

FOR FAVOUR OF EXCHANGE

CENTRE OF ADVANCED STUDY IN LINGUISTICS
UNIVERSITY OF POONA

PRACTICAL PHONETICS

PART I

PERI BHASKARARAO

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PHONETICS**

PART I

CENTRE OF ADVANCED STUDY IN LINGUISTICS
UNIVERSITY OF POONA AT DECCAN COLLEGE
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Centre of Advanced Study in Linguistics
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A. M. Ghatage
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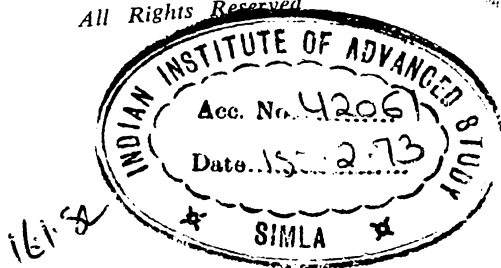
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FOR FAVOUR OF EXCHANGE

TO

SRI KALYAN CHAKRAVARTI

PROEM

This book being the first part of a proposed two-part volume on practical phonetics presents some useful essentials of the phonetics of segmentals. Section I on basic mechanisms gives a foundation for the theory of phonetic description. Section II contains descriptions of sound types, exercises in bare sound, and, whenever available, exercises from natural languages. Diagrams are given wherever necessary in the explanation of basic mechanisms. The student is advised to practise drawing them and correlating them with various sounds described. Section III concludes this part with review exercises including exercises on diagrams. The sections and the exercises are graded to certain extent.

I am thankful to Dr. Amrit M. Ghatage for his constant encouragement and help during the writing and printing of this book. Dr. Ashok R. Kelkar has carefully gone through the whole of this book and gave me several useful comments and criticisms. He kindly made me available his unpublished manuscript, Proposal for a reformed system of phonetic writing, which influenced to a large extent the phonetic script used in this book. Diagram 1 in this book is adopted from his notes on phonetics. The influence of the writings of Professors Kelkar, Abercrombie, Catford, and Ladefoged will be apparent throughout this book. •

My thanks are due to the following persons and sources from whom the materials for the language exercises (L.E.s) are collected :

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I. BASIC MECHANISMS

I. 1. AIRSTREAMS AND MECHANISMS:

1.1. Speech sounds are produced by disturbing the surrounding air by means of the organs of speech. The organs of speech have other primary functions like breathing and eating.

1.2. In the process of speech, keeping lungs at one end and the lips and the nasal opening at the other, if the air is drawn towards lungs it is called ingressive airstream and if it is drawn in the opposite direction it is called egressive airstream. Either of these airstreams is utilized in the production of speech sounds; in some instances both of them are utilized. Airstreams can be produced by various airstream mechanisms.

Indeed the whole speech apparatus can be looked upon as a system of air cavities with interconnecting passages (Diagram 1). So far as speech is concerned, we can neglect the foodpipe and the eartube for our present purpose. The velic passage can be opened or closed by moving the soft palate (velum). The faucal passage can be opened or closed by raising the back of the tongue. The

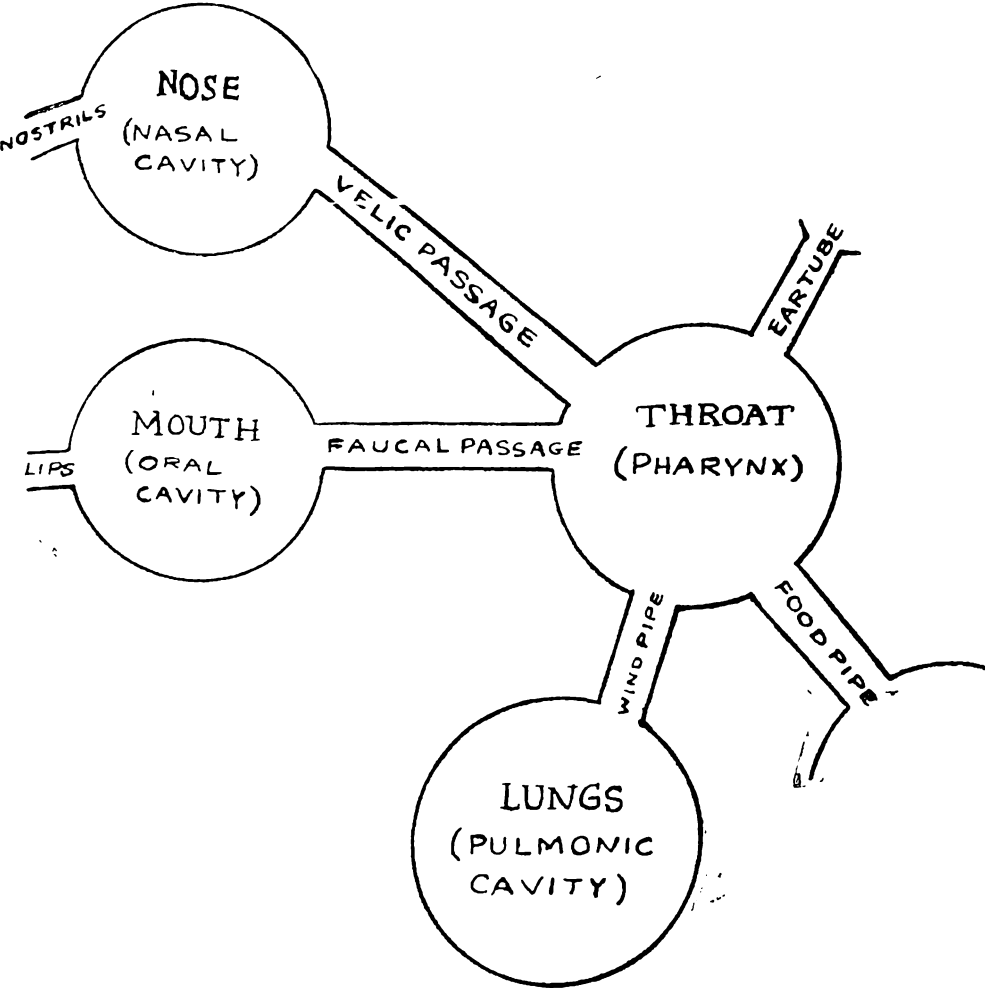


Diagram 1

opening of the windpipe into the pharyngeal cavity is modified into the voice-box (larynx) containing the vocal folds.

1.3. An airstream mechanism can be viewed as a cavity whose volume can be increased or decreased. There are three main types of airstream mechanisms, viz., pulmonic, glottalic, and velaric. The adjustable portion of the chamber is called an initiator. The pulmonic, glottalic, and velaric airstreams are initiated by the initiators—lungs, larynx, and velum—along-with-the-back-of-the-tongue respectively.

1.4. The pulmonic airstream mechanism lies between lungs at the posterior end and lips and nostrils at the anterior end (Diagram 2).

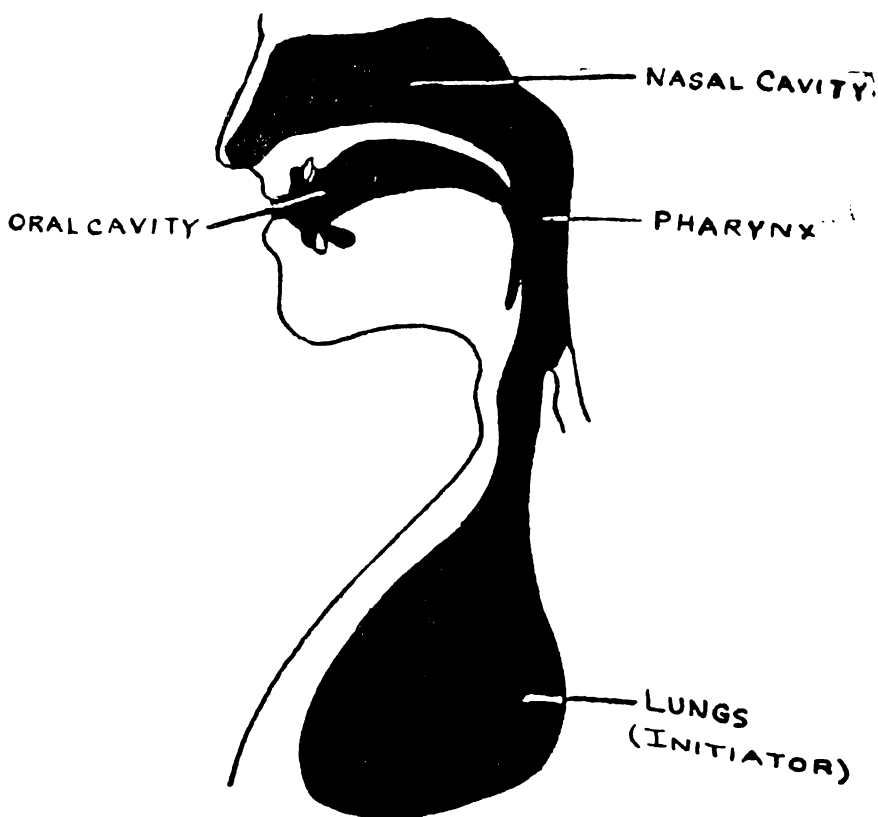


Diagram 2

By the action of the respiratory muscles lungs can either be contracted or expanded and when contracted the air from lungs goes out either through the oral opening or nasal opening or through both. This type of airstream is called a pulmonic egressive airstream. When the lungs are expanded air flows into lungs either through the oral opening or the nasal opening or both. This type of airstream is called a pulmonic ingressive airstream.

1.5. The glottalic airstream mechanism lies between the larynx with glottis tightly or loosely closed at the posterior end and lips and nostrils at the anterior end (Diagram 3).

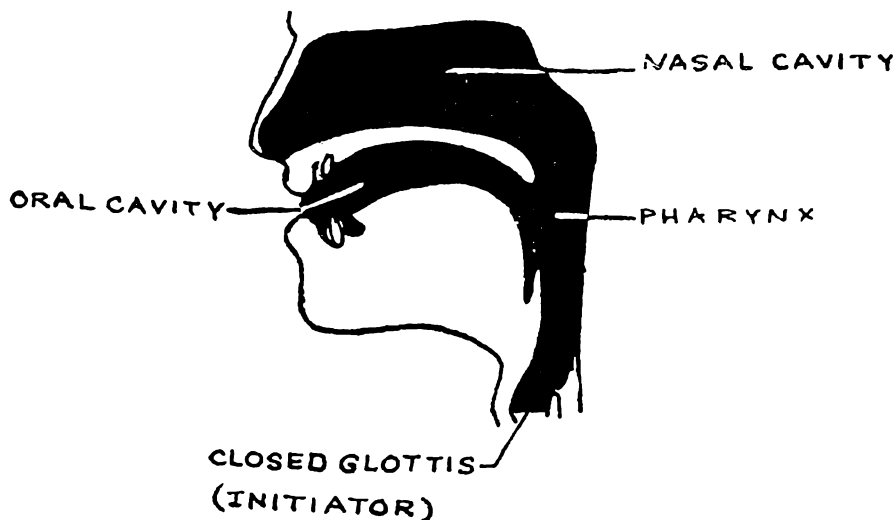


Diagram 3

When the larynx (with tightly or loosely closed glottis) is raised the air thus compressed will escape either through oral opening or nasal opening or both. This is glottalic egressive airstream. When the larynx is lowered air rushes in through oral opening or nasal opening or both. This is glottalic ingressive airstream.

1.6. Velaric airstream mechanism lies between the velum and the back of the tongue tightly pressed against it at the posterior end and the oral opening at the anterior end. Note that thus only

the oral cavity is used—the nasal cavity and the pharynx remaining excluded (Diagram 4).

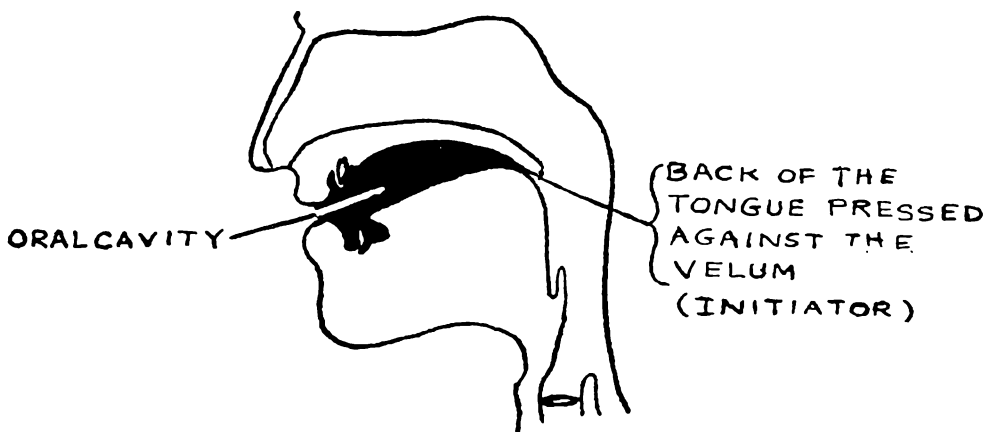


Diagram 4

When the oral cavity is expanded by sliding the tongue posteriorly (backwards and downwards) and still keeping the contact between the back of the tongue and the velum tight, air is drawn in upto the closed velum. The airstream thus produced is known as velaric ingressive airstream. When the oral cavity is compressed by reversing the above action air flows out and the resulting airstream is known as velaric egressive airstream.

I. 2. ARTICULATION :

2.1. The airstream thus produced can be obstructed or modified at one or more places.

2.2. The nature of obstruction or modification (manner of articulation) gives rise to one axis of distinction and the place or zone at which the obstruction takes place (place of articulation) gives rise to another axis of distinction.

2.3. Places of Articulation :

Each place of articulation is defined by the lower articulator and the upper articulator involved in the obstruction or modification of the airstream (Diagram 5).

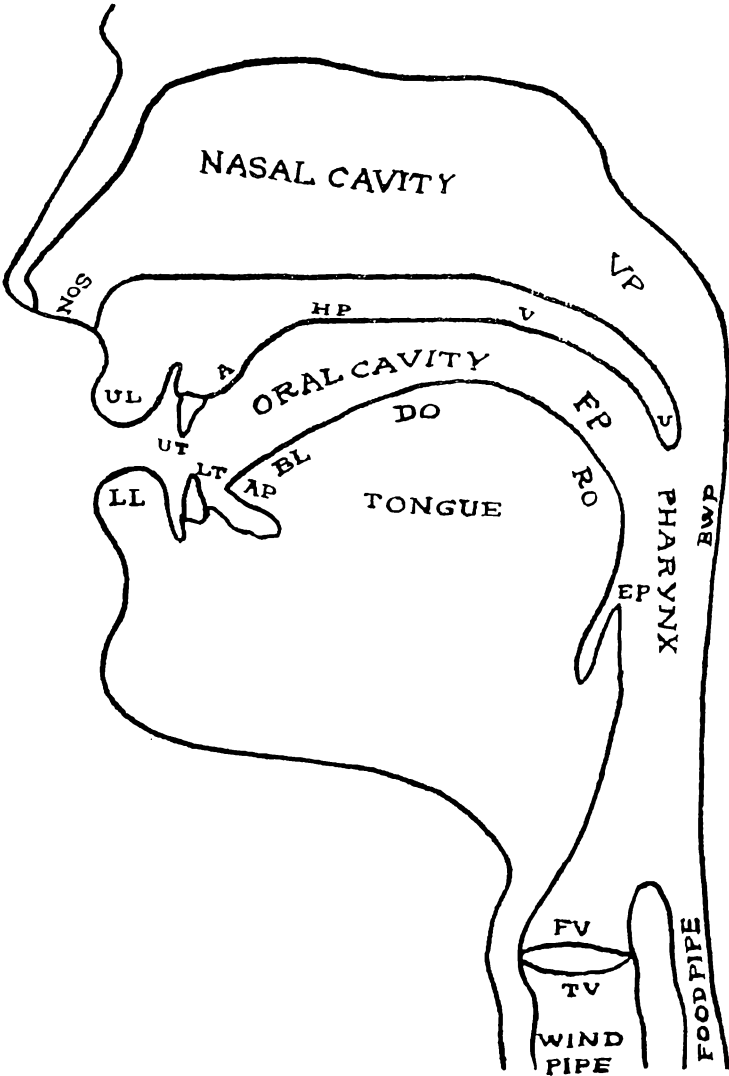


Diagram 5

TV True vocal folds
 FV False vocal folds
 EP Epiglottis

RO Root
 FP Faucal passage
 DO Dorsum

BL	Blade	A	Alveolus
AP	Apex	HP	Hardpalate
LT	Lower front teeth	V	Velum
LL	Lower lip	VP	Velic passage
UL	Upper lip	U	Uvula
NOS	Nostrils	BWP	Back wall of the pharynx
UT	Upper front teeth		

2.3.1. The lower articulators are :

- (1) Lower lip
- (2) Areas of tongue
 - (a) Apex (tip)
 - (b) Lamina (blade)
 - (c) Dorsum (front, centre, and back)
 - (d) Root

We can also mention here lower front teeth and sides of tongue.

2.3.2. The upper articulators are :

- (3) Upper lip
- (4) Upper front teeth
- (5) Alveolus (back gums of the upper front teeth)
- (6) Palate (hard palate—front, centre, back)
- (7) Oral surface of the velum (soft palate)
 - (i) Front part
 - (ii) Back part
- (8) Uvula
- (9) Posterior side of the pharyngeal wall.

We can also mention here the upper side teeth (not shown in the diagram).

2.3.3. As an instance of the place of articulation, the bilabial place of articulation is due to the combined action of the upper lip which is the upper articulator and the lower lip which is the lower articulator. Table 1 gives various places of articulation:

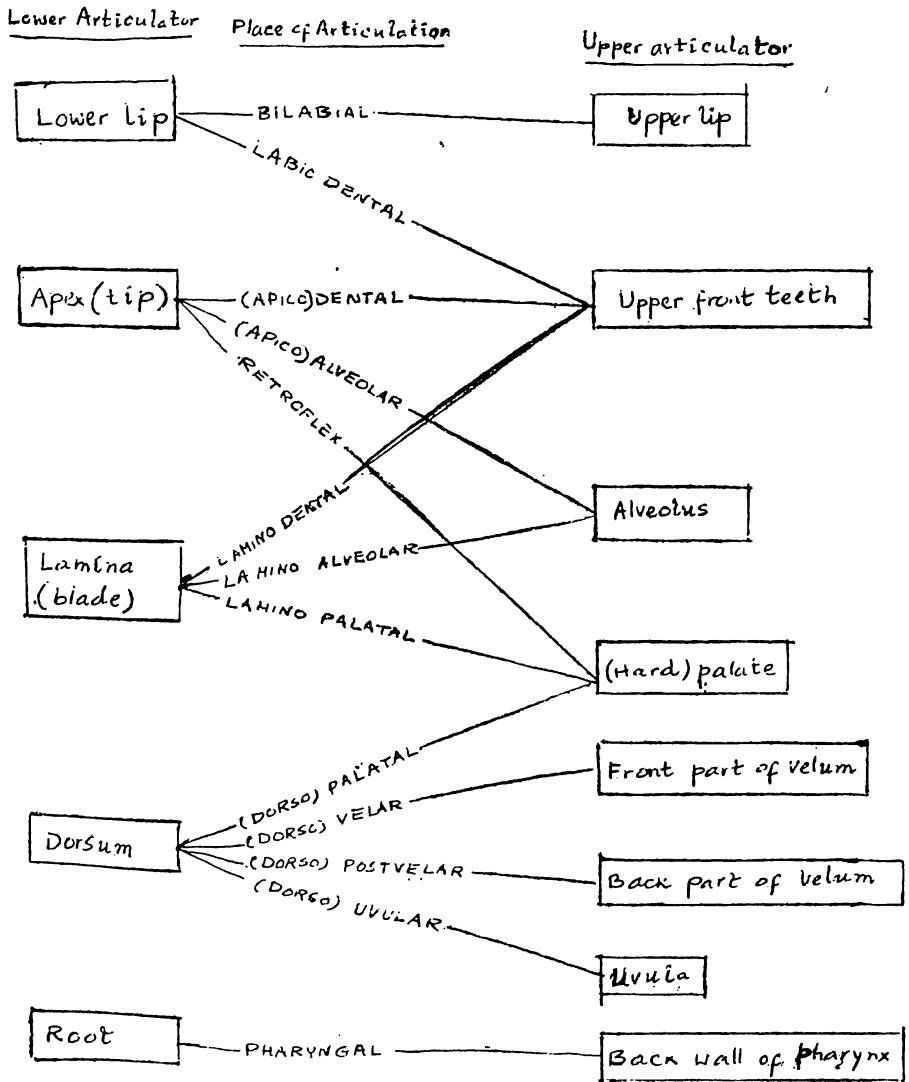


Table 1

This table gives only some main articulations and can be further expanded by making finer distinctions. For instance, palatal can be further divided into pre-palatal and post-palatal.

