2. VOWEL SYSTEM

2.1. Vowels

English Vowels

iː uː
tʃ ʃ u
æ ə
əː aː

Malayalam Vowels

iː uː w
ɯ
ø ø
dː aː

Vowels may be classified according to the position of the tongue, viz. front vowels, central vowels and back vowels.

English has twelve vowels - four front vowels, three central vowels and five back vowels. Malayalam has four front vowels, two central vowels, and five back vowels including short unrounded vowel [ɯ].
2.1.1. Front Vowels

2.1.1.1. English Front Vowels

[ iː ] is a high-front, tense, unrounded vowel. Many people use a somewhat diphthongal variety of this, especially in final position. They pronounce 'see' as [ siː ] rather than [ siː ]. Some use [ iː ] as the first element of the diphthong in 'hear' thus [ hɪː ] instead of [ hɪː ].

[ i ] is a low-high, front, lax, unrounded vowel. [ i ] sound contains many slight variants. The two vowels of the word 'pity' have difference, [ i ] is a more retracted variety. In the final position an opener variety [ ɪ ] is used.

eg: [ ˈsɪtɪ ] 'city'

[ e ] is a high-mid-front, tense and unrounded vowel. It has [ e ] and [ ɛ ] as its variants.

eg: [ ˈbed ] 'bed'

[ ə ] is a high-low-front, lax and unrounded vowel. This sound is different from all the sounds given above, because the lateral contact of the tongue with the upper teeth is broken. [ ə ] and [ ə ] are its varieties.

eg: [ ˈbæŋk ] 'bank'
2.1.1.2. Malayalam Front Vowels

[i] is a short unrounded high front vowel. It occurs initially, medially and finally. When it occurs initially, it is always preceded by a shade of the sound [y]. The tongue moves towards palate but changes that position and moves to front to produce [i].

eg: [y i s t a m] 'liking'

[i:] is a long, unrounded, high, front vowel. It occurs in all the three positions. In initial position, like [i], this too has an onglide of [y].

eg: [y i: c: a] 'house fly'

[e] is a short unrounded, mid front vowel. This sound occurs initially, medially and finally. This vowel also has an onglide of [y] initially.

eg: [y e r a] 'worm'

[e:] is a long unrounded mid front vowel. It also occurs in the initial, medial and final positions. It too has an onglide of [y].

eg: [y e: n i] 'ladder'
2.1.1.3. **Contrast**

English and Malayalam have four front vowels each.

<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i]</td>
<td>[iː]</td>
</tr>
<tr>
<td>'it'</td>
<td>'no, not'</td>
</tr>
<tr>
<td>[iː]</td>
<td>[iː z i]</td>
</tr>
<tr>
<td>'easy'</td>
<td>'housefly'</td>
</tr>
<tr>
<td>[e]</td>
<td>[e ə]</td>
</tr>
<tr>
<td>'egg'</td>
<td>'worm'</td>
</tr>
<tr>
<td>[æː]</td>
<td>[æː t]</td>
</tr>
<tr>
<td>'at'</td>
<td>'ladder'</td>
</tr>
</tbody>
</table>

[i] and [e] are similar vowels in English and Malayalam. One peculiar aspect of these Malayalam vowels is that they have an onglide of [y] in the initial position.

eg: [i]   [y i lː a]
[iː]  [y iː cː a]
[e]   [y e rː a]

[i], [iː] and [e] have not much variation except the [y] onglide in the initial position. English [i] has two variations [i] and [iː]. The English unrounded vowel [æː] has two pronunciations [æː] and [æː].

English [æː] is absent in Malayalam. It creates difficulty for Malayalam speakers. [i], [iː] and [e] occur in initial, medial and final positions in Malayalam. In English [i] and [iː] occur in all positions but [e] and [æː] occur initially and medially only.
<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[i] 'ink'</td>
<td>[i] 'no'</td>
</tr>
<tr>
<td>[p i l] 'pill'</td>
<td>[v i l a] 'price'</td>
</tr>
<tr>
<td>[s i t i] 'city'</td>
<td>[n a ri] 'jackal'</td>
</tr>
<tr>
<td>[iː] 'eagle'</td>
<td>[iː] 'fly'</td>
</tr>
<tr>
<td>[s iː t] 'cheat'</td>
<td>[v iː t] 'house'</td>
</tr>
<tr>
<td>[a] 'see'</td>
<td>[t iː] 'fire'</td>
</tr>
<tr>
<td>[e k o u] 'echo'</td>
<td>[e] 'eight'</td>
</tr>
<tr>
<td>[w e l] 'well'</td>
<td>[c e v i] 'ear'</td>
</tr>
<tr>
<td>[æ] 'absent'</td>
<td>[i v i T e] 'here'</td>
</tr>
<tr>
<td>[æ:] 'bank'</td>
<td></td>
</tr>
</tbody>
</table>

The absence of [æː] is the major learning problem as far as the front vowels are concerned. So a Malayalam speaker makes various substitutions for this sound. Some people replace this vowel by a fronted [aː] or [a] initially. When a consonant precedes it, an [aː] or [a] with an onglide of [y] or [eː] is used.

eg: Initial [æː] replaced by [aː]

<table>
<thead>
<tr>
<th>æː b d o m e n</th>
<th>abdomen [ a b d o m e n ]</th>
</tr>
</thead>
</table>

Initial [æː] replaced by [aː]

<table>
<thead>
<tr>
<th>æː s i d</th>
<th>acid [ aː s i d ʌ ]</th>
</tr>
</thead>
</table>

Medial [æː] replaced by [aː] or [eː]

<table>
<thead>
<tr>
<th>m æ p</th>
<th>map [ m aː p ʌ ] or [ m eː p ʌ ]</th>
</tr>
</thead>
</table>

Medial [æː] replaced by [aː] with an onglide [Y]

| k æ p | cap [ k Y aː p ʌ ] |
Malayalam [i:] is slightly opener and more centralised than English [i:]. There is not much difference between the two [e].

