

Braille System – a Chance for the Blind.

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Introduction.

I am a very curious person. If I hear a new word, I never leave it without a question: « What is this? ». And the word Braille was one of them.

Six dots. Six bumps. Six bumps in different patterns, like constellations, spreading out over the page. What are they? Numbers, letters, words. Who made this code? It was Louis Braille, a French 12-year-old, who was blind. And his work changed the world of reading and writing forever. Now practically every country in the world uses Braille. Braille books have double-sided pages, which saves a lot of space. Braille signs help blind people get around in public spaces. Moreover, that is most important, blind people can communicate independently, without print.

I was inspired by the example of Louis Braille. To my mind it is very important to be independent and, on the other hand, demanded in your life.

The aim of my work is to explore Braille's system and to show his contribution to the development of mankind. Besides, I want to learn more about disabled people who got a success and famous all over the world.

Biography

Louis Braille was born in Coupvray, France, a small town about twenty miles east of Paris. He and his three elder siblings – Monique Catherine (b.1793), Louis-Simon (b.1795), and Marie Céline (b.1797) – lived with their parents, Simon-René and Monique, on three hectares of land and vineyards in the countryside. Simon-René maintained a successful enterprise as a leatherer and maker of horse tack.

As soon as he could walk, Braille spent time playing in his father's workshop. At the age of three, the child was toying with some of the tools, trying to make holes in a piece of leather with an awl. Squinting closely at the surface, he pressed down hard to drive the point in, and the awl glanced across the tough leather and struck him in one of his eyes. A local physician bound and patched the affected eye and even arranged for Braille to be met the next day in Paris by a surgeon, but no treatment could save the damaged organ. In agony, the young boy suffered for weeks as the wound became severely infected; an infection which then spread to his other eye, likely due to sympathetic ophthalmia.

Louis Braille survived the torment of the infection but by the age of five he was completely blind in both eyes. Due to his young age, Braille did not realize at first that he had lost his sight, and often asked why it was always dark. His parents made many efforts – quite uncommon for the era – to raise their youngest child in a normal fashion, and he prospered in their care. He learned to navigate the village and country paths with canes his father hewed for him, and he grew up seemingly at peace with his disability. Braille's bright and creative mind impressed the local teachers and priests, and he was accommodated with higher education.

Braille studied in Coupvray until the age of ten. Because of his combination of intelligence and diligence, Braille was permitted to attend one of the first schools for blind children in the world, the Royal Institute for Blind Youth, since renamed to the National Institute for Blind Youth in Paris. Braille, the last of the family's children to leave the household, departed for the school in February 1819. At that time the Royal Institute was an underfunded, ramshackle affair, but it provided a relatively stable

environment for blind children to learn and associate together.

The children were taught how to read by a system devised by the school's founder, Valentin Haüy. Not blind himself, Haüy was a philanthropist who devoted his life to helping the blind. He designed and manufactured a small library of books for the children using a technique of embossing heavy paper with the raised imprints of Latin letters. Readers would trace their fingers over the text, comprehending slowly but in a traditional fashion which Haüy could appreciate. Braille was helped by the Haüy books, but he also despaired over their lack of depth: the amount of information kept in such books was necessarily small. Because the raised letters were made in a complex artisanal process using wet paper pressed against copper wire, the children could not hope to "write" by themselves. So that the young Louis could send letters back home, Simon-René provided him with an alphabet made from bits of thick leather. It was a slow and cumbersome process, but the boy could at least trace the letters' outlines and write his first sentences.

The handcrafted Haüy books all came in uncomfortable sizes and weights for children. They were laboriously constructed, very fragile, and expensive to obtain: when Haüy's school first opened, it had a total of three books. Nonetheless, Haüy promoted their use with zeal. To him, the books presented a system which would be readily approved by educators and indeed they seemed – to the sighted – to offer the best achievable results. Braille and his schoolmates, however, could detect all too well the books' crushing limitations. Nonetheless, Haüy's efforts still provided a breakthrough achievement – the recognition of the sense of touch as a workable strategy for sightless reading. Haüy's only personal limitation was that he was "talking to the fingers [with] the language of the eye."

