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Lectures
on
Phonetics.
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Lectures on Phonetics.
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1. Language, that is to say the expression of human thought by means of articulated sounds may be analyzed from different points of view. The analysis takes place with the sentence as the natural unit of speech, not with the single words.

I) The sentence may be analyzed logically - knowing - that is to say according to the notions represented by its single components for words - categories of words, vocabulary.

II) The sentence may be analyzed with regard to the way how the grammatical relations of the single words in the sentence are expressed - Syntax, flexion.

III) The sentence may be analyzed with regard to the sounds constituting it.
- Phonetics

2. Phonetics is the science which treats of the formation and character of

speech sounds and traces how syllables, words and sentences are formed out of them.

Phonetics or physiology of sound -
 φωνητική, Λογική φησιολογία - as it
 is also termed, is to be counted among
the sciences of nature.

It enters into the domain of physics
 because of its acoustic analysis of
 the speech sound; and on the other
 hand it is partly identical with
physiology because it treats of
 the functions of the organs of
 speech. It is evident that phonetic
 is a very important ^{auxiliary} science for the
 philologist and every student of language
 generally inasmuch as it treats of
 the ground elements constituting
 every spoken utterance (i.e. sound)

Preliminary Remarks on the
 History of Phonetics.

3. Phonetics has become really a

science only since several decades
 although a certain kind of phonetical
 investigation is not seldom to be found
 even in very ancient times. Worth
 mentioning however are only the Greeks
 and the Indians.

Plato in his "Kratylus" gives a di-
 vision of letters which we follow still
 now-a-days. He distinguishes

- 1) voiced letters (φ ω ρ η ε υ τ α)
- i.e. Vowels (vocalis)
- 2) Voiceless letters (α φ ω υ α)
- i.e. consonants

and the latter he subdivides further into

- a) voiceless, but not soundless,
 i.e. semi-vowels
- β) both voiceless and soundless,
 i.e. all consonants with the exception
 of semi-vowels.

On this division was founded the follow-
 ing system of the later Greek grammari-
 ans

- I) Φωνήεντα (voiced, vowels)
- II) Σύμφωντα (consonants)

a) *Hēmiphōna* (semivowels)

l, m, n, r, s,
Hydra (liquidae)
 l, m, n, r

b) *Aphōna* (mutae) vowels

α) *Psila* = lenues κ τ π
 β) *Mesa* = medial γ δ β
 γ) *Dasia* = aspiratae χ θ φ

(On Plato compare also Steinthal's *G. d. w.*

Phonik supplement by von Steinthal
 Berlin 1875 p. 25, 26)

4. Aristotle was the first to apply the comparative method to phonetics. His views about phonetics may be best guessed from his *Historia animalium* ch. 105. In this passage, Aristotle distinguishes: 1) *φῶφος* sound or noise in general of inanimate nature, or uttered by animate beings without the aid of the larynx. 2) *φωνή* voice, uttered by the aid of the larynx - by breathing beings. - 3) *διὰ χεκτης*, i.e. the articulation of the voice by the aid of the

larynx and lips

The *φῶφος* is the sound produced with a certain idea (*μετά φαντασίας τινος*); the voice of the animal has therefore a meaning. The animals call each other for common life & copulation (*πρὸς τὴν ἐπιβίωσιν καὶ τοῦ κληρονομίου*), every species with its peculiar sounds. (cf. *Historia animalium* III, 9)

The action of the vocal chords (*φθονοβάνδρα*) is not mentioned by Aristotle, he evidently does not know anything about them. Some remarks on the sounds are found also in Aristotle's *Ars Poetica* chap. 20, 21, where a short epitome of grammar is given. He distinguishes there like Plato 3 classes of elementary ^{speech} sounds "vowels, semivowels and consonants". The first and second classes are audible by themselves, but the third becomes audible only by connection with a vowel. This is however

not correct, since sounds like k, p may be very well and audibly pronounced without a vowel. It is a fine and correct observation of Aristotle that he considers the semi-vowels as phonēnta in contradistinction with Plato and others. He finds the distinction of vowels + semi-vowels in the circumstances that in producing the latter ones a leaning ($\tau\rho\omicron\upsilon\sigma\pi\omicron\lambda\eta$) of the tongue against the other parts of the mouth, or, as we now call it, an oral catch takes place.

The mediae t, d, g are by Aristotle as well as by Plato ^{are} counted among the aphone-voiceless sounds, whilst modern phonetics designates them as voiced; the true nature of these sounds has therefore not been recognized by them. Very curious too is the circumstance that Plato and Aristotle class the ζ sigma (ς) with the semi-vowels.

The three Aristotelian elements of Phonetics are still acknowledged in modern definition of sound & language with only a very small modification.

We define now "

- 1) $\kappa\sigma\phi\omicron\varsigma$ sound in general
- 2) $\phi\omicron\upsilon\omicron\eta$ sound produced by the vibration of membrana similar to the vocal chords of man and stretched across the respiratory stream of air.
- 3) $\delta\iota\alpha\lambda\epsilon\kappa\tau\omicron\varsigma$ sounds produced by articulations of the vocal chords combined with articulations of other organs - mouth and nose ^{touching} touched by the respiratory stream of air.

3 5. Of greater value and more accurate than the phonetical classifications of the Greeks or those of the Indians. The ancient sacred hymns of the Vedas were for many centuries handed down by oral tradition only, and in

order to preserve them with utmost accuracy the so called Vedānga works were composed. Among these works are the Śikharā or Śi (phonetic directories) which include the praticārkhyas, i.e. phonetic treatises written in the Sutra style regulating the euphonic combinations of letters & their peculiar pronunciations according to the different practice of different Śākhā Śākhās (branches or schools of Vedas).