2.4. Manners of Articulation :

Following are the various manners of articulation :

2.4.1. Stop: Complete and firm closure by the upper and lower articulators gives rise to a stop. Some amount of higher air pressure is built up on the inner side of the closed articulators in egressive air mechanisms; lower air pressure in ingressive air mechanisms. Stops may be released or unreleased. Released stops may also be called plosives. Stops may be oral or nasal. Nasal stops are also called nasals.

2.4.2. Trill: The contact between the two articulators is loose so one or both of the articulators flap against each other several times while the airstream is produced.

2.4.3. Flap: The body of the lower articulator is pulled back and brought forward suddenly so that it hits against the upper articulator while passing only once and settles down. While drawing back, the articulators do not make any contact.

2.4.4. Tap: There is only one tap of the lower articulator against the upper articulator.

2.4.5. Fricative: There is a contact between the two articulators leaving an articulatory stricture through which the airstream flows producing turbulence or friction noise. The intensity of friction will be greater if the stricture is narrower, if the airstream is stronger, and if voicing is absent.

2.4.6. Lateral : The lateral is like a stop in the median line of articulation, but unlike a stop the contact is not complete and there is free passage on one or both sides of the tongue.

Trills, flaps, and taps are sometimes grouped together as tremulants. Nasals, trills, and laterals are sometimes grouped together as resonants. Fricatives and resonants are also grouped together as continuants.

Unlike all the other consonantal manners of articulations listed so far, vowels are produced without any obstruction in the oral-pharyngeal channel.

I.3. ORAL-NASAL:

It will be noticed that so far we have taken no account of what happens outside the oral and the pharyngeal cavities and the faucal passage joining them. While the main drama of speech production takes place as it were between the airstream initiating mechanisms (described in I.1) and the airstream controlling mechanisms of the oro-pharyngeal channel (described in I.2), important background support and modification is available (a) from the nasal cavity (described here) and (b) from the larynx (described in the next section, I.4).

The velic passage leading into the nasal cavity can be closed off or left open by the raising or lowering of the soft palate (velum) in relation to the back wall of the upper portion of the pharynx. If the velic passage is blocked, the nasal cavity is left idle, giving us a purely oral sound. When we consider at the same time the possibility of blocking off the oral passage (i. e. stops as a manner of articulation), four combined possibilities present themselves to us (see diagrams 6-9):

(1) Both the velic passage and oral channel are blocked giving rise to ORAL STOPS. Here also belong oral flaps and taps.

(2) The velic passage is left open, but the oral channel is blocked. This gives rise to NASAL STOPS (or, simply, NASALS). Here also belong nasal flaps and taps. When a nasal stop is at the dorso-velar place of articulation, naturally the lowering of the velum no less than the raising of the back of the tongue helps the oral closure.

(3) The velic passage is closed and the oral channel is left open. This gives rise to ORAL sounds (other than oral stops, flaps and taps of course).

(4) Both the velic passage and the oral channel are left open giving rise to ORI-NASAL sounds. Ori-nasal sounds are often thought of as NASALIZED versions of oral sounds and thus distinguished from purely nasal sounds (i. e. nasal stops).

It is obvious that only the pulmonic and the glottalic air-mechanisms can utilize the full range of these possibilities. (Of course if the pharyngeal channel is closed, we can only have oral stops as the opening or closing of the velic passage will be of no account.) The velaric airstream mechanism can, however, utilize only the first and the third possibility, since only the oral cavity is active

It is possible, of course, that while the velaric airstream mechanism is active the idle pharyngeal and nasal cavities can be put to use by simultaneously activating either the pulmonic or the glottalic airstream and utilizing either the first or the second possibility.

Oral stops and fricatives are sometimes grouped together as obstruents.

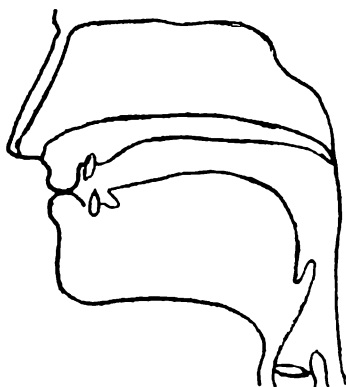


Diagram 6 :
An oral stop [p]

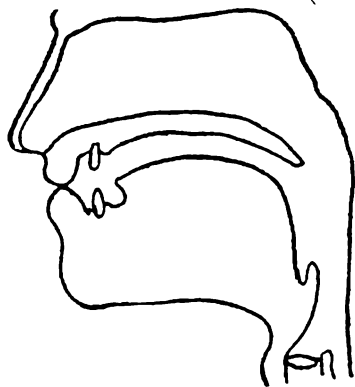


Diagram 7 :
A nasal stop [m]

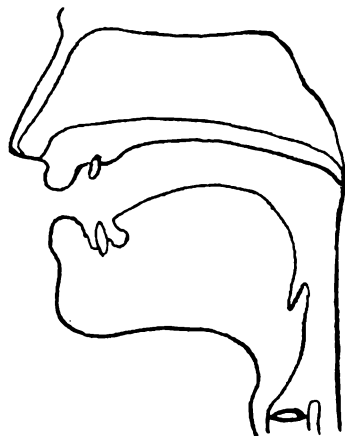


Diagram 8 :
An oral continuant

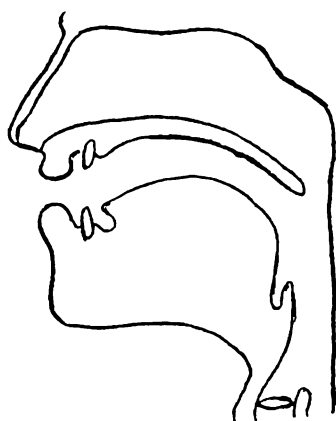


Diagram 9 :
An ori-nasal continuant

I.4. STATES OF THE GLOTTIS:

While the lower end of the windpipe is modified into a syrinx giving birds their voice, mammals (including man) get their voice from the larynx which is a modification of the upper end of the windpipe. We have already noticed the raising and the lowering of the larynx in the glottalic airstream mechanism. Here we are concerned with the glottis i. e. the passage between the vocal folds situated in the larynx. The airstream passing through the glottis can be modified by the various positions the vocal folds can attain. The following are the important states of the glottis :

4.1. Glottal Stop: Complete lengthwise closure of the vocal folds gives rise to the glottal stop. The glottal stop initiates the glottalic airstream mechanism. It can also be combined with the pulmonic airstream as in cough or hiccup.

4.2. Breath: The vocal folds are kept apart. No voice is produced by the passing airstream, though turbulence or friction at the glottis is a possibility.

4.3. Voice: The vocal folds are brought very near to each other so that they are almost touching. The passing airstream sets them vibrating and gives rise to plain voice.

4.4. Breathy voice: The vocal folds are kept in a different position than in plain voice. There is a comparatively free passage for the airstream through the posterior portion of the vocal folds where they are kept apart. The rest of the length of the vocal folds is set in vibration. More quantity of air is required in the production of breathy voice than in plain voice.

4.5. Creaky voice : In the production of creaky voice the airstream passes through the anterior portion of the vocal folds thus vibrating them at that portion. The posterior portions of the vocal folds are held together so that the airstream does not escape through that portion. The vibrations of the vocal folds can be heard distinctly in creaky voice.

4.6. Whisper: The posterior portions of the vocal folds are so placed that there is a nearly triangular opening in the posterior

part through which the airstream passes. The anterior portions of the vocal folds are held together.

Positions 1, 2, and 6 are grouped together as VOICELESS positions as opposed to the remaining VOICED positions. (Two more possibilities, not dealt with here, are the voiceless creak and the inverse voice.)



II. EXERCISES

II. 1. PULMONIC AIRSTREAM:

In a majority of languages the pulmonic egressive airstream is used in the production of sounds. But pulmonic ingressive sounds also can be produced by articulating while inhaling.

1.1. Produce the following sequence :

[ssssss]

Then reverse the flow of air to produce [ssssss] with an arrow pointing right. You might have used this sound before as a cry of pain. Listen for the difference.

1.2. Try the same procedure with some other pulmonic egressive sounds you know like :

[lll] [fff] [mmm] [aaa] .

1.3. Note that it is difficult to continue 'talking' with a pulmonic ingressive airstream.

1.4.

1. [f] (hold it as long as you can)
[→]

2. [s] (hold it as long as you can)
[→]

3. [ffssss]
[→]

4. [ssffffss]
[→]

5. [ssllllss]
[→]

II.2. PLACES OF ARTICULATION AND ORAL STOPS:

In these exercises various oral stops produced at different places of articulation will be practised. To produce a voiceless stop, for instance, a bilabial stop, [p] make a firm closure with the two lips and release the closure smartly without making any audible friction.

Practise stops followed by and preceded by vowels. In this exercise we select the vowel [a] to precede and/or to follow the stops.

Practise the following voiceless stops :

Bilabial	Dental	Alveolar	Retro- flex	Pala- tal	Velar	Post velar
----------	--------	----------	----------------	--------------	-------	------------

p	t̪	t̪	ʈ	k̠	k	q
---	----	----	---	----	---	---

2.1.

- | | |
|-----------|---------------|
| 1. [apa] | 6. [paʈa] |
| 2. [papa] | 7. [ʈapa] |
| 3. [pap] | 8. [paʈap] |
| 4. [aʈa] | 9. [ʈapaʈ] |
| 5. [ʈaʈa] | 10. [ʈaʈapaʈ] |

2.2.

- | | |
|-------------|---------------|
| 1. [ʈaʈa] | 6. [taʈaʈa] |
| 2. [ʈaʈa] | 7. [ataʈaʈa] |
| 3. [ʈaʈata] | 8. [paʈaʈa] |
| 4. [ʈataʈa] | 9. [ʈapaʈa] |
| 5. [ʈataʈa] | 10. [ʈapaʈap] |

2.3.

- | | |
|-------------|---------------|
| 1. [ʈaka] | 6. [qakaqa] |
| 2. [kaʈaka] | 7. [kakaʈaka] |
| 3. [akaka] | 8. [qaʈata] |
| 4. [akata] | 9. [ʈakaqa] |
| 5. [kaqa] | 10. [paqata] |

L.E.1. Malayalam (Dravidian).

- | | | | |
|----|----|---------|---------------------------|
| 1. | a. | [u:ʈu] | ‘ flute ’ |
| | b. | [u:ʈʈu] | ‘ spring ’ |
| | c. | [u:ʈʈu] | ‘ to feed ’ |
| 2. | a. | [aʈam] | ‘ a festival decoration ’ |
| | b. | [aʈam] | ‘ end ’ |
| | c. | [aʈam] | ‘ cupboard ’ |
| 3. | a. | [oʈʈa] | ‘ similar ’ |
| | b. | [otta] | ‘ single ’ |
| | c. | [o:ʈʈa] | ‘ large hole ’ |

4. a. [poʈʈu] 'to cover by both the palms'
 b. [puʈʈu] 'ant hill'
 c. [puʈʈu] 'a special dish made of flour and raisins'
5. a. [poʈʈu] 'to cover by both the palms'
 b. [poʈʈa] 'scaly overgrowth'
 c. [poʈʈu] 'dot'
6. a. [po:ʈʈu] 'water buffalo'
 b. [po:ʈʈu] 'to look after'
 c. [po:ʈʈu] 'let (one) go!'
7. a. [paʈʈu] 'ten'
 b. [paʈʈu] 'grains which are sprinkled on floor'
 c. [paʈʈu] 'silk'
8. a. [paʈʈi] 'hood of a snake'
 b. [pa:ʈʈa] 'cockroach'
 c. [paʈʈi] 'dog'
9. a. [kaʈʈi] 'knife'
 b. [ka:ʈʈu] 'wind'
 c. [kaʈʈi] 'thick'
10. a. [ka:ʈʈu] 'waiting'
 b. [ka:ʈʈu] 'wind'
 c. [kaʈʈu] 'to show'
11. a. [kaʈʈi] 'knife'
 b. [kaʈʈa] 'fresh undried straw'
 c. [kaʈʈa] 'brick'
12. a. [kuʈʈi] 'stab'
 b. [kuʈʈi] 'peg'
 c. [kuʈʈi] 'infant'
13. a. [viʈʈu] 'seed'
 b. [viʈʈu] 'selling'
 c. [viʈʈu] 'leaving'
14. a. [muʈʈu] 'pearl'
 b. [muʈʈu] 'ripened fruits'
 c. [muʈʈu] 'elbow'
15. a. [muʈʈam] 'kiss'
 b. [muʈʈam] 'front yard'
 c. [muʈʈam] 'a piece of log having a node'

L.E.2. Urdu (Indo-Aryan)

- | | | | |
|----|----|----------|--------------------------|
| 1. | a. | [kal] | 'famine' |
| | b. | [qal] | 'a saying' |
| 2. | a. | [ʈak] | 'to wait for' |
| | b. | [ʈaq] | 'niche' |
| 3. | a. | [həlki] | 'light in weight' |
| | b. | [həlqi] | 'throaty' |
| 4. | a. | [məksul] | 'damaged' |
| | b. | [məqʈul] | 'slain' |
| 5. | a. | [nukʈa] | 'a point in a statement' |
| | b. | [nuqʈa] | 'dot' |

L.E.3. Malto (Dravidian)

- | | | | |
|----|----|---------|----------------------------------|
| 1. | a. | [kale] | 'leaf cup' |
| | b. | [qale] | 'to rob' |
| 2. | a. | [kase] | 'dirt on the body' |
| | b. | [qase] | 'to become bitterish' |
| 3. | a. | [kalge] | 'to break off a part with teeth' |
| | b. | [qalge] | 'to disturb as water' |

II.3. VOICE-VOICELESS :

Produce a long [s]. Simple hissing would give this sound. Then make it voiced-[z] (buzzing). Produce the sequence [sz] without a gap between them and without altering the point of articulation. While shifting from [s] to [z] you can clearly observe the addition of voicing.

3.1. Practise the following :

1. [sz] (hold each for some time)
2. [zs] (hold each for some time)
3. [ss zz ss]
4. [zz ss zz]
5. [asaza]
6. [zasaza]

And the following :

	Bilabial	Dental	Alveolar	Retroflex	Palatal	Velar	Postvelar
Voiced stops	b	ɸ	ɖ	ɽ	ç	g	ŋ

3.3.

- | | |
|-------------|----------------|
| 1. [paba] | 6. [ɖaɖaɖa] |
| 2. [bapaba] | 7. [aɸaba] |
| 3. [baɸa] | 8. [abaçaɸa] |
| 4. [ɖaɖa] | 9. [ɖabaɸaçga] |
| 5. [ɖaɸaɖa] | 10. [ɸaçgaɸa] |

3.4.

- | | |
|--------------|--------------|
| 1. [ɸaçga] | 6. [qaGaqa] |
| 2. [gaçgaɸa] | 7. [kaçgaGa] |
| 3. [aGaGa] | 8. [gaGaka] |
| 4. [kagaka] | 9. [paGaqa] |
| 5. [aGaqa] | 10. [qabaɸa] |

II. 4. FRICATIVES:

4. 1. Practise the following :

	Bilabial	Labio-dental	Dental
Voiceless	ɸ	f	θ
Voiced	β	v	ð

[ɸ] can be produced by bringing both the lips closer and passing an egressive airstream to cause enough audible friction. Imitation of blowing a candle out will also give this fricative. While producing [ɸ] add voice to get [β].

[f] can be produced by holding upper lip and lower teeth together. There may be enough opening to produce audible friction even when both the articulators are held together. Add voice to get [v]. Find out whether it is possible to produce a labio-dental stop.

Maintaining the full intensity of friction when combined with voicing is important. Indian speakers frequently fail to produce proper voiced fricatives—they do not make these fricative enough.

[θ] can be produced by keeping the tip of the tongue very near to the edge of the upper teeth. The tip of the tongue may even stick

out a bit. By adding voice [ð] can be produced. In the production of [θ] and [ð] the lamina makes a slit for the passage of the air stream. That is why these are called slit fricatives (as compared to groove fricatives to be examined next).

4.1.1.

- | | |
|-----------|-----------------|
| 1. [fav] | 9. [θaϕ] |
| 2. [ϕaf] | 10. [ϕað] |
| 3. [ϕϕββ] | 11. [ðaβ] |
| 4. [βav] | 12. [ðavaβ] |
| 5. [βaϕ] | 13. [θafaϕ] |
| 6. [θaf] | 14. [vafaθaðaϕ] |
| 7. [θav] | 15. [βafavaθað] |
| 8. [θθðð] | |

L.E.4. Hmar (Tibeto-Burman)

- | | |
|---------------|------------------------------|
| 1. a. [fe:] | ‘ to go ’ |
| b. [ve:] | ‘ also ’ |
| 2. a. [fa:] | ‘ to take ones meal to eat ’ |
| b. [va:] | ‘ to go somewhere ’ |
| 3. a. [vaki] | ‘ parrot ’ |
| b. [fa:k] | ‘ to eat ’ |
| 4. a. [faŋ] | ‘ always ’ |
| b. [va:ŋ] | ‘ sky ’ |
| 5. a. [farŋu] | ‘ kinswoman ’ |
| b. [var] | ‘ wise ’ |
| 6. a. [fa:i] | ‘ clean ’ |
| b. [va:i] | ‘ Hindusthani ’ |
| 7. a. [fu:] | ‘ sugarcane ’ |
| b. [vu:] | ‘ buzzing of bee ’ |
| 8. a. [fuŋ] | ‘ to wrap ’ |
| b. [vuŋ] | ‘ skin ’ |
| 9. a. [fur] | ‘ rainy season ’ |
| b. [vur] | ‘ to bless ’ |

4. 2. Groove Fricatives :

Practise the following :

	Lamino dental groove	Lamino alveolar groove	Lamino palatal groove	Retroflex groove
voice- less	ʃ	s	ʂ	ʂ̠
voiced	ʒ	z	ʐ	ʐ̠

These fricatives are known as groove fricatives. In their production the tongue attains a grooved shape. The groove is front to back in the first three pairs, but left to right in the last pair.

[ʃ] can be produced by keeping the tip of the tongue just a little away from the back of the upper teeth and making a short groove through which the jet of air flows out and eddies against the base of the upper and the lower front teeth. Addition of voice to it gives [ʒ]. This pair involves the apex, the lamina, and the upper front teeth as articulators.

[s] can be produced by keeping the tip of the tongue at the alveolar region and making a short groove to let the airstream out. [z] can be produced by adding voice to it. This pair involves the apex, the lamina, and the alveolus as articulators.

[ʂ] can be produced by keeping the blade at the junction of the alveolus and the palate and making a groove to let the airstream out. The groove will be deeper and longer than in the case of [s] and [z]. Addition of voice gives [ʐ]. This pair involves the apex (which is raised along with the lamina), the lamina, the alveolus, and the palate as articulators.

