society, of which he was a member, Münif Pasha stated that the Arabic alphabet could not represent certain sounds in Turkish, especially vowels. Ahmet Cevdet Pasha supported this view. Ziya Gökalp advocated switching to the Latin alphabet.

During the reign of Şükrü Bey, Minister of Education during the Second Constitutional Era, attempts were made to implement separate letters. Enver Pasha, in accordance with the principle of one letter for one sound, abandoned the use of different Arabic letters at the beginning, middle, and end of words and instead

worked towards writing letters in separate letters. He developed the alphabet known as the Ordu Elifbas, Hatt-ı Cedit, or Enver Pasha Alphabet (Figure 24). This alphabet was ordered to be used in army correspondence, but it failed to provide the expected benefits and caused confusion. Dr. Milaslı Hakkı Bey, Cihangirli M. Şinasi, İsmail Hakkı, the literary scholars Ali Nusret, Ahmet Hikmet, and Celal Esad supported the method with their books and articles.



Figure-24: Enver Pasha Alphabet

When the Crimean War began in 1855, the Istanbul-Shumen telegraph line was laid to ensure communication between Crimea and Istanbul. Initially, communication was made in French over this first telegraph connection, and later, the Turkish Morse Code was developed by Mustafa Bey, and this Morse Code was used in telegraph communication until the Alphabet Revolution [33], Figure-25.

Letter	Morse	Letter Sound	Letter	Morse	Letter Sound	Letter	Morse	Letter Sound	Letter	Morse	Letter Sound
A	•—	ا A	I	••	خ H	Q	—•—•—	ض D	Y	—•—•—	ئث K
B	—•••	ب B	J	•—•—•—	د D	R	••••	ط T	Z	—•—••	ل L
C	—••—•	پ P	K	—••—	ذ Z	S	•••	ظ Z	Ş	—•—•—•—	م Ch
D	—••	ت T	L	•—••	ر R	T	—	ع A	Ö	—•—•—•	ن Ö
E	•	ث S	M	—•—	ز Z, ل	U	••—	غ G	A	•••—	و V
F	••—•	ج C	N	—••	س S	V	•••—	ف F	H	••••	ه H
G	—•—•	چ Ç	O	—•—•—	ش Ş	W	••—•—	لا La	Ü	••—	ی Y
H	••••	ح H	P	•—•••	ص S	X	—••—	ق K		—•••—	ء E

Figure 25: Morse alphabet arranged by Mustafa Efendi (slightly modified by İzzet Bey): Morse alphabet arranged by Mustafa Efendi (slightly modified by İzzet Bey)

During the years of Abdulhamid II's tyranny, changes and innovations to the Arabic alphabet were prevented. The issue resurfaced during the Second Constitutional Era. The Ministry of Education established commissions to correct and regulate the rules of letters and spelling, and private associations such as the Islah-ı Huruf Society were also established.

These debates continued until the 1928 Alphabet Revolution. The alphabet, approved in 1928 and called the Turkish Abece, is a phonetic alphabet; it consists of 21 consonants and 8 vowels. During the development of the Turkish alphabet, attempts were made to assign a letter to each phoneme. Languages with a phonetic alphabet are described as "*pronounced as written, written as pronounced.*" As mentioned earlier, these alphabets are called transparent alphabets. It is difficult to find a natural language that is written as pronounced and read as written. It is not possible, nor is it necessary, to represent all the elements that distinguish spoken language from written language, such as stress, intonation, melody, and pauses, in written form, with a standard alphabet. Just as spoken language influences the alphabet, writing influences speech. One of the first attempts to represent phonemes with one-to-one graphemes was undertaken by the IPA.