There are five praticārkhyas extant:

1) Ānukīya pr. of the Rig-veda, published and translated by F. Max Müller in his edition of the Rig-veda 1856 and by Regnier in the Journal Asiatique 1856 p. 58.

2) Taittirīya pr. belonging to the black Yajur-veda, edited and translated by W. D. Whitney.

3) Rājasaneyi pr. belonging to the White Yajur-veda edited & translated Al. Weber in Indische Studien, IV, 1858

4) Śharoa-veda-pr (called also Ānukīya later - adhyāyika)

belonging to the Śharoa-veda, pub. & tr. by W. D. Whitney 1862.

5) Priklant-vyākaraṇa pr. belonging to Sāma-veda, pub. by Buruell 1879.

Among the works of later Indian Grammarian is to be mentioned the celebrated Sanskrit Grammar of Pāṇini.

In the following we give the system of sounds as it is elaborated by the Indian Grammarian.

6. The Indians distinguish vowels (Svara i.e. sound) and consonants (Vyañjana i.e. marking intelligible).

Vowels are subdivided into simple vowels - Samānaśhara i.e. equal or uniform syllable and diphthongs - Sandhiśhara i.e. syllable consisting of a combination.

Consonants are subdivided into:

1) Space i.e. touching i.e. must not nasal sounds

2) antahstha, being in the midst i.e. semi-vowels

3) śhman, spirant.

Mute and nasal sounds are called

Sparca

Sparkya because their formation requires a perfect closure or touching not only a mere approaching of the organs of the mouth. They are divided into five classes for or Varga according to the ^{organ} ~~source~~ by which the closure is formed. These five classes of muktas are:

- a) The guttural class
- b) The palatal "
- c) The Lingual or cerebral class
- d) The dental class
- e) The labial class.

The gutturals, jihvāmūlīya, are according to the pratisakhya formed by touching the hind part of the palate (soft palate) with the hind part of the tongue, therefore the name jihvāmūlīya - produced with the root of the tongue.

Panini however says that the gutturals are formed in the throat Kantha.

The palatals, tālavīya, are set to be formed at the palate by the middle back of the tongue.

The linguals, mūrdhanya, - head sounds

- therefore also called cēbraṭas are said to be formed by bending the point of the tongue upwards & drawing it back to the roof of the palate.

The dentals, dantīya are said to be formed by the point of the tongue at the teeth or at the limbs of the teeth.

The labials, oshṭhīya, formed with the lips are the name indicated.

7. There are five classes in every class of the muktas: two voiceless ones, two voiced ones and one nasal sound.

The Indians correctly observed that the difference between voiceless, aghoṣha & voiced sounds ghoṣhavant depends upon the opening (Vivāra) and closing (Sanvāra) of the glottis. The nasal sound anu-nāsīka (through the nose) are said to be formed by mouth and nose together; nasality (ānu-nāsīkiya) is produced by some closure of the nose.

The voiceless sounds are one tenuis aspirata & one tenuis-apirata, f.i. k, kh.

The voiced sounds are one media and one media aspirata, f.i. ḍ ḍh. For every

muske class is a different corresponding nasal sounds as the fifth member of the line.

It may be observed here that the Indian palatals + linguals are not original sounds, but developed out of gutturals + dentals respectively.

§ The semi-vowels are called such because they stand in the midst between vowels + consonants, or because their place in the table of sounds is between muske + spirants. They are said to be formed by a slight touching (ishatsprishita) or imperfect touching (dushprishita) of the organs. They are classed by the Indians as belonging to a certain line of muske thus y is regarded as palatal, r as lingual, l as dental + v as labial. The above classification of r as lingual is that of Panini, the *pratishtakya*, however considers it more as dental for they define r as formed at the limbs of the teeth. The formation of l , namely that the stream of air passes along on both sides of the tongue, was unknown

to the Indian Grammarians.

§ 1. The spirants, , are three sibilants and one aspiration.

The three sibilants belong to three classes of muske respectively, as

s is dental, a sibilant formed between the tongue and the roof of the mouth directly behind the upper line of the teeth. sh is lingual, formed by the point of the tongue turned up towards the roof of the palate. According to *Atharva veda* pr. I, 23 the tongue takes the shape of a trough.

$ç$ is a palatal sibilant formed in the front part of the hard palate.

The lingual as well as the palatal sibilant are not original sounds but the former one is a lingualized s , and the latter one originates from original k just as all other palatal sounds came from original gutturals.

The aspiration is described as a voiced sound + figurative also in the laws of phonetic change (*sandhi*) as a voiced sound also h is not an original sound, but mostly originates from gh (cf. *Yaj.*: *Adhuksham*), more

seldom from bh + dh (√grah √grabh, Tuah
 *vash ppp naddha.

10. To these consonants the Indian grammarians
 add still some sounds of less important character.
 "Anusvāra" is ni is a nasal sound is a
 imperfect closure of the organ necessary for
 the formation of a real nasal. In forming it
 nasal resonant is combined with a certain
 degree of aperture of the mouth. The opinion of
 the Indian grammarians as to its real character
 are much divided.

Visarga or Vis arjanīya i.e. belonging to
 the end h is a vocalic aspiration, it is
 an original sound but a substitute of s + a
 in certain cases.

Anuvāsika though written with a
 sign different from Anusvāra is practically
 identical with the one

11. Just as the consonants are divided
 into classes according to the organ with
 which they are formed, thus the vowels
 too are divided into classes on the prin-
 ciple of their formation. Short and
 long ṛ are considered as palatal,

short and long u as labial by all Indian
 grammarians. For short and long a generally
 no class is given; only Panini designates
 it as belonging to the class of gutturals
 just as he does with h. This is however
 to be regarded only as a shift from the part
 of Panini, because he could not otherwise
 bring these sounds under a heading and had
 to leave the system incomplete.

r ṛ are regarded as lingual both originate
 from syllables containing r and l.