English [i:] has two pronunciations [i:] and [i'] as in 'bead' [b i:d] and 'beat' [b i:t]. [i] also has two varieties [i] and [I] as in 'kid' [k i:d] and 'kit' [k i:t]. [e] has two pronunciations [e] and [e'] as in 'det' [d e t] and 'head' [h e:d]. [æ] also has two varieties [æ] and [æ'] as in 'cat' [k æ t] and 'lad' [l æ'd].
2.1.2. Central Vowels

2.1.2.1. English Central Vowels

[ ~ ] is a low-mid, back-central, lax and unrounded vowel. It is so low as to be heard as almost [ a ] by non-English speakers.

[ ~ ] occurs in very few foreign languages.

Daniel Jones describes it as half open central unrounded vowel. In London dialectal speech the sound used is near to cardinal [ ~ ], i.e., an open front vowel. Many southern speakers use [ e ] for [ ~ ] in words like 'such' and 'just'. In a number of words written with 'o' some speakers use [ ~ ]

eg: 'accomplish' [ e k m p l i s ]

The basic spelling for [ ~ ] is 'u' followed by a single orthographic consonant in a monosyllable

eg: 'cut' [ k ~ t ]

[ e ] vowel is mid-central, lax. The lips are neutral or often, as when the sound is sustained, very slightly rounded. It differs from [ ~ ] in several characteristics, it may be slightly rounded but [ ~ ] is unrounded.

[ ~ ] is stressed always and [ e ] is always unstressed. Speakers make use of several distinguishable varieties of [ e ]. An opener variety is generally used in the final position.

eg: [ o u ] 'over', [ m ~ e ] 'mother'
Southern speakers substitute [ʌ] for [e]

eg: [ouvʌ] 'over'

A less open variety appears to be usual in the final position
when [ʃ, ʒ, ts] or [dz] precedes

eg: [eiʃə] 'Asia'

In many regions [e] is replaced by r-coloured [ə] when
the spelling has 'r' finally or followed by a consonant.

eg: [ouvə] 'over'

[ə] is between half close and half open central, unrounded

eg: [bəd] 'bird'

A closer variety may be represented phonetically [əː] and
an opener one may be represented phonetically [əɹ]. An
open variety which is like a lengthened [ʌ] is also heard.

2.1.2.2. Malayalam Central Vowels

[a]. It is a short, low, central vowel. This occurs
medially
initially, and finally. While producing this sound the mouth
is open and the lips are neutral.

eg: [ara] 'half'

[va1a] 'net'
[aː]. A long, low, central vowel is produced in the same way as the vowel [ a ]. It occurs in all the three positions.

eg: [ aː naː ] 'elephant'
[ k aː l aː ] 'oxen'
[ t aː ] 'give'

Central vowels in Malayalam have no specific variations.

2.1.2.3. Contrast

English has three central vowels, viz. [ ^, o, eː ], while Malayalam has two [ a, aː ]. [ ^ ] in English may be considered as a parallel for Malayalam [ aː ]. English [ o ] and [ eː ] are absent in Malayalam. Malayalam [ aː ] is a little fronter and more centralised than English [ aː ]. Although Malayalam has no [ o ] and [ eː ] we can say roughly that [ o ] exists as a variety of Malayalam [ aː ]. English [ ^ ] occurs in the initial and medial positions. It does not occur finally. Malayalam [ aː ] occurs in all the three positions. English [ o ] and [ eː ] occur in all three positions. Examples are given below:

```
<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ^ ]</td>
<td>[ aː p ]</td>
</tr>
<tr>
<td>[ n aː t ]</td>
<td>[ k aː T aː l aː ]</td>
</tr>
<tr>
<td>[ aː ]</td>
<td>[ aː p: aː n ]</td>
</tr>
<tr>
<td></td>
<td>[ v a ː l aː ]</td>
</tr>
</tbody>
</table>
```
English [\^] has two varieties - one [\^] as in 'but'
[b \^ t] and [\^'] as in 'bud' [b \^d]. Malayalam [a] is also said to have two pronunciations [e] and [a].

English [e] is spoken in two ways - one [e] as in
[e b a u t] and [e] which occurs generally with the occurrence of final 'r' spelling as in [m e i k e] 'maker'.

Malayalam [a] is an equivalent to English [\^]. [e] and [a] are absent in Malayalam. So they may create difficulties to the learner. They are difficult vowels of English for the Malayali people, like the sound [ae]. Malayalam [a] has a variety but it is generally not used instead of the English [e]. In unstressed positions English [\^] itself is realised as [a] because this vowel has an elusive nature and it has varied spelling forms. In English [e] never occurs in stressed syllables. Malayalam speakers have difficulty with this vowel because it occurs in the unstressed syllables and it is used instead of other vowels in that position.
It does the work of [ɪ] as in 'the' [θiː], [e] as in 'themselves' [θɛmbəlvəz], [æ] as in 'that' [θæt], [ɑː] as in 'are' [ɑː], [ɔ] as in 'obscure' [əbˈskjʊə], [ɔː] as in 'for' [ɔːr], [ʌ] as in 'must' [mʌst], and diphthongs like [əʊ] as in 'obliged' [əˈblɪdʒd], [eə] as in 'were' [wəːr], etc.

It is difficult to describe the exact value of the vowel [e]. It is always subject to varied pronunciation depending on the individual speaker as well. There is one extreme short [e] as in [əmʌŋ]. A higher and more retracted form of [e] exists when a velar consonant [k] or [g] follows. There is another [ʌ] like sound which is an opener one having more duration. It occurs in the final position.

eg: [əʊvə] 'over'

Malayalam speakers realise initial [e] of English as [e], [a], or [ɔ]

eg: [e] as in [əbˈvə] 'above' [əbəvə]
[ɑː] as in [əˈkaʊnt] 'account' [əkəʊnt]
[ɔ] as in [əbˈɪdʒənt] 'obedient'
[əbɪdʒənt]

Malayalam speakers realise word final [e] in 'r' ending words as [ər] and [ə] in other words.

[ər] as in [rɛdɪstə] 'register' [rɛdɪstə]
[ɑːr] as in [məstə] 'mortar' [məstə]
[ɑː] as in [ekstrə] 'extra' [ekstrə]
Malayalam speakers replace [ a ] or [ eː ] for [ e ] in the medial position.

eg: [ a ] as in [ a k ʃ o n ] 'action' [ aː k ʃ o n ]
    [ eː ] as in [ m o d e n ] 'modern' [ m oː diː n ]

The English [ eː ] is one of the difficult sounds for Malayalam speakers. Educated people, however, are not making any substitution. They realise [ eː ] in their pronunciation in words like 'return' [ r i tː eː n ].