Braille read the Haüy books repeatedly, and he was equally attentive to the oral instruction offered by the school. He proved to be a highly proficient student and, after he had exhausted the school's curriculum, he was immediately asked to remain as a teacher's aide. By 1833, he was elevated to a full professorship. For much of the rest of his life, Braille stayed at the Institute where he taught history, geometry, and

algebra.

Braille's ear for music enabled him to become an accomplished cellist and organist in classes taught by Jean-Nicholas Mairigues. Later in life, his musical talents led him to play the organ for churches all over France. A devout Catholic, Braille held the position of organist in Paris at the Church of Saint-Nicolas-des-Champs from 1834 to 1839, and later at the Church of Saint-Vincent-de-Paul.

Braille was determined to invent a system of reading and writing that could bridge the gap in communication between the sighted and the blind. In his own words: "Access to communication in the widest sense is access to knowledge, and that is vitally important for us if we [the blind] are not to go on being despised or patronized by condescending sighted people. We do not need pity, nor do we need to be reminded we are vulnerable. We must be treated as equals – and communication is the way this can be brought about."

In 1821, Braille learned of a communication system devised by Captain Charles Barbier of the French Army. Some sources depict Braille learning about it from a newspaper account read to him by a friend, while others say the officer, aware of its potential, made a special visit to the school. In either case, Barbier willingly shared his invention called "night writing" which was a code of dots and dashes impressed into thick paper. These impressions could be interpreted entirely by the fingers, letting soldiers share information on the battlefield without having light or needing to speak. The captain's code turned out to be too complex to use in its original military form, but it inspired Braille to develop a system of his own.

Braille worked tirelessly on his ideas, and his system was largely completed by 1824, when he was fifteen years old. From Barbier's night writing, he innovated by simplifying its form and maximizing its efficiency. He made uniform columns for each letter, and he reduced the twelve raised dots to six. He published his system in 1829, and by the second edition in 1837 had discarded the dashes because they were too difficult to read. Crucially, Braille's smaller cells were capable of being recognized as letters with a single touch of a finger.

Braille created his own raised-dot system by using an awl, the same kind of implement which had blinded him. In the process of designing his system, he also designed an ergonomic interface for using it, based on Barbier's own slate and stylus tools. By soldering two metal strips across the slate, he created a secure area for the stylus which would keep the lines straight and readable.

By these modest means, Braille constructed a robust communication system. "It bears the stamp of genius" wrote Dr. Richard Slating French, former director of the California School for the Blind, "like the Roman alphabet itself."

The system was soon extended to include Braille musical notation. Passionate about his own music, Braille took meticulous care in its planning to ensure that the musical code would be "flexible enough to meet the unique requirements of any instrument." In 1829, he published the first book about his system, *Method of Writing Words, Music, and Plain Songs by Means of Dots, for Use by the Blind and Arranged for Them*. Ironically this book was first printed by the raised letter method of the Haüy system.

Braille produced several written works about Braille and as general education for the blind. *Method of Writing Words, Music, and Plain Songs...* (1829) was revised and republished in 1837; his mathematics guide, *Little Synopsis of Arithmetic for Beginners*, entered use in 1838; and his monograph *New Method for Representing by Dots the Form of Letters, Maps, Geometric Figures, Musical Symbols, etc., for Use by the Blind* was first published in 1839. Many of Braille's original printed works remain available at the Braille birthplace museum in Coupvray.

New Method for Representing by Dots... (1839) put forth Braille's plan for a new writing system with which blind people could write letters that could be read by sighted people. Called decapoint, the system combined his method of dot-punching with a new specialized grill which Braille devised to overlay the paper. When used with an associated number table (also designed by Braille and requiring

memorization), the grill could permit a blind writer to faithfully reproduce the standard alphabet.

After the introduction of decapoint, Braille gave assistance to his friend Pierre-François-Victor Foucault, who was working on the development of his Raphigraphe, a device that could emboss letters in the manner of a typewriter. Foucault's machine was hailed as a great success and was exhibited at the World's Fair in Paris in 1855.

Although Braille was admired and respected by his pupils, his writing system was not taught at the Institute during his lifetime. The successors of Valentin Haüy, who had died in 1822, showed no interest in altering the established methods of the school, and indeed, they were actively hostile to its use. Dr. Alexandre François-René Pignier, headmaster at the school, was dismissed from his post after he had a history book translated into braille.