√bhr bharāmi (पृष्टुw fero bear)

a	i	u	r	l
ā	e	o	ar(ṛa)	al
a	ai	au	ār(ṛā)	āl

l is counted as dental. Some grammarians
 add to the short l still the long ḷ but this
 sound does not exist in reality & has been
 invented by them to perfectiate the
 system. Of the diphthongs, ai and au are
 considered as palatal, ou and ou as labial.

The above classification of ṛ, ṛ and
l is that of Panini; the prati
 however designate them as general -

jihva mūṭya - which apparently is wrong.

12. As for the quantity of the sounds the Indian grammarians are of opinion that a consonant has half the weight of a short vowel, and that a long vowel and a diphthong are double as heavy as a short vowel. Besides them there exist still a length, called *pluta* - swimming i.e. extended which is three times as long as a short vowel, it occurs only very seldom.

Therefore if we take the length of a short vowel as the unity of one mora, we have: -

- Consonants = half the mora
- Short vowels = 1 mora
- Long vowels = 2 morae
- Diphthongs = 2 morae
- pluta = 3 morae

13. After all we have said about the Indians give for their language including 49 different sounds which are represented in the following table

Simple Vowels	[Guttural]	a	ā
	palatal	i	ī
	labial	u	ū
	lingual	r	ṛ
Diphthongs	dental	l	[ḷ]
	palatal	e	ai
	labial	o	au

Visarga ḥ
Ansvara ṁ ṃ

Mutae + Nasal Sounds	guttural	voiced - aspirate	voiced	voiced aff.	nasal
		k	kh	g	gh
	palatal	ç	ch	j	jh
	lingual	t	th	d	dh
	dental	ṭ	ṭh	ḍ	ḍh
	labial	p	ph	b	bh

Semi-Vowels	pal.	y
	ling.	r
	dent.	l
	lab.	v

Sibilants	pal.	ç
	ling.	ś (sh, s)
	dent.	ṣ

Aspiration h

§ 14. Works on Phonetics. Among the most important works on phonetics are enumerated the following ones

1. A. M. Bell's Visible Speech London 1867
2. Dr. Brücke's Grundzüge der Physiologie und Systematik der Vornasen
2^d edition Wien 1876
- x 3. A. J. Ellis' On early English Pronunciation, London 1869.
4. Dr. Sievers' Grundzüge der Phonetik
3rd Edition Leipzig 1886
- x 5. H. Sweet's Handbook of Phonetics
Oxford 1877.
- y 6. " The History of English Sounds, Oxford 1888.
7. Sweet's Primer of Phonetics,
Oxford 1891
8. F. Teichner's Phonetik zur physiologischen Physiologie der Stimme und Sprache
2 parts Leipzig.
9. H. Victor's Elemente der Phonetik und Orthographie des Deutschen,

Englischen und Französischen. 1887.

10. Dr. Seelmann, Die Ursprünge des Lateinischen nach philologischen, historischen, sprachwissenschaftlichen 1885.
11. M. Trautmann Die Vornasen 1884-86

Among the journals which treat exclusively or partly on phonetic questions are to be mentioned:

- x 1. Phonetische Studien ed. by Victor Marburg 1888 Sequence
- x 2. Internationale Zeitschrift für Allgemeine Sprachwissenschaft
ed. F. Teichner Leipzig 1884 seq.
Compare also the lecture of the second vol. of Max Müller's Lectures on the Science of Language where a number of diagrams with explanatory notes are given.
- x 3. W. D. Whitney's Oriental and Linguistic Studies. 2^d ed. New York 1874 (III. How shall we spell, the elements of English pron. IV. the relation between vowel + consonant, X Bell's Visible

speech P.P. 181-317)

R. Lepsius Standard Alphabet for reducing unwritten languages and foreign graphic systems to a uniform orthography in Neurpaean Letters, 2^d ed London 1863.

The best diagrams are contained in F. Teichmeyer's Atlas (2^d Vol. of his phonetic)

For further indications of works on phonetics see the appendices in the works of Sievers and Teichmeyer

15. Organ of Speech.

The human organ of speech consists of two parts essentially different with different functions:—

1. The Apparatus of Respiration

2. The Apparatus for Speaking

(1) The apparatus of respiration consists of the lungs and that system of muscular muscles which is necessary in order to regulate the outbreathing of the air or expiration and the inbreathing of the air or inspiration. Speech sounds are generally formed with out breathing.

There are only a few sounds in some languages which are formed with inspiration as the so called clicks or suction stops (dyfunktzlonen) in the Bushman Hottentot languages; also the hiss in Arabic is according to our opinion counted among the sounds caused by inspiration.

The apparatus of respiration has to provide the respiratory stream of air which is necessary for speaking. expiration in speaking takes place in single impulses which may be shorter or longer and differ in loudness and stress according to the force with which the breath is expelled. We call these impulses breath impulses (Expirationsstöße)

(Expirationsstöße)

To enter into details about the structure of the apparatus of respiration is unnecessary for our purposes. Of greatest importance however is the second apparatus — the apparatus for speaking.