Others change [ eː ] and use [ eː ] in their pronunciation in many words.

eg: [ r i tː eː n ] 'return' [ r i tː eː n ]
    [ g eː l ] 'girl' [ g eː l ]
    [ m o d eː niː tiː ] 'dodernity' [ m oː deː niː tiː ]

Malayalam speakers also make the following substitutions in initial, medial and final positions. Initially they use [ eː ], [ eː r ] or [ a r ]

eg: [ eː ] as in [ eː n iː st ] 'earnest' [ eː n eː s t ]
    [ eː r ] as in [ eː l iː ] 'early' [ eː r l iː ]
    [ a r ] as in [ eː æ n t ] 'urgent' [ æ r j eː n ]

Medially they use [ eː r ], [ a r ] or [ eː i ]

eg: [ eː r ] as in [ eː k s p æ t ] 'expert' [ eː ks p æ r t ]
    [ a r ] as in [ tʃ eː tʃ ] 'church' [ tʃ eː tʃ ]
    [ eː i ] as in [ p eː s ] 'purse' [ p eː l ]
Finally they use [ a r ] or [ e r ]

e.g.: as in [ s t e r ] 'stir' [ s t a r ] or [ s t e r ]

as in [ s e ] 'sir' [ s a r ]

2.1.3. Back Vowels

2.1.3.1. English Back Vowels

[ ə: ] is low-back, lax and unrounded. The commonly used key-word is 'father' [ f ə: f e: ].

[ o ] is a low-mid-back, lax and rounded vowel. It is nearly open with slight lip rounding. Sometimes it is replaced by an up stressed [ ə ].

e.g.: [ b i k o z ] 'because' [ b i k e z ]

[ o: ] is a high-mid-back, tense and rounded vowel. It is intermediate between open and half open. Formerly the pronunciation with [ o: ] was very common, now the pronunciation with [ o ] is more usual in many words.

Some people substitute [ ə o ] or [ ə: ] in words written with 'r'

e.g.: [ s o e ] 'sore' instead of [ s o: ]

[ o: ] has two varieties [ o: ] and [ o' ].

[ u ] is a low-high-back, lax and rounded vowel. It is between close and half close.
Some people use an unrounded \([ u ]\) phonetically represented as \([ u]\).

\[ \text{eg: } [ g u d ] \text{ instead of } [ g u d ] \text{ 'good'} \]

\([ u: ]\) is a high-back, tense and rounded vowel.

It is nearly close. Many people use an \([ u w ]\) like diphthongal sound for \([ u: ]\).

\[ \text{eg: } [ m u w n ] \text{ for 'moon' } [ m u: n ] \]

Some others use an advanced \([ u ]\), which starts with a central sound \([ e ]\) and moves towards \([ u ]\).

\[ \text{eg: } [ m e u n ] \text{ for 'moon' } [ m u: n ] \]

2.1.3.2. Malayalam Back Vowels

\([ o ]\). In the production of this sound the lips are somewhat rounded. It is a short-mid-back rounded vowel. It occurs only initially and medially. When it occurs initially, it has an onglide of \([ v ]\).\(^6\)

\[ \text{eg: } [ o n i \mu ] \text{ 'ons'} \]

\([ o: ]\). It has longer duration and is produced in the same way as \([ o ]\). This sound is described as the long, mid-back, rounded vowel.

\([ o: ]\) occurs in the initial, medial and final positions.
[u]. This is a short, high-back rounded vowel. It occurs initially, medially and finally. In the initial position this sound has also an onglide of [v].

eg: [v u p u] 'salt'

[u]. This sound is the longer counterpart of [u] and is produced in the same way as [u]. It is described as high-back-tense and rounded vowel. It occurs initially, medially and finally.

[u] is short-high-back unrounded vowel. This is a complicated vowel sound. A.R. Raja Varma considers the value of this sound as half [u] as in [ka:tw] 'forest'. Some others think the phonetic value of this sound must be half of the vowel [a]. L.V. Ramaswami Iyengar observes this sound as an independent vowel sound and gives its value in the tabular-representation of half-close central vowel. Anyhow the development of final [u], i.e. [u] seems to be rather complicated. After plosives [u] is obligatory and therefore fully predictable. This vowel has been called 'enunciative vowel' by Valentine.

Consonant clusters are absent in Malayalam in the final position and single consonants are rare in that position. So it is normal for words in that language to end in a vowel - a short, neutral vowel, for euphonic reasons. In Malayalam this enunciative vowel is found to occur in the pausal positions after words ending in obstruents and long sonorants.

eg: [u p u] 'salt'
2.1.3.3. Contrast

English has five back vowels, viz. [ Ai, o, oi, u, ui ]. Malayalam also has five back vowels [ o, o: , u, ui, u: ]. English [ u ] and [ u: ] have parallels in Malayalam, i.e. [ u ] and [ u: ]. Malayalam [ u ] is closer than English [ u ]. In the place of English [ a: ] Malayalam speakers use a fronter and more centralised vowel [ a: ]. Though Malayalam [ a: ] is a central vowel, it is retracted enough to be treated as a back vowel. So it might be taken to be a parallel sound for English [ a: ].

English [ o ] and [ o: ] do not exist in Malayalam. They are the difficult back vowels for Malayalam speakers. They replace these by [ o ] and [ o: ].

eg: [ o r e t e ] 'orator' is realised in Malayalam as

[ o r e t a r ].

[ o: b i t ] 'orbit' is realised in Malayalam as

[ a: r b i t u ]

Malayalam [ o ] does not occur word finally. Malayalam [ u ] and [ u: ] occur in all the three positions. English [ u ] and [ o ] do not occur finally except the [ u ] which occurs in the stressed form of 'to' [ t u ]. English [ u ] is restricted to initial position.

<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ a: ]</td>
<td>[ a: v i ] 'steam'</td>
</tr>
<tr>
<td>[ f t a: ]</td>
<td>[ k a: t u ] 'forest'</td>
</tr>
<tr>
<td>[ u ]</td>
<td>[ t a: ] 'give'</td>
</tr>
<tr>
<td>[ o: ]</td>
<td>[ o: ]</td>
</tr>
</tbody>
</table>
English [a:] has two varieties [A] and [a:], as in [h A]t] 'heart' and [h A d] 'hard', respectively. [u] has two varieties [u] and [u*], as in [f u t] 'foot' and [g u* d] 'good'. Likewise,

[u:] has two varieties in [b u* s t] 'boost' and [b u* z] 'booze', [o] in [m o k] 'mock' and [m o b] 'mob', and [o:] in [u o s] 'shore' and [s o:] 'saw', respectively.

