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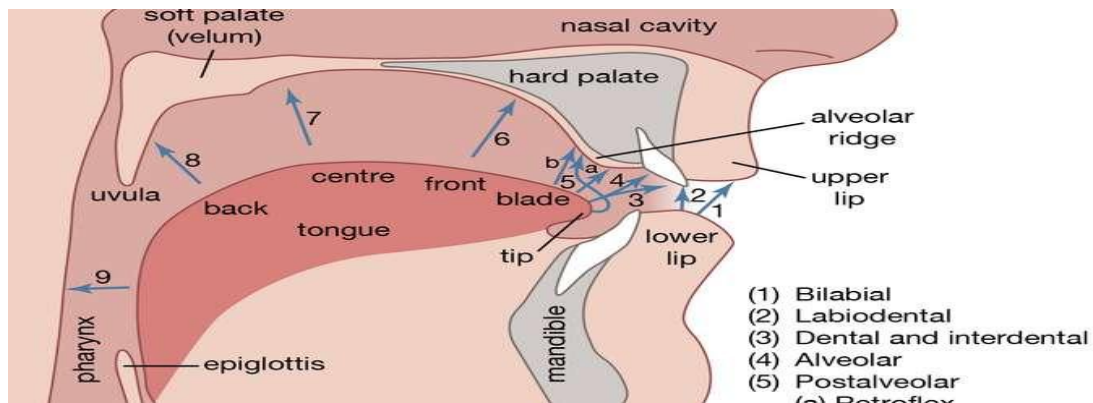
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CLASS: -T. Y. B. A. Semester –6 English PAPER :-19 (English Language, Phonetics and Literary Terms)

Phonetics, the study of **speech** sounds and their physiological production and acoustic qualities. It deals with the configurations of the vocal tract used to produce speech sounds (articulatory phonetics), the acoustic properties of speech sounds (acoustic phonetics), and the manner of combining sounds so as to make syllables, words, and sentences (linguistic phonetics).

Articulatory Phonetics

The traditional method of describing speech sounds is in terms of the movements of the vocal organs that produce them. The main structures that are important in the production of speech are the lungs and the **respiratory system**, together with the vocal organs shown in **Figure 1**. The airstream from the lungs passes between the **vocal cords**, which are two small muscular folds located in the larynx at the top of the windpipe. The space between the vocal cords is known as the **glottis**. If the vocal cords are apart, as they are normally when breathing out, the air from the lungs will have a relatively free passage into the pharynx (see **Figure 1**) and the mouth. But if the vocal cords are adjusted so that there is a narrow passage between them, the airstream will cause them to be sucked together. As soon as they are together there will be no flow of air, and the pressure below them will be built up until they are blown apart again. The flow of air between them will then cause them to be sucked together again, and the vibratory cycle will continue. Sounds produced when the vocal cords are vibrating are said to be **voiced**, as opposed to those in which the vocal cords are apart, which are said to be voiceless.



human vocal organs and points of articulation

Diagram depicting the location of human vocal organs and possible places of articulation used for speech.

The air passages above the vocal cords are known collectively as the vocal tract. For phonetic purposes they may be divided into the oral tract within the mouth and the pharynx, and the nasal tract within the nose. Many speech sounds are characterized by movements of the lower articulators—*i.e.*, the tongue or the lower lip—toward the upper articulators within the oral tract. The upper surface includes several important structures from the point of view of speech production, such as the upper lip and the upper teeth; [Figure 1](#) illustrates most of the terms that are commonly used. The [alveolar ridge](#) is a small protuberance just behind the upper front teeth that can easily be felt with the tongue. The major part of the roof of the mouth is formed by the [hard palate](#) in the front, and the [soft palate](#) or velum at the back. The soft palate is a muscular flap that can be raised so as to shut off the nasal tract and prevent air from going out through the nose. When it is raised so that the soft palate is pressed against the back wall of the pharynx there is said to be a velic closure. At the lower end of the soft palate is a small hanging appendage known as the uvula.