(2) The apparatus of speaking consists of three parts which are situated before the apparatus

exp.
insp.

of respiration, i.e. larynx (Rufh Ruff)
the cavity of the mouth (Mundraum)
and the cavity of the nose (Nasenraum)
The cavity of the mouth and nose together
are called the Vokaltrichter by German pho-
 neticians. The larynx and Ansatzrohr
 modify the respiratory stream of air expelled
 from the lung, and create the sounds. This
 modification consists either in stopping
of the respiratory stream of air whereby
 sounds are formed - *f. i.* f, s, ch are
 formed by driving the respiratory stream
 of air through a narrowed passage, p, k,
t by a sudden opening or explosion of
 the passage which had been closed a moment
 before. - or in the resonatory mo-
 dification of sound. Both actions, stopping
 of the stream of air and resonatory modification
 are operating wherever a speech sound is formed.

16 The larynx is the upper extremity of the
 windpipe and is composed of five cartilages.
 Above the middle of the larynx are stretched
 two elastic ligaments the vocal chords,
 (Stimmknäuel, cordae vocales) having an

aperture between them called the glottis
 or true glottis (Stimmritze) (glottis vera).
 The vocal chords & the glottis are two most
 important organs of the larynx. At one
 end, in the front, the vocal chords are
 firmly inserted in the larynx; at the other
 end they are fixed to two movable cartilages.
 The aperture between the ligaments themselves
 is called glottis proper, that between the
 movable cartilages is called cartilage
glottis. The vocal chords can be stretched
 or relaxed at pleasure. They are of different
 length in man & woman; the length in woman
 is about $\frac{2}{3}$ of those in man, therefore
 the difference between male & female
 voices. The glottis proper & cartilage glottis
 can be closed and opened independently
 of each other.

A little above the vocal chords are two
 other ligaments which however do not con-
 tain their own muscles like the vocal chords.
 They are called false vocal chords, and
 the aperture between them is called the
upper or false glottis - glottis spuria.

Also the false glottis can be narrowed and widened.

The uppermost part of the larynx, is the epiglottis, a flat cartilage in the form of a plate, it hangs like a valve over the aperture of the larynx and may even be pressed against it, as is done in swallowing and in producing certain sounds. By its being closed, it prevents food from getting into the larynx and windpipe which would cause suffocation.

For the glottis 4 different states come into consideration:

1) The glottis is wide open as in ordinary breathing. Then the vocal ligaments are relaxed and no sound is produced.

We may call it the passive state of glottis (breath). The other three states are active.

2) The vocal chords are approximated so much that the respiratory stream of air in passing through causes them to vibrate. The sound thus produced

is called voice (Stimm in Ton or Stimmen). We distinguish chest voice or thick register and the head voice or thin register. The chest voice is produced if the glottis is entirely closed and the air passes through it in a series of puffs. The head voice is produced if the chords are approximated only so much that their edges are ^{caused} vibrated. The shrillest of this sort form of head voice is called falsetto. Chest voice, head voice & falsetto are the three registers of voice.

Chest register, head register, and medium or falsetto register.

3) The glottis is so much narrowed that the respiratory stream of air in passing through causes only a friction, not a vibration, at the edges of the glottis. The sound thus produced is called whistle (Flüßstimm). There are two degrees of whistle, weak & medium. In the former one the whole glottis is narrowed, in the latter one, which is the ordinary form of whistle, the chords

glottis is entirely closed so that the breath passes only through laryngeal glottis.

The term whisper has in phonetics not quite the same meaning as in popular use. Whilst in popular voice whisper is my speech without voice, whisper in phonetics means: absence of voice + contraction of the glottis. By this contraction the force of outgoing air is diminished, so that consequently whispered sound is farther than breathed sounds.

4) The glottis is closed. This closure partly causes the momentary stopping of the expiratory stream of air, partly an accumulation of air below the glottis. If the glottis is suddenly opened, an explosion of the accumulated air takes place.

The shape of the glottis in breathing, speaking with voice, and whispering is about the following one. The glottis opening is



The glottis shut up in speaking.



The glottis in whispering.

17. The cavity immediately above ^{the larynx} is called the pharynx. It is separated from the mouth by a muscular valve, the uvula (Zäpfchen). In ordinary breathing without speech, the uvula hangs down to the breast plate, through the nose as well as the mouth. In speaking however, the uvula is mostly pressed back so as to close the passage into the nose. Only for some sounds the so-called nasal sound the passage into the nose is opened to the expiratory stream of air, whilst at the same time the passage into the mouth is entirely closed by the uvula pressed forwards.

The mouth cavity partly operates as the resonance chamber, partly

it is used for producing sounds by being more or less narrowed or entirely shut up. The mouth cavity consists of following part.

Jaw

1) The mouth cavity is situated between the immovable upper jaw and the movable lower jaw. The latter moves round two fixed points. The angle between the upper & lower jaw is called the angle of the jaws (Kieferwinkel).

2) The outer extremity of the mouth cavity is bounded by the lips which partly follow passively the motions of the lower jaw - passive & neutral state of the lips - partly move independently by means of their own muscles. There are three kinds of the active motions of the lips:

Lips Active motions

- a) The lip aperture is lengthened in the shape of a chink whereby the corners of the mouth are drawn back. This is done by pronouncing clear i.
- b) The lips are rounded i.e. the aperture of the lips is more or less narrowed so as to take a circular or oval

form - u, o, u, ö.

c) The lips are projected or pointed (vorstülpen); this is partly done in pronouncing u, o, u, ö, and certain kinds of the sound.

Tongue

3) On the lower jaw rest the tongue which is easily movable and may take most different shapes. Of the tongue we distinguish the tip or point (Züngenspitze) together with the blade which includes the upper surface of the tongue in mediate behind the point (Züngensblatt), the middle of point and the back (Züngenswurzel). Of the back we distinguish again the front, middle, and hind part. The motions of the tongue are partly independent partly they depend upon the motions of the larynx with which the tongue stands in connection. If the larynx is raised the tongue is raised and forced forwards; if the larynx sinks down the tongue is drawn backwards.