There is a variety of [ʂ] which does not involve the apex, which lies idle behind the lower front teeth. Some phoneticians write the two varieties differently — the fronted, apex-raised [ʂ] [ʐ] are written as [ʃ] [ʒ] and the retracted, apex-lowered [ʂ̠] [ʐ̠] are written as [ç] [ʒ̠].

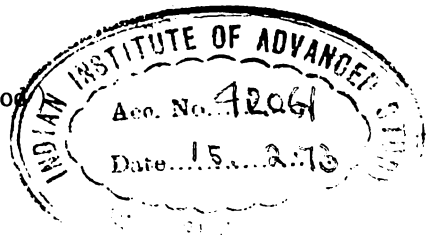
[ʂ̠] can be produced by drawing back the tip of the tongue or making it point upwards to the front portion of the palate and making a side-to-side groove in the blade of the tongue. Addition

of voice gives [ʒ]. This pair involves the apex, the lamina, and the palate as articulators.

- | | |
|--|---|
| <p>4. 2. 1.</p> <ol style="list-style-type: none"> 1. [ʃa] 2. [aʃa] 3. [ʃasa] 4. [saʃa] 5. [saʃaʒa] 6. [ʃaʒaʒa] 7. [ʃʃzz] 8. [sszz] 9. [zaʃaʒa] 10. [ʒasaʒa] | <p>4. 2. 2.</p> <ol style="list-style-type: none"> 1. [saʃa] 2. [ʃaʃa] 3. [ʃaʃaʒa] 4. [ʃʃʒʒʃʃ] 5. [ʃaʒaʃa] 6. [ʃaʃaʃa] 7. [ʃasaʃa] 8. [ʃaʃasa] 9. [ʃaʃaʃa] 10. [ʃasaʃaʃa] 11. [ʒazaʒaʒa] 12. [ʒaʒazaza] |
|--|---|

L.E.5. Dacca Bengali (Indo-Aryan)

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. a. [ʃa:l] b. [sa:l] 2. a. [ʃaka] b. [saka] 3. a. [ʃika] b. [sika] 4. a. [ʃo:l] b. [so:l] 5. a. [ʃi:lɔ] b. [si:l] 6. a. [ʃuri] b. [suri] 7. a. [ʃera] b. [sera] | <p>‘ bark of a tree, skin ’
 ‘ thatched roof ’</p> <p>‘ to sieve through ’
 ‘ wheel ’</p> <p>‘ suspended loop ’
 ‘ musk rat ’</p> <p>‘ trickery ’
 ‘ let us go ! ’</p> <p>‘ He was ’
 ‘ kite (bird) ’</p> <p>‘ knife ’
 ‘ theft ’</p> <p>‘ torn ’
 ‘ split (wood) ’</p> |
|---|---|



8. a. [aʃʃe] ' (it) is there '
 b. [ɳasse] ' (he) dances '
9. a. [kaʃʃe] ' near by '
 b. [kasse] ' (he) washes '
10. a. [bəʃa] ' selected '
 b. [bəsa] ' a kind of fish '

L. E. 6. Telugu (Dravidian)

1. a. [ɖɔ:sa] ' cucumber '
 b. [ɖɔ:ʃe] ' pancake '
 c. [ɖɔ:ʃaṽ] ' fault '
2. a. [vi:səṽ] ' a measure of land '
 b. [vi:ʃe] ' a measure of 3lbs. '
 c. [ve:ʃaṽ] ' role (in a play) '
 d. [viʃaṽ] ' poison '
3. a. [rahasyaṽ] ' secret '
 b. [ɳaʃyaṽ] ' snuff '
 c. [puʃyaṽ] ' a month '
 d. [b^ha:ʃyaṽ] ' commentary '
4. a. [kasa:yi] ' butcher '
 b. [ka:ʃi:] ' the city of Benares '
 c. [ka:ʃa:yi] ' ochre colour '
5. a. [ko:səṽ] ' for '
 b. [ko:ʃeṽ] ' chamber '
 c. [ro:ʃaṽ] ' anger '
6. a. [se:laṽ] ' the city of Salem '
 b. [ʃe:luwa:] ' shawl '
7. a. [sa:ɳtaṽ] ' complete '
 b. [ʃe:ɳtaṽ] ' calmness '
8. a. [saɳka] ' armpit '
 b. [ʃeɳka] ' doubt '
9. a. [a:sakt̪i] ' interest '
 b. [a:ʃe] ' desire '
 c. [a:ʃa:ɖaṽ] ' a month '
10. a. [sava:lu] ' challenge '
 b. [ʃeva:lu] ' corpses '

4.3. Practise the following :

	Palatal	Velar	Postvelar	Pharyngeal	Glottal
Voiceless	ç	x	χ	ħ	h
Voiced	ç̣	ɣ	ɣ̣	ħ̣	ɦ

[ç] can be produced by keeping the dorsum at the palate and allowing a narrow slit for the airstream to pass through producing audible friction. [ç̣] is the voiced counterpart of [ç].

[x] is produced by raising the back of the tongue towards the velum till there is a narrow slit left for the passing airstream. [ɣ] is the voiced counterpart of [x].

To produce [χ] the far back of the tongue should be raised towards the far back of the velum till a narrow slit is left between the two articulators. [ɣ̣] is a voiced counterpart of [χ].

In the production of [ħ] the root of the tongue is drawn much backwards and downwards to make a narrow passage with the pharyngeal wall. By adding voice to it we get [ħ̣].

The place of articulation of the glottal sounds [h] and [ɦ] falls outside the main oral-pharyngeal zone, though they are grouped by some with the other fricatives. Since, however, [h] and [ɦ] are glottal in their origin, there can be a simultaneous articulation anywhere in the oral-pharyngeal zone and/or of course in the velic passage while [h] or [ɦ] is being produced. In other words, a pure unmodified [h] cannot be produced just as a pure unmodified voice tone cannot be produced. Same is the case with [ɦ]. Both are essentially states of the glottis. As we shall see later, voiced sounds—whether vowels or consonants—can be breathy. Breathiness and the voiced glottal fricative are two ways of looking at the same thing. Similarly, [h] can hardly be distinguished from breath and whisper. In other words [h_a] and [ḥ_a] are practically the same and [ɦ_a] and [ɦ̣_a] are the same. A subtle distinction between [ḥ] and [ḥ_o] can be drawn by assigning the former symbol to whisper or breath with little local turbulence at the glottis and the latter symbol to breath with audible local turbulence. Compare the words *heart* and *art* as ordinarily spoken and their “whispered” versions.

[h _a :ṭ]	and	[ḥ _a :ṭ]	‘heart’
[a:ṭ]	and	[̣ _a :ṭ]	‘art’

In practising the following, train yourself to listen for the difference between [x̣] and [x], between [x̣] and [h] and between [χ] and [ħ]. Similarly with the corresponding voiced pairs.

4.3.1.

1. [x̣a]
2. [ạx̣a]
3. [ix̣i]
4. [x̣a]
5. [x̣ax̣a]
6. [x̣ạʕ̣a]
7. [ʕ̣ax̣a]
8. [x̣ax̣ạʕ̣a]
9. [x̣ạʕ̣a]
10. [ʕ̣ạʕ̣a]

4.3.3.

1. [xu]
2. [ħu]
3. [uħu]
4. [χuħu]
5. [ħħχχ]
6. [ħħʕʕ]
7. [ʕʕx̣x̣]
8. [xuʕu]
9. [ħuxuʕu]
10. [χuħuʕu]

4.3.2.

1. [χa]
2. [xuχu]
3. [χuxu]
4. [χχx̣x̣]
5. [ʕʕx̣x̣]
6. [xxʕʕ]
7. [xxχχ]
8. [x̣aχa]
9. [ʕ̣ax̣a]
10. [x̣ax̣aχa]

4.1.3.4.

1. [ħu]
2. [ħuh]
3. [huħ]
4. [ʕuh]
5. [huʕ]
6. [hahaχa]
7. [ʕaha]
8. [hahaħa]

L.E.7. Urdu (Indo-Aryan)

1. a. [axa] 'excellent'
- b. [aʕa] 'master'
2. a. [surx] 'red'
- b. [murʕ] 'rooster'

3. a. [xəm] 'coil'
 b. [ʎəm] 'grief'
 c. [fəm] 'we'
4. a. [fəsl] 'crop'
 b. [sal] 'year'
 c. [zila] 'district'
 d. [ʃal] 'shawl'
 e. [ʒala] 'frost'
 f. [xal] 'mole'
 g. [ʎal] 'cave'
 h. [fial] 'state, condition'

II.5. TREMULANTS:

5.1. Practise the following :

	Apico	Apico	Retrofled	Uvular
	alveolar	alveolar	flap	trill
	trill	tap		
Voiced	r	ɾ	ɽ	R

[r] is produced by keeping the tip of the tongue loosely at the alveolar region and letting the airstream flutter it up and down. If the tongue is pressed much you may get a fricative instead of a trill. If it is kept too loose the trill may not be produced. So the tongue pressure should be adjusted accordingly till you get the tongue tip set in visible vibration. The mechanism is best understood by watching the trill produced by the two lips (for which we have not supplied any special symbol above).

[ɾ] can be produced by quickly hitting (tapping) the alveolar region by the tip of the tongue in one fast stroke. The tip of the tongue should come down immediately after the tapping. Precaution should be taken, especially in a word final position when followed by a pause, to see that the tip is not set in vibration while hitting the upper articulator.

To produce [ɽ] make the tip of the tongue point backwards and then throw it forward and upwards against the palate. After hitting the palate the tongue tip should come forward to its normal position. Care should be taken to not to hit the palate with the tip of the tongue while curling it back.

[R] can be produced by raising the back of the tongue a little and passing a strong airstream so as to set the uvula in considerable vibration. It is easier to start with a voiceless uvular trill [ʀ] first and than to add voice to it.

It may be noticed that the upper articulator, uvula is set in vibration in this case whereas in the case of [r] it is the tongue which is a lower articulator that vibrates.

You may find it easier to pronounce [R] or [ʀ] when followed by the back vowel [ɔ] or the central [a].

Tremulants can be produced with articulators other than the apex and the uvula—for example, bilabially.

5.1.1

1. [ar]
2. [arr̥r̥]
3. [rr̥ra]
4. [r̥rar̥ra]
5. [aʀa]
6. [ʀaʀa]
7. [ʀaʀa]
8. [ruʀu]
9. [ʃiʃi]
10. [aʀora]

5.1.2

1. [ʀaʀi]
2. [ʀaʀ]
3. [ʀaʀ]
4. [aʀaʀ]
5. [aʀaʀ]
6. [aʀaʀa]
7. [riʀa]
8. [ruʀa]
9. [aʀoʀa]
10. [aʀoʀa]

5.1.3

- | | |
|------------|-------------|
| 1. [ʀ̥a] | 6. [ʀaʀa] |
| 2. [ʀ̥o] | 7. [ʀaʀa] |
| 3. [oʀ̥o] | 8. [ʀaʀaʀa] |
| 4. [oʀoʀo] | 9. [ʀaʀaʀa] |
| 5. [ʀaʀa] | 10. [ʀaʀa] |

L.E.8. Tamil of Kanyakumari (Dravidian)

1. a. [va:ʃu] 'to gather'
- b. [va:ru] 'waist belt'
- c. [va:ru] 'to wither'

2. a. [vaɾu] 'rows'
 b. [ʈari] 'loom'
 c. [va:ɾi] 'filter'
3. a. [uri] 'to peel'
 b. [uri] 'hanging loop'
 c. [kuɾi] 'to drink'
4. a. [kaɾi] 'coal'
 b. [kari] 'stain'
 c. [kaɾi] 'to bite'
5. a. [kaɾa] 'border'
 b. [kara] 'stain'
 c. [kaɾa] 'shop'
6. a. [ko:fi] 'having drawn water'
 b. [kori] 'to gnaw'
 c. [ko:ɾi] 'crore'
 d. [koɾi] 'banner'
7. a. [aɾa] 'hip'
 b. [ara] 'room'
 c. [aɾa] 'a type of pancake'
8. a. [u:ɾu] 'to creep'
 b. [u:ru] 'to ooze'
 c. [u:ɾu] 'the seedling which is being transplanted,'
9. a. [peɾu] 'great'
 b. [peru] 'to give birth'
 c. [paɾu] 'to tie down'
10. a. [pe:fu] 'name'
 b. [pɛ:ru] 'delivery'
 c. [ke:ɾu] 'spoiling'
11. a. [ve:ɾu] 'root'
 b. [ve:ru] 'other'
 c. [ve:ɾã] 'hunter man'
12. a. [i:ɾu] 'louse'
 b. [i:ru] 'gums'
 c. [i:ɾu] 'mortgage'

13. a. [ifɪw] 'to sit'
 b. [ɪrɪw] 'filter'
 c. [iɾɪw] 'to keep'
14. a. [ofɪw] 'one'
 b. [orɪw] 'to devote special attention (especially by a mother to her child)'
 c. [o:ɾɪw] 'tile'
 d. [koɾɪw] 'to give'

L.E.9. Telugu (Dravidian)

1. a. [ʌ:ru] 'to cool (intr.)'
 b. [ʌ:ɾu] 'to play'
2. a. [mʌri] 'again'
 b. [mʌɾi] 'cleanliness'
3. a. [vʌ:ru] 'they'
 b. [vʌ:ɾu] 'he (remote)'
4. a. [va:ra] 'side'
 b. [va:ɾa] 'street'
5. a. [pe:ru] 'name'
 b. [pe:ɾu] 'piece of wood'
6. a. [ko:ru] 'to wish'
 b. [ko:ɾu] 'leg of a cot'
7. a. [ɟʌri] 'near'
 b. [ɟʌɾi] 'fence'
8. a. [koruku] 'to gnaw'
 b. [koɾuku] 'Son'
9. a. [kɔ:ɾʌlu] 'fangs'
 b. [kɔ:ɾʌlu] 'daughter in law'
10. a. [mʌ:ru] 'to change (intr)'
 b. [mʌ:ɾu] 'to char (intr)'

5.2. The apico-alveolar trills can be further distinguished as advanced and retracted. If the trilling is done at a slightly forward area of the mean alveolar region it is an advanced alveolar trill. The trilling is done at a slightly backward area of the mean alveolar region in the case of a retracted alveolar trill.

Practise the following :

Advanced alveolar

Retracted alveolar

trill

trill

r[<]

r[>]

In Malayalam this distinction is functionally important.

L. E. 10. Malayalam (Dravidian)

- | | | | |
|----|----|----------------------------|--------------------|
| 1. | a. | [va : r ^{<} u] | ' to gather up ' |
| | b. | [va : r ^{>} u] | ' waist belt ' |
| 2. | a. | [mar ^{<} a] | ' screen ' |
| | b. | [mar ^{>} am] | ' tree ' |
| 3. | a. | [var ^{<} i] | ' row ' |
| | b. | [ʈar ^{>} i] | ' loom ' |
| 4. | a. | [kar ^{<} i] | ' coal ' |
| | b. | [kar ^{>} i] | ' curry ' |
| 5. | a. | [kar ^{<} a] | ' border ' |
| | b. | [kar ^{>} a] | ' stain ' |
| 6. | a. | [ʈar ^{<} i] | ' small particle ' |
| | b. | [ʈar ^{>} i] | ' loom ' |
| 7. | a. | [ko:r ^{<} i] | ' to draw water ' |
| | b. | [ku:r ^{>} i] | ' mark ' |
| 8. | a. | [ar ^{<} a] | ' hip ' |
| | b. | [ar ^{>} a] | ' room ' |

5.3. In 5.1 we have practised a retroflex flap produced by the articulators palate and the apex. A flap can be produced at post palatal region also i. e., at the area which is further backward than the mean palate region. For this type of flap we use the symbol [r[>]]

Some dialects of Hindi distinguish between a [r[>]] and an alveolar tap [ɾ]. In some varieties of standard Hindi the distinction is between [r[>]] and [r].

L.E. 11. Patna variety of Hindi (Indo-Aryan).

- | | | | |
|----|----|--------------------------|-------------|
| 1. | a. | [ʈa:ra] | ' star ' |
| | b. | [ʈa:r ^{>} a] | ' guessed ' |

- | | | | |
|----|----|-----------|----------------------|
| 2. | a. | [sa:ri] | ' all (feminine) ' |
| | b. | [sa:r̥i] | ' sari ' |
| 3. | a. | [kəra] | ' done ' |
| | b. | [kəɾ̥a] | ' frying pan ' |
| 4. | a. | [səɾ] | ' head ' |
| | b. | [səɾ̥] | ' to decompose ' |
| 5. | a. | [ma:r] | ' beating ' |
| | b. | [ma:r̥] | ' rice gruel ' |
| 6. | a. | [t̪ʰuri] | ' knife ' |
| | b. | [t̪ʰur̥i] | ' bundle ' |
| 7. | a. | [t̪ʰo:r] | ' extreme and ' |
| | b. | [t̪ʰo:r̥] | ' to leave ' |

II.6. LATERALS :

Practise the following :

	Alveolar lateral	Retroflex lateral	Palatal lateral
Voiced	l	ɭ	ʎ

To produce [l] the tip of the tongue should be kept against the alveolus and a wide passage made on one or both the sides of the middle of the tongue allowing a large quantity of airstream to pass through without making any audible friction.

[ɭ] can be produced by keeping the tip of the tongue against the palate and allowing the airstream pass through as in the case of [l].

To produce [ʎ] the middle of the tongue should be kept against the front part of the hard palate and a wide passage made on one or both sides of the back part of the tongue allowing a large quantity of airstream to pass through without making any audible friction.

6.1.

- | | | | |
|----|--------|-----|-----------|
| 1. | [lll] | 6. | [ʎaʎa] |
| 2. | [all] | 7. | [zaʎa] |
| 3. | [lal] | 8. | [lazal] |
| 4. | [alil] | 9. | [zɭal] |
| 5. | [alaʎ] | 10. | [ʎizalaz] |

6.2.

- | | |
|------------|-------------|
| 1. [laʌ] | 6. [zaʌaž] |
| 2. [ʌa] | 7. [la]z] |
| 3. [žʌʌ] | 8. [z]až] |
| 4. [jaʌaž] | 9. [žʌi]z] |
| 5. [ʌuliž] | 10. [zla]z] |

II. 7. MIXED MANNERS OF ARTICULATION :

The manners of articulations described so far can be mixed to a limited extent : we can mention the following important types :

(i) Approximants — fricative like articulation without friction.

(ii) Lateralized fricatives, approximants and tremulants.

(iii) Affricated stops or affricates — stops with fricative release.

We shall take up the combination of nasality with the various manners of articulation later (in II. 14).

Among the mixed manners listed above manners (ii) and (iii) belong to one category because in their production two basic manners are combined. Approximants are different from the rest of the mixed manner types. In the production of an approximant the set up is just like in the production of a fricative but the turbulence is absent when it is voiced. The absence of friction is either due to voicing, or wider stricture than in a fricative or airstream with less force. Lateralized fricatives, approximants and tremulants are different from affricated stops because in the production of the former the mixed manners are simultaneously produced whereas in the production of the latter one manner follows the other (fricative follows stop).

7. 1. APPROXIMANTS :

Practise the following approximations :

Bilabial	Ladiodental	Alveolar	Retroflex	Palatal
w	u ^v	z ^v	ʒ ^v	y

To produce [w] produce a [β] and while producing it reduce the friction between the two lips either by decreasing the force of the egressive airstream or by slightly widening the gap between the two lips. All voiced approximants are non-turbulent or frictionless. But voiceless approximants have friction. Rest of the approximants can be produced in the same way i. e. , either by using a slightly wider stricture than in their fricative counterparts or by using an airstream with lesser force than in their fricative counterparts.