Malayalam [a:],[u:] and [u:] have no such varieties when compared to English. Malayalam [u] is an absent sound in English. Some linguists consider the final [u] as a short
But [u:] and [u] stand in contrast in the following words:

[ i t u ] 'put'

[ a T u ] 'swing'

[ i t : u ] 'having put'

[ a T w ] 'goat'

English [o] and [o:] do not occur in Malayalam. Malayalam [o] and [o:] do not occur in English. So English [o] and [o:] create problem for Malayalam speakers and [o] and [o:] create pronunciation problem for English speakers.

Malayalam speakers replace [o] and [o:] by [o] and [o:].

eg: [ o f e n s ] 'offence'

[ o ơ g n ] 'organ'

Some people substitute [a:] or [o:] for English [o:] in some words.

eg: [ o p e r e i s n ] 'operation'

or [ a p a r e s a n ]

English [o:] is sometimes substituted by [a:]

eg: [ o: 1 ] 'all' [ a: l ] (or [ o: l ])

Malayalam [u] and [u:] are similar sounds to such sounds of English, though Malayalam [u:] is slightly opener than English [u:] and Malayalam [u] is not as centralised as English [u].
Malayalam speakers substitute [ aː ] for [ dː ]. English [ dː ] is more retracted than Malayalam [ aː ]. So a phonetically similar variety could be a fair substitute if realised with the appropriate lengthening.
2.2. **Diphthongs**

Diphthong is a combination of a full vowel with a glide vowel before or after it. Since any vowel may be linked with any other vowel to form a diphthong the number and variety of diphthongs may be very large. But in Malayalam there are only two diphthongs, viz. [ai] and [au], while there are eight diphthongs in English viz. [ei], [ai], [oi], [ou], [au], [ai], [eə] and [ue] according to Daniel Jones and Aber Crombie.

In Malayalam [ai] and [au] are not treated as single units. They should be structurally interpreted as [ay] and [av]. Traditionally [ai] and [au] are treated as diphthongs in the literary language.

As there exist separate graphemes for [ai] and [au] we may be tempted to classify them as one unit sounds.

English diphthongs are absent in Malayalam. Malayalam speakers realise them in different ways which are discussed in the following pages.

**Diphthong [eɪ]**

English [eɪ] occurs in all positions.

**Initial** [eim] ‘aim’

**Medial** [meid] ‘made’

**Final** [mei] ‘may’
In Malayalam [ai] is not available in the alphabet. But the diphthongal value is often heard in speech in the evolution of [e y]. [e i] is realised by the Malayalam speakers as a long [eː] or as a short [e] followed by a [i] onglide plus [i]. Educated speakers use [e y] also. Some people use [e y] in some words and [eː] in other words. It differs from individual to individual. In the final position it is realised mostly as [eː].

**Initial**

- [e i tʃ] 'aitch' [eyɪtʃ]
- [e i t] 'eight' [eyɪt]
- [e i l] 'ail' [eyɪl]

**Medial**

- [m e i t] 'mate' [meɪt]
- [w e i st] 'waist' [weɪst] or [veɪst]
- [d e i t] 'date' [deɪt] or [deɪt]

**Final**

- [p r e i] 'pray' [prei]
- [s w e i] 'sway' [swei]
- [s t e i l] 'stay' [stei]

**Diphthong [ai]**

English [ai] occurs in all positions.

**Initial**

- [a i t ə m] 'item'

**Medial**

- [d a i d] 'died'

**Final**

- [l a i] 'lie'

In Malayalam [ai] is not treated as one unit though it is present in the alphabet. It can be structured as
a sequence of [ a y ] because '-y' occurs in final position of root syllables and derivative suffixes just like other sonorants.

eg: [ k a y ] 'hand'

[ i ] is written as non-syllabic vowel only after [ a: ]. Elsewhere it is always graphically represented as consonant [ y ]. There are pairs where the diphthong [ a i ] is in free variation with the sequence of [ a y ]

eg: [ p a i y a n ] > [ p a y ; a n ] 'boy'

In Malayalam, English [ a i ] is sometimes realised as a diphthong. But the Malayalam speakers often realise it as short [ a ] plus [ y ] onglide. In the initial and medial position [ a y ] is followed by [ i ].

eg:

<table>
<thead>
<tr>
<th>Initial</th>
<th>[ a i l ] 'isle'</th>
<th>[ a y i l ]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[ a i d i ] 'idea'</td>
<td>[ a y i d i a ]</td>
</tr>
<tr>
<td></td>
<td>[ a i d l ] 'idol'</td>
<td>[ a y i d a ]</td>
</tr>
<tr>
<td>Medial</td>
<td>[ l a i k ] 'like'</td>
<td>[ l a y i k ]</td>
</tr>
<tr>
<td></td>
<td>[ l a i t ] 'light'</td>
<td>[ l a y i t ]</td>
</tr>
<tr>
<td></td>
<td>[ s a i n ] 'sing'</td>
<td>[ s a y i n ]</td>
</tr>
<tr>
<td>Final</td>
<td>[ f l a i ] 'fly'</td>
<td>[ f l a y ]</td>
</tr>
<tr>
<td></td>
<td>[ m a i ] 'my'</td>
<td>[ m a y ]</td>
</tr>
<tr>
<td></td>
<td>[ l a i ] 'lie'</td>
<td>[ l a y ]</td>
</tr>
</tbody>
</table>
Diphthong [ o i ]

English [ o i ] occurs in all positions.

eg:

Initial [ o i l ] 'oil'
Medial [ d ə k o i t ] 'dacoit'
Final [ dʒ o i ] 'joy'

English [ o i ] is absent in Malayalam. Malayalam speakers realise it as a diphthong but very often as a long [ oː ] plus a [ y ] glide plus [ i ] in all positions except the final position.

eg:

Initial [ o i l ə ] 'oiler' [ oː y i l ə r ]
[ o i n t m ə nt ] 'ointment' [ oː y i n t m ə n d ə m ]
[ o i s t e r ] 'oyster' [ oː y i s t ə r ]
Medial [ p o i n t ] 'point' [ p oː y i n d ə m ]
[ t o i s ] 'toys' [ t oː y i s w ]
[ tʃ ɔ i s ] 'choice' [ c oː y i s w ]
Final [ dʒ o i ] 'joy' [ j oː y ]
[ t o i ] 'toy' [ t oː y ]
[ b o i ] 'boy' [ b oː y ]

Diphthong [ a u ]

English [ a u ] occurs in all positions.
eg:
Initial [ a u t ] 'out'
Medial [ t a u n ] 'town'
Final [ n a u ] 'now'

In Malayalam [ a u ] is not treated as one unit, though it is present in the alphabet. It can be structured as a sequence [ a v ] because [ u ] is written as a non-syllabic vowel only after [ aː ]. Elsewhere it is always graphically represented as consonant [ v ]. [ a u ] or [ a v ] does not occur word finally in Malayalam. It occurs only initially and medially.

eg: [ a u d a r i y a m ] or [ a v d a r y a m ] 'hospitality'
    [ k a u m a r a m ] or [ k a v m a r a m ] 'teenage'

Now Malayalam speakers realise English [ a u ] in a number of words without a glide.

eg: [ a u t ] 'out' [ a u t ː u ]
    [ t a u n ] 'town' [ t a u n ]
    [ d a u ] 'thou' [ d a u ] or [ d a v ]

In some words the diphthong is split up into [ a ] and [ u ] and a [ v ] glide comes between.
eg: [aʊt] for [aʊt] 'out'
[əʊn] for [əʊn] 'ounce'
[pəʊd] for [pəʊd] 'powder'
[əʊn] for [əʊn] 'town'
[nəʊ] for [nəʊ] 'now'
[θəʊ] for [θəʊ] 'thou'

Diphthong [əʊ]

English [əʊ] occurs in all positions.

eg:

<table>
<thead>
<tr>
<th>Position</th>
<th>Word</th>
<th>Pronunciation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial</td>
<td>[əʊt]</td>
<td>'oat'</td>
</tr>
<tr>
<td></td>
<td>[əʊθ]</td>
<td>'oath'</td>
</tr>
<tr>
<td>Medial</td>
<td>[pəʊl]</td>
<td>'pole'</td>
</tr>
<tr>
<td></td>
<td>[məʊl]</td>
<td>'mole'</td>
</tr>
<tr>
<td>Final</td>
<td>[ʃəʊ]</td>
<td>'show'</td>
</tr>
</tbody>
</table>

Malayalam speakers recognise it as [oː] in initial, medial and final positions.

eg: [əʊl] [d] 'old' [ə: l d] [əʊk] 'oak' [ə: k] [səʊl] 'sole' [sə: l] [pəʊl] 'pole' [pə: l] [fəʊl] 'flow' [fə: l] [səʊl] 'slow' [sə: l]

A word like 'omit' is realised by the Malayalam speakers with a short [o].
eg: [əumɪt] 'omit' [ɒmɪt]w

Diphthong [i e]

English diphthong [i e] occurs rarely in initial and medial positions.

eg:
Initial [i e] 'ear'
Medial [i d i ə t] 'idiot'
Final [j i e] 'year'

In the medial position [i e] occurs in inflected forms and is fairly distributed finally. Malayalam speakers recognise the first element of [i e] as a long [iː] and the second element is recognised as [eː] or [əɹ] with the [yː] glide coming in between.

eg: [i e] 'ear' [iː y a r]  
[k i l i ə d] 'cleared' [k l i ɪ ə d]  
[b i ə d] 'beard' [b i ɪ ə d]  
[k l i e] 'clear' [k l i ɪ ə r]  
[f i e] 'fear' [f ʰ i ɪ ə r]  
[n i e] 'near' [n i ɪ ə r]

Diphthong [e ə]

English diphthong [e ə] occurs rarely in the initial position.
eg:
Initial [ e e ] 'air'
Medial [ f l e e d ] 'flared'
Final [ w e e ] 'wear'

In the medial position [ e e ] occurs in inflected forms and is fairly distributed finally. Malayalam speakers realise the first element of [ e e ] without change and the second element is realised as [ e i ] word medially. In the final position in 'r' ending words short [ a ] is used instead of [ e i ] and in the final position it is followed by [ e r ] in such words and the [ y ] glide always comes in between.

eg: [ e e ] 'air' [ e y a r ]
   [ k e e d ] 'cared' [ k e y a d ]
   [ d e e d ] 'dared' [ d e y e a d ]
   [ p e e ] 'pair' [ p e y a r ]
   [ h e e ] 'hair' [ h e y a r ]

Diphthong [ u e ]

English [ u e ] occurs in the medial and final positions. It does not occur word initially.

eg:
Initial -
Medial [ f u e l i ] 'surely'
Final [ f j u a ] 'fewer'

Generally the diphthong [ u e ] occurs only finally. But in some inflected forms it occurs medially also. Malayalam
speakers realise it as a long [uː] or short [u], plus short [a] with [v] glide coming in between, followed by [r] in 'r' ending words. Sometimes it is heard as [uːr].

eg: [pjʊərəi] 'puree' [pjʊərəi]
[pjʊərəli] 'purely' [pjʊərəli]
[fjuːə] 'fewer' [fjuːə]
[kjʊə] 'cure' [kjʊə]
2.3. **Vowel sequences**

In English the sequences of vowels are not excluded from diphthongs. They form a glide within one syllable. They have a starting point or first element and a second element. The first element may be one of the vowels [i, e, a, o, u] and the second element [i, u, e]. They are treated as separate sound units in English.

No vowel clusters are found in Malayalam. But in Malayalam Alphabet there are two diphthongs [ai] and [au]. But in pronunciation they have [y] and [v] interference, respectively. English [ai] and [au] sequences are changed into [ay] or [ayi] and [av] or [avu]. Whenever there is a chance of a vowel sequence [v] or [y] glide intervenes in Malayalam.

There are some words ending in vowels in Malayalam. When these words are followed by a word which has an initial vowel there could be a vowel sequence if the pause is removed. But in Malayalam in such places an elision takes place.