4) Of the aperture of the upper jaw

we distinguish the following

a) the teeth. Of them, we have again to distinguish the edge & the lining ~~where~~ the place they join the gum.

1) alveolars (teeth's roots) i.e. that part of the upper jaw in which the upper teeth are inserted, it has a convex form.

c) The hard or front palate a concave roof reaching from the alveolars till above the midst of the mouth.

d) The soft or hind palate a movable muscular plate between the cavity of the mouth & that of the nose. In the midst of the soft palate, in its hind part, hangs down the uvula.

Only the soft palate can move independently there are 3 kinds of its moving:

a) It may be pressed forward & downward against the hind part of the tongue.

b) It may be pressed backward & upward against the hind wall of the mouth cavity.

Movements of uvula

c) It may move partly between both these parts.

d) If the mouth is wide open one beholds through the aperture between the tongue & the soft palate the hind wall of the mouth cavity. Upwards it communicates with the nose.

Downwards it goes over into the pharynx which is situated immediately behind the larynx and the wind pipe.

§ 18. Cavity of the nose is situated above the cavity of the mouth and is separated from the latter by the hard and soft palate. It is with exception of the soft palate, entirely closed in by bony surroundings.

On the outward side by their cartilaginous parts. The nasal cavity is divided into a right and left half, by means of a vertical partition which in the interior part of the nose consists of bone, while the outer part of cartilaginous substances. The cavity of the nose serves nearly exclusively as a

resonance chamber, seldom it is used for producing fricative sounds. The communication of the cavity of the nose with the larynx and the cavity of the mouth is dependent upon the slit of the soft palate. There are three possibilities:

- 1) If the uvula is raised it closes the inferior entrance to the nose and thus separates the nasal cavity from the larynx and the cavity of the mouth.
- 2) If the uvula is pressed down towards the back of the tongue the cavity of the nose communicates with the larynx but the inferior entrance to the cavity of the ^{mouth} ~~nose~~ is shut up.
- 3) If the soft palate - i.e. ^{uvula} - is in its natural state and freely hangs down the air stream may pass from the larynx into the nose as well as into the mouth, as the three chambers - larynx, mouth and nose - are in communication with ^{one} each other. The nose is as already mentioned a self-acting producer of speech sounds; it may modify the sounds if the slit of uvula allows the air stream to pass

through it.

§ 19. Speech is produced by the regular reciprocal operation of the apparatus of respiration and the apparatus of speech. This regular activity is in modern phonetics called articulation. But according to the old usage, one still today often speaks of the articulation of a single letter like a, e, b, s etc., and means thereby the definite position which the apparatus of speech assumes in order to produce the sounds.

The state of the apparatus of speech in ordinary breathing is called indifferent state; it is the natural base of all articulations of the apparatus of speech and is therefore also often called the base of articulation.

§ 20. Every sentence, when pronounced, is for our ear a series of sounds with rhythmical articulation. In these ^{members} of sounds ~~we~~ distinguish a number of particles, which we designate with the name of syllables. F.i. The sentence

particles

Scylling - facts of speech - syllables - speech sounds } 1.

The goes, consists of two syllables, the goes away, of four syllables etc. Single syllables however as which we arrive by this analysis, are not all of equal weight; generally they are arranged in groups, and in these groups syllables with stronger and weaker pronunciation alternate, and are joined together with a sort of rhythmical unity. p. i. as the stone he goes away alone we have three groups of syllables, every group of iambic rhythm (- -). Such groups are called facts of speech (Sprachfakta) in analogy with the fact in music.

Therefore, with regard to its phonetic rhythmic composition, every sentence is divided into facts of speech and then again into syllables.

The minimum measure of a sentence is one fact of speech and the minimum measure of a fact of speech is one syllable.

2) A syllable may consist of one or several elements, these elements are called speech-sounds. These speech-sounds are of three different kinds:

- 1) Sounds with fixed configuration

(Stimmloslaut) through the whole time in which such a sound is produced, the apparatus of speech rests in the same fixed configuration, p. i. in pronouncing a, l, f, s.

2) Glides or transition sounds (Übergangslaute)

They are produced in passing from one position into another. p. i. There are off-glides + on-glides. p. i. If we take the word ala, we have not only three sounds of fixed configuration, a, l, a, but between the first a and l we have a glide and between l and the second a we have again a glide. The glides are mostly not specially indicated in the phonetic method of writing except in such cases where the transition is made very slowly so that the glide becomes quite distinct and therefore must be written separately. p. i. aya pronounced with slow transition develops into aiya.

3) Stops or explosion sounds (Explosionslaute) they are pro-

caused by the sudden removal of some stop (closure). in the apparatus of speech so that the air accumulated behind the closure suddenly explodes audibly, as in p, t, k. If another speech sound follows the stop, as in pa, ta, ka, both are connected by a glide.

The stops are often, with respect to their momentary character, called momentary sounds whilst the vowels with fixed configuration are sometimes also called duration sounds because they can be continued for any length of time. We distinguish voiceless & voiced stops.

22. If in the apparatus of speech some closure is made, the flowing out of the respiratory stream of air is interrupted. Such prohibitive positions of the apparatus of speech precede necessarily all stops. These interruptions develop into real pauses & the formation of sounds, if not during their duration some sound is produced & the longer. Thus for inst. the prohibitive position

of the vocal p in apa is really identical with a pause in the sound formation. Whilst the prohibitive position of the voiced b in aba produces no pause, because the voice continues as long as that prohibitive position endures. Since explorin and prohibitive position are practically not to be separated from each other it has become customary to imply both elements in the name of stop.