As may be seen from [Figure 1](#), there are also specific names for different parts of the [tongue](#). The tip and blade are the most mobile parts. Behind the blade is the so-called front of the tongue; it is actually the forward part of the body of the tongue and lies underneath the hard palate when the tongue is at rest. The remainder of the body of the tongue may be divided into the centre, which is partly beneath the hard palate and partly beneath the soft palate; the back, which is beneath the soft palate; and the root, which is opposite the back wall of the pharynx.



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The major division in speech sounds is that between **vowels** and **consonants**. Phoneticians have found it difficult to give a precise definition of the articulatory distinction between these two classes of sounds. Most authorities would agree that a vowel is a **sound** that is produced without any major constrictions in the vocal tract, so that there is a relatively free passage for the air. It is also syllabic. This description is unsatisfactory in that no adequate definition of the notion syllabic has yet been formulated.

Consonants

In the formation of consonants, the airstream through the vocal tract is obstructed in some way. Consonants can be classified according to the place and manner of this obstruction. Some of the possible places of articulation are indicated by the arrows going from one of the lower articulators to one of the upper articulators in **Figure 1**. The principal terms that are required in the description of English articulation, and the structures of the vocal tract that they involve are: bilabial, the two lips; dental, tongue tip or blade and the upper front teeth; alveolar, tongue tip or blade and the teeth ridge; retroflex, tongue tip and the back part of the teeth ridge; palato-alveolar, tongue blade and the back part of the teeth ridge; palatal, front of tongue and hard palate; and velar, back of tongue and soft palate. The additional places of articulation shown in **Figure 1** are required in the description of other languages. Note that the terms for the various places of articulation denote both the portion of the lower articulators (*i.e.*, lower lip and tongue) and the portion of the upper articulatory structures that are involved. Thus velar denotes a sound in which the back of the tongue and the soft palate are involved, and retroflex implies a sound involving the tip of the tongue and the back part of the alveolar ridge. If it is necessary to distinguish between sounds made with the tip of the tongue and those made with the blade, the terms apical (tip) and laminal (blade) may be used.

There are six basic manners of articulation that can be used at these places of articulation: **stop**, fricative, approximant, trill, tap, and lateral.



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Stops

Stops involve closure of the articulators to obstruct the airstream. This manner of articulation can be considered in terms of nasal and oral stops. If the soft palate is down so that air can still go out through the nose, there is said to be a nasal stop. Sounds of this kind occur at the beginning of the words *my* and *nigh*. If, in addition to the articulatory closure in the mouth, the soft palate is raised so that the nasal tract is blocked off, then the airstream will be completely obstructed, the pressure in the mouth will be built up, and an oral stop will be formed. When the articulators open the airstream will be released with a plosive quality. This kind of sound occurs in the consonants in the words *pie*, *tie*, *kye*, *buy*, *die*, and *guy*. Many authorities refer to these two articulations as nasals, meaning nasal stops (closure of the articulators in the oral tract), and stops, meaning oral stops (raising of the soft palate to form a velic closure).

Fricatives

A fricative sound involves the close approximation of two articulators, so that the airstream is partially obstructed and a turbulent airflow is produced. The mechanisms used in the production of these sounds may be compared to the physical forces involved when the wind “whistles” round a corner. Examples are the initial sounds in the words *fie*, *thigh*, *sigh*, and *shy*. Some authorities divide fricatives into slit and grooved fricatives, or rill and flat fricatives, depending on the shape of the constriction in the mouth required to produce them. Other authorities divide fricatives into sibilants, as in *sigh* and *shy*, and nonsibilants, as in *fie* and *thigh*. This division is based on acoustic criteria (see below).

Approximants

Approximants are produced when one articulator approaches another but does not make the vocal tract so narrow that a turbulent airstream results. The terms frictionless continuant, semivowel, and glide are sometimes used for some of the sounds made with this manner of articulation. The consonants in the words *we* and *you* are examples of approximants.