Braille had always been a sickly child, and his condition worsened in adulthood. A persistent respiratory illness, long believed to be tuberculosis, dogged him, and by the age of forty, he was forced to relinquish his position as a teacher. Despite the lack of a cure at the time, Braille lived with the illness for 16 years. When his condition reached mortal danger, he was admitted to the infirmary at the Royal Institution, where he died in 1852, two days after he had reached the age of forty-three.

Braille System

Each braille character or "cell" is made up of 6 dot positions, arranged in a rectangle comprising 2 columns of 3 dots each. A dot may be raised at any of the 6 positions, or any combination. Counting the space, in which no dots are raised, there are 64 such combinations (that is, 2 to the 6th power). For reference purposes, a particular combination may be described by naming the positions where dots are raised, the positions being universally numbered 1 through 3 from top to bottom on the left, and 4 through 6 from top to bottom on the right. For example, dots 1-3-4 would describe a cell with three dots raised, at the top and bottom in the left column and on top of the right column. In the original French, and also in English and all other languages written in the Roman alphabet, that pattern would most often be used for the letter "m", but it can also have other meanings depending on language, braille code and context.

The basis of the various braille codes for the world's natural languages is a straightforward assignment of most of the dot patterns to letters of the alphabet, punctuation marks and other symbols. This is done with a certain consistency, quite often with reference to Louis Braille's original assignments, to the extent possible given the great variety of alphabets, accent marks, vocalization marks, etc. that are in use. For example, the "m" mentioned above would be used for mu in Greek, and mim in Arabic, both of which have an "m" sound. (Note that it is not considered important for a braille character to resemble the corresponding print symbol in "shape", and so few of them do.)

Because the 64 distinct characters are never enough to cover all possible print signs and their variants, it is necessary to use multi-character sequences for some purposes. Often this is accomplished by using certain characters as "prefixes" or "indicators" that affect the meaning of subsequent cells. For example, in English a dot 6 before a letter indicates that the letter is a capital, whereas otherwise it is understood to be lower case. For another example, dots 3-4-5-6, called the "numeric indicator", causes certain following letters (a through j) to be reinterpreted as digits. Dot height, cell

size and cell spacing are always uniform, and so many significant characteristics of the text, such as italics used for emphasis, must be handled by such indicators in Braille. An exception is that formatting, such as the centering of main headings, is commonly used in Braille in much the same way, and for most of the same purposes, as in print.

Separate Braille codes may be used for notation systems other than natural languages, such as music, mathematics and computer programming, and even for highly specialized pursuits such as chess. The basis of such codes remains an association between the 64 possible Braille characters, or distinct sequences of such characters, and the symbols and other notational elements of interest. There is current research, under the auspices of the International Council on English Braille (ICEB), as to whether some of these separate codes, notably for mathematics and the sciences, should be combined along with the literary code into a single Unified Braille Code (UBC) for English.

The size of the Braille cell is such that only about 25 lines of about 40 cells each, that is 1000 characters, can fit on a page of the usual size, which is about 11 inches wide by 11 or 12 inches deep. This contrasts with the 3500 or so characters that will fit on a standard, smaller, typed page. Moreover, Braille paper must be much heavier to hold the dots, and the dots themselves considerably increase the effective thickness of a page. The result is that paper Braille is very bulky. To mitigate this problem somewhat, most larger Braille books are published in "interpoint", that is with the embossing done on both sides of each sheet, with a slight diagonal offset to prevent the dots on the two sides from interfering with each other. But even in interpoint, a standard desk dictionary is likely to occupy a whole bookcase in braille.

Partly because of the bulk problem, and partly to improve the speed of writing and reading, the literary braille codes for English and many other languages employ "contractions" that substitute shorter sequences for the full spelling of commonly-occurring letter groups. For example, "the" is usually just one character in English Braille, not only in the definite article but also in words such as "lather" and

"chrysanthemum". However, that contraction is not used in words such as "motheaten" or "sweetheart", because of the way those words are constructed or pronounced. In other words, phonetics does play a role in modern Braille -- but not so as to compromise an accurate representation of spelling. Wherever the Braille character for "the" appears, the reader can be sure that it stands for exactly those three letters and not some other sequence that may sound the same. When contractions are used, the Braille is usually called "grade 2" in contrast to "grade 1" transcriptions where all words are spelled out letter-for-letter. In English, which has 189 contractions, almost all Braille is grade 2. The only exceptions are transcriptions for special purposes, such as for beginning readers. However, there are advocates for making grade 1 Braille more widely available, so that, for example, persons who become blind later in life will have less to memorize and hence will find braille more immediately useful.