7.1.1.	7.1.2.	7.1.3.
1. [βawa]	1. [wa ^v a]	1. [zaz ^v a]
2. [waβa]	2. [va ^v a]	2. [z ^v azaz ^v a]
3. [waβawa]	3. [v ^v ava]	3. [ʒaz ^v za]
4. [βawaβa]	4. [v ^v awav ^v a]	4. [zaz ^v az ^v a]
5. [φawaφa]	5. [v ^v az ^v av ^v a]	5. [yaz ^v aya]
6. [φawaβa]		6. [z ^v azaza]
7. [zaya]		7. [z ^v ayasa]
8. [waya]		8. [saz ^v az ^v a]
9. [yawaya]		9. [waz ^v az ^v a]
10. [βayaφa]		10. [yawaz ^v a]

L. E. 12. Tamil of South Arcot (Dravidian).

1. a. [va : l]	‘tail’
b. [va : z ^v]	‘to live (imp. sg.)’
2. a. [ali]	‘eunuch’
b. [az ^v i]	‘to destroy (imp.sg.)’
3. a. [ʈa : li]	‘marriage badge’
b. [ʈa : z ^v i]	‘clay pot’
4. a. [ʈo : l]	‘skin’
b. [ʈo : z ^v i]	‘girl friend’
5. a. [ɳa : li]	‘four’
b. [ɳa : z ^v i]	‘time’
6. a. [molɛ]	‘breasts’
b. [moz ^v ɛ]	‘sharpness’

7. a. [tʌɪ] 'head'
 b. [tʌzʷɛ] 'green leaves'
8. a. [kali] 'name of the present Age'
 b. [kazʷi] 'stick'

7.1.3. Can you produce some other approximants like velar approximant, pharyngeal approximant?

7.2. LATERALIZED FRICATIVES, APPROXIMANTS AND TREMULANTS:

Fricatives, approximants and tremulants can be lateralized. In their production there is a passage created on one or both the sides of the tongue in addition to their median passage.

7.2.1. **Lateralized Fricatives :** In the production of a lateralized fricative the airstream escapes through the opening or openings created at the sides of the tongue. Audible turbulence is produced in this process. These are different from the ordinary median fricatives in the position of passage of release for airstream and from the ordinary resonant laterals in the presence of local turbulence.

Practise the following :

	Apico alveolar lateralized fricative	Retroflex lateralized fricative
Voiceless	ʈ	ʈ̡
Voiced	ɻ	ɻ̡

To produce [ʈ] keep the apex at the alveolar region. Holding it firmly there make narrow openings on both the sides of the tongue at the middle region. This slit should be narrow enough to produce audible friction. Addition of voice to it gives [ɻ].

[ʈ̡] can be produced by the same procedure as in [ʈ] except here you should keep the apex at the palate firmly. Addition of voice gives [ɻ̡].

7.2.1.1.

1. [sa]
2. [sʈ]
3. [ʈaʈa]
4. [aʈaʈ]
5. [ʈʌ]
6. [ʈʌʈʌ]
7. [sʈsʈsʈ]
8. [zʌzʌzʌ]
9. [ʈsaʌza]
10. [ʌzaʈsa]

7.2.1.2

1. [ʈaʈa]
2. [ʈsaʈa]
3. [ʈasaʈa]
4. [ʈaʌa]
5. [zaʌa]
6. [ʌzaʌ]
7. [ʈsaʌa]
8. [zʌaʌza]
9. [ʌzaʈsa]
10. [ʈsaʌza]

7.2.2. Lateralized Approximants :

Practise the following :

Alveolar lateralized approximant	Retroflex lateralized approximant
--	---

Voiced	↓	↓	
--------	---	---	--

To produce [ɭ] produce a [zʷ] and while producing it make an opening at one or both the sides of the middle of the tongue. [ɭ] can similarly be produced by starting with [zʷ] and lateralizing it by making an opening on both the sides of the tongue.

7.2.2.1

- | | |
|---------------|----------------|
| 1. [zʷɭa] | 6. [azʷɭazʷɭa] |
| 2. [azʷɭa] | 7. [zʷɭazʷɭa] |
| 3. [zʷɭazʷɭa] | 8. [ɭaɭa] |
| 4. [aɭzʷa] | 9. [ɭaɭa] |
| 5. [zʷɭa] | 10. [ɭaɭaɭa] |

L.E.13. Malayalam (Dravidian)

- | | | | |
|----|----|---------|----------------|
| 1. | a. | [alaku] | ‘ to wash ’ |
| | b. | [aɭaku] | ‘ to measure ’ |
| | c. | [aɭaku] | ‘ dirt ’ |

2. a. [kala] 'art'
 b. [kaɹa] 'weed'
 c. [kaɹa] 'long pole'
3. a. [kali] 'anger'
 b. [kaɹi] 'play'
 c. [kaɹi] 'to eat'
4. a. [ku : li] 'wager'
 b. [kuɹi] 'bath'
 c. [kuɹi] 'pit'
5. a. [ala] 'wave'
 b. [a : ɹu] 'man'
 c. [a : ɹam] 'depth'
6. a. [vali] 'to draw'
 b. [vaɹa] 'bangle'
 c. [vaɹi] 'path'
7. a. [mala] 'mountain'
 b. [vaɹa] 'bangle'
 c. [maɹa] 'rain'
8. a. [va : lu] 'tail'
 b. [va : ɹu] 'sword'
 c. [va : ɹa] 'banana'

7.2.3. Lateralized Tremulants :

Practise the following :

	Apico		Apico
	alveolar	Retroflex	alveolar
	lateralized	lateralized	lateralized
	tap	flap	trill
Voiced	ɹ _L	ɹ _L	ɹ _L

To produce [ɹ_L] tap the alveolar region with the apex while lowering the sides of the middle of the tongue so that there is a passage left between the upper side teeth and the sides of the tongue.

To produce [ɹ_L] do exactly like in the production of [ɹ] except that here the sides of the tongue should not touch the upper side

teeth. There should be enough opening on both the sides of the tongue.

To produce [r_L] keep the apex and the lamina at the alveolar region and make a narrow gap at both the sides of the tongue. Adjust the opened sides of the tongue to set them in vibration by a voiced airstream. Some times you may get some amount of friction added to the trilling. Try to avoid friction.

7.2.3.1.

- | | |
|--|---|
| 1. [ar _L a] | 6. [arar _L a] |
| 2. [ar _L afa] | 7. [ar _L ara] |
| 3. [arar _L a] | 8. [ar _L ar _L a] |
| 4. [ar _L ara] | 9. [ar _L ar _L a] |
| 5. [ar _L ar _L a] | 10. [ar _L ar _L a] |

L.E.14. Mandiali (Indo-Aryan-Pahari group).

- | | |
|--|------------------|
| 1. a. [bar _L] | ' hair ' |
| b. [bar] | ' fence ' |
| 2. a. [lar _L a] | ' saliva ' |
| b. [lara] | ' husband ' |
| 3. a. [kar _L a] | ' black ' |
| b. [kar ^h a] | ' potion ' |
| 4. a. [bar _L u] | ' ear ring ' |
| b. [ɖaru] | ' pomegranate ' |
| 5. a. [gar _L i] | ' scolding ' |
| b. [gari] | ' cart ' |
| 6. a. [ker _L a] | ' plantain ' |
| b. [bera] | ' goat ' |
| 7. a. [gor _L i] | ' tablet ' |
| b. [g ^h ori] | ' female horse ' |
| 8. a. [ə ^h r _L] | ' plough ' |
| b. [ə ^h ɽ] | ' flood ' |

L.E.15. Tamil of of South Arcot (Dravidian)

- | | | | |
|----|----|-------------------------|---------------------------|
| 1. | a. | [va:r _L i] | 'sword' |
| | b. | [va:l] | 'tail' |
| | c. | [va:z ^v i] | 'to live' |
| 2. | a. | [ar _L i] | 'to offer (imp. sg.)' |
| | b. | [ali] | 'eunuch' |
| | c. | [az ^v i] | 'to destroy(imp. sg.)' |
| 3. | a. | [ta : r _L i] | 'to fry (imp. sg.)' |
| | b. | [ta : li] | 'marriage badge' |
| | c. | [ta : z ^v i] | 'clay pot' |
| 4. | a. | [to : r _L i] | 'shoulder' |
| | b. | [to:l] | 'skin' |
| | c. | [to : z ^v i] | 'girl friend' |
| 5. | a. | [na : r _L i] | 'day' |
| | b. | [na : li] | 'four' |
| | c. | [na : z ^v i] | 'time' |
| 6. | a. | [mor _L E] | 'sprout' |
| | b. | [molE] | 'breasts' |
| | c. | [moz ^v E] | 'sharpness' |
| 7. | a. | [tar _L E] | 'weeds' |
| | b. | [talE] | 'head' |
| | c. | [taz ^v E] | 'green leaves' |
| 8. | a. | [kar _L i] | 'flour paste' |
| | b. | [kali] | 'name of the present Age' |
| | c. | [kaz ^v i] | 'stick' |

7.3. AFFRICATED STOPS :

An affricate or affricated stop is a combination of a stop and a homorganic fricative. An affricated stop has a stop in the beginning followed by a fricative release. The homorganic fricative may be either a median fricative or a lateralized fricative. Thus, a median affricate is a stop+homorganic median fricative and a lateralized affricate is a stop+homorganic lateralized fricative.

Practise the following :

	Apico dental (median) affricate	Alveolo- palatal (median) affricate	Retroflex (median) affricate	Apico alveolar lateralized affricate
Voiceless	t̪ʂ	t̪ʃ	t̪ʂ	t̪ʰ
Voiced	d̪ʂ	d̪ʃ	d̪ʂ	d̪ʱ

To produce [t̪ʂ] make a closure for the stop [t̪]. Instead of releasing the closure smartly slur into a [ʂ]. Try to remove any possible gap between the two i. e. the stop and the fricative. To get [d̪ʂ] slur from [d̪] to [ʂ] just like in [t̪ʂ].

To produce [t̪ʃ] make a closure with the lamina at the post alveolar region and slur into a [ʃ]. Add voice to get [d̪ʃ].

To produce [t̪ʂ] make a closure with the apex at the palatal, preferably pre-palatal, region and slur into a [ʂ]. Add voice to get [d̪ʂ].

To produce [t̪ʰ] make a closure with the apex at the alveolus and slur into a lateral voiceless fricative [ʰ] by opening a small gap on both sides of the middle of the tongue. Addition of voice to it gives [d̪ʱ].

7.3.1.

1. [t̪aʂa]
2. [t̪aʂa]
3. [t̪aʂaʂa]
4. [t̪ʂa]
5. [t̪ʂʂʂʂ]
6. [t̪ʂat̪ʂa]
7. [at̪ʂad̪ʂa]
8. [d̪ʂʂʂʂ]
9. [ad̪ʂat̪ʂa]
10. [ad̪ʂat̪ʂad̪ʂa]

7.3.2.

1. [taʂa]
2. [taʂaʂa]
3. [t̪ʂa]
4. [t̪ʂʂʂʂ]
5. [t̪ʂat̪ʂa]
6. [t̪ʂat̪ʂa]
7. [t̪ʂad̪ʂa]
8. [d̪ʂat̪ʂa]
9. [d̪ʂad̪ʂat̪ʂa]
10. [t̪ʂad̪ʂat̪ʂad̪ʂa]

10. a. [dʒəg] 'to live (Imp.)'
 b. [dʒəg] 'work'
11. a. [dʒu:n] 'non-tender (as a vegetable)'
 b. [dʒu:n] 'month of June'
12. a. [dʒər] 'if'
 b. [dʒwər] 'fever'
13. a. [ga:ndʒa:] 'to harass (Imp. pl.)'
 b. [ga:ndʒa:] 'Ganja'
14. a. [pu:dʒa:] 'to worship (Imp. pl.)'
 b. [pu:dʒa:] 'worship'

L. E. 17. Telugu (Dravidian)

1. a. [pat̪ʂa] 'yellow'
 b. [pat̪ʂaw̃] 'fortnight'
2. a. [at̪ʂaw̃] 'real'
 b. [at̪ʂaraw̃] 'letter'
3. a. [pɪt̪ʂa] 'scrotum'
 b. [bit̪ʂa] 'alms'
4. a. [pɪt̪ʂuka] 'sparrow'
 b. [bit̪ʂu] 'mendicant (Buddhist)'
5. a. [kurt̪ʂi] 'chair'
 b. [kut̪ʂi] 'belley'
6. a. [pʌt̪ʂi] 'wet'
 b. [pʌt̪ʂi] 'bird'
7. a. [t̪ʂawʌt̪a] 'dullard'
 b. [t̪ʂawaraw̃] 'hair cut'
8. a. [t̪ʂʌ:ru] 'thin soup'
 b. [t̪ʂa:raw̃] 'alkali'
9. a. [t̪ʂe : w̃a] 'colocassia (arum)'
 b. [t̪ʂe : w̃aw̃] 'welfare'

L. E. 18. Hmar (Tibeto-Burman)

1. a. [t̪ʂi] 'clan, corn'
 b. [t̪ʂit̪] 'decant'
 c. [t̪ʂin] 'complete'

- | | | | |
|----|----|-----------|---------------|
| 2. | a. | [t̚ʰɪr] | 'to complain' |
| | b. | [t̚ʰɪr] | 'to compare' |
| 3. | a. | [t̚ʰeɪr] | 'to dwell' |
| | b. | [t̚ʰeɪr] | 'dish' |
| 4. | a. | [t̚ʰa:k] | 'eager' |
| | b. | [t̚ʰa:k] | 'to brew' |
| 5. | a. | [t̚ʰəɪr] | 'to derive' |
| | b. | [t̚ʰəɪr] | 'to elect' |
| 6. | a. | [t̚ʰau] | 'to dig' |
| | b. | [t̚ʰau] | 'durable' |
| 7. | a. | [t̚ʰo:r] | 'extra' |
| | b. | [t̚ʰo:r] | 'direct' |
| 8. | a. | [t̚ʰu:t̚] | 'dull' |
| | b. | [t̚ʰu:] | 'to collapse' |

7.3.5. Try and practise some other possible affricates like :

	Bilabial	Labio-dental	Velar
Voiceless	p ^ɸ	p ^f	k ^x
Voiced	b ^β	b ^v	g ^ɣ

Find out if you can add some more to this list.

II. 8. VOWELS :

The range of vowel quality is a continuum. But vowels can be classified depending upon three axes, viz., 1) horizontal front-to-back axis, 2) vertical axis, and 3) the axis of lip posture. In the production of a vowel the tongue has a convex upper shape. On the horizontal axis vowels can be further divided into a) front, b) central, and c) back depending upon the position of the highest point (hump) of the tongue. On the vertical axis starting with the tongue at the greatest distance from the floor of the mouth, vowels can be divided further into a) high, b) mid, and c) low. These are mean (average) vertical divisions which can be further divided into close and open sub-zones: the close position being higher than the mean position and the open position being lower than the mean position. The axis of lip posture

gives rise to distinctions designated by self-explanatory terms, viz., 1) unrounded and 2) rounded. The left and the right corners of the lips are pushed together in rounded vowels.

Vowels can be either voiced or voiceless, oral or nasalized. In this section we shall take up only voiced oral vowels.

A combination of the various divisions on all the three axes results in thirty-six possible types of vowels. In fact the classification of vowels can be refined further by narrowing the distinctions on these axes or simplified further by having fewer distinctions. That is why establishment of vowel types is arbitrary and is like calibration on a given scale. Among these types we will practise some.

		<i>Front</i>		<i>Central</i>		<i>Back</i>	
		<i>U</i>	<i>R</i>	<i>U</i>	<i>R</i>	<i>U</i>	<i>R</i>
<i>High</i>	{ <i>Close</i>	i	ü	ɨ	ʉ	ɯ	u
	{ <i>Open</i>	ɪ		ɨ			ʊ
<i>Mid</i>	{ <i>Close</i>	e	ø	ə	ɘ	ɤ	o
	{ <i>Open</i>	ɛ					ɔ
<i>Low</i>	{ <i>Close</i>	æ	œ	ʌ			ɔ̃
	{ <i>Open</i>	ɑ		ɑ			ɒ

U = unrounded; *R* = Rounded.

Table 2

8.1. FRONT UNROUNDED VOWELS :

The six vowels in the front unrounded column can be viewed as six auditorily (and to some extent articulatorily) equidistant steps from the highest to the lowest position of the tongue. For the vowel produced at the highest position we assign the symbol [i], and for the lowest [ɑ].

To produce [i] make a slightly convex hump of that part of the tongue which lies approximately below the alveolar region. Keep the lips in a spread position. Of course the passage created by the convex hump of the tongue and the alveolus should be just wide enough not to produce any turbulence. To produce the rest of the

front vowels lower the lower jaw gradually stopping at approximately equidistant steps as explained above. You can observe some of these movements in a mirror.

Practise the following :

8.1.1.

- | | |
|-------------|---------------------------|
| 1. [iiii] | 6. [iɪii] |
| 2. [iiɑɑɑ] | 7. [ɪiɪɪ] |
| 3. [ɑɑiiɑɑ] | 8. slur from [ii] to [ɑɑ] |
| 4. [iiɪɪ] | 9. slur from [ɪɪ] to [ɑɑ] |
| 5. [ɪɪɪɪ] | 10. [iɪɑɑ] |

8.1.2.

- | | |
|-------------|----------------------------|
| 1. [iiɪee] | 6. [ɪeeɑɑ] |
| 2. [ɪeeɪɪ] | 7. slur from [ee] to [ɑɑ] |
| 3. [eeɪee] | 8. slur from [ɑɑ] to [ee] |
| 4. [eeɪii] | 9. slur from [ii] to [ee] |
| 5. [ɪiiɪee] | 10. slur from [ee] to [ii] |

8.1.3.

- | | |
|--------------|----------------------------|
| 1. [eeEE] | 6. [EEeeɪɪ] |
| 2. [iiɪeeEE] | 7. slur from [EE] to [ɑɑ] |
| 3. [ɪeeEE] | 8. slur from [ɑɑ] to [EE] |
| 4. [eeEEee] | 9. slur from [ii] to [EE] |
| 5. [EEeeEE] | 10. slur from [EE] to [ii] |

8.1.4.

- | | |
|-------------|----------------|
| 1. [EEææ] | 6. [ææɑɑ] |
| 2. [eeEEææ] | 7. [ɑɑææ] |
| 3. [ææEEee] | 8. [ææEEææɑɑ] |
| 4. [EEææEE] | 9. [ɑɑææɑɑ] |
| 5. [ææEEææ] | 10. [EEææɑɑææ] |

8.2. BACK ROUNDED VOWELS :

We have practised the front unrounded vowels [i] to [a] by following gradual steps from the highest to the lowest point on the continuum. The same procedure can be performed with the back rounded vowels.

To produce [u] make a slightly convex hump at that part of the tongue which lies approximately below the velum. Keep the lips rounded. Now produce pulmonic egressive airstream along with voicing. Adjust the height of the hump of the tongue by raising it a little but stop it at that point after which any more raising produces some kind of turbulence or friction. This is [u].

8.2.1.

- | | |
|-------------|--------------------------------|
| 1. [uuuuu] | 6. [oouoo] |
| 2. [uuu] | 7. slur from [u] to [o] |
| 3. [uuuuuu] | 8. slur from [u] to [o] to [u] |
| 4. [uuuuoo] | 9. [uoo] |
| 5. [uouuu] | 10. [ouuu] |

8.2.2.

- | | |
|-------------|--------------|
| 1. [ooɔɔ] | 6. [ooɔɔΩΩ] |
| 2. [uuooɔɔ] | 7. [ΩΩɔɔΩΩ] |
| 3. [ɔɔooɔɔ] | 8. [ɔɔΩΩɔɔ] |
| 4. [ooɔɔoo] | 9. [ɔɔΩΩɔɔ] |
| 5. [ɔɔoouu] | 10. [ɔɔΩΩɔɔ] |

8.3. CENTRAL UNROUNDED VOWELS :

To produce [ɨ] make a slightly convex hump at that part of the tongue that lies approximately below the palate. While producing a pulmonic egressive airstream along with voice raise the tongue to that extent that any more raising will produce turbulence or friction. Keep the lips unrounded.