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Trills

A trill results when an articulator is held loosely fairly close to another articulator, so that it is set into vibration by the airstream. The tongue tip and blade, the uvula, and the lips are the only articulators than can be used in this way. Tongue tip trills occur in some forms of Scottish English in words such as *rye* and *ire*. Uvular trills are comparatively rare but are used in some dialects of French, but not Parisian French. Trills of the lips are even rarer but do occur in a few African languages.

Taps

A tap is produced if one articulator is thrown against another, as when the loosely held tongue tip makes a single tap against the upper teeth or the alveolar ridge. The consonant in the middle of a word such as *letter* or *Betty* is often made in this way in American English. The term flap is also used to describe these sounds, but some authorities make a distinction between taps as defined here and flaps, in which the tip of the tongue is raised up and back and then strikes the alveolar ridge as it returns to a position behind the lower front teeth. Some languages—*e.g.*, Hausa, the principal language of Northern Nigeria—distinguish between words containing a flap and words containing a tap. The distinction between a trill and a tap is used in Spanish to distinguish between words such as *perro*, meaning “dog,” and *pero*, meaning “but.”

Laterals

When the airstream is obstructed in the mid-line of the oral tract, and there is incomplete closure between one or both sides of the tongue and the roof of the mouth, the resulting sound is classified as a lateral. The sounds at the beginning and end of the word *lull* are laterals in most forms of American English.

The production of many sounds involves more than one of these six basic manners of articulation. The sounds at the beginning and end of the word *church* are stops combined with fricatives. The articulators—tongue tip or blade, and alveolar ridge—come together for the stop, and then, instead of coming fully apart, they separate only slightly so that a fricative is made at the same place of articulation.



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This kind of combination is called an **affricate**. Lateral articulations may also occur in combination with other manners of articulation. The laterals in a word such as *lull* might more properly be called lateral approximants, in that the airstream passes out freely between the sides of the tongue and the roof of the mouth without a turbulent airstream being produced. But in some sounds in other languages the sides of the tongue are closer to the roof of the mouth and a lateral fricative occurs; an example is the sound spelled *ll* in Welsh words such as *llan* “church” and the name *Lluellyn*.

Secondary articulations

When an approximant articulation occurs at the same time as another articulation is being made at a different place in the vocal tract, the approximant is said to form a secondary articulation. There are special terms for some of these possibilities. Added lip **rounding** is called labialization; it occurs in the formation of several English sounds—*e.g.*, during the **pronunciation** of the palato-alveolar fricative at the beginning of the word *shoe*. Raising of the front of the tongue while simultaneously making another articulation elsewhere in the vocal tract is called **palatalization**. It is the distinguishing characteristic of the soft consonants in Russian and also occurs, to a lesser extent, in English; *e.g.*, in the first consonant in the word *leaf*. Raising of the back of the tongue to form a secondary articulation is called **velarization**; it occurs in the last consonant in the word *feel*, which therefore does not contain the same sounds as those in the reverse order in the word *leaf*. Retracting of the root of the tongue while making another articulation is called **pharyngealization**; it occurs in Arabic in what are called emphatic consonants.

The states of the glottis, places of articulation, and manners of articulation discussed above are sufficient to distinguish between the major contrasts among the consonants of English and many other languages. But additional possibilities have to be taken into account in a more detailed description of English, or in descriptions of several other languages. Among these possibilities are variations in the timing of the states of the glottis. In addition to the contrast between the voiced and voiceless states of the glottis that occur during an articulation, there may be variations in the state of the glottis during the release of the articulation. Thus both



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the *p* in *pin* and that in *spinare* voiceless bilabial stops, but they differ in that the glottis remains in a voiceless position for a short time after the release of the bilabial stop in *pin*, whereas in *spin* the voicing starts as soon as the lips come apart. When there is a period of voicelessness during the release of an articulation, the **sound** is said to be aspirated. The main difference between the consonants in *pea* and *bee*, when these words are said in isolation, is not that the one is voiceless and the other voiced, but that the first is **aspirated** and the second is unaspirated. Some languages distinguish between both voiced–voiceless and aspirated–unaspirated sounds. Thus **Thai** has contrasts between voiceless aspirated stops, voiceless unaspirated stops, and voiced unaspirated stops.

