The Phonetic Notation System of Melville Bell and its Role in the History of Phonetics

Le système de notation phonétique de Melville Bell et son rôle dans l'histoire de la phonétique

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Abstract

Alexander Melville Bell was an inventor, like his son Alexander Graham Bell. In 1867, Melville Bell invented the first universal phonetic alphabetic system, one that he called "Visible Speech." Visible Speech was also used by elocutionists of the time to teach speech production to the deaf and to people with stuttering and articulatory problems. Some aspects of Melville Bell's phonetics contribution had a lasting impact on the science of phonetics, especially in its representation of vowels. Other aspects, such as the notation system he used, were lost to posterity. This article argues that Melville Bell's work can offer a case study, of sorts, to illustrate that one cannot assume today's practices will be long lasting ones.

Abrégé

Alexander Melville Bell était inventeur, comme son fils Alexander Graham Bell. En 1867, Melville Bell a inventé le premier alphabet phonétique universel, qu'il a baptisé « Visible Speech » (le langage visible). Les professeurs d'élocution de l'époque ont également utilisé le langage visible pour enseigner la production de sons aux sourds et aux gens ayant des problèmes de bégaiement et d'articulation. Certains volets de la contribution de Melville Bell à la phonétique ont eu un effet durable sur la science de la phonétique, notamment dans sa représentation des voyelles. D'autres volets, tel le système de notation qu'il employait, n'ont pas passé à la postérité. Cet article soutient que les travaux de Melville Bell peuvent servir d'étude de cas, en quelque sorte, pour illustrer le fait qu'on ne peut pas supposer que les pratiques d'aujourd'hui perdureront.

Key Words: history, phonetics, visible speech, phonetic alphabet

Unlike psychologists, linguists, or deaf educators, those in the field of speech-language pathology have tended to ignore their historical origins. This historical nearsightedness can lead to a lack of appreciation of how much therapeutic practices depend upon the times in which they originate. We can see from the evolution of Melville Bell's notation system that knowledge and practices that are taken as established today may either be forgotten or have lasting relevance to later generations.

Among the first people in Canada to carry out speech therapy practices was Alexander Melville Bell. While he is best known today as the father of Alexander Graham Bell, Melville Bell deserves more recognition for his own invention—a universal phonetic alphabet. Melville called his alphabet "Visible Speech" and designed it to depict sounds from many languages, as well as vocal noises such as coughing and sneezing. As described by an anonymous contemporary of Melville Bell's in 1865:

"The symbols represent the most elementary actions of the organs: put together they produce compounds. A full sneeze, for example, is a complex operation: it comes among what are called inarticulate sounds; but Mr. Bell writes it down, and, for aught we know, could undertake to furnish every member of the house of Commons with a symbol representative of his own particular sneeze, as distinguished from those of all his colleagues" (Cited in A. M. Bell, 1867, p. 29).

Melville Bell worked as an elocutionist and as a college lecturer first in Edinburgh, Scotland, then in Brantford and Kingston, Ontario, and finally, in Boston, Massachusetts. He lectured to young college students and provided elocution lessons to public speakers,

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deaf speakers, and people who had articulation and stuttering difficulties. He, like his son, performed a version of what we know today as speech therapy.

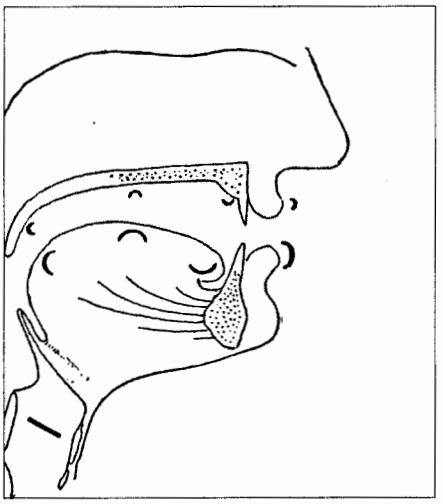
Early in his work Melville Bell became interested in phonetics and the physiology of speech. It was around 1850 when he began developing his alphabet that was to be regarded as the first successful attempt to create a universal system of phonetics.