23. In every syllable which is composed of several sounds one sound is predominant and forms a syllable already by itself, if the other sounds are dropped, for i. wine, side; within mistakes i forms a syllable. A sound which can form a syllable by itself is called syllabic; the other sounds in the same syllable are called non-syllabic. The distinction between syllabic & non-syllabic is generally parallel to that between vowel & consonant, but

vowel is therefore not identical with syllabic, and consonant not identical with non-syllabic. For such voiced consonants as t, l, and the nasals are often syllabic - cf. n in the German word offene = afne, and even voiceless consonants can be syllabic as in (pat) where s is syllabically equivalent to a vowel by virtue of its length and stress, the unsyllabic p and t being comparatively momentary & slender. A vowel in the other hand can lose its syllabicness, especially in combination with another vowel with which it then forms a diphthong.

§ 24. The speech sounds may be arranged into groups in different ways. Look following table e.g.

p	b	f	v	m
t	d	s	z	n
k	g	ch	(ʒ)	(b)

1. (a) In the first horizontal line labials
 (b) In the second " " line dentals
 (c) " " third " " " guttural
2. (a) In the first vertical double line explosion sounds (voiceless + voiced)
 (b) In the second vertical double line spirants (voiceless + voiced)
 (c) In the third vertical nasals

3. In the first and the third vertical lines it voiceless sounds. In the second, fourth & fifth lines it voiced sounds.

There are especially two ways in which we can classify single sounds: -

- 1) The genetic i.e. the sounds are classified according to the method how they are produced.
- 2) The acoustic classification i.e. the sounds are classified according to their acoustic value which they have for the ear. In former times only the second classification, more or less purely developed

was known. The technical terms of modern phonetics are, for the greater part, still of its former times.

§ 2.5. Genetic Classification

A genetic classification can be made from various points of view:

(A) Classification with respect to the degree of articulation of the larynx

- 1) Sounds with widely open glottis — voiceless sounds
- 2) Sounds with narrowed glottis:
 - α) voiced sounds
 - β) whispered sounds
- 3) Sounds with closure of the glottis — glottal stops

(B) Classification with respect to the degrees of narrowness of the superglottal passages

- 1) Sounds with an aperture in the superglottal passage:
 - α) Without sound-forming narrowness — sonorous sounds e.g. most vowels, nasals & liquids

- β) With sound-forming narrowness — fricative sounds or spirants e.g. f, s, ch, v, z, j, sh,
- 2) Stops or explosive sounds e.g.

p, t, k, b, d, g.

(C) Classification with respect to the places of articulation in the superglottal passages

1) Labials

α) bi-labial or pure labials, in producing which only both lips are active, e.g. p, b, m.

β) labiodentals (lip-teeth) in producing which under lip is pressed against upper teeth e.g. f, v, pf,

2) Linguals

α) Sounds produced with the point of the tongue. These are again subdivided into — 1) dentals (t, d) 2) alveolars (n, l)

β) Sounds produced by the front or the middle part of the tongue, together with the hard palate - palatals

γ) Sounds produced by the hind part of the tongue together with the soft palate - gutturals

δ) Velar sounds (faucal sounds) in producing which the uvula articulates against the hind wall of the mouth. Here are the unvoiced such explosive sound as are heard in words like tetna, abma chun in going over from t to n, t from t to m

Δ) Classification with respect to the circumstances that the cavity of the nose partakes in the formation of the sound or not.

1) The cavity of the nose is entirely shut up pure-maunt sounds (vocal sounds)

2) The expiratory stream of air flows through the mouth as well as the nose. the nasalized sounds (Mouth-nose-sounds)

3) The cavity of the mouth is shut up and the expiratory stream of air flows only through the nose. (pure-nasals)

ε) Classification with respect to the differences of energy in the sound-forming expiration.

1) Fortes

2) Lenes.

*

§ 26. Acoustic Classification

1) Noises - (Gymnufflauter) produced with formation of a friction sound at a narrow passage or an explosive sound in consequence of explosion of a closure. To this group belong the spirants + stops in classification B, 1, β, B, 2

They are either voiced or voiceless.

2) Simple sounds - (Donorlauter)

These are the sounds in classification

§ 19
This classification into voiced & voiceless sounds is of special importance for the history of languages.

§ 27.) The Sonorous sounds

They are subdivided into vowels, liquids and nasals. In producing the pure vowels and liquids the cavity of the nose is shut up by the raised uvula. In producing the nasalized vowels & liquids the uvula hangs down loosely. In producing the nasals, the passage into the mouth is shut up by the uvula.

§ 28.) Vowels. are voiced modified by different configurations of the supra-glottal passages, which act as resonance chamber, but without audible friction. The effective part of the resonance chamber are the tongue & the lips. Upon the position of the tongue & the shape of the lip-aperture depends the differentiation of vowels. The movements of the tongue & the lips are independent upon each other.

The best & most practical classification of vowels according to the position of the tongue is that of Bell in visible speech. The movements of the tongue are either horizontal or vertical - backwards & forwards, upwards & downwards. With respect to the horizontal movement we distinguish:

- 1) Back or guttural vowels. The articulating part of the tongue touches the soft palate. a, o, u.
 - 2) Front or palatal vowels. The articulating part of the tongue touches the hard palate. i, e, ä, ö, ü.
 - 3) Mixed or palato-guttural vowels. The articulating part of the tongue touches between the front between the hard & soft palate. y (Russisch) i in bird in six.
- With respect to the vertical elevation of the tongue & therefore its distance from the palate we distinguish high, mid, & low vowels. An instance for this the comparison

of them is (i-e-a) or u-a-ä (fall).
 By combination we thus have altogether
 nine vowel positions

high-back high-mixed high-front
 mid-back mid-mixed mid-front
 low-back low-mixed low-front

With respect to the tensely + laxness, or
 slakiness or flattening of the tongue, but
 distinguishes narrow + wide vowels. This
 distinction is partly identical with its dis-
 tinction into close + open vowels.