Several languages use more than just the voiced and voiceless states of the glottis. In **Hindi** and many of the other languages of India, some sounds are produced while the vocal cords are vibrating for part of their length but are apart, so that a considerable amount of air escapes between them at one end. This phenomenon is known as **breathy voice**, or murmur. Other languages have sounds in which the vocal cords are held tightly together so that only part of their length can vibrate. This kind of sound, which is usually very low pitched, is sometimes called creaky voice, or vocal fry. It is used to make contrasts between consonants in several **American Indian languages**. An additional glottal state that is widely used—*e.g.*, in the Austronesian (Malayo–Polynesian) languages of the Philippines—is **aglottal stop**, a tight closure of the two vocal cords. This articulation also occurs in many forms of English as the usual pronunciation of *tin* words such as *bitten* and *fatten*.

Types of airstream

In English, all sounds are produced with an airstream caused by the expiration of the air from the lungs. This is known as a pulmonic airstream. Other mechanisms for producing an airstream also occur. If there is a glottal stop and the closed glottis is moved rapidly upward or downward it can act like a piston pushing or pulling the air in the pharynx. This is the glottalic airstream mechanism. When there is an upward movement of the closed glottis the resulting sound is called an **ejective**. Amharic, the national language of Ethiopia, uses this mechanism to produce both ejective stops and fricatives, which contrast with the more usual stops and fricatives made with a pulmonic airstream mechanism. A downward



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movement of the glottis is used in the production of implosive sounds, which occur in many **American Indian**, African, and other languages. The use of movements of the tongue to suck air into the mouth is known as the velaric airstream mechanism; it occurs in the production of **clicks**, which are regular **speech** sounds in many languages of southern Africa.

To summarize, a consonant may be described by reference to seven factors: (1) state of the glottis, (2) secondary articulation (if any), (3) place of articulation, (4) type of airstream, (5) central or lateral articulation, (6) velic closure—oral or nasal, and (7) manner of articulation. Thus the consonant at the beginning of the word *swim* is a (1) voiceless, (2) labialized, (3) alveolar, (4) pulmonic, (5) central, (6) oral, (7) fricative. Unless a specific statement is made to the contrary, consonants are usually presumed to have a pulmonic airstream and no secondary articulation, and it is also assumed that they are not laterals or nasals. Consequently, points 2, 4, 5, and 6 are often disregarded and a three-term description—*e.g.*, voiceless alveolar fricative is sufficient.