Melville Bell's Phonetic Alphabet

Melville Bell's phonetic notation system, like the phonetic alphabets that preceded and followed it, portrayed articulation in terms of place, manner, and voicing (e.g., Ellis, 1848; Holder, 1669; Sweet, 1877). But Melville Bell did not use traditional orthography from letters of the alphabet. Instead, he used characters that were iconic representations of the activity of the articulators.

The chart in Figure 1 was used by Graham Bell to teach how his father's system portrayed consonant placement (A. G. Bell, 1906, p. 41). The large curved lines on the lower lip and tongue represent the lower articulators (which the Bells saw as the active ones) and the smaller curved lines on the palate and upper lip represent more passive articulators, the contact point for the active articulators.

Figure 1



In order to serve as phonetic symbols for speech sounds, the curve representing larger element or active place of articulation for a sound was separated from the drawing. For example, the curve on the lower lip, a semicircle open at the left, was used to depict labials ( ), the curve on the tongue tip was used to represent alveolars ( ), and the curve on the back of the tongue was used to represent velars ( ).

The curves depicting the place of articulation were combined with other symbols that show manner and voicing features of sounds. Like those for place, markings for manner and voice were derived from movements involved in articulation. For example, Melville Bell used straight lines to represent articulatory closure (which he called "shut") that produced stops ( ). Fricatives were depicted through the use of two small semi-circles that look like a backwardly curved capital E ( ). This was in keeping with Melville Bell's thinking that the air passes through two sides of the mouth for fricatives. The nasal indicator was shaped like an s (S) to represent the shape of the uvula, an articulator whose position is associated with nasality.

The voice-voiceless distinction in Melville Bell's phonetic alphabet was portrayed using two symbols: a horizontal line for voiced (a closed glottis) (—), and an elliptical circle (an open glottis) or absence of a vertical line for voicelessness (0).

Other features, such as aspiration (>) and trilling ( ), were also indicated in ways that were reminiscent of a salient aspect of physical production of the sound.

The full notation system involved combining indicators of place, manner, voicing and modifying features such as aspiration. For example, in Figure 2 the left-most symbol represents "p" and is comprised of a circle closed at the right showing lip involvement, a vertical line showing articulatory closure (stop), and a right bracket showing aspiration. The second symbol in Figure 2 represents a "b", combining features that Melville described as "lips shut" and voicing. The third symbol is an "f" showing the "lip divided aperture" and the fourth a "v" adding voicing to the features used to represent the "f".

Figure 2

= "p"	= "b"	= "f"	= "v"

Melville Bell's combination of place, manner, and voicing indicators to form single speech sounds is reminiscent of what was later to be dubbed a distinctive feature approach. (See Fromkin & Ladefoged [1981] for a history of distinctive features.)

Vowels in Melville Bell's system are also straight vertical lines with dots strategically placed on the line to signify where in the mouth the tongue is most constricted. A dot on the right side of the line is a front vowel ( ), and one on the left side of the line is a back vowel ( ). Dots placed at the top of the line are high vowels ( ); those low on the line are low vowels ( ).

Recommended Uses for Visible Speech Alphabet

Melville and Graham Bell argued in their various publications for a wide variety of uses for Visible Speech (see Table 1). The Bells saw Visible Speech as a means to enhance speaking, reading, and writing for various populations and as a way to aid in learning foreign

languages. Melville Bell also aimed to have his Visible Speech alphabet used by linguists, phoneticians, and language teachers as a standard for pronunciation of sounds in different languages.