Each vowel position can further be
 modified by rounding - labiali-
 zation, i.e. contraction of the mouth
 cavity by compression of the cheeks,
 & the narrowing of the lip aperture.
 Thus we have a total of twenty six
 elementary vowels which we shall
 exhibit in 15 next tables

I Narrow vowels

	back	mixed	front
high	1. ʌ	4. ih	7. i
mid	2. ɔ	5. eh	8. e
low	3. ɒ	6. aeh	9. ae

For the illustration of this table 15 fol-
 lowing words may serve as key-words.

- | | |
|------------------|---------------------------------|
| 2. South English | <u>But</u> |
| 3. Scotch | <u>But</u> |
| 4. Prussian | <u>Syn</u> |
| 5. German | <u>Tabu</u> |
| 6. English | <u>Bird</u> |
| 7. French | <u>firi</u> <u>ifri</u> (Germ.) |
| 8. French | <u>éti</u> <u>éti</u> (Germ.) |
| 9. English | <u>air</u> |

I Wide Vowels

	back	mixed	front
high	10 A	13 <u>ih</u>	16 <u>i</u>
mid	11 a	14 <u>eh</u>	17 <u>e</u>
low	12 a	15 <u>ah</u>	18 <u>ae</u>

11. Eng. father, St. Padre
 N. Germ. water
12. Scotch father, Sout East Germ. fater
13. Eng. pretty
14. Eng. eye, better
15. Eng. how
16. Eng. bit, pity N. Germ. Fiff
17. Eng. men, red, say
18. Eng. man

I Narrow round vowels

	back	mixed	front
high	19 u	22 <u>uh</u>	25 <u>y</u>
mid	20 o	23 <u>oh</u>	26 <u>o</u>
low	21 <u>o</u>	24 <u>oh</u>	27 <u>oe</u>

- 19 Fr. sou Fr. dü
- 20 Germ. o U. dolore
- 21 Eng. saw
- 25 Fr. lune Germ. über
- 26 Fr. peu " pöu jönn
- 27 Fr. peur

I Wide round vowels

back		mixed		front	
28	<u>u</u>	31	<u>uh</u>	34	<u>y</u>
29	<u>o</u>	32	<u>oh</u>	35	<u>ø</u>
30	<u>ɔ</u>	33	<u>ɔh</u>	36	<u>œ</u>

28. Eng. full

29. Germ. Block Woll, Eng. boy

30. Eng. not folly

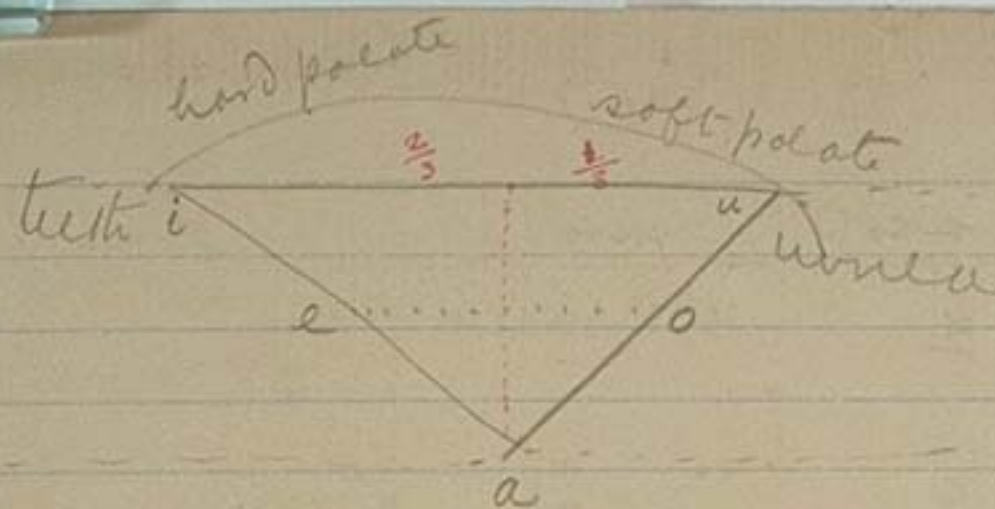
31. " value

32. Fr. homme

34. Germ. Reiz

35. " Reiz Fr. people

28. To show in which part of the mouth the articulation of principal vowels takes place, the following diagram may be looked up.



The curved line represents the roof of the cavity of the mouth, the top line connects the center of the soft palate with the center of the hard palate. The letters a, i, u have been put there where the tongue articulates in order that these sounds be produced. The a sounds take place between the palatal i sounds & guttural u sounds. Thus we have

guttural vowels	<u>u</u>	<u>o</u>
palatal "	<u>i</u>	<u>e</u>
medio palatal v.	<u>a</u>	

If the tongue is raised (from its ordinary position it occupies in breathing) only a few points about twice as far away from the center of the hard palate as from that of the soft we have the resonance of the open or pure a. Immediate raising

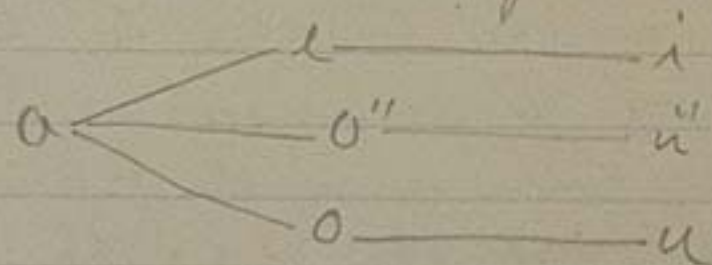
Hillwag's

u ü i
o ö e
a ä
a

Brücke's

a^o a
a^o a^o
l^a a^o o^a
l^o l^o o^e o
i^o i^u uⁱ u

Another arrangement of Du Bois Reymond (1812) represents the opening of the mouth & the angle between the jaws



The deficiency of this system of Brücke & Lupton is that only the acoustic effect on the ear is considered, whilst nearly no attention at all has been paid to the place of articulation. The system of Bell

on the contrary, is based entirely on the articulation of the vowel, and no attention is paid to the acoustic effects. Details about the vowels.