8.3.1.

- | | |
|-------------------------|---------------------------------|
| 1. [ɨɨɨɨ] | 6. [ɨɨlæ] |
| 2. slur from [ɨ] to [a] | 7. [æɨlæ] |
| 3. slur from [a] to [ɨ] | 8. [ɨɨlæɨɨ] |
| 4. [ɨɨɨ] | 9. [æɨlɨ] |
| 5. [ɨɨɨ] | 10. slur from [ɨ] to [ə] to [ɨ] |

8.3.2.

- | | |
|-------------|-------------------------|
| 1. [Həə] | 6. [HəəΛΛ] |
| 2. [IHəəIH] | 7. [əəΛΛəə] |
| 3. [əəIHəə] | 8. slur from [I] to [Λ] |
| 4. [əəΛΛ] | 9. [ΛΛəə] |
| 5. [ΛΛəəΛΛ] | 10. [əəΛΛəə] |

8.4. FRONT AND CENTRAL ROUNDED VOWELS:

We have practised front and central vowels of unrounded type. All these vowels can have rounded counterparts. Among all the possible rounded front and central vowels we shall practise only some selected vowels.

To produce [ü] keep the tongue position and everything exactly as in the production of [i] and add lip rounding to it simultaneously.

For [ø] and [œ] start with [e] and [æ] respectively and while keeping the tongue position and everything unaltered add lip rounding simultaneously.

8.4.1.

- | | |
|-------------|--------------|
| 1. [iiiüüü] | 6. [øøeeøø] |
| 2. [iiüüii] | 7. [ææœœœœ] |
| 3. [üüüüüü] | 8. [ææœœææ] |
| 4. [eeeøøø] | 9. [œœææœœ] |
| 5. [eeøøee] | 10. [üüøøœœ] |

To produce [ɥ] and [ɤ] start with [i] and [ə] respectively and while keeping the tongue position etc. unaltered add lip rounding simultaneously.

8.4.2.

- | | |
|-------------|------------|
| 1. [iiiɥɥɥ] | 4. [əəɤɤɤ] |
| 2. [iiɥɥii] | 5. [əɤɤə] |
| 3. [ɥɥiiiɥ] | 6. [ɤɤəəɤ] |

8.5. BACK UNROUNDED VOWELS : We have practised back rounded vowels. All these vowels can have unrounded counterparts of which we shall practise only two.

To produce [ɯ] and [ʌ] start from [u] and [o] respectively and spread the lips while keeping the tongue position etc. unaltered.

8.5.1.

- | | |
|-------------|-------------------------|
| 1. [uuuuɯɯ] | 5. [ooʌʌoo] |
| 2. [uuɯuuu] | 6. [ʌʌooʌʌ] |
| 3. [ɯuuuuɯ] | 7. slur from [ɯ] to [ʌ] |
| 4. [oooʌʌʌ] | 8. slur from [ʌ] to [ɯ] |

L. E. 19. Bengali (Indo-Aryan)

- | | |
|-----------------|----------------------|
| 1. a. [mela] | 'festival' |
| b. [mɛla] | 'many' |
| 2. a. [bela] | 'seashore' |
| b. [bɛla] | 'time' |
| 3. a. [ɟiʃa] | 'senses' |
| b. [ɟeʃ] | 'land' |
| c. [ɟɛkʰa] | 'sight' |
| 4. a. [bibi] | 'wife of a muslim' |
| b. [bebak] | 'everybody' |
| c. [bʰɛbatʰɛka] | 'perplexity' |
| 5. a. [boŋ] | 'sister' |
| b. [bɔŋ] | 'forest' |
| 6. a. [gʱur] | 'fainting sensation' |
| b. [gʱor] | 'intense' |
| c. [gʱɔr] | 'house' |
| 7. a. [gura] | 'trunk of a tree' |
| b. [goɾa] | 'fair complexion' |
| c. [gɔɾa] | 'to build' |
| 8. a. [mor] | 'mine' |
| b. [mɔr] | 'to die (imp. sg.)' |
| 9. a. [tɔra] | 'you (pl.)' |
| b. [tɔɾa] | 'haste' |

L. E. 20. Telugu (Dravidian)

- | | | | |
|----|----|-----------|-------------------------|
| 1. | a. | [ɳi:ra:] | ' Is it water ? ' |
| | b. | [ɳr:ra:] | ' Is it toddy ? ' |
| 2. | a. | [pilla:] | ' Is it a cat ? ' |
| | b. | [ɽilla:] | ' Is it a girl ? ' |
| 3. | a. | [pɛt̪ta:] | ' Is it a trunk box ? ' |
| | b. | [pɛt̪ta:] | ' Is it a hen ? ' |
| 4. | a. | [wɛɳɳa:] | ' Is it a back bone ? ' |
| | b. | [wɛɳɳa:] | ' Is it butter ? ' |
| 5. | a. | [aɽta:] | ' Is it a pancake ? ' |
| | b. | [aɽta:] | ' Is it card board ? ' |
| 6. | a. | [bɒlla:] | ' Is it a lizard ? ' |
| | b. | [balla:] | ' Is it a slate ? ' |

L. E. 21. Tulu (Dravidian)

- | | | | |
|----|----|---------|----------------------|
| 1. | a. | [pa:ri] | ' You (pl.) run ' |
| | b. | [pa:ri] | ' You (sg.) run ' |
| | c. | [pa:ru] | ' It may run ' |
| 2. | a. | [pa:ri] | ' small grove ' |
| | b. | [pa:ri] | ' condition ' |
| | c. | [bo:ru] | ' tooth less ' |
| 3. | a. | [ampi] | ' You (pl.) do ' |
| | b. | [ampi] | ' You (sg.) do ' |
| | c. | [ampu] | ' It may do ' |
| 4. | a. | [marli] | ' mad ' |
| | b. | [kurlu] | ' puffed rice ' |
| 5. | a. | [urɖu] | ' black gram ' |
| | b. | [marɖi] | ' medicine ' |
| 6. | a. | [aɻiwe] | ' mouth of a river ' |
| | b. | [aɻuwe] | ' He may cry ' |

L. E. 22. Assamese (Indo-Aryan)

- | | | | |
|----|----|-------|----------------|
| 1. | a. | [bil] | ' small lake ' |
| | b. | [bel] | ' bell ' |
| | c. | [bɛl] | ' wood apple ' |

- | | | | |
|----|--------|-------------|-------------------|
| d. | [buli] | 'like' | |
| e. | [bol] | 'to colour' | |
| f. | [bɔl] | 'let us go' | |
| g. | [bɔ̃l] | 'strength' | |
| | | | |
| 2. | a. | [bis] | 'to fan (imp.)' |
| | b. | [bes] | 'fine' |
| | c. | [bɛs] | 'to sell (imp.)' |
| | d. | [bas] | 'to chose (imp.)' |
| | e. | [mus] | 'to clean (imp.)' |
| | f. | [kɔ̃t] | 'coat' |
| | g. | [kɔ̃t] | 'where' |
| | h. | [pɔ̃t] | 'picture' |

II. 9. GLOTTAL STOP AND CREAKY VOICE :

9. 1. Glottal stop is produced by closing the glottis completely. Glottal stop can never be voiced because tightly closed vocal folds can not vibrate. In otherwords both glottal stop and voicing utilize the same organ viz., vocal folds, in the case of the former they should be completely closed (tightly pressed against each other) and in the case of the latter they should be kept in vibration by an airstream. This is how a glottal stop is different from the rest of the stops.

A glottal closure can be achieved by 'holding breath'. Pronounce a sequence of the same vowel with intermediate sharp checks. The checks you hear are glottal stops. The symbol for a glottal stop is [ʔ].

Practise the following :

9.1.1.

- | | | | |
|----|---------|-----|-----------|
| 1. | [a:] | 6. | [ʔa:] |
| 2. | [aʔaʔa] | 7. | [ʔa:ʔ] |
| 3. | [aʔʔʔa] | 8. | [ʔaʔa] |
| 4. | [aʔʔʔ] | 9. | [ʔaʔaʔaʔ] |
| 5. | [aʔ] | 10. | [aʔʔa:ʔ] |

9.1.2.

- | | |
|--------------|--------------|
| 1. [ap] | 6. [amʔ] |
| 2. [apaʔ] | 7. [amʔm] |
| 3. [apʔa] | 8. [maʔma] |
| 4. [aʔpa] | 9. [abʔa] |
| 5. [aʔpaʔpa] | 10. [ʔbaʔba] |

9.1.3.

- | | |
|-------------|-----------------|
| 1. [aha] | 6. [ahʔahʔ] |
| 2. [ahaʔ] | 7. [hhʔss] |
| 3. [ahʔa] | 8. [ʔhhaaʔ] |
| 4. [hʔhʔha] | 9. [ʔssaʔ] |
| 5. [sʔsʔs] | 10. [haʔhaʔhaʔ] |

L. E. 23. Savara (Munda)

- | | | |
|-----|--------------|-----------------------------|
| 1. | a. [ba:l] | ‘ to burn (tr.) ’ |
| | b. [ʔba:l] | ‘ to be roasted (intr.) ’ |
| 2. | a. [ba:r] | ‘ to change (tr.) ’ |
| | b. [ʔba:r] | ‘ to be changed (intr.) ’ |
| 3. | a. [bebe] | ‘ to surround ’ |
| | b. [bʔebʔe:] | ‘ satisfactorily ’ |
| 4. | a. [ɖa:] | ‘ to water ’ |
| | b. [ɖʔa:] | ‘ to become watery ’ |
| 5. | a. [ɖo:ŋəŋ] | ‘ cross-beam of a house ’ |
| | b. [ɖʔo:ŋəŋ] | ‘ body of living beings ’ |
| 6. | a. [ɖU] | ‘ to finish ’ |
| | b. [ɖʔu:l] | ‘ to suck ’ |
| 7. | a. [kui] | ‘ to be rolled as leaves ’ |
| | b. [kʔu:i] | ‘ to be sold out ’ |
| 8. | a. [la:] | ‘ to spill (tr.) ’ |
| | b. [lʔa:] | ‘ to be spilt (intr.) ’ |
| 9. | a. [le:m] | ‘ to salute ’ |
| | b. [lʔe:m] | ‘ to be dissolved ’ |
| 10. | a. [lu:] | ‘ to nourish ’ |
| | b. [lʔu:] | ‘ to be alive ’ |

- | | | | |
|-----|----|-----------|-----------------|
| 11. | a. | [mo:ɖa:ŋ] | 'mist' |
| | b. | [mʔo:ɖəŋ] | 'eye' |
| 12. | a. | [reɖ] | 'to tie' |
| | b. | [rʔe:ɖ] | 'fat' |
| 13. | a. | [seɖ] | 'to throw away' |
| | b. | [sʔeɖ] | 'to be lost' |
| 14. | a. | [siŋ] | 'to praise' |
| | b. | [sʔi:ŋ] | 'hand' |
| 15. | a. | [u:] | 'to commence' |
| | b. | [uʔu:] | 'yes' |
| | c. | [uʔu:ŋ] | 'hair' |

9.2. In creaky voice each vibration of the vocal folds can be heard distinctly. A creaky vowel can be produced by trying the vowels at the lowest note and then trying a still lower note. Vowels as well as consonants can be of creaky quality. The symbol for creaky voice is [̰] used as a subscript.

Practise the following :

9.2.1.

1. [a:] at a higher pitch
2. [a:] at a lower pitch
3. [a:a:] go from high to low pitch
4. [a:] at the base (lowest pitch you can produce)
5. [a:̰a:]
6. [̰a:a:]
7. [a:̰a:̰a:]
8. [̰a:a:̰a:]
9. [̰a:ʔa:]
10. [a:ʔa:ʔa]

9.2.2.

- | | | | |
|----|-----------|----|-------------|
| 1. | [̰a:mm] | 4. | [̰m̰m̰a:a:] |
| 2. | [̰a:m̰m̰] | 5. | [̰m̰ma:] |
| 3. | [̰m̰m̰a:] | 6. | [̰a:zz] |

- | | |
|-------------|--------------|
| 7. [zzmm] | 9. [a:zz] |
| 8. [a:mmzz] | 10. [a:zza:] |

9.2.3.

- | | |
|-------------|--------------|
| 1. [baba] | 6. [baɗaga] |
| 2. [ba:ba] | 7. [gaɗɗga] |
| 3. [ba:ba] | 8. [ba:ba] |
| 4. [ba:ma] | 9. [mabaza] |
| 5. [zza:ba] | 10. [bazama] |

9.2.4.

1. [paba]
2. [pa:ba]
3. [bapa]
4. [ka:ga]
5. [ga:ka]
6. [ba:ʔa]
7. [a:ʔa:ka]
8. [mapaba]

II. 10. GLOTTALIC AIRSTREAM :

As it was mentioned in I.1.5. the glottalic airstream is produced by the piston like action of the glottis which may be completely or partially closed by the vocal folds. Glottalic airstream may be ingressive or egressive.

10.1. GLOTTALIC INGRESSIVE SOUNDS :

10.1.1. **Implosives:** Glottalic ingressive plosives are called simply implosives which are also known as 'injectives' or 'recursives'.

Practise the following :

	Bilabial	Alveolar	Retroflex	Velar
Voiceless	p''	t''	ʈ''	k''
Voiced	b''	d''	ɖ''	g''

To produce [p''] :

- (a) Close the larynx. This can be done by holding breath. :
- (b) Close the lips while keeping the glottal (laryngeal) closure intact.
- (c) Keeping the larynx closed bring it down as low as you can. You can observe the downward movement of the larynx by looking at your throat in a mirror.
- (d) Keeping the larynx at the lowered position while feeling a partial vacuum in the oral cavity open the bilabial closure. You can hear the implosion when air rushes into the oral chamber down to the larynx.
- (e) While doing all this don't lower the velum.
- (f) After step (d) the incoming air fills in the oral cavity. But, for the production of the sounds that follow [p''], say [a], the glottis has to be opened. That is why in producing a [p''a] you can hear the opening of glottis between [p''] and [a]. Try to reduce the interval between this opening of the glottis and the production of the [p''].

To produce [b''] perform steps (a) and (b) as in the production of [p'']. But at step (c) try to add voicing to it. It can be done by keeping a very small opening in the glottis. This can be achieved by deliberately trying to add voice to [p''].

In the production of [b''] or any voiced glottalic ingressive sound the pulmonic air (air present in the lungs under some pressure) leaks into the partial vacuum created by the downward movement of the larynx through the small slit in the glottis. This leakage causes that portion of the vocal cords which is apart to vibrate. Soon after this voicing starts the oral closure may be released as in step (d).

Only in the case of voiceless glottalic ingressesives it is possible to maintain the partial vacuum as long as we want by not opening the oral closure or glottal closure. But with a voiced glottalic ingressive like [b''] it is not possible because the air leaking from the lungs (which produces the voice) fills up the partial vacuum after some time. That is why if you continue keeping the lips (and the

velum) closed you can hear the voice to continue and fade out after some time.

[t̥'], [t̄'], and [k''] can be produced by following the steps (a), (c) and (d) as in the case of [p''] but at step (b) appropriate articulators should be selected for the respective sounds.

[d̄'], [d̥'], and [g''] also can be produced by following the same steps as for the production of [b''] and choosing the appropriate articulators.

10.1.1.1.

1. [ap]
2. [apʔ]
3. [appʔʔʔ]
4. [ap''a]
5. [ap''ʔa]
6. [ap''ʔʔa]
7. [ap''ʔa]
8. [ap''a]
9. [ap''ap''a]
10. [p''ap''ap'']

10.1.1.2.

1. [ap''a]
2. [ab''ʔa]
3. [ab''a]
4. [ap''ab''a]
5. [b''ap''ab''a]

10.1.1.3.

- | | |
|---------------------|----------------------|
| 1. [ap''at̄''] | 7. [k''at̄''ad̄''a] |
| 2. [t̄''at̄''ap''] | 8. [d̄''at̄''ak''a] |
| 3. [p''at̄''ap''] | 9. [d̄''ad̄''a] |
| 4. [t̄''ak''ap''] | 10. [d̄''ad̄''ag''a] |
| 5. [t̄''ak''at̄''a] | 11. [g''ad̄''ab''a] |
| 6. [k''at̄''at̄''a] | 12. [b''ad̄''ag''a] |

L. E. 24. Sindhi (Indo-Aryan)

- | | | | |
|----|----|--------------------------|------------------|
| 1 | a. | [ba:bo] | 'father' |
| | b. | [b''a:b''o] | 'paternal uncle' |
| 2. | a. | [bət̄ [̣] so] | 'saved' |
| | b. | [b''ət̄ [̣] so] | 'child' |

- | | | | |
|-----|----|---|--------------------------------|
| 3. | a. | [bak ^h ʊ] | ‘victim’ |
| | b. | [b ^ʰ ək ^h ʊ] | ‘embrace’ |
| 4. | a. | [birʊ] | ‘vexed’ |
| | b. | [b ^ʰ irʊ] | ‘hole’ |
| 5. | a. | [bilo] | ‘arrangement’ |
| | b. | [b ^ʰ ilo] | ‘tom cat’ |
| 6. | a. | [budžo] | ‘a gesture denoting a curse’ |
| | b. | [b ^ʰ udžo] | ‘whole’ |
| 7. | a. | [d̥a:b ^ʰ ə] | ‘a coin of small denomination’ |
| | b. | [d ^ʰ a:b ^ʰ ə] | ‘lungi’ |
| 8. | a. | [d̥ədd̥ʊ] | ‘worthless’ |
| | b. | [d ^ʰ əd ^ʰ d ^ʰ ʊ] | ‘dullard’ |
| 9. | a. | [d̥əppʊ] | ‘fear’ |
| | b. | [d ^ʰ əppʊ] | ‘a quality like beauty’ |
| 10. | a. | [d̥amb ^h ʊ] | ‘hypocrisy’ |
| | b. | [d ^ʰ amb ^h ʊ] | ‘cautery’ |
| 11. | a. | [d̥o:hʊ] | ‘deceit’ |
| | b. | [d ^ʰ o:hʊ] | ‘fault’ |
| 12. | a. | [d̥innəlʊ] | ‘afraid’ |
| | b. | [d ^ʰ innəlʊ] | ‘given’ |
| 13. | a. | [d̥žə:ʊ] | ‘barley’ |
| | b. | [d ^ʰ ə:ʊ] | ‘sealing wax’ |
| 14. | a. | [d̥žərʊ] | ‘water’ |
| | b. | [d ^ʰ ərʊ] | ‘flame’ |
| 15. | a. | [d̥žə:rɔ] | ‘shelf’ |
| | b. | [d ^ʰ ə:rɔ] | ‘cobweb’ |
| 16. | a. | [d̥žə:i] | ‘positively’ |
| | b. | [d ^ʰ ə:i] | ‘born’ |
| 17. | a. | [d̥žəmmʊ] | ‘death-god’ |
| | b. | [d̥əmmʊ] | ‘birth’ |
| 18. | a. | [gə:r] | ‘abuse’ |
| | b. | [g ^ʰ ə:r] | ‘gravel’ |
| 19. | a. | [gə:rɔ] | ‘mud plaster’ |
| | b. | [g ^ʰ ar:ɔ] | ‘a very coarse type of flour’ |

20. a. [ga:ŋo] 'song'
 b. [g'a:ŋo] 'camel's collar'
21. a. [gəllɔ] 'inside portion of throat'
 b. [g'əllɔ] 'front of the neck'
22. a. [gi:tə] 'songs'
 b. [g'i:tə] 'a gulp'