*eg: [evident a: yirun u]→ [eviden a: yirun u]*

Here the word final [e] of the first word has disappeared. In literary language it is changed to [evident a: yirun u]. Here the [e] is there but [y] comes between [e] and [a:], similarly

*[individual a: nos]→ [individual a: nos]*
In this word the [e] has disappeared. In literature it brings an extra [y] sound: [i\ i\ i\ e\ y\ a\ n\ o:]
This can not be said as a vowel sequence, similarly
\[i\ i\ \ +\ [e] \ becomes\ [i\ y\ e].\]
\[e.g.:\ [k\ i\ i\ i\ ]\ \ +\ [e\ \ t\ i\ ]\ \ \Rightarrow\ [k\ i\ \ i\ i\ y\ e\ t\ i\ ]\]
\[m\ a\ s\ i\ i\ ]\ +\ [e\ \ v\ i\ d\ e]\ \Rightarrow\ [m\ a\ s\ i\ y\ e\ v\ i\ d\ e]\]
\[i\ i\ \ +\ [a] \ becomes\ [i\ y\ a]\]
\[e.g.:\ [k\ a\ i\ i\ ]\ \ +\ [a\ i\ a]\ \ \Rightarrow\ [k\ a\ i\ y\ a\ l\ i\ a]\]
\[a\ ]\ +\ [o\ i\ ]\ becomes\ [a\ y\ o\ i]\]
\[e.g.:\ [p\ a\ n\ a\ ]\ \ +\ [o\ i\ l\ a]\ \ \Rightarrow\ [p\ a\ n\ a\ y\ o\ i\ l\ a]\]
\[a\ ]\ +\ [u]\ becomes\ [a\ y\ u]\]
\[e.g.:\ [m\ a\ l\ a\ ]\ \ +\ [u\ \ n\ d\ u]\ \ \Rightarrow\ [m\ a\ l\ a\ y\ u\ n\ d\ u]\]
\[u\ ]\ +\ [u]\ becomes\ [u].\ One\ [u]\ disappeared.
\[e.g.:\ [p\ o\ i\ k\ u\ n\ u\ ]\ \ +\ [u\ \ n\ d\ u]\ \ \Rightarrow\ [p\ o\ i\ k\ u\ n\ u\ y\ n\ d\ u]\]

Such changes are numerous in Malayalam. It indicates that a vowel sequence in pronunciation is avoided by elision of one vowel or by bringing a [y] glide in between.

Sequences occur with short as well as long vowels.
These sequences of two vowels take the form of a vowel plus semivowel. The second part of the sequence acts like a consonant, i.e., \(VV\) acts like \(VC\).
\[e.g.:\ [k\ a\ i\ ]\ becomes\ [k\ a\ y\ ]\ 'hand'

So we may come to a conclusion that in Malayalam, vowel sequences do not occur. In the written word \(p\ a\ i\ a\ n\ 'boy'\)
there are three vowels. As there can not be a three vowel-sequence in Malayalam in pronunciation it changes into 
\[ p a y: a n \].

The back glide \([ v ]\) is used after back non-low vowels and the front glide \([ y ]\) is used after other vowels.

eg: \([ po\text{-}\tilde{u}] + [a; i] \rightarrow [ po\text{-}\tilde{u}v a; i ] \)  
\([ po\text{-}\tilde{u}] + [a; yi] \rightarrow [ po\text{-}\tilde{u}v a; yi ] \)  
\([ k a r i ] + [um] \rightarrow [ k a r i y u m ] \)  
\([ p a r a ] + [um] \rightarrow [ p a r a y u m ] \)
2.4. **Nasalization**

Nasalization of vowels is a universal feature. Malayalam speakers and the Americans use nasalization frequently. Nasalization lowers the vowels. But some people consider that nasalization raises the vowels or neutralize it. Nasalized vowels are produced mainly by velo-pharyngeal closure. The uvula is lowered. The back part of the tongue is retracted. There are two frequency components which distinguish the nasalized vowels. One is high pitched tone and the other is lower tone. Nasalized vowels are produced with resonances changed usually toward a lower pitch with the closure of the velar part. The soft palate is lowered.

All vowels in English can be nasalized. The slight withdrawal of the soft palate results in weak nasalization in English. The full lowering of the soft palate results in strong nasalization. Many people use nasalized vowels when nasal consonants are adjacent. Some people nasalize their vowels even when there is no adjacent nasal consonants.

Malayalam is generally considered to be a 'nasal language'. In colloquial speech in central Kerala, the [e] means 'why'. It is different from [e]. In normal English speech nasalized vowels are not found though the vowels which occur in the neighbourhood of nasal consonants are partially nasalized. Both in English and Malayalam nasalization is not considered as unit sound. Both languages do not mark nasalization traditionally. Vowels of both languages can be transformed into their nasalized counterparts if the soft plate is lowered.
(1) The vowels which occur between two nasal consonants can be nasalized partially in both languages. English nasalized \([i\, i: \, e\, u\, a\, u\, o\, o:\, e\, i\, e:\, i:\, a, u, o, o:\, a, i, u, o, o:\] have analogues in Malayalam.

<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[minister]</td>
<td>[m#i#] 'name of a girl'</td>
</tr>
<tr>
<td>[mean]</td>
<td>[m#i#n] 'fish'</td>
</tr>
<tr>
<td>[mental]</td>
<td>[n##c#] 'chest'</td>
</tr>
<tr>
<td>[noon]</td>
<td>[m##n#] 'three'</td>
</tr>
</tbody>
</table>

English nasalized \([\#e, \#o, \#\#, \#v, \#i\] and Malayalam \([\#a, \#i, \#e, \#u, \#o, \#i\] have no parallels.