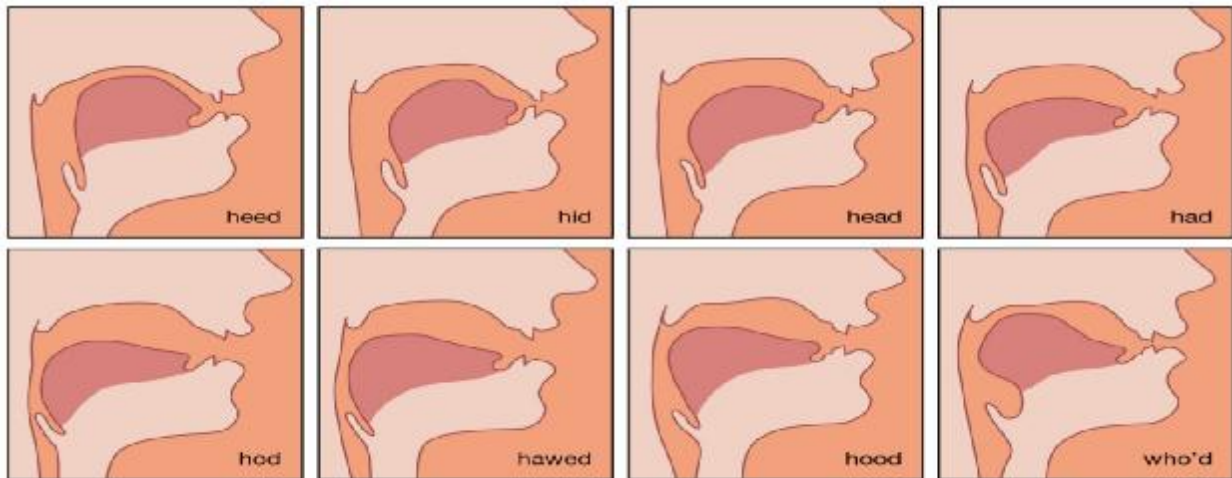
Vowels

Vowels traditionally have been specified in terms of the position of the highest point of the tongue and the position of the lips. **Figure 2** shows these positions for eight different vowels. The highest point of the tongue is in the front of the mouth for the vowels in *heed*, *hid*, *head*, and *had*. Accordingly, these vowels are classified as front vowels, whereas the vowels in *hod*, *hawed*, *hood*, and *who'd* are classified as back vowels. The tongue is highest in the vowels in *heed* and *who'd*, which are therefore called high, or close, vowels, and lowest in the vowels in *had* and *hod*, which are called low, or open, vowels. The height of the tongue for the vowels in the other words is between these two extremes, and they are therefore called midvowels. Lip positions may be described as being rounded, as in *who'd*, or unrounded or spread, as in *heed*.



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Tongue position for vowel sounds

Diagram showing tongue position for the vowel sounds in the English-language words *heed*, *hid*, *head*, *had*, *hod*, *hawed*, *hood*, and *who'd*.

The specification of vowels in terms of the position of the highest point of the tongue is not entirely satisfactory for a number of reasons. In the first place, it disregards the fact that the shape of the tongue as a whole is very different in front vowels and in back vowels. Second, although the height of the tongue in front vowels varies by approximately equal amounts for what are called equidistant steps in vowel quality, this is just not factually true in descriptions of back vowels. Third, the width of the [pharynx](#) varies considerably, and to some extent independently of the height of the tongue, in different vowels.

Some authorities use terms such as [tense](#) and lax to describe the degree of tension in the tongue muscles, particularly those muscles responsible for the bunching up of the tongue lengthways. Other authorities use the term tense to specify a greater degree of muscular activity, resulting in a greater deformation of the tongue from its neutral position. Tense vowels are longer than the corresponding lax vowels. The vowels in *heed* and *hawed* are tense, whereas those in *hid* and *head* are lax.

In many languages there is a strong tendency for front vowels to have spread lip positions, and back vowels to have lip rounding. As will be seen in the next section, this results in vowels that are acoustically maximally distinct. But many



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languages—*e.g.*, [French](#) and German—have front rounded vowels. Thus French has a contrast between a high front unrounded vowel in *vie*, “life,” and a high front rounded vowel with a very similar tongue position in *vu*, “seen,” as well as a high back rounded vowel in *vous*, “you.” Unrounded back vowels also occur—*e.g.*, in Vietnamese.

Nasalized vowels, in which the soft palate is lowered so that part of the airstream goes out through the nose, occur in many languages. French distinguishes between several nasalized vowels and vowels made with similar tongue positions but with the soft palate raised. Low vowels in many forms of English are often nasalized, especially when they occur between nasal consonants, as in *man*.

Because of the difficulty of observing the precise tongue positions that occur in vowels, a set of eight vowels known as the cardinal vowels has been devised to act as reference points. This set of vowels is defined partly in articulatory and partly in auditory terms. Cardinal vowel number one is defined as the highest and farthest front tongue position that can be made without producing a fricative sound; cardinal vowel number five is defined as the lowest and farthest back vowel. Cardinal vowels two, three, and four are a series of front vowels that form auditorily equidistant steps between cardinal vowels one and five; and cardinal vowels six, seven, and eight are a series of back vowels with the same sized auditory steps as in the front vowel series. Phoneticians who have been trained in the cardinal vowel system are able to make precise descriptions of the vowels of any language in terms of these reference points.