L. E. 25. Multani (Indo-Aryan)

1. a. [b'illa] 'tom cat'
 b. [billa] 'badge'
2. a. [b'əs] 'to finish (Imp.)'
 b. [bəs] 'bus'
3. a. [b'a:l] 'child'
 b. [ba:l] 'ball'
4. a. [b'əŋŋa] 'limit'
 b. [bəŋŋa] 'bridegroom'
5. a. [b'ətʃʂa] 'child'
 b. [bətʃʂa] 'remnant'
6. a. [b'ətʃri] 'thirty two'
 b. [bətʃi] 'wick lamp'
7. a. [b'əhaʃʃar] 'seventy two'
 b. [bəhʃər] 'better'
8. a. [b'ua:] 'door'
 b. [bua:] 'father's sister'
9. a. [b'o] 'to become sour'
 b. [bo] 'smell'
10. a. [d'id'u] 'small frog'
 b. [d'idʱu] 'one and a half'
 c. [dʱidʱu] 'stomach'
11. a. [d'a:li] 'branch'
 b. [da:li] 'name of a girl'
 c. [d'a:rʱi] 'beard'
12. a. [əd'd'a:] 'stop'
 b. [əndɑ:] 'egg'

- | | | | |
|-----|----|---------------|---|
| 13. | a. | [gʊd̪ˈd̪i] | ‘doll’ |
| | b. | [gid̪di] | ‘cotton stuffed jacket’ |
| 14. | a. | [d̪ˈəŋgʱU] | ‘leg’ |
| | b. | [d̪ʒəŋgʱU] | ‘battle’ |
| 15. | a. | [d̪ˈaːlaː] | ‘cobweb’ |
| | b. | [d̪ʒaːlaː] | ‘recess in a wall’ |
| 16. | a. | [d̪ˈəmn̪a] | ‘to bathe’ |
| | b. | [d̪ʒəmn̪a] | ‘River Jamuna’ |
| 17. | a. | [d̪ˈət̪U] | ‘uneducated person’ |
| | b. | [d̪ʒət̪a] | ‘braid’ |
| 18. | a. | [səd̪ˈd̪iːaː] | ‘right side’ |
| | b. | [səd̪ʒaː] | ‘punishment’ |
| 19. | a. | [g̪ˈaːn̪a] | ‘wrist thread’ |
| | b. | [gaːn̪a] | ‘song’ |
| 20. | a. | [g̪ˈəd̪di] | ‘bundle’ |
| | b. | [gəd̪ˈd̪i] | ‘train’ |
| 21. | a. | [g̪ˈənd̪fiə] | ‘knot’ |
| | b. | [gənd̪ə] | ‘rubbish’ |
| 22. | a. | [g̪ˈit̪ʃi] | ‘neck’ |
| | b. | [gət̪ʃi] | ‘corner of a room with an outlet for water’ |
| 23. | a. | [g̪ˈɔr] | ‘jaggery’ |
| | b. | [gɔr] | ‘quality of art’ |

10.1.1.4. Care should be taken not to confuse aspiration and breathy voice (which are due to pulmonic air stream) with glottalic implosion.

L.E. 26. Sindhi (Indo-Aryan).

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|----|----|-------------|--------------------------|
| 1. | a. | [b̪ˈəɾU] | ‘to burn (imp. intr.)’ |
| | b. | [b̪fiəɾU] | ‘support’ |
| | c. | [b̪əɾU] | ‘desert’ |
| | d. | [p̪həɾU] | ‘fruit’ |
| | e. | [p̪əɾU] | ‘wing’ |
| 2. | a. | [b̪ˈaːlU] | ‘child’ |
| | b. | [b̪fiːaːlU] | ‘favour’ |

- | | | | |
|-----|----|----------------------------------|--------------------------------------|
| 3. | a. | [b''a:lo] | 'a kind of bracelet' |
| | b. | [b ^{fi} a:lo] | 'spear' |
| 4. | a. | [b''ut <u>to</u> :] | 'unadorned' |
| | b. | [b ^{fi} ut <u>to</u> :] | 'a small ear of corn' |
| 5. | a. | [b''a:ri:] | 'a party or sect' |
| | b. | [b ^{fi} a:ri:] | 'heavy' |
| 6. | a. | [d''a:ru] | 'a crack in wood or wall' |
| | b. | [d ^{fi} a:ru] | 'blade of sword' |
| 7. | a. | [d''a:ko] | 'step of a ladder' |
| | b. | [d ^{fi} a:ko] | 'thick bush' |
| 8. | a. | [d''e:ru] | 'husband's brother' |
| | b. | [d ^{fi} e:ru] | 'heap' |
| 9. | a. | [d''o:lu] | 'bucket' |
| | b. | [d ^{fi} o:lu] | 'boy friend' |
| 10. | a. | [d''a:rɔ] | 'cobweb' |
| | b. | [d ^{žfi} a:rɔ] | 'weak' |
| | c. | [d ^ž a:rɔ] | 'shelf' |
| | d. | [t ^š h'a:rɔ] | 'nest of eggs' |
| | e. | [t ^š a:rɔ] | 'fodder' |
| | f. | [za:ru] | 'place' |
| 11. | a. | [d''əttu] | 'Musalman' |
| | b. | [d ^{žfi} əttu] | 'a snatch' |
| 12. | a. | [sud''əlʊ] | 'swollen' |
| | b. | [sud ^{žfi} əlʊ] | 'known' |
| 13. | a. | [g''a:tʊ] | 'neck' |
| | b. | [g ^{fi} a:tʊ] | 'open bathing place' |
| | c. | [ga:t ^h ʊ] | 'abrasion' |
| | d. | [k ^h a:tʊ] | 'a hole made in a wall by a burglar' |
| | e. | [ka:tʊ] | 'wood' |
| 14. | a. | [g''əru] | 'fruit pulp' |
| | b. | [g ^{fi} əru] | 'house' |
| 15. | a. | [g''a:inʊ] | 'to sing' |
| | b. | [g ^{fi} a:inʊ] | 'to attract' |

16. a. [g^hetto] 'lumpsum'
 b. [g^hetto] 'ram'
 17. a. [g^hitti] 'a mouthful'
 b. [g^hitti] 'street'

10.1.1.5. Try to produce implosives at other places of articulation like :

	Dental	Uvular
Voiceless	t ^h	q ^h
Voiced	d ^h	g ^h

10.1.1.6. Can you produce other types of sounds which also use glottalic ingressive airstream, for instance, a glottalic ingressive affricate ?

10.2. GLOTTALIC EGRESSIVE SOUNDS:

10.2.1. **Ejectives** : Glottalic egressive plosives are also called ejectives or glottalized stops.

Practise the following :

	Bilabial	Dental	Alveolar	Retroflex	Velar
Voiceless	p ^h	t ^h	t ^h	t ^h	k ^h
Voiced	b ^h	d ^h	d ^h	d ^h	g ^h

To produce [p^h]

- Close the larynx by holding breath.
- Close the lips while keeping the glottal (laryngeal) closure intact.
- Keeping the larynx closed push it up as high as you can. The upward movement of the larynx can be observed by looking at your throat in a mirror.
- Keeping the larynx at the raised position and feeling the higher pressure in the oral cavity open the bilabial closure. The ejection of sound can be heard when the air rushes out from the oral chamber to outside.
- Don't lower the velum while performing the above steps.
- Try to reduce the distance of the bilabial release and the glottal release that follows the bilabial release in the production of a sequence like [p^ha]. The overall effect should be [p^ha] but not [p^h ? a].

To produce [b'] perform steps a) and b). While doing c) add voicing. Like in the case of voiced implosives in the production of a voiced ejective a small opening in the glottis should be made. This can be achieved by deliberately adding voice to [p']. The pulmonic air which is at a higher pressure leaks through the narrow opening in the glottis into the region above the larynx in which the pressure is constantly increasing due to the upward movement of this "leaky" larynx. Like in a voiced implosive the voice in a voiced ejective is due to the vibration of that part of the vocal cords, which allows the pulmonic air to leak through.

To produce [t'], [t̥'] [t̥'] [k'] and their voiced counterparts chose the appropriate articulators.

10.2.1.1.

1. [ap]
2. [apʔ]
3. [apʔʔʔ]
4. [ap'a]
5. [p'a]
6. [pʔ'a]
7. [ap'ap'a]
8. [p'aʔa]

10.2.1.2.

1. [ap'ab]
2. [abap']
3. [ap'ab']
4. [b'ap']
5. [ab'ab'a]
6. [ab'ʔʔʔ]
7. [b'aʔ]
8. [p'ab'ap']

10.2.1.3.

1. [at̥'a]
2. [at̥'ap']
3. [p'at̥'a]
4. [t̥'ap'at̥'a]
5. [t̥'at̥'a]
6. [t̥'at̥'a]
7. [t̥at̥'a]
8. [t̥'at̥'a]
9. [t̥'at̥'at̥'a]
10. [t̥'at̥'at̥'ap'a]

10.2.1.4.

1. [k'at̥'a]
2. [ak'ab'a]
3. [ab'aɖ'a]
4. [at̥'aɖ'a]
5. [aɖ'aɖ'a]
6. [ɖ'aɖ'a]
7. [aɖ'a]
8. [ag'a]
9. [g'eɖ'a]
10. [ag'eɖ'e]

10.2.2. Try to produce glottalic egressive fricatives and affricates also e.g., [s'] and [t̪^s']. These can be produced by combining the appropriate articulators, stricture type and the glottalic egressive air stream.

II. 11. VELARIC AIRSTREAM :

11.1. Clicks :

Velaric airstream can be either ingressive or egressive. Sounds produced by utilizing velaric ingressive airstream are called clicks. There is no special term for the velaric egressive sounds. Clicks are commonly used in different speech communities : the "tsk tsk" (voiceless dental click) in English expressing reproof and the "cocco" (limino alveolar voiceless click) in Telugu expressing pity or sympathy are some examples.

Practise the following :

	Bilabial	Apico dental	Lamino alveolar	Palatal	Retroflex
Voiceless	p _{KK}	t̪ _{KK}	t̪ _{KK}	k̪ _{KK}	t̪ _{KK}
Voiced	p _{GG}	t̪ _{GG}	t̪ _{GG}	k̪ _{GG}	t̪ _{GG}
Nasalized	p _{NN}	t̪ _{NN}	t̪ _{NN}	k̪ _{NN}	t̪ _{NN}

To produce a [p_{KK}] maintain a bilabial closure and release it by pulling the tongue downwards and backwards. All the voiceless clicks are produced by the downward and backward action of the tongue which creates a rarification in the cavity above the tongue and the air rushes into that cavity as soon as an opening is created. A majority of clicks have a voiceless affricated release. Other voiceless clicks can be produced by combining the velaric ingressive airstream with the appropriate articulators.

In the production of voiceless clicks the pulmonic airstream is not utilized. Notice that the pulmonic airstream can be simultaneously produced while the velaric airstream is in operation; you can breathe in and out while producing a click. Breathing in and out needs the lowering of the velum. Produce voicing without lowering velum (that is, keeping the nasal passage shut) and simultaneously produce a click. This will give you a voiced click.

11.1.1.

1. [akṭa]
2. [akt_{KK}a]
3. [ṭ_{KK}ṭ_{KK}ṭ_{KK}]
4. [ṭ_{KK}p_{KK}]
5. [p_{KK}ṭ_{KK}ṭ_{KK}]
6. [k_{KK}ṭ^ʒa]
7. [ṭ_{KK}ṭa]
8. [tat_{KK}]
9. [p_{KK}ṭa]
10. [ṭ^ʒp_{KK}ṭ^ʒa]

11.1.2.

1. [ṭ^ʒṭ_{KK}]
2. [ṭ^ʒṭ_{KK}ṭ^ʒ]
3. [p_{KK}p^ʒp_{KK}]
4. [ṭ^ʒṭ_{KK}ṭ^ʒa]
5. [aap_{GG}a]
6. [p_{GG}aap_{GG}a]
7. [ṭ_{GG}aap_{GG}a]
8. [p_{GG}aab^ʒa]
9. [b^ʒap_{GG}p^ʒa]
10. [ṭ^ʒṭ_{GG}ad^ʒa]

To produce a nasalized click follow the same steps as in the production of a voiced click but bring down the velum to open the entrance to the nasal passage. You can continuously produce clicks while humming. Practise the following :

11.1.3.

- | | |
|---|--|
| 1. [p _{GG} p _{GG}] | 6. [ṭ _{NN} ṭāāp _{NN}] |
| 2. [ap _{GG} aaāāp _{NN} ā] | 7. [āāap _{NN} ṭ _{NN}] |
| 3. [p _{NN} ṭ _{NN} ṭ _{NN} ṭ _{NN}] | 8. [b ^ʒ āāp _{NN}] |
| 4. [p _{NN} ṭ _{NN} ṭāāp _{NN}] | 9. [p _{NN} p ^ʒ] |
| 5. [ṭ _{NN} ṭ _{NN} ṭ _{NN}] | 10. [p ^ʒ p ^ʒ p _{NN}] |

Clicks also can be laterally released. In a laterally released click the affrication is more distinctly audible than in a medianly released click.

Practise the following ;

	Lamino alveolar lateral click	Retroflex lateral click
Voiceless	ṭ ^ʔ _{KK}	ṭ ^ʔ _{KK}
Voiced	ṭ ^ʔ _{GG}	ṭ ^ʔ _{GG}
Nasalized	ṭ ^ʔ _{NN}	ṭ ^ʔ _{NN}

11.1.4.

- | | |
|---|---|
| 1. [t ^l _{KK} t ^l _{KK}] | 6. [t ^l _{GG} at ^l _{GG}] |
| 2. [t _{KK} t ^l _{KK}] | 7. [t ^l _{NN} āāt ^l _{GG}] |
| 3. [t ^l _{KK} t _{KK} t ^l _{KK}] | 8. [āāt ^l _{NN} āāt ^l _{NN}] |
| 4. [t ^l _{KK} t ^l _{KK}] | 9. [t ^l _{NN} ŋŋt ^l _{KK}] |
| 5. [t ^l _{KK} aat ^l _{GG}] | 10. [t ^l _{NN} ŋŋt ^l _{NN}] |

11.2. Velaric Egressive [t]Stops :

Sounds produced by egressive velaric airstream are quite possible though they are not known as phonologically utilized in languages.

Practise the following :

	Bilabial	Apico-dental
Voiceless	p _K	t _K
Voiced	p _G	t _G
Nasal	p _N	t _N

To produce [p_K] set the articulators etc. in the same way as for the production of [p_{KK}] and instead of pushing the tongue backwards and downwards push it forwards and upwards. Release the closure to let the velaric airstream to pass out. Rest of the velaric egressive sounds can be produced by combining the appropriate articulators with the velaric egressive airstream. Voicing and nasalization can be combined like in clicks with a velaric egressive sound to give rise to voiced and nasalized sounds respectively. These sounds also generally have affricated release.

11.2.1.

- | | |
|--|--|
| 1. [p _K p _K p _K] | 6. [t _N ŋŋt _{NN}] |
| 2. [p _K p _K p _K p _{KK} p _{KK}] | 7. [p _N ŋŋp _{NN} ŋ] |
| 3. [p _G a _{GG}] | 8. [p _{NN} āāp _N] |
| 4. [p _{GG} aaāp _N] | 9. [t ^l _{KK} t _K] |
| 5. [p _N ŋŋt _N ŋ] | 10. [t _K t ^l _{KK}] |

11.3. Try to combine clicks and velar egressive sounds with glottalic air stream also.

12. ASPIRATION, BREATHY VOICE, AND WHISPER :

12.1. Voiceless consonants can be aspirated. In an aspirated stop comparatively more pressure is built up behind the closure before the release and when released there will be a puff of air before the following vowel sets in (distinctly if it is a voiced vowel),

Practise the following :

	Bilabial	alveolar	velar
Voiceless aspirated	p ^h	t ^h	k ^h
	12.1.1.		12.1.2.
	1. [apppa]		1. [p ^h at ^h aka]
	2. [papppa]		2. [k ^h at ^h ʔt ^h a]
	3. [ap ^h a]		3. [t ^h at ^h ʔʔk ^h ʔa]
	4. [pap ^h a]		4. [sp ^h art ^h a]
	5. [p ^h apa]		5. [sp ^h ʔsp ^h ʔʔa]
	6. [arp ^h ap ^h a]		6. [sp ^h ʔp ^h ʔʔ]
	7. [p ^h ap ^h a]		7. [p ^h b ^h ʔa]
	8. [p ^h ap ^h ap ^h a]		8. [b ^h ʔat ^h ʔep ^h a]
	9. [arp ^h asp ^h a]		9. [k ^h ʔʔp ^h ʔa]
	10. [arp ^h ʔap ^h a]		10. [p ^h ʔʔt ^h u]

L. E. 27. Hindi (Indo-Aryan)

- | | | | |
|----|----|---------------------|-------------------------|
| 1. | a. | [pəl] | ‘ moment ’ |
| | b. | [p ^h əl] | ‘ fruit ’ |
| 2. | a. | [pal] | ‘ sail ’ |
| | b. | [p ^h al] | ‘ blade, plough share ’ |
| 3. | a. | [paɽ] | ‘ beetle ’ |
| | b. | [p ^h aɽ] | ‘ a jump ’ |
| 4. | a. | [bap] | ‘ father ’ |
| | b. | [bap ^h] | ‘ vapour ’ |

- | | | | |
|-----|----|-----------|-----------------------|
| 5. | a. | [t̪əʋ] | 'body' |
| | b. | [t̪ʰəʋ] | 'breast (of animals)' |
| 6. | a. | [t̪ali:] | 'clapping' |
| | b. | [t̪ʰali:] | 'dining plate' |
| 7. | a. | [sa t̪] | 'seven' |
| | b. | [sa t̪ʰ] | 'in company' |
| 8. | a. | [t̪aŋa] | 'taunt' |
| | b. | [t̪ʰaŋa] | 'police station' |
| 9. | a. | [t̪at̪] | 'bamboo curtain' |
| | b. | [t̪ʰat̪ʰ] | 'luxury' |
| 10. | a. | [ka t̪] | 'to cut (tr.)' |
| | b. | [ka t̪ʰ] | 'piece of wood' |
| 11. | a. | [kaŋa] | 'one eyed man' |
| | b. | [kʰaŋa] | 'food' |
| 12. | a. | [ku l̪] | 'family' |
| | b. | [kʰu l̪] | 'to open (intr.)' |

12.2. In the production of breathy voice the vocal folds are adjusted differently and the quantity of egressive pulmonic air is more compared to the state in the production of ordinary voice. Consonants as well as vowels can be produced with breathy voice.

12.2.1. Practise the following :

Breathy i_h u_h a_h

To produce a breathy vowel let more air escape out along with its ordinary voiced counterpart.

12.2.1.1.