<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[man]</td>
<td>-</td>
</tr>
<tr>
<td>[mamma]</td>
<td>-</td>
</tr>
<tr>
<td>[mum]</td>
<td>-</td>
</tr>
<tr>
<td>[nod]</td>
<td>-</td>
</tr>
<tr>
<td>[norm]</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>[m##n#a] 'house'</td>
</tr>
<tr>
<td>-</td>
<td>[m##n] 'deer'</td>
</tr>
<tr>
<td>-</td>
<td>[m##n#o#n#] 'a caste'</td>
</tr>
<tr>
<td></td>
<td>[m##n#i#] 'monk'</td>
</tr>
<tr>
<td></td>
<td>[m##n#t#a] 'jug'</td>
</tr>
<tr>
<td></td>
<td>[m##n#t#a] 'son'</td>
</tr>
</tbody>
</table>

(2) Vowels occurring before nasal consonants are usually nasalized in both languages. English nasalized \([\#e, \#i, \#u, \#u, \#e\] have analogues in Malayalam.
### English | Malayalam
---|---
[pɪn] 'pin' | [vɪn] 'sky'
[skrɪ:n] 'screen' | [vɨnā] 'guitar'
[ɒpətʃuːnɪzəm] 'opportunism' | [tʊnɪ] 'cloth'
[spʊrn] 'spoon' | [tʊrnʊ] 'pillar'
[pɛn] 'pen' | [pɛnʊ] 'woman'

English nasalized [ʃ, ʃ̩, ʃ̊, ŋ, ŋ̃, ŋ̊] have no analogues in Malayalam. Malayalam nasalized [n, n̩, n̋, o̩, ɔ̊] have no analogues in English.

### English | Malayalam
---|---
[bæŋk] 'bank' | -
[lɛ:n] 'learn' | -
[sʌn] 'sun' | -
[bɔnd] 'bond' | -
[bɔːn] 'born' | -
[pʌnɔ] 'a plant'
[pɹəbwe] 'snake'
[tənɔu] 'peel'
[t̩ɔːni] 'boat'
[pɛːnʌ] 'pen'

(3) Word final vowels after nasal consonants are partially nasalized. English nasalized [i, iː, uː] have analogues in Malayalam.
English | Malayalam
---|---
\([ m \tilde{n} \tilde{i} ]\) 'many' | \([ p \tilde{n} i \tilde{\iota} ]\) 'work'
\([ n \tilde{i}: ]\) 'knee' | \([ n \tilde{i}: ]\) 'you'
\([ m \tilde{u}: ]\) 'moo' | \([ v \tilde{a} \tilde{n}: \tilde{u} ]\) 'came'

English \([ \tilde{e}, \tilde{a}, \tilde{o} ]\) do not occur word finally.
\([ \tilde{e} ]\) and \([ \tilde{o} ]\) have no analogues in Malayalam. Similarly
Malayalam \([ \tilde{a}, \tilde{a}, \tilde{u}, \tilde{\alpha}, \tilde{e}, \tilde{\alpha} ]\) have no parallels in English.

eg:

English | Malayalam
---|---
\([ p \tilde{a}: t n \tilde{e} ]\) 'partner' | 
\([ s n \tilde{o}: ]\) 'snore' | 
\([ \tilde{a} m: \tilde{a} ]\) 'mother'
\([ \tilde{a}: \tilde{\iota} ]\) 'dog'
\([ v \tilde{a} n: \tilde{u} ]\) 'came'
\([ v \tilde{a} n: \tilde{\alpha}: ]\) 'did (he) come'
\([ \tilde{e} m: \tilde{e}: ]\) 'me'
\([ m \tilde{a}: n: \tilde{\alpha}: ]\) 'soil'

(4) Vowels occurring after nasals and before voiceless consonants also get nasalized. English nasalized \([ i, i:, e, u, u: ]\) have analogues in Malayalam.

eg:

English | Malayalam
---|---
\([ n \tilde{i}: p ]\) 'nip' | \([ m \tilde{a}: n \tilde{i}: k; \tilde{\alpha}: m ]\) 'a jewelled coil'
\([ n \tilde{i}: t ]\) 'neat' | \([ n \tilde{i}: \tilde{t}: \tilde{\alpha}: m ]\) 'length'
\([ m \tilde{e}: t r i k ]\) 'metric' | \([ \tilde{u}: \tilde{e}: k; i \tilde{\alpha}: ]\) 'pressed'
\([ n \tilde{u}: k ]\) 'nook' | \([ \tilde{m}: \tilde{u}: t: \tilde{\alpha}: ]\) 'knee'
\([ m \tilde{u}: \tilde{t}: ]\) 'moot' | \([ m \tilde{u}: t: \tilde{a} ]\) 'an insect'
English [ə, ʊ, ɒ, ɔː] have no analogues in Malayalam. Similarly Malayalam [ə, ʊ, ɒ, ɔː] have no analogues in English.

<table>
<thead>
<tr>
<th>English</th>
<th>Malayalam</th>
</tr>
</thead>
<tbody>
<tr>
<td>[n ɒp]</td>
<td>'nap'</td>
</tr>
<tr>
<td>[m ʌt ən]</td>
<td>'mutton'</td>
</tr>
<tr>
<td>[m ət]</td>
<td>'mart'</td>
</tr>
<tr>
<td>[m ɒp]</td>
<td>'mop'</td>
</tr>
<tr>
<td>[n əz ə]</td>
<td>'north'</td>
</tr>
<tr>
<td>[n əz ə m]</td>
<td>'profit'</td>
</tr>
<tr>
<td>[m ʌt ɪ]</td>
<td>'codefish'</td>
</tr>
<tr>
<td>[n əz ɪ]</td>
<td>'hunged'</td>
</tr>
<tr>
<td>[m ɒt ɯ]</td>
<td>'bud'</td>
</tr>
<tr>
<td>[n əz k ɪ]</td>
<td>'looked'</td>
</tr>
</tbody>
</table>
2.5. Length

Malayalam has 11 vowels out of which 5 are long and 6 are short. English has 12 vowels - 5 long and 7 short.