The basic simplicity of the braille system makes it easy to miss some of the depth and subtlety that are the real reasons for its success for so many years. Computer technologists in particular may consider the 6-dot cell to be simply analogous to a 6-bit byte, the kind that gave rise to 64-character codes such as BCD (Binary Coded Decimal) in an earlier computing era. That analogy is technically correct and useful up to a point, but the fact that Braille is read by the human finger and the passing dots are turned into meaning by the human mind means that Braille codes must have characteristics that go well beyond the somewhat arbitrary and mechanical codes used by computers. Louis Braille originally laid out the 63 nonblank characters in a seven-line table, an arrangement still universally used for the study of braille. This table, which is given below, is by no means merely a listing by numeric value of the Braille "byte" but rather reflects consideration of the role that certain kinds of dots, such as "upper" (dots 1 and 4) and "left" (dots 1, 2 and 3) play in basic symbol recognition, and moreover the importance of balancing both dot placement and "density" throughout symbol sequences, words, and sentences. As a result of attention to these important human factors, readers of Braille commonly read in whole words and quickly grasp larger passages, as do readers of print.

(As a footnote to the notion of the Braille cell as byte: Nowadays an 8-bit byte, which allows for 256 distinct characters, is the norm for computers. Only partly coincidentally, there is also now some use of 8-dot braille, formed by adding a dot position to each column, for certain special purposes, especially those related to computer access. However, due to cell size and other considerations, six-dot Braille still seems to represent the best balance for general reading purposes. In other words, Louis Braille's original reasoning remains operative.)

Famous Blind People

Helen Adams Keller (June 27, 1880 – June 1, 1968) was an American author, political activist, and lecturer. She was the first deaf-blind person to earn a bachelor of arts degree. The story of how Keller's teacher, Anne Sullivan, broke through the isolation imposed by a near complete lack of language, allowing the girl to blossom as she learned to communicate, has become widely known through the dramatic depictions of the play and film *The Miracle Worker*. Her birthplace in West Tuscumbia, Alabama, is now a museum and sponsors an annual "Helen Keller Day". Her birthday on June 27 is commemorated as Helen Keller Day in the U.S. state of Pennsylvania and was authorized at the federal level by presidential proclamation by President Jimmy Carter in 1980, the 100th anniversary of her birth.

A prolific author, Keller was well-traveled and outspoken in her convictions. A member of the Socialist Party of America and the Industrial Workers of the World, she campaigned for women's suffrage, labor rights, socialism, antimilitarism, and other similar causes. She was inducted into the Alabama Women's Hall of Fame in 1971 and was one of twelve inaugural inductees to the Alabama Writers Hall of Fame on June 8, 2015. Helen proved to the world that deaf people could all learn to communicate and that they could survive in the hearing world. She also taught that deaf people are capable of doing things that hearing people can do. She is one of the most famous deaf people in history and she is an idol to many deaf people in the world.

Thomas Pryor Gore (December 10, 1870 – March 16, 1949) was an American politician who served as one of the first two United States Senators from Oklahoma, from 1907 to 1921 and again from 1931 to 1937. He first entered politics as an activist for the Populist Party, and continued this affiliation after he moved to Texas. In 1899, just before moving to Oklahoma Territory to practice law in Lawton, he formally joined the Democratic Party and campaigned for William Jennings Bryan as President. In the Senate, his anti-war beliefs caused him conflict with both President

Woodrow Wilson and President Franklin D. Roosevelt. Gore lost his eyesight during his youth. He was the maternal grandfather of noted author Gore Vidal.

Oscar-Claude Monet (14 November 1840 – 5 December 1926) was a founder of French Impressionist painting, and the most consistent and prolific practitioner of the movement's philosophy of expressing one's perceptions before nature, especially as applied to plein-air landscape painting. The term "Impressionism" is derived from the title of his painting *Impression, soleil levant* (*Impression, Sunrise*), which was exhibited in 1874 in the first of the independent exhibitions mounted by Monet and his associates as an alternative to the Salon de Paris.