- | | | | |
|----|--|-----|---|
| 1. | [aaa _h a _h] | 6. | [paapa _h a _h] |
| 2. | [a _h a _h a _h] | 7. | [ba _h a _h paa] |
| 3. | [a _h a _h aaa _h a _h] | 8. | [pa _h a _h baa] |
| 4. | [a _h a _h uu _h u _h] | 9. | [ba _h a _h pa _h a _h] |
| 5. | [aai _h i _h u _h u _h aa] | 10. | [pu _h u _h biipa _h a _h] |

L. E. 28. Gujarati (Indo-Aryan)

- | | | | |
|----|----|--------------------|--------|
| 1. | a. | [a:] | 'this' |
| | b. | [a _h :] | 'yes' |

- | | | | |
|-----|----|-------------|---|
| 2. | a. | [paṛ] | ‘ gratefulness ’ |
| | b. | [paḥṛ] | ‘ mountain ’ |
| 3. | a. | [maro] | ‘ to beat (imp.) ’ |
| | b. | [maḥro] | ‘ mine (masc.) ’ |
| 4. | a. | [ṭara] | ‘ star ’ |
| | b. | [ṭaḥra] | ‘ your (pl.) ’ |
| 5. | a. | [lawo] | ‘ to bring (imp.) ’ |
| | b. | [laḥwo] | ‘ pleasure ’ |
| 6. | a. | [por] | ‘ last or next year ’ |
| | b. | [poḥr] | ‘ early morning ’ |
| 7. | a. | [mor] | ‘ peacock ’ |
| | b. | [amba moḥr] | ‘ mango blossom ’ |
| 8. | a. | [koṇa] | ‘ whose (masc. pl.) ’ |
| | b. | [koḥ:] | ‘ to say (imp.) ’ |
| 9. | a. | [mel] | ‘ dirt ’ |
| | b. | [meḥl] | ‘ palace ’ |
| 10. | a. | [pelo] | ‘ that (masc.) ’ |
| | b. | [peḥlo] | ‘ first (masc.) ’ |
| 11. | a. | [selū] | ‘ a type of heavily golden laced sari ’ |
| | b. | [seḥlū] | ‘ easy ’ |
| 12. | a. | [keṽū] | ‘ how (neut.) ’ |
| | b. | [keḥṽū] | ‘ to tell ’ |

12.2.2. Breathy consonants are also known as voiced aspirated consonants. In the production of a breathy consonant the vocal cords attain the same position as in the case of a breathy vowel. Voiced consonants can be made breathy by passing more pulmonic egressive air simultaneously with voicing.

Practise the following :

	Bilabial stop	Bilabial nasal	Bilabial approximant	Alveolar trill	Alveolar lateral
Breathy	b ^h	m ^h	w ^h	r ^h	l ^h

12.2.2.1.

- | | |
|---|---|
| 1. [ba _{fi} a _{fi}] | 9. [m ^{fi} abam ^{fi} a] |
| 2. [a _{fi} ba _{fi} a _{fi}] | 10. [m ^{fi} a _{fi} b ^{fi} a _{fi} w ^{fi} a] |
| 3. [a _{fi} b ^{fi} a _{fi} a _{fi}] | 11. [w ^{fi} a _{fi} wam ^{fi} a _{fi}] |
| 4. [b ^{fi} a _{fi} b ^{fi} a _{fi}] | 12. [waw ^{fi} a _{fi} r ^{fi} a _{fi}] |
| 5. [b ^{fi} ab ^{fi} a] | 13. [r ^{fi} a _{fi} l ^{fi} a _{fi}] |
| 6. [b ^{fi} aa _{fi} ba _{fi}] | 14. [l ^{fi} a _{fi} m ^{fi} a _{fi} ra _{fi}] |
| 7. [b ^{fi} a _{fi} m ^{fi} a _{fi}] | 15. [l ^{fi} ala _{fi} r ^{fi} a _{fi}] |
| 8. [ba _{fi} m ^{fi} a] | 16. [r ^{fi} ara _{fi} l ^{fi} a _{fi}] |

L. E. 29. Marathi (Indo-Aryan)

- | | |
|--|-------------------------------------|
| 1. a. [mən] | ‘ maund (measurement of weight) ’ |
| b. [m ^{fi} a _{fi} n] | ‘ proverb ’ |
| 2. a. [mala] | ‘ garland ’ |
| b. [tum ^{fi} a _{fi} ala] | ‘ to you (pl.) ’ |
| 3. a. [mor] | ‘ peacock ’ |
| b. [m ^{fi} o _{fi} rkya] | ‘ leader ’ |
| 4. a. [nəwət̪a] | ‘ newness ’ |
| b. [n ^{fi} ə _{fi} w ^{fi} ə _{fi} t̪a] | ‘ was not ’ |
| 5. a. [u _{fi}] | ‘ sunshine ’ |
| b. [u _{fi} ə _{fi}] | ‘ sunshines ’ |
| 6. a. [t̪aṇa] | ‘ tones (musical) ’ |
| b. [t̪a _{fi} ṇa _{fi}] | ‘ very young child ’ |
| 7. a. [t̪i _{fi}] | ‘ by her ’ |
| b. [t̪i _{fi} ṅ _{fi}] | ‘ all the three ’ |
| 8. a. [kəṇa] | ‘ pivot wheel ’ |
| b. [kəṅ ^{fi} a _{fi}] | ‘ to moan (imp. pl.) ’ |
| 9. a. [ras] | ‘ heap ’ |
| b. [r ^{fi} a _{fi} s] | ‘ decay ’ |
| 10. a. [rəs] | ‘ taste ’ |
| b. [r ^{fi} ə _{fi} swə] | ‘ short ’ |
| 11. a. [t̪əra] | ‘ to float (imp. pl.) ’ |
| b. [ut̪əra] | ‘ please get down ’ |
| c. [t̪ə _{fi} r ^{fi} a _{fi}] | ‘ style ’ |

- | | | | |
|-----|----|-------------------------------------|---------------------------|
| 12. | a. | [gora] | ‘ white person ’ |
| | b. | [gor ^h a _h] | ‘ young calf ’ |
| 13. | a. | [lawa] | ‘ to plant (imp. pl.) ’ |
| | b. | [l ^h a _h wa] | ‘ bush quail (bird) ’ |
| 14. | a. | [alə] | ‘ ginger ’ |
| | b. | [vəl ^h ə _h] | ‘ oar ’ |
| 15. | a. | [dʒila] | ‘ to whom (fem.) ’ |
| | b. | [dʒil ^h a _h] | ‘ district ’ |
| 16. | a. | [mewa] | ‘ a kind of sweet meat ’ |
| | b. | [kew ^h a _h] | ‘ when ’ |

12.2.2.2. Try other breathy consonants like

[d^h], [g^h], [z^h], [b^h].

12.3. Vowels can be whispered by arranging the vocal cords differently as explained in 4.6.

Practise the following :

whispered â î û

Whispered vowels are very commonly used in languages though not with phonological significance. Whispering can either be soft or loud (stage whisper).

12.3.1.

- | | | | |
|----|---------|----|--------|
| 1. | [a:â:] | 3. | [ûaû] |
| 2. | [â:i:] | 4. | [uûuâ] |
| 5. | [âiuêu] | | |

13. VOICELESS CONSONANTS AND VOWELS :

In the previous exercises we have practised voiceless stops, fricatives and affricates. In this section we will concentrate on voiceless resonants and vowels. Voiced stops, fricatives, and affricates have separate symbols from their voiceless counterparts. But we will use the symbol [.] as a subscript below the respective symbol to denote voiceless trills, resonants, nasals and vowels.

13.1. Practise the following :

	Alveolar trill	Dental lateral resonant	Bilabial nasal	Dental nasal	Velar nasal
Voiceless	ʀ	ɭ	ᵿ	ŋ	ŋ̥

For all the above sounds start with a voiced counterpart i.e. [r, l] etc. first and then gradually delete voicing.

13.1.1.

- | | |
|-------------|--------------|
| 1. [arrʀ] | 6. [allla] |
| 2. [arrʀʀ̥] | 7. [all̥la] |
| 3. [ʀrrra] | 8. [llla] |
| 4. [rrrrr] | 9. [arrḁla] |
| 5. [araʀa] | 10. [ʀrḁla] |

L. E. 30. Hmar (Tibeto-Burman)

- | | |
|--------------|--------------------------|
| 1. a. [ri:] | 'sound' |
| b. [ʀri:] | 'to hear' |
| c. [ʀri:] | 'disease' |
| 2. a. [ril] | 'guts' |
| b. [ʀril] | 'to instruct' |
| 3. a. [rik] | 'heavy' |
| b. [ʀrik] | 'louse' |
| 4. a. [ri:k] | 'stay' |
| b. [ʀri:k] | 'animal fat' |
| 5. a. [ren] | 'miser' |
| b. [ʀren] | 'to tie round the waist' |
| 6. a. [ru] | 'bone' |
| b. [ʀru] | 'to wipe' |
| 7. a. [ri:ŋ] | 'neck' |
| b. [ʀri:ŋ] | 'green' |

L. E. 31. Hmar (Tibeto-Burman)

- | | |
|-------------|-----------|
| 1. a. [la:] | 'to take' |
| b. [lla:] | 'far' |

- | | | | |
|----|----|----------|-----------------------------|
| 2. | a. | [la:m] | ' dance ' |
| | b. | [l̥lam] | ' a measure of length ' |
| 3. | a. | [ləw] | ' field ' |
| | b. | [l̥ləw] | ' green grass ' |
| 4. | a. | [lim] | ' portrait ' |
| | b. | [l̥lim] | ' shadow ' |
| 5. | a. | [lu:] | ' head ' |
| | b. | [l̥lu:] | ' value ' |
| 6. | a. | [lui:] | ' to climb up ' |
| | b. | [l̥lui:] | ' old ' |
| 7. | a. | [lum] | ' heat ' |
| | b. | [l̥lu:m] | ' a kind of red clay ' |
| 8. | a. | [lɔ:i] | ' water buffalo ' |
| | b. | [l̥lɔ:i] | ' to sharpen ' |
| 9. | a. | [lɔ:k] | ' at once ' |
| | b. | [l̥lɔ:k] | ' to make into big pieces ' |

13.1.2.

1. [mmm] without oral plosion (humming)
2. [mma]
3. [m̥m̥m̥] without oral plosion (voiceless humming)
4. [m̥m̥m̥m̥m̥m̥]
5. [m̥m̥ma]
6. [m̥m̥mam̥ma]
7. [m̥m̥am̥na]
8. [m̥n̥ḁm̥ḁ]
9. [m̥m̥ḁm̥ḁ]
10. [m̥m̥mam̥ḁm̥ḁ]

L. E. 32. Hmar (Tibeto-Burman)

- | | | | |
|----|----|---------|-----------------|
| 1. | a. | [ma:] | ' to abdicate ' |
| | b. | [m̥ma:] | ' before ' |
| 2. | a. | [məŋ] | ' to dream ' |
| | b. | [m̥məŋ] | ' to abuse ' |

- | | | | |
|-----|----|---------|--|
| 3. | a. | [mai] | ‘pumpkin’ |
| | b. | [ṃmai] | ‘face’ |
| 4. | a. | [mɔ] | ‘blunt’ |
| | b. | [ṃmɔ] | ‘stick’ |
| 5. | a. | [ni:] | ‘sun’ |
| | b. | [ṃni:] | ‘appeal’ |
| 6. | a. | [nu:] | ‘mother’ |
| | b. | [ṃnu:] | ‘late’ |
| 7. | a. | [ɽu:i] | ‘one lakh’ |
| | b. | [ṃɽu:i] | ‘ground’ |
| 8. | a. | [ɽɔʔ] | ‘to shake’ |
| | b. | [ṃɽɔʔ] | ‘to chase’ |
| 9. | a. | [ɽɔ:k] | ‘afterwards’ |
| | b. | [ṃɽɔ:k] | ‘to keep away’ |
| 10. | a. | [na:] | ‘pain’ |
| | b. | [ṃna:] | ‘fallen leaf’ |
| 11. | a. | [ṃam] | ‘to press’ |
| | b. | [ṃṃam] | ‘tribe’ |
| 12. | a. | [ʃa:] | ‘fish’ |
| | b. | [ṃʃa:] | ‘to turn the face’ |
| 13. | a. | [ʃa:i] | ‘to hear’ |
| | b. | [ṃʃa:i] | ‘to lean on’ |
| 14. | a. | [ʃəl] | ‘ankle’ |
| | b. | [ṃʃəl] | ‘rude behaviour’ |
| 15. | a. | [ʃei] | ‘feeling of heaviness due to overeating’ |
| | b. | [ṃʃei] | ‘to fast’ |

13.2. Practise the following.

ɨ	ʉ
ɛ	ɔ

Voiceless vowels can be produced by keeping the tongue in the appropriate position and “blowing out” some pulmonic air. A completely voiceless vowel will not be audibly very distinct. To make it distinct, in languages some kind of glottalic friction or whispering is added to them. In this exercise you may start with this kind of

vowels (Slightly whispered or with slight glottalic friction) but the target should be a completely voiceless vowel.

13.2.1.

- | | |
|---------------|----------------|
| 1. [i:̥:] | 6. [a:̥ma:] |
| 2. [i:̥i:̥:] | 7. [ɪ̥namə] |
| 3. [i:̥u:] | 8. [ʒḁʏʏi̥] |
| 4. [u:̥i:̥a:] | 9. [ʏ̥r̥r̥u] |
| 5. [a:̥i:̥a:] | 10. [l̥ḁr̥ra] |

14. NASALS AND NASALIZATION :

14.1. VELIC CONTROL: For the production of a nasal or a nasalized vowel one should be able to control the movement of velum. To attain this control, practise the following :

	Bila- bial	Labio- dental	Dental	Alveo- lar	Retro- flex	Palatal	Velar	Post- velar
Voiced nasal	m	ɱ	n̪	n	ɳ	ɲ	ŋ	ɴ

In the following exercises whenever a sequence of a nasal and a stop, or a stop and a nasal is given produce the first sound in that sequence (whether a nasal or a stop) without oral plosion. Thus keeping the oral closure intact move the velum to produce either the nasal or the stop whichever is the second sound of the sequence.

14.1.1.

- | | |
|--------------|------------------|
| 1. [abbba] | 8. [aɖ̪na] |
| 2. [ammma] | 9. [aŋɖ̪aɖ̪na] |
| 3. [abma] | 10. [aɖ̪̠namba] |
| 4. [amba] | 11. [amban̪ga] |
| 5. [ambabma] | 12. [an̪gaɖ̪na] |
| 6. [aŋ̠ɖ̪a] | 13. [aŋ̠jan̪ga] |
| 7. [aɖ̪̠na] | 14. [aŋ̠ɖ̪an̪ga] |
| | 15. [aŋ̠jamba] |

L. E. 33. Telugu (Dravidian)

- | | | | |
|-----|----|--------------|--|
| 1. | a. | [amba] | ' a goddess ' |
| | b. | [abba] | ' father ' |
| 2. | a. | [ʌmbu] | ' arrow ' |
| | b. | [ʌbbu] | ' to inherit ' |
| 3. | a. | [tʃembu] | ' small utensil ' |
| | b. | [sabbu] | ' soap ' |
| 4. | a. | [bʌ:mbu] | ' bomb ' |
| | b. | [bʌ:bu] | ' younger paternal uncle ' |
| 5. | a. | [ʊpma:] | ' a kind of dish ' |
| | b. | [ubbu] | ' to swell ' |
| 6. | a. | [paŋɖommiɖi] | ' nineteen ' |
| | b. | [paɖɪʌ:lugu] | ' fourteen ' |
| | c. | [peɖɖa] | ' big ' |
| 7. | a. | [aŋɖaṽ] | ' beauty ' |
| | b. | [aɖɖaṽ] | ' mirror ' |
| 8. | a. | [buŋga] | ' baloon ' |
| | b. | [bugga] | ' cheek ' |
| 9. | a. | [boŋgu] | ' hollow stem like that of a bamboo: ' |
| | b. | [boggu] | ' charcoal ' |
| 10. | a. | [ʊŋgaraṽ] | ' signet ring ' |
| | b. | [uggu] | ' milk given to infants ' |

14.2. NASALS : Once the velic control is attained production of nasals can be done by combining the appropriate articulator and the velic position for a nasal.

Practise the following :

L.E. 34. Malayalam (Dravidian)

- | | | | |
|----|----|----------|--------------|
| 1. | a. | [a:ma] | ' tortoise ' |
| | b. | [a:ŋa] | ' elephant ' |
| | c. | [a:ŋa] | ' swearing ' |
| 2. | a. | [pʌm̩mi] | ' slowly ' |
| | b. | [pʌŋ̩ni] | ' pig ' |
| | c. | [pʌŋ̩ni] | ' fever ' |
| | d. | [ʌŋ̩ni] | ' squirrel ' |
| | e. | [pʌŋ̩ni] | ' cotton ' |
| | f. | [mʌŋ̩ni] | ' faded ' |

- | | | | |
|----|----|----------|-----------------------|
| 3. | a. | [mu:ŋu] | ' three ' |
| | b. | [ku:ŋu] | ' hunch back ' |
| | c. | [puŋŋu] | ' sore ' |
| | d. | [kuŋŋu] | ' baby ' |
| 4. | a. | [ʌm̄mi] | ' grinding stone ' |
| | b. | [pʌŋŋi] | ' pig ' |
| | c. | [kʌŋŋi] | ' a month ' |
| | d. | [kʌŋŋi] | ' ring ' |
| | e. | [kʌŋŋi] | ' gruel ' |
| | f. | [kʌŋŋi] | ' crushed ' |
| 5. | a. | [amma] | ' mother ' |
| | b. | [aŋŋu] | ' that day ' |
| | c. | [maŋŋu] | ' a measure ' |
| | d. | [maŋŋu] | ' mud ' |
| | e. | [maŋŋu] | ' snow ' |
| | f. | [aŋŋu] | ' you (honorific) ' |
| 6. | a. | [amma] | ' mother ' |
| | b. | [anna] | ' a proper name ' |
| | c. | [eŋŋa] | ' oil ' |
| | d. | [maŋŋa] | ' yellow ' |
| | e. | [ma:ŋŋa] | ' mango ' |

14.3. NASALIZATION : In 1.3. we saw that in position 3 the velum can be kept at an approximately neutral position i.e., neither completely lowered nor completely raised. In this position both the nasal and the oral passages are simultaneously kept open. Vowels, fricatives, resonants, and approximants can be nasalized by combining this type of velic position with the appropriate stricture type and articulators.

We use the symbol [~] as a super script for nasalization.

Practise the following :

14.3.1.

- | | | | |
|----|----------|-----|----------|
| 1. | [aaa] | 6. | [ā:bā:] |
| 2. | [a:ā] | 7. | [pa:ā:] |
| 3. | [ā:a:] | 8. | [ā:pā:] |
| 4. | [a:ā:a:] | 9. | [pā:bā:] |
| 5. | [ba:ā:] | 10. | [ba:pā:] |

14.3.2.

- | | |
|--------------|--------------|
| 1. [i:mā:] | 6. [ma:bā] |
| 2. [i:mā:] | 7. [pābama] |
| 3. [i:mā:a:] | 8. [pibāmi] |
| 4. [i:ma:] | 9. [būbuma] |
| 5. [pāma:] | 10. [mamāba] |

14.3.3.