Parallel to the expansion of the Ottoman Empire, Arabic and Persian words began to enter the language. After a while, Arabic became the language of science, and Persian the language of literature. Education in madrasahs began to be conducted in Arabic. As a result of these developments, the language spoken in Istanbul shifted from Turkish to Turkish, becoming the language spoken in rural areas. In such a mixed language, spelling and scientific rules also broke down. Borrowed words began to be written as they were in the language they were adopted from. This created the necessity of memorizing the spelling of words. Arabic and Persian influences began to be seen in phrases. For example, prefixes were added to words,

breaking the principle of adjectives preceding nouns, and even new words were coined according to Arabic and Persian rules. Some of these developments aimed at corrupting Turkish include:

- **Bâb-ı âlî:** بابعلی The Great Gate; **bâb:** door; **âlî:** great, sublime; both are of Arabic origin, the adjective comes after the noun.
- **Dersââdet:** درسعادت The Gate of Happiness, Istanbul; **der** (Persian): door, passage; **sa'âdet** (Arabic): happiness, the adjective comes after the noun.
- **Hıfzıssihha Institute:** حفظ الصحة Health Measures Institution; **hıfız** (Arabic): protect, prevent; **el-sihha** (Arabic): health, **institute** (French): institution, **-sü** (Turkish). The adjective comes after the noun, the article el precedes the word **sihha**, only the suffix **sü** is in Turkish.
- **Nâmevcut:** ناموجود Not present; **na** (Persian negative suffix): , **mevcut** (Arabic): existing, found. The Persian negative suffix was added to the Arabic word.
- **Tayyâre:** طیاره Airplane; A Turkish word derived from the Arabic word **tayerân** (to fly)

Turkish is a language rich in vowels. While the Turkish alphabet has eight vowels, our language is known to have only 13.

- **Long front "a":** This sound is produced at the front of the tongue and is long. It is usually seen in words borrowed from Arabic. For example, the "a" in *ilave, mana*.
- **Front "a":** This sound, overlaid with a hat, is produced at the front of the tongue. It is usually seen in words borrowed from Arabic. For example, the "a" in *kâr, hâl*.
- **Centralized "o":** This is a sound borrowed from Western languages. Its origin is toward the center of the tongue. For example, the "o" in *alkol, gol, rol*.
- **Centralized "u":** This is the "u" sound found in some words borrowed from Arabic. It is written with a hat overlaid. Its origin is toward the center of the tongue. For example, the "u" in *Halûk, mahlûk*
- **Closed "e":** The "e"s in the two Turkish words "yel" and "gel" are different sounds. The "e" in "yel" is more closed than the "e" in "gel."

According to these explanations, it can be said that there are a total of 13 vowels in modern Turkish [34]. Therefore, there are 13 vowel phonemes in Turkish, but only 8 corresponding vowel letters. It is also known that "ğ" tends to transform into "y" when it comes next to a back vowel and to lengthen the vowel when it comes next to a back vowel [35]. For these reasons, significant problems were experienced in writing Turkish with Arabic Alphabet.

From mid-August 9, 1928, until the end of the year, two alphabets were used in newspapers and official offices, but from the beginning of the year 1929, only the Turkish abece was used. The adoption of the new alphabet naturally caused controversy. Those who opposed the new alphabet said;

- They argued that the Turks had been severed from their past,
- Fewer people would read old publications,
- One day, all people would become illiterate.

Those who defended the new alphabet argued that:

- Learning to read and write with the Arabic alphabet was very difficult, and therefore the literacy rate in society was very low.
- The Turkish alphabet could rapidly increase the number of literates.

- The Turkish alphabet could rapidly increase the number of literates,
- Arabic letters were insufficient for the printing press.
- The Arabic alphabet was inadequate for Turkish and caused spelling errors.

Public schools were opened to disseminate the new alphabet, and these schools quickly achieved success. Table-3 shows the performance of the public schools.

Table-3: Performance of Public Schools

Years	Number of Courses	Number of Teachers	Number of Students (Ö)	Number of graduates(M)	Ratio (M/Ö) %
1928-29	20.489	16.922	1.045.500	526.881	50,39
1929-30	12.937	11.307	544.534	245.663	45,11
1930-31	9.602	8.940	352.902	172.322	48,82
1931-32	5.915	5.437	205.349	99.491	48,44
1932-33	5.107	4.084	157.639	80.559	51,10
Total	54.050	46.690	2.203.924	1.124.916	48,78

Considering that Turkey's population was 14.832.724 in 1927, and that those educated were middle-aged (approximately 30% of the population), it can be easily said that half of the population was educated within five years.