Table 1. Uses of Visible Speech and Sample Sources Where the Uses are Described and Elaborated

Teaching children to read (A.M. Bell, 1858)
Offering science a universal alphabet (A.M. Bell, 1867)
Teaching the blind to read (A.M. Bell, 1867)
Teaching oratory to preachers, actors, or anyone with normal speech who wants to improve upon it (A.M. Bell, 1868)
Providing a written language for the blind (A.G. Bell, 1872)
Teaching illiterate adults to read (A.G. Bell, 1872)
Teaching speech to children who are deaf (A.G. Bell, 1872)
Capturing the sounds of unwritten language (A.G. Bell, 1872)
Comparing the phonetic systems of different languages (A.G. Bell, 1872)
Improving the speech of children with articulatory disorders and children and adults who stutter (A.M. Bell, 1878)
Teacher training (A.M. Bell, 1883)

The Visible Speech system was most often used by the Bells to teach speech to those with communication disabilities. Graham Bell concentrated his efforts for many years on devising ways to use his father's alphabet for teaching oral language to his deaf students in the UK, Canada, and the US. Graham Bell also used it to provide speech therapy to students in his practice who stuttered or had articulatory problems (Duchan, 2005).

The Scientific Impact of Melville Bell's Invention

In the mid 19th century, when Melville Bell published his alphabet, many others in Europe and America were working to develop notation systems for depicting pronounced speech. These scientists came to the phonetic enterprise with different backgrounds and interests. Some, such as Samuel Johnson and Noah Webster, were lexicographers with an interest in capturing standard sound pronunciations. Others, such as George Bernard Shaw and Benjamin Franklin, were spelling reformers looking to standardize, rationalize, and simplify spelling practices. Elocutionists such as Andrew Comstock and Melville and Graham Bell came to the study of phonetics through their interest in oratory and speech therapy.

Melville Bell's Visible Speech notation system was seen by his contemporaries as being an advance over other efforts because it was more precise, it captured sounds of all languages, and it offered a conceptual system for understanding vowels. Bell's classification of vowels into horizontal (high vs. low) and vertical (front vs. back) dimensions was further developed and popularized by Henry Sweet in 1877. The combined work on vowels of the two men came to be called the Bell-Sweet model of vowel production (Catford, 1981) and is still seen as a viable way of representing the articulation of vowels across languages.

Melville Bell's vowel system was to have an impact on the development of the International Phonetics Alphabet, first issued in Paris in 1889 by the International Phonetic Association. The IPA, as it is now called, was an amalgam of different alphabets that existed at the time and was based on the following set of principles (International Phonetic Association, 1999).

- There should be a separate sign for each distinctive sound, that is, for each sound which, being used instead of another, in the same language, can change the meaning of the word.
- When any sound is found in several languages, the same sign should be used in all. This applies also to very similar shades of sound.
- The alphabet should consist as much as possible of the ordinary letters of the Roman alphabet, as few new letters as possible being used.
- In assigning values to the Roman letters, international usage should decide.
- The new letters should be suggestive of the sounds they represent, by their resemblance to the old ones.
- Diacritic marks should be avoided, being trying for the eyes and troublesome to write.

It was on the third criterion, having to do with making the letters in the phonetic alphabet look like ordinary letters of the Roman alphabet, that Melville Bell's Visible Speech alphabet failed. Those hoping to use Melville Bell's Visible Speech system found it difficult to learn and remember because the notations were unlike anything they had seen previously (Gordon, 1892). It was also difficult because many of the characters looked alike. Therefore, although Melville Bell's phonetic studies and notation system preceded the development of the IPA, it was eventually forgotten and replaced by a more familiar, transparent, and therefore more learnable alphabet.

Melville Bell's alphabet is seen by today's phoneticians as being significant historically because it was the first alphabet that allowed them to depict the sounds of speech independent of the choice of particular language or dialect and because it offered a rational system for understanding and depicting vowels (Catford, 1981).

Melville Bell's Visible Speech system is relevant not only for what it successfully contributed to later generations, but for what did not get passed on. In particular, Melville Bell's effort to create a notation system whose symbols looked liked articulators ended up being too difficult to learn, especially for those unacquainted with the anatomy involved in speech production.

Knowing which of Melville's contributions lasted and which ones did not has significance to us today. It not only helps us learn about the origins of current practices, but it also helps us understand why the tools and practices considered to be the best in one generation of practitioners may not fit the next. Perhaps the most important lesson to be learned from history is humility.

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Received: September 18, 2004

Accepted: May 9, 2005