- | | |
|-------------|--------------|
| 1. [aawa] | 6. [waṽāza] |
| 2. [ā:ṽā] | 7. [ṽālā] |
| 3. [ṽāwa] | 8. [laiāza] |
| 4. [waṽāwi] | 9. [īaṽa] |
| 5. [ṽāzā] | 10. [zāṽāṽa] |

L. E. 35. Hindi (Indo-Aryan)

- | | |
|--------------|--------------------|
| 1. a. [ak] | ‘calatropis plant’ |
| b. [āk] | ‘to examine’ |
| 2. a. [sas] | ‘mother-in-law’ |
| b. [sās] | ‘breath’ |
| 3. a. [bas] | ‘bad smell’ |
| b. [bās] | ‘bamboo’ |
| 4. a. [kəha] | ‘said (masc.)’ |
| b. [kəhā] | ‘where’ |

L. E. 36. Mandiali (Indo-Aryan-Pahadi Group)

- | | |
|--------------|-----------------|
| 1. a. [kai] | ‘unit’ |
| b. [kāi] | ‘miser’ |
| 2. a. [sai] | ‘advance’ |
| b. [sāi] | ‘lord’ |
| 3. a. [gi:ḍ] | ‘pulp of fruit’ |
| b. [gī:ḍ] | ‘ball’ |
| 4. a. [bava] | ‘rumours’ |
| b. [bāva] | ‘left side’ |

5. a. [bahi] ' She struck '
 b. [bāhi] ' She beats '
 6. a. [bag] ' garden '
 b. [bāg] ' cock's crowing '
 7. a. [b^{fi}ag] ' fortune '
 b. [b^{fi}āg] ' nothing '
 8. a. [sadž] ' partnership '
 b. [sādž] ' evening '
 9. a. [keš] ' cash '
 b. [keš] ' anxiety '
 10. a. [seo] ' bridge '
 b. [sēo] ' they '

L. E. 37. Bengali (Indo-Aryan).

1. a. [iṭa] ' pellet '
 b. [iṭ] ' brick '
 2. a. [iḍa] ' a Muslim name '
 b. [iḍara] ' cemented well '
 3. a. [ihar] ' his '
 b. [īhar] ' his (honorific) '
 4. a. [šid^{fi}a] ' straight '
 b. [šid^{fi}] ' breaking through a wall '
 5. a. [eke] ' to him '
 b. [ēke] ' to him (honorific) '
 6. a. [ēṛano] ' to avoid '
 b. [ēre] ' male calf '
 7. a. [tətalliš] ' forty three '
 b. [tētul] ' tamarind '
 8. a. [petš petše] ' marshy '
 b. [pētš] ' twisting '
 c. [pētša] ' owl '
 9. a. [aḍ^{fi}ar] ' receptacle '
 b. [āḍ^{fi}ar] ' darkness '
 10. a. [kaḍa] ' mud '
 b. [kāḍa] ' to cry '

- | | | | |
|-----|----|------------------------|------------------------|
| 11. | a. | [baɖ ^h ia] | 'obstacle' |
| | b. | [bãɖ ^h ia] | 'binding' |
| 12. | a. | [baš̃] | 'residence' |
| | b. | [bãš̃] | 'bamboo' |
| 13. | a. | [b ^h ɔy] | 'fear' |
| | b. | [b ^h ɔyʂa] | 'of a buffalo' |
| 14. | a. | [pɔyla] | 'first' |
| | b. | [pɔyɪrɪʂ̃] | 'thirty five' |
| 15. | a. | [ɖ ^h ioa] | 'washed' |
| | b. | [ɖ ^h ioã] | 'smoke' |
| 16. | a. | [p ^h oɽa] | 'blooming' |
| | b. | [p ^h oɽã] | 'drop' |
| 17. | a. | [t̪ ^h uɽu] | 'sputum' |
| | b. | [t̪ ^h ũɽni] | 'chin' |
| 18. | a. | [kuɽi] | 'twenty' |
| | b. | [kũɽi] | 'bud' |
| 19. | a. | [b ^h uri] | 'many' |
| | b. | [b ^h ũɽi] | 'pot-belly' |
| 0. | a. | [ʂuru] | 'beginning' |
| | b. | [ʂũɽ] | 'trunk of an elephant' |

L.E. 38. Telugu (Dravidian)

- 1 a. [ra : wa :] 'Won't you come?'
 b. [ra : wã :] 'Shouldn't we come?'
 c. [ra : ma :] 'O Rama!'
- 2 a. [ve||awanna : ɽu] 'He said that you will not go'
 b. [ve||a wãnna : ɽu] 'He said that we will not go'
 c. [ve||amanna : ɽu] 'He asked (us) to go'
- 3 a. [a : wɽa] 'curd vada (a dish)'
 b. [a : wãɽa] 'distance of three miles'

14.4. Besides the nasals given in 12.1 and 12.2 try to produce some other like nasal taps and nasal flaps. Try to produce nasalized trills also.

15. VOWEL AND CONSONANT LENGTH :

Vowels and consonants can be either short or long. The shortness or length is measured on a relative basis. A long stop or a nasal is produced by prolonging its oral closure. Vowels and rest of the consonants can be lengthened by prolonging their production.

Practise the following :

Short i e u o a m l r p

Long i: e: u: o: a: mm ll rr pp

15.1.

- | | |
|-------------|--------------------|
| 1. [ʔi] | 7. [u:i:ʔ] |
| 2. [iʔiʔiʔ] | 8. [i:e:ʔu:] |
| 3. [ʔiʔiʔ] | 9. [u:e:o:ʔo] |
| 4. [iʔi:ʔ] | 10. [a:ʔaʔa:ʔaʔ] |
| 5. [i:ʔiʔ] | 11. [a:ʔe:ʔu:ʔo:ʔ] |
| 6. [i:ʔu:ʔ] | 12. [ʔi:ʔiʔuʔu:] |

15.2.

1. [papa]
2. [pa:pa]
3. [papa:ʔ]
4. [pa:pa:ʔaʔ]
5. [apa:ʔ]
6. [appa]
7. [a:ppa]
8. [ammappa]
9. [a:ppama]
10. [a:mma:pa]

15.3.

1. [palla]
2. [i:lappa]
3. [u:rilla]
4. [urri:la]
5. [mu:lirra]
6. [rulli:mma:ʔ]
7. [le:rrippa]
8. [pa:rrilla]
9. [arrullemma]
10. [ammaʔa:ma]

L. E. 39. Telugu (Dravidian).

1. a. [ʌgu] ' to become '
- b. [ʌ:gu] ' to stop (intr.) '

2. a. [kʌŋʊka] 'therefore'
b. [kʌ:ŋʊka] 'gift'
3. a. [vʌri] 'paddy'
b. [vʌ:ri] 'their'
4. a. [maŋāw̃] 'we (inclusive)'
b. [ma:ŋāw̃] 'measuring system'
5. a. [iŋūw̃] 'iron'
b. [i:ŋu] 'to bear a child'
6. a. [pilucu] 'to call'
b. [pi:lucu] 'to inhale'
7. a. [miɡaʈa] 'remaining'
b. [mi:ɡara] 'cream'
8. a. [kiɭāw̃] 'copper rust'
b. [ki:lakāw̃] 'secret'
9. a. [uri] 'hanging (punishment)'
b. [u:ri] 'of a village'
10. a. [uli] 'chise'
b. [u:lu] 'wool'
c. [ku:li] 'wages'
11. a. [mulugu] 'to moan'
b. [mu:lugu] 'marrow'
12. a. [puʈa] 'page'
b. [pu:ʈa] 'half day'
13. a. [eruɡu] 'to know'
b. [e:ruɡu] 'to defecate'
14. a. [tʃeruʈʃu] 'to spoil (tr.)'
b. [tʃe:ruʈʃu] 'to bring together'
15. a. [meɾa] 'neck'
b. [me:ɾa] 'first floor of a house'
16. a. [peɾa] 'bunch of (bananas)'
b. [pe:ɾa] 'cattle dung'

L. E. 40. Telugu (Dravidian).

1. a. [mɔŋa] 'point'
b. [mɔŋŋa] 'day before yesterday'

- | | | | |
|-----|----|-----------|--------------------------|
| 2. | a. | [pʌni] | 'work' |
| | b. | [pʌɳni] | 'comb' |
| 3. | a. | [bʌli] | 'sacrifice' |
| | b. | [bʌlli] | 'wall lizard' |
| 4. | a. | [uli] | 'chisel' |
| | b. | [ulli] | 'onion' |
| 5. | a. | [mʌri] | 'then, again' |
| | b. | [mʌrri] | 'banyan tree' |
| 6. | a. | [pʌɽi] | 'husband' |
| | b. | [pʌɽɽi] | 'cotton' |
| 7. | a. | [ʌɽi] | 'that thing, that:women' |
| | b. | [ʌɽɽi] | 'rent' |
| 8. | a. | [gʌɽi] | 'room' |
| | b. | [gʌɽɽi] | 'throne' |
| 9. | a. | [ʌɽu] | 'that side' |
| | b. | [ʌɽɽu] | 'pancake' |
| 10. | a. | [puɽa] | 'page' |
| | b. | [puɽɽa] | 'anthill' |
| 11. | a. | [mɔga] | 'male' |
| | b. | [mɔgga] | 'bud' |
| 12. | a. | [tʌgɪɳa] | 'suitable' |
| | b. | [tʌggɪɳa] | 'diminished (adj.)' |

L. E. 41. Telugu (Dravidian)

- | | | | |
|----|----|---------|--------------------|
| 1. | a. | [ʌ:pu] | 'to stop (tr.)' |
| | b. | [ʌppu] | 'loan' |
| 2. | a. | [kʌ:pu] | 'watching' |
| | b. | [kʌppu] | 'lid' |
| 3. | a. | [me:pu] | 'to feed (cattle)' |
| | b. | [meppu] | 'praising' |
| 4. | a. | [kɔ:ɽa] | 'cut' |
| | b. | [kɔɽɽa] | 'new' |
| 5. | a. | [a:ɽa] | 'play' |
| | b. | [aɽɽa] | 'cover' |

- | | | | |
|-----|----|-----------|--------------------------------|
| 6. | a. | [pɪ:t̪ɑ] | ' wooden seat ' |
| | b. | [pɪt̪t̪ɑ] | ' bird ' |
| 7. | a. | [kʌ:t̪u] | ' bite ' |
| | b. | [kʌt̪t̪u] | ' tie, knot ' |
| 8. | a. | [me:t̪u] | ' heap ' |
| | b. | [met̪t̪u] | ' step ' |
| 9. | a. | [t̪ɔ:kɑ] | ' tail ' |
| | b. | [t̪ɔkkɑ] | ' skin ' |
| 10. | a. | [ɲʌ:kʉ] | ' to lick ' |
| | b. | [ɲʌkkʉ] | ' to hide (intr.) ' |
| 11. | a. | [ʉ:kɑ] | ' husk ' |
| | b. | [ʉkkɑ] | ' sultriness ' |
| 12. | a. | [ʉ:bi] | ' quick sand ' |
| | b. | [ʉbbi] | ' having swollen ' |
| 13. | a. | [gʌ:d̪i] | ' store for grains ' |
| | b. | [gʌd̪d̪i] | ' throne ' |
| 14. | a. | [pʌ:d̪u] | ' collection of plants ' |
| | b. | [pʌd̪d̪u] | ' accounts ' |
| 15. | a. | [t̪ʌ:gu] | ' to drink ' |
| | b. | [t̪ʌggu] | ' to decrease ' |
| 16. | a. | [mu:gu] | ' to gather around (intr.) ' |
| | b. | [muggu] | ' to ripen (intr.) ' |
| 17. | a. | [kʌ:ɲi] | ' but ' |
| | b. | [kʌɲɲi] | ' rope for tying cattle ' |
| 18. | a. | [mʌ:ɲu] | ' to heal (intr.) ' |
| | b. | [mʌɲɲu] | ' soil ' |
| 19. | a. | [kʌ:lu] | ' leg ' |
| | b. | [kʌllu] | ' toddy ' |

15.4. How can you lengthen an affricate? By lengthening its stop component or its fricative component?

15.5. Practise recognizing different distinctions in length like short, half long and long vowels.

III. REVIEW EXERCISES

R.E.1. How many types of consonants can you produce with a pulmonic ingressive airstream? Write down their descriptions and appropriate symbols.

R.E.2. How many types of trills are possible? Can you produce a trill by using pulmonic ingressive airstream? Give a phonetic description of 'snore'. Can you produce trills using velaric and glottalic airstreams?

R.E.3. What are the combinatory possibilities of apex? Is an apico-velar stop or an approximant possible? Note down some other possible articulatory combinations which are not given in this book, for example, apico-labial.

R.E.4. Produce and write down symbols for the voiced counterparts of the following :

[t̪], [p^h], [q], [ɕ], [t̪ʷ], [ʃ], [kʷ]

R.E.5. Produce and write down symbols for the voiceless counterparts of the following :

[bʰ], [pʰ], [tʰ], [t̪ʰ], [t̪ʰʷ], [t̪ʰʷ], [t̪ʰʷ]

R.E.6. In this exercise you are asked to give descriptions of and symbols for some selected sounds from your mother tongue. Column A contains the names of the languages. Select your mother tongue from column A and describe and symbolize the sounds given against it in column B.

A	B
1. Assamese	Fricatives
2. Bengali	Fricatives
3. Gujarati	Breathy stops
4. Hindi	Breathy stops and flaps
5. Kannada	Fricatives
6. Kashmiri	Central vowels
7. Malayalam	Back vowels
8. Marathi	Central vowels
9. Oriya	Nasals
10. Panjabi	Central and Back vowels
11. Sindhi	Low vowels
12. Tamil	Voiced stops
13. Telugu	Nasals and nasalized sounds
14. Urdu	Fricatives

R.E.7. Approximate descriptions of some sounds are given below. Read them and produce each of them and give appropriate symbols to each.

1. Pul. Egr. Vd.	apico alveolar trill
2. Glot. Egr. Vl.	apico alveolar fricative
3. Vel. Ingr. Vl.	bilabial stop
4. Pul. Egr. Vd.	uvular nasal
5. Glot. Ingr. Vd.	palatal stop
6. Vel. Egr. Vl.	apico alveolar lateral affricate
7. Pul. Ingr. Vl.	bilabial stop
8. Vel. Ingr. Vd.	apico alveolar nasalized stop
9. Pul. Egr. Vl.	apico alveolar lateral resonant
10. Pul. Egr. Vd.	retroflex lateral affricate
11. Pul. Egr. Vd.	apico alveolar lateral fricative
12. Glot. Egr. Vl.	retroflex stop
13. Pul. Egr. Vl.	bilabial trill
14. Vel. Ingr. Vd.	bilabial nasalized stop
15. Glot. Ingr. Vl.	bilabial fricative

R.E.8. Describe the difference between the sound represented in column A and the sound represented by the symbol opposite to it in column B.

	A		B
1.	[b]		[m]
2.	[t _{KK}]		[t →]
3.	[d'']		[d →]
4.	[m]		[ŋ]
5.	[β]		[b]
6.	[l]		[l]
7.	[r]		[R]
8.	[ü]		[u]
9.	[t̥]		[t']
10.	[œ]		[Ω]
11.	[a]		[ɑ]
12.	[a̲]		[a _f]
13.	[u _f]		[u]
14.	[p ^h]		[b ^h]

R. E. 9. Fill up the gaps with appropriate symbols.

E. g.	[p] - [b]	Answer	[p] - [b]
	[t] - [—]		[t] - [d]
1.	[m] - [ŋ]	4.	[i] - [ü]
	[ĝ] - [—]		[w] - [—]
2.	[ĝ] - [y]	5.	[ʃ] - [ʒ]
	[d] - [—]		[—] - [i]
3.	[—]' - [z]	6.	[ü] - [ø]
	[š] - [ž]		[t̥] - [—]

7. [p] - [p_{KK}][—] - [p_{GG}]

8. [u] - [ʊ]

[i] - [—]

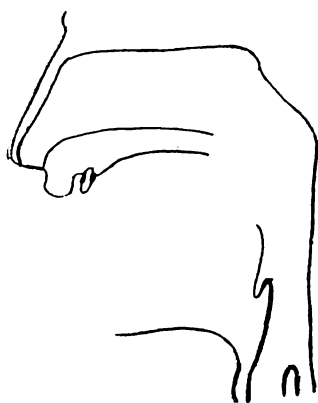
9. [p] - [p_→]

[t] - [—]

10. [b] - [p]

[m] - [—]

R. E. 10. Some incomplete sectional diagrams are given below. Each diagram carries a symbol below it. Complete the diagram to show the articulation indicated by the symbol. Indicate voice-voiceless difference by using symbols v and VL respectively at the place where glottis should be situated.



[f]

Diagram 10

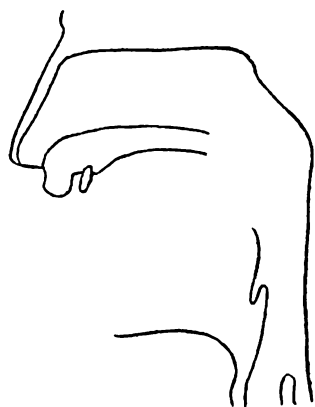
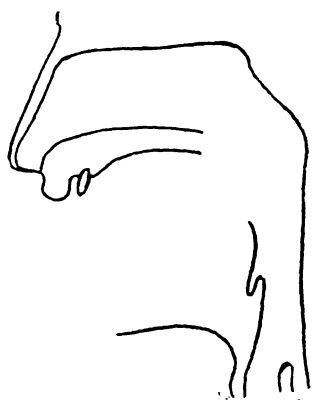
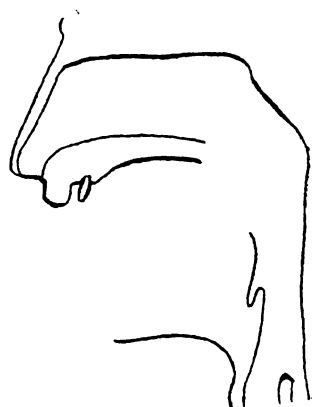
[t_{KK}]

Diagram 11



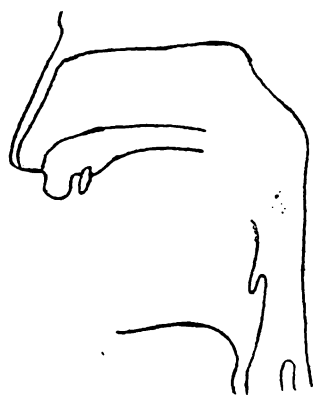
[ŋ]

Diagram 12



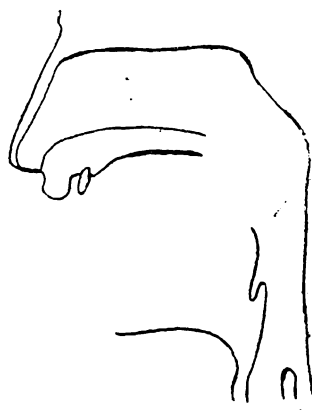
[t]

Diagram 13



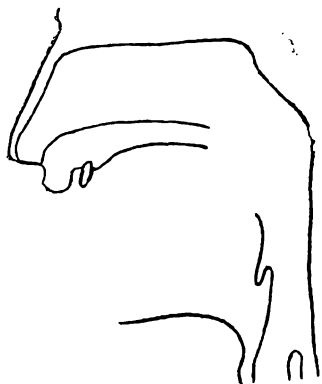
[ʃ]

Diagram 14



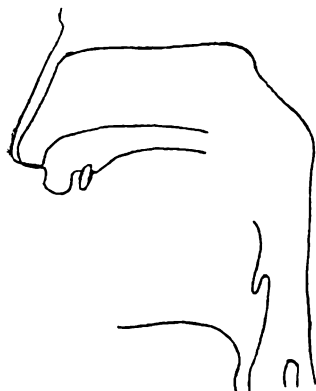
[i]

Diagram 15.



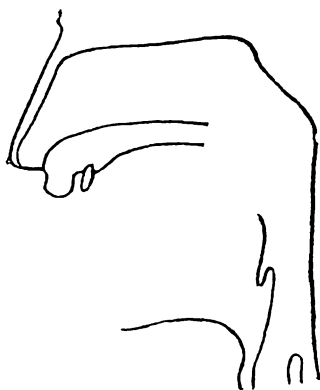
[z]

Diagram 16



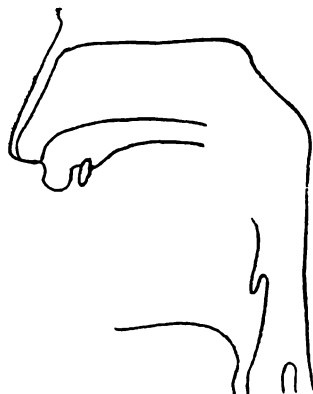
[b'']

Diagram 17



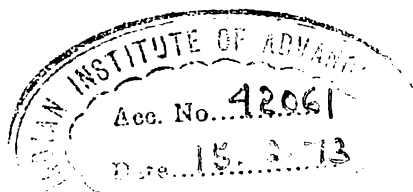
[u]

Diagram 18



[ā]

Diagram 19



LIST OF PUBLICATIONS

1. Hindi : A spoken approach, by G. H. Fairbanks and P. B. Pandit, 1965, 84 pp. Rs. 6.00
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