Literacy rates in Türkiye from 1927 to 2020 are presented in Table-4. Detailed data for 2010 and 2020 are shown in Figure-26. The results were calculated using data obtained from the Turkish Statistical Institute (TÜİK).

Table-4: Literacy Rates by Year

Years	1927	1935	1950	1960	1970	1980	1990	2000	2010	2020
Ratio %	11	20,4	33,6	40,1	55	66,7	80	86,5	88,9	94,8

Conclusion

Although nearly a century has passed since the alphabet reform, its beneficial or detrimental effects are still debated. As previously mentioned, the issue is discussed from a political perspective, not a technical one. This article focuses on the necessity of the alphabet reform and the technical evaluation of its consequences. From this perspective, we reach the following conclusions:

- The Arabic alphabet was developed for Semitic speakers and therefore meets the needs of these languages.
- Using the Arabic alphabet as is (with three additional letters) was not appropriate for Turkish. Consonants with no Turkish equivalent could have been omitted, and Turkish vowels could have been added.
- Because the Ottoman Empire was a multinational empire, each community used

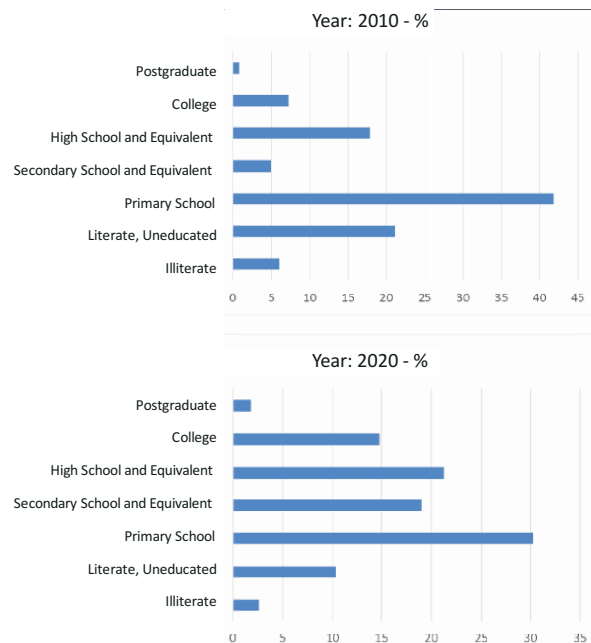


Figure-26: The status of literacy in 2010 and 2020

its own language and script. After the conquest of Istanbul, Turkish was influenced by Arabic and Persian. In this context, Arabic became the language of the madrasah, and Persian became the language of literature. However, these languages failed to find their place among the Anatolian Turks.

- After the establishment of printing for Muslims, the difficulty of typesetting with Arabic script was recognized. After extensive research, the number of typesetting characters was reduced from 700 to 110. The main problem was that the typesetting process was suitable for isolated letters, but not for cursive Arabic writing. The typesetting characters were designed for the syllabical form of the Naskh script. Because Turkish vowels cannot be accurately represented in syllabical script, the same written words can be pronounced very differently.
- Although attempts were made to write Arabic letters separately to facilitate typesetting, this was unsuccessful and caused confusion during the war. Therefore, its use was abandoned.
- The introduction of the telegraph presented a new problem. To address this, a Morse code based on Arabic letters was developed and used until the Alphabet Revolution.
- The alphabet was discussed from 1862 to 1928, and as can be seen from the foregoing, it was concluded that continuing to use the Arabic alphabet was an obstacle to adapting to the modern world. A Turkish alphabet, appropriate to the Turkish language and based on the Latin alphabet, was created and began to be used after a six-month transition period. Linguists and Atatürk participated in the development of the Turkish alphabet.
- While the literacy rate was 11% in 1927, this rate reached 33,6% 23 years later and 94,8% in 2020. This result is proof of the success of the Turkish alphabet.

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