



LINGUAPHONE

CARDINAL VOWELS

SPOKEN BY

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Text of Records with Explanatory Notes by

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THE USE OF CARDINAL VOWELS

It is no easy matter to describe a quality of sound (timbre) by means of written words. Yet this is what writers on linguistic theory and on the practical teaching of spoken languages often have to try to do. They have to manage as best they can to describe the speech elements of languages foreign to the reader, in such a way as to give him a good idea of what they sound like.

In old-fashioned books the authors contented themselves with identifying most, if not all, sounds of foreign languages with sounds of their readers' mother tongue, or by making some sort of comparison between the foreign sounds and sounds which the readers were assumed to be familiar with. We know now that such identifications and comparisons are generally bound to be wide of the mark, and this for two reasons: (1) the sounds, and especially the vowels, of two different languages are seldom identical, and (2) different speakers of the same language pronounce differently, so that it is ambiguous to speak of "the sound" used in any particular word. It is easy to satisfy oneself on this latter point by asking a number of English people one after another to repeat common words such as *get* or *day* or *tea*. It will be found that it is meaningless to speak of "the English vowel in *get*," because different English people use different vowel sounds in this word. And so on with other words.

In books of a more modern type the nature of foreign sounds is explained much better. Use is made, to a greater or less extent, of the science of Phonetics. Readers are given descriptions of the mechanism of the articulating organs, they are told what positions have to be taken up or what movements performed by the tongue, lips, etc., in uttering foreign sounds. The principle is that the

reader should place or move his tongue, etc., in the manner described, and so find out for himself what the foreign sounds are like.

It is found by experience that the reader can very often succeed well in doing this, especially if the sounds are consonants. When the sounds are vowels, the task is much less easy, since in forming many vowels the tongue is far removed from the roof of the mouth, and so cannot be guided by the sensation of touch. One can, it is true, perceive to a certain extent the muscular sensation in the tongue when a vowel is pronounced, and in the case of many vowels one can partially see the tongue position in a mirror. But muscular sensations are difficult to describe, and photographs of the mouth do not show as much as is needful. The provision of such descriptions or the reproduction of photographs are often insufficient to enable the reader to make the required vowels with the necessary precision. These means must in fact be supplemented by something which will explain to him *what the unknown vowels sound like*—something which will give him a mental picture of their qualities.

Fortunately modern phonetic science provides us with a method which will do this. The principle is to describe the qualities of unknown vowels by their relation to those of known vowels. As has been shown above, the vowels of any particular language cannot be used for this purpose. It has therefore been found necessary to choose a standard set of vowels for reference—a scale of vowels which can be used in the same sort of way as a scale of degrees which enables us to specify temperatures. The vowel sounds of such a scale are called **CARDINAL VOWELS**. They are chosen on a scientific basis and are independent of the vowels of any language.

Several scales of cardinal vowels could be devised. The one which I have found in practice to give particularly good results is a scale of eight primary vowels, and it is these vowels that are reproduced on the Linguaphone double-sided record numbered ENG.252-253.

Those interested in the reasons for the selection of these particular sounds are referred to my *Outline of English Phonetics** (Chaps. VII and VIII, and particularly §§ 131-147). Here it may be said briefly that the first four are known technically in phonetics as "front" vowels and that the remaining four are "back" vowels. Cardinal Vowel No. 1 (i) is the "closest" possible front vowel; No. 5 (a) is the "openest" possible back vowel. The others are front vowels (e, ε, æ) and back vowels (ɔ, o, u) so chosen that there are approximately equal degrees of acoustic separation between each vowel and the next; the acoustic distance i—e is approximately equal to the acoustic distance e—ε, and so on.

Eight other Cardinal Vowels can be deduced from these by adding lip-rounding to i, e, ε, æ and a, and by taking the lip-rounding away from ɔ, o and u. And two further ones can be established which have tongue positions intermediate between those of i and u. These ten are called **Secondary Cardinal Vowels**. They are reproduced on the Linguaphone double-sided record numbered ENG.254A-255.

It must always be borne in mind that the Cardinal Vowels cannot be described by reference to the actual vowels of any language. It is the vowels of languages which have to be described by reference to the Cardinal Vowels. Thus the verbal description of a foreign vowel as being "two thirds of the distance from Cardinal 2 to Cardinal 3" has a very definite meaning to any reader familiar with the Cardinal Vowels. So has the description "intermediate between Cardinal 16 and Cardinal 17."

Charts illustrating the relationship of the vowels of various languages to the vowels of this cardinal system have been published in several books. Among these may be mentioned, besides my own works—*An Outline of English Phonetics*, *The Phoneme* (Heffer) and *The Pronunciation of English* (Cambridge University Press)—*The*

* Eighth edition (1956) published by Heffer, Cambridge.

Phonetics of English by I. C. Ward (Heffer), *The Phonetics of French* by L. E. Armstrong (Bell), *A Historical Introduction to French Phonetics* by A. Lloyd James, the *Italian Phonetic Reader* by Camilli (University of London Press), *The Pronunciation of Spanish* by Stirling (Cambridge University Press), the *Russian Pronunciation* by S. Boyanus (Lund Humphries) and the *Colloquial Sinhalese Reader* by Perera and Jones (Manchester University Press).

Cardinal Vowels can only be learnt from a teacher who knows how to make them or from a gramophone record or tape record. It is for the purpose of making these vowels widely known that these Linguaphone records of them have been prepared. Users of the records are recommended to study the vowels in conjunction with the relevant sections of the *Outline of English Phonetics* referred to above.

D. J.

March, 1956.

NOTE

A slight knocking sound is heard in some places on the records. It is the sound of a tuning-fork which was struck from time to time during the making of the records to check the pitch of the vowels.

TEXTS OF THE RECORDS

CARDINAL VOWELS

In this explanatory pamphlet the vowel sounds are represented by their International Phonetic symbols.

The mark : means that the vowel is long.

TEXT OF RECORD (ENG.252—SIDE 1)

This is a record of eight vowel-sounds which it is found convenient to use as primary cardinal points in phonetic research. The vowel-sounds of any language can be described by reference to them. They are said here approximately on the note F₂ of New Philharmonic pitch.

The eight Primary Cardinal Vowels pronounced short:

No. 1. i No. 2. e No. 3. ε No. 4. a

No. 5. ɑ No. 6. ɔ No. 7. ɒ No. 8. u

i e ε a ɑ ɔ ɒ u

The eight Primary Cardinal Vowels pronounced long:

No. 1. i: No. 2. e: No. 3. ε: No. 4. a:

No. 5. ɑ: No. 6. ɔ: No. 7. ɒ: No. 8. u:

i: e: ε: a: ɑ: ɔ: ɒ: u:

The eight Primary Cardinal Vowels, each pronounced twice short and once long:

No. 1. i i i: No. 2. e e e:

No. 3. ε ε ε: No. 4. a a a:

No. 5. ɑ ɑ ɑ: No. 6. ɔ ɔ ɔ:

No. 7. ɒ ɒ ɒ: No. 8. u u u:

TEXT OF RECORD (ENG.253—SIDE 2)

In the principal section of this record the same Cardinal Vowels are said in pairs for comparison. They are pronounced approximately on the note F₂ of New Philharmonic pitch.

The eight Primary Cardinal Vowels pronounced in pairs for comparison:

No. 1 and No. 2. i e i e iε:iε:

No. 2 and No. 3. e ε e ε e:ε:e:

No. 3 and No. 4. ε a ε a ε:ε:a:

No. 4 and No. 5. a ɑ a ɑ a:ɑ:a:

No. 5 and No. 6. ɑ ɔ ɑ ɔ ɑ:ɑ:ɑ:

No. 6 and No. 7. ɔ ɒ ɔ ɒ ɔ:ɔ:ɔ:

No. 7 and No. 8. ɒ u ɒ u ɒ:u:ɒ:

The eight Primary Cardinal Vowels pronounced with a falling intonation (∨):

i: e: ε: a: ɑ: ɔ: ɒ: u:

The eight Primary Cardinal Vowels pronounced with a rising intonation (∕):

i: e: ε: a: ɑ: ɔ: ɒ: u:

TEXT OF RECORD (ENG.254A—SIDE 1)

There are ten Secondary Cardinal Vowels, which may be numbered from 9 to 18. The first eight of these are formed with the same tongue positions as the eight Primary Cardinal Vowels, but they have different lip positions. For instance, No. 9 has the tongue position of No. 1, but is said with rounded lips, and No. 16 has the tongue position of No. 8, but is said with spread lips.

Here are the first eight Secondary Cardinal Vowels said approximately on the note F₄ of New Philharmonic pitch.

No. 9.	y	No. 10.	ø	No. 11.	œ	No. 12.	œ
No. 13.	ɒ	No. 14.	ʌ	No. 15.	ɤ	No. 16.	ɯ
	y	ø	œ	ɒ	ʌ	ɤ	ɯ
	y y y:	ø ø ø:	œ œ œ:	œ œ œ:			
	ɒ ɒ ɒ:	ʌ ʌ ʌ:	ɤ ɤ ɤ:	ɯ ɯ ɯ:			

Numbers 17 and 18, have tongue positions intermediate between those of No. 1 and No. 8. No. 17 is said with spread lips, and No. 18 with rounded lips. Here are these two sounds said approximately on the same pitch as the others.

No. 17.	i	No. 18.	u
i i i:		u u u:	

TEXT OF RECORD (ENG.255—SIDE 2)

In this record various Cardinal Vowels are compared with each other.

First set (unrounded vowels Nos. 5, 14, 15, 16 and 17):

ɑ ʌ ɤ ɯ i i ɯ ɤ ʌ ɑ

Second set (rounded vowels Nos. 18, 9, 10, 11, 12 and 13):

u y ø œ œ ɒ ɒ œ œ ø y u

Third set (Nos. 16, 17 and 1):

ɯ i i i i ɯ

Fourth set (Nos. 8, 18 and 9):

u u y y u u

Fifth set (Nos. 8 and 16):

u ɯ u ɯ u:ɯu:ɯ:

Sixth set (Nos. 7 and 15):

o y o y o:y:o:y:

Seventh set (Nos. 6 and 14):

ɔ ʌ ɔ ʌ ɔ:ʌ:ɔ:ʌ:

Eighth set (Nos. 13 and 5):

ɒ ɑ ɒ ɑ ɒ:ɑ:ɒ:ɑ:

Ninth set (Nos. 17 and 18):

i u i u i:u:i:u:

SOME INDICATIONS OF THE VALUES OF THE CARDINAL VOWELS

Although, as explained on p. 6, Cardinal Vowels cannot be described by reference to vowels existing in particular languages, it may be of value to some users of these Records if we suggest here, by means of examples drawn from languages, a rough general idea of the types of sound to which the Cardinal Vowels belong.

In the following approximate guide the term "Southern English" is to be understood to mean "English as pronounced by many, though not all, educated Londoners"; "French" means "French as pronounced by many, but not all, Parisians"; "German" means "the North German recommended for use on the Stage."

Cardinal 1 (i). The "closest" possible kind of *i*. Near to the French sound of *i* in *si*, German sound of *ie* in *Biene*.

Cardinal 2 (e). Near to the French sound of *e* in *thé*, German sound of *ee* in *Schnee*.

Cardinal 3 (ɛ). Near to the French sound of *é* in *même*.

Cardinal 4 (a). Near to the French sound of *a* in *la*. Used by many Northern English people in words like *grass*, *chance*.

Cardinal 5 (ɑ). The most "retracted" kind of *a*-sound. Near to the French sound of *a* in *pas*.

Cardinal 6 (ɔ). Near to the German sound of *o* in *Sonne*.

Cardinal 7 (ɒ). Near to the vowel-sound in *home* as generally pronounced in Scottish English.

Cardinal 8 (u). Near to the German sound of *u* in *gut*.

Cardinal 9 (y). Near to the French sound of *u* in *lune*. The cardinal sound is, however, more *i*-like in quality than this French sound. The sound of *y* in the Norwegian word *sy* is nearer to Cardinal *y* than the French sound is.

Cardinal 10 (ø). Near to the French sound of *eu* in *peu*, but somewhat more *e*-like in quality.

Cardinal 11 (œ). Near to the French sound of *eu* in *peur*, but somewhat more *ɛ*-like in quality.

Cardinal 12 (œ̃). Made by trying to sound Cardinal 4 with simultaneous "open" lip-rounding. This cardinal sound is not known to occur in any language.

Cardinal 13 (ɒ̃). Near to the Southern English sound of *o* in *hot*.

Cardinal 14 (ɔ̃). The sound arrived at by "unrounding" Cardinal 6 (ɔ). It is comparable to a very "retracted" variety of the English sound of *u* in *cup*.

Cardinal 15 (ɤ). Comparable to one variety of the Southern English sound of *ir* in *bird*, or (more nearly) to the Marathi vowel in *मग* (mɔ:g, then), but more "retracted" than either of these. Sounds near to Cardinal 15 occur in Vietnamese and other languages of South-East Asia.

Cardinal 16 (ɯ). Made by trying to utter Cardinal 8 (u) with the lips "spread" as for *i*. The Russian sound of *u* in *бул* (bul) is near to Cardinal 16. A similar sound occurs in languages of South-East Asia, e.g. in the word *mū* (hand) in the Shan language of Burma.

Cardinal 17 (ɨ). A sound half way between Cardinal 16 (ɯ) and Cardinal 1 (i). The Russian sound of *u* in *буль* (bitj) is near to this. So is the North Welsh sound of *u* in *Llandudno* (lan'didno). The vowel *i* has a certain acoustic resemblance to *y* (No. 9), but it is formed with a different tongue position and is said with spread lips.

Cardinal 18 (ɯ̃). The sound produced by uttering *i* with simultaneous lip-rounding. The sound of *oo* in *book* as pronounced by many Scottish people is near to this. So is the Norwegian sound of *u* in *hus*.