In Malayalam all vowels except [u] contrast in length in the initial and medial position.

eg: **Initial**

<table>
<thead>
<tr>
<th>Malayalam</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>[a la]</td>
<td>'wave'</td>
</tr>
<tr>
<td>[i t: i]</td>
<td>'name'</td>
</tr>
<tr>
<td>[u ma]</td>
<td>'name'</td>
</tr>
<tr>
<td>[e n t u]</td>
<td>'what'</td>
</tr>
<tr>
<td>[o t: i]</td>
<td>'stuck'</td>
</tr>
</tbody>
</table>

**Medial**

<table>
<thead>
<tr>
<th>Malayalam</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>[m a l a]</td>
<td>'hill'</td>
</tr>
<tr>
<td>[v i h: i]</td>
<td>'ached'</td>
</tr>
<tr>
<td>[m u l a]</td>
<td>'breast'</td>
</tr>
<tr>
<td>[c e m b u]</td>
<td>'copper'</td>
</tr>
<tr>
<td>[p o t: u]</td>
<td>'hole'</td>
</tr>
</tbody>
</table>

Except [o] and [u] all other vowels contrast in the final position.

eg: | Malayalam | English |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[p a t a]</td>
<td>'foam'</td>
</tr>
<tr>
<td>[p a t i]</td>
<td>'husband'</td>
</tr>
<tr>
<td>[p a r u]</td>
<td>'swelling'</td>
</tr>
<tr>
<td>[a v i d e]</td>
<td>'there'</td>
</tr>
</tbody>
</table>

[Note: The transcription of Malayalam sounds in English is approximate and not entirely accurate.]
All short vowels have length oppositions in all positions except

(1) Short [ o ] does not occur word finally.

(2) In an open syllable of monosyllabic words the vowel is always long. ²²

(3) Vowel [ u ] is short and occurs only finally.

eg. [ v-a: ] 'come.'

Vowels are capable of being continued during a longer period. The length of them varies greatly. There are three degrees of duration for short vowels, i.e., extra short, short, and half long. ²³ An extra short vowel is represented by [ v ], half long by [ v' ] and short vowel by [ v ].

[ v ] vowel (with an extra short duration) occurs before a long stop.

eg: [ a p: a n ] 'father'

[ v' ] half long vowel freely varying with the short vowel occurs word finally.

eg: [ m u n i ] ~ [ m u n i' ] 'monk'

[ v ] short vowel occurs in all other places.

eg: [ p a l a k a ] 'wood'

There are two degrees of duration for long vowels, i.e., extra long represented by [ v: ] and long vowels represented by [ v' ].
[vː] occurs word finally with an accent.

eg: [kʊtʃː] 'child'

[vː] long vowel occurs in all other places.

eg: [mɪlk] [pəl] 'milk'

In English, in accented syllables long vowels are fully long when they are final or in a syllable closed by a lenis consonant. But they are shortened when they occur in a syllable closed by a fortis consonant.

eg: [ʌt] in 'boot' [bʊt] is only about half long as the [ʌt] of 'food' [fʊd] 27h

The rules regarding length are as follows. 25

(1) [iː, aː, oː, uː, eː] are fully long when final.

eg: [iː] in 'knee' [niː]
 [aː] in 'star' [stɑː]
 [ɔː] in 'war' [wɔː]
 [uː] in 'blue' [bluː]
 [eː] in 'blur' [blər]

(2) They are fully long when a voiced consonant follows and the syllable is final in a sentence.

eg: [iː] in 'weed' [wiːd]
 [æː] in 'farm' [færm]
 [ɔː] in 'pause' [pəuz]
 [uː] in 'food' [fʊd]
 [eː] in 'curd' [kɜːd]
(3) They are less long in similar positions when weakly stressed, as [iː] in 'linseed' [lɪnˌsɛd].

(4) They are less long, often not more than half long, when weakly stressed syllables follow,

e.g.: [uː] in 'opportunity' [əˈpəʊtjuːnɪtɪ]

(5) They are half long when a breathed consonant follows in the same syllable.

e.g.: [iː] in 'meat' [miːt]
[ɑː] in 'half' [hɑːf]
[ɔː] in 'port' [pɔːt]
[uː] in 'loose' [luːs]
[eː] in 'burst' [bɜːst]

(6) They are half long or even less than half long in weakly stressed position preceding a strong stress.

e.g.: [ɔː] in 'audacious' [ˈɔːdəsi] 26

In Malayalam length is more a question of time duration while in English it is a complex of duration and quality.

The difference between [i] and [iː] in Malayalam words [ciː] 'mouth' and [ciː] 'hissed' is that the first vowel in the second word is used twice long in time duration than the first vowel in the first word.

But in English the distinction between the [i] in 'sit' [sɪt] and [iː] in 'seat' [sɪːt] is a factor of time duration and a factor of diphthongization along with the
difference in tongue height. The word 'seat' may be transcribed as [s iː t] or as [ s iː t] or [ s iː t]. But similar segments cannot be transcribed in Malayalam. It is because they are not diphthongized versions. They are pure long vowels in Malayalam. Vowels preceding long consonants are shorter in duration in Malayalam than in English. Malayalam vowels do not operate in terms of simple and complex apparatus of diphthongs or diphthongizing of long vowels. In English [æ] is considered as neutral. It is not mentioned as having length opposition. Similarly [u] in Malayalam is not mentioned as having length opposition.

Diphthongs vary in length in the same way as the vowels. Fully long diphthongs are heard in words like 'high' [h a i], 'raise' [r e i s], 'slow' [s l o u], etc. in English. If we consider Malayalam [a i] and [a u] as diphthongs they can be said as long.

eg: [ a i ] as in [ k a i p u ] 'bitterness'
     [ a u ] as in [ a u s a t h a m ] 'medicine'

Diphthongs are generally considered long. The length of diphthongs also varies according to the surrounding sounds. However, Malayalam speakers realise the diphthongs in English with onglides of [ y ] and [ v ], the details of which have already been given in the preceding section.
Reference

   (b) Jones, Daniel : 'The Pronunciation of English', 1963, 
       P. 24. 
   (c) Ward, C. Ida : 'The Phonetics of English', 1972, 
       P. 79.

2. (a) Shyamala Kumari, B. : 'Malayalam Phonetic Reader'; 
       1972, p. 50. 
   (b) Velayudhan, S. : 'Vowel Duration in Malayalam', 1971, 
       P. 6. 
   (c) Sreedhar, M.V. : 'Phonology of the Cochin Dialect of 


6. Ibid.


8. Eyyer Ramaswami : 'A Brief Account of Malayalam Phonetics', 
       Journal of the Department of Letters, University of 
       Calcutta, XIV, 1927.

9. Valentine, E. : 'Enunciated Vowel in Malayalam' I.J.D.L., 


11. Gimson, A.C. : 'An Introduction to the Pronunciation of 
       English', 1969, pp. 126-144.
       Jones, Daniel : 'An Outline of English Phonetics', 1964, 
       pp. 100-125.
    (c) Jones Daniel: Ibid, pp. 134-139.
27. Ibid, p. 5.