Monet's ambition of documenting the French countryside led him to adopt a method of painting the same scene many times in order to capture the changing of light and the passing of the seasons. From 1883 Monet lived in Giverny, where he purchased a house and property and began a vast landscaping project which included lily ponds that would become the subjects of his best-known works. In 1899 he began painting the water lilies, first in vertical views with a Japanese bridge as a central feature, and later in the series of large-scale paintings that was to occupy him continuously for the next 20 years of his life.

Stevland Hardaway Morris (May 13, 1950), known by his stage name Stevie Wonder, is an American musician, singer, songwriter, record producer, and multi-instrumentalist. A child prodigy, he is considered to be one of the most critically and commercially successful musical performers of the late 20th century. Wonder signed with Motown's Tamla label at the age of 11, and he continued performing and recording for Motown into the 2010s. He has been blind since shortly after birth.

Raymond Charles Robinson (September 23, 1930 – June 10, 2004), known professionally as Ray Charles, was an American singer, songwriter, musician, and composer. Among friends and fellow musicians he preferred being called "Brother Ray." He was often referred to as "The Genius." Charles was blind from the age of seven.

He pioneered the genre of soul music during the 1950s by combining blues, rhythm and blues, and gospel styles into the music he recorded for Atlantic Records. He also contributed to the integration of country and rhythm and blues and pop music during the 1960s with his crossover success on ABC Records, most notably with his two Modern Sounds albums. While he was with ABC, Charles became one of the first African-American musicians to be granted artistic control by a mainstream record company.

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Christopher Holmes, Baron Holmes of Richmond, (15 October 1971) is a British former swimmer and life peer in the House of Lords. He won a total of nine gold, five silver, and one bronze medal at the Paralympic Games. Holmes represented Great Britain at four Paralympic Games between 1988 and 2000 and is the only British Paralympic swimmer to win six gold medals at a single Games. After retiring from swimming he worked as a journalist and solicitor. He was Director of Paralympic Integration for the London Olympics and it was announced that he would be elevated to the House of Lords in August 2013, as a Conservative Party Peer.

Diana Gudaevna Gurtskaya (2 July 1978 in Sukhumi, Georgia) is a blind Georgian singer who resides in Moscow, Russia. Following a failed attempt in Belarus the previous year Diana, on 1 March 2008, won the Georgian national final with 39.4% of the vote, therefore she represented Georgia at the 2008 Eurovision Song Contest in Belgrade, Serbia. She won a place in the final at the second semi-final on 22 May and finished 11th.

Franklin Delano Roosevelt - (January 30, 1882 - April 12, 1945) Franklin was the 32nd President of the United States of America and played a big role during World

War II. Roosevelt eventually aided the poor and un-employed of America and restored order at various times during his Presidency. He was also the only President to ever get elected 4 terms in a row, mostly because of his help in the recovery of the economy. It has been said that Roosevelt had several disabilities including vision impairment.

Johnny Depp - John Christopher "Johnny" Depp II (born June 9, 1963) is an American actor, producer, and musician. He has won the Golden Globe Award and Screen Actors Guild Award for Best Actor. Depp, who shot to fame in the late 1980s hit TV series "21 Jump Street", confessed in the July issue of Rolling Stone that he is blind in his left eye and near-sighted in his right. Depp has starred in films including "Pirates of the Caribbean" and "Edward Scissorhands". If Depp isn't wearing glasses while acting he can only see a few inches in front of him. Something fans may have never realized until now.

Conclusion

Having investigated this topic I came to the conclusion, that Braille contributed much to the development of mankind.

6 Braille's dots give blind people an opportunity to create 64 combinations. They can be used to mark all letters of any language, punctuation marks, numbers, chemical and physical signs, musical notes. In comparison with other systems such as Barber's it is simpler and that is why more convenient. It takes less time to learn to use it. This system allows blind people to read and write at a higher rate than other systems do. Thanks to it thousands of people all over the world could read, write and communicate with others.

I found out that a lot of famous and successful people, who achieved much in their life and became famous and rich, were blind

I figured out that in our city it is possible to learn Braille system and read books in "The Society of the Blind"

My work can be used by people who are in difficult situations: who are seriously ill or have physical defects. The example of Braille and other blind celebrities can encourage them to be confident, overcome difficulties and be successful.

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