I. Vowels without nasal resonance (pure vowels)

1) Neutral vowels

§ 30. u and o The u sounds. The resonance of u is the deepest of all vowels & resonance and the place of articulation of u is furthest back of all vowels. Victor in his "Elemente der Phonetik" gives the following description:—

The back of the tongue is raised quite close to the soft palate, the front part of the tongue is lowered down & bent backwards. In consequence of this there is in the front part of the mouth cavity a rather large resonance chamber, the effect of which is generally increased by pushing the lips & forming a small round lip aperture (whereby the rows of the teeth are not far distant from

each other.)

§ 31. u sounds in German.

There are two u sounds in German, different both in quality and quantity.

I. Long and close u (phonetic sign \bar{u}), as in du, a little shorter, it is in unaccented syllables; Rän-
gen

II. Short u which is a little open and (phonetic sign u).

The close and open vowels are produced by the high or deep raising of the tongue.

Orthography

I. Long u is written:—

1. u: du, Bube, Reichthum
2. uh: Kuh
3. hu: after t, Spinn
4. ou: in words borrowed from French: Routé, Jour

II. Short u is written

1. u: muß, un, Kauf
Luft, müde

2. ou in words borrowed from French, —
Donche.

§ 32. u sounds in English. In producing the English u sounds, the lips are generally less projected than in German but the same rounding takes place. There are three u sounds in English, but the German close u does not exist.

I. Long u, begins with open or intermediate u and ends with the lip position of consonantal w: it is a diphthong. Before voiceless consonants it is shortened but nevertheless retains its diphthongic character.

— root = [ru̯ɪt or ru̯ɔt]
do = [dū]

Before vowel and final r the second element does not appear

— ruin = [ru̯i:n]
poor = [kju̯r]

II. The same sound with forgoing j (i) = some new =

[njūū]

une = [yūin]

IV. Short u is open

book = [būk]

or orthography

There are the following different spellings for English u: -

I. Long u [ūū] is written: -

1. oo : too, spoon
2. o : do, who, two, move, tom's, whom
3. oe : shoe, canoe
4. ou : a) you, through, wound
b) words borrowed from French: Tour, soup, route
5. ou, borrowed from French: manoeuvre
6. u, ruin, rude, beside, trust,
7. ue, blue
8. eu, Rheumatism
9. ew, ew, Jew, chew
10. ui, bruise, recruit, fruit, juice, (and

often in) suit

II. The sound iūū is written: -

1) u : Duke, usage, assume, impugne

2) ui, due

3) eu, feud, connoisseur

4) ew, dew

5) ui, nuisance, suit

6) eu, beauty

7) ieu, adieu, lieu

8) ieu, view

III Short u [ū] is written

1. oo, book, good, stood

wood, food, wool

2. u, bull, full, pull

pulpsit-, bush, punch

cushion, menu, put

butcher, pudding

~~with~~ sugar

3. o, woman, wolf

bosom

4. ou, could, should, would

33. u sounds in French

There is only a close u in French
long u short

I. long u rouge

II. Short u route

The u sound in French is generally
written ou or ou; in one case
it is written ou ou [u:]

§ 34. The o sounds.

We treat o sounds together with the o sounds.

There are three shades of o:-

1) Intermediate o, articulating just
in the midst between u + a.

2) Close o. its articulation is double
as far distant from a as it is from u

3) Open o. its articulation is double
as far distant from u as it is from a

§ 35. The o sounds in German

There is a long + short o; long o is
close, short o is intermediate or open.

I. long o is written:-

1. o: fo, rope, brot, hoch,
blou, mond,

2. oo: (these words are borrowed from
middle German) Loos, Moos

Moos

3. of: wof, of,

4. fo after t: tofen, tofen, tofen, tofen

5. oo (middle German) sooft (strong of "ton")

6. oi (") sois soif

7. oo: Le onse

8. au: (not from French) Janse

9. au: plutan (from French)

10. oa (English) soaft, soaks (lake)

II. Short o is written always with o:-

Loos, soome, sochsois, soosid
ob

it may be remarked here short
o forms the first part of the diph-
thong oi. (the second part is a sound
between i + u) written in German
in four different ways:

1. oi: foit, loisse, loisse, foisse

2. oi: eplu, loif, loif, foif

foissan

3. oi: (middle German)

4. oi kinu (only word)

(also written kinu) comes
from French.

the
§ 36. O sounds in English.

There are three o sounds in English:

I. Long diphthongic o as in ^{no} ~~know~~, go.

The first part is intermediate or close long o, the second part is a short unaccented u. In pronouncing this second part the tongue is in the position of o whilst only the lips by + by go over in the rounding of u (no = nōu, note = nōt)

In unaccented syllables where o is placed before a vowel it remains within this second element.

poet = pōt

poetical = pōtēkōl

II. Long open o as in lord.

It is identical with a in all, war. Accented o before simple a is always thus, before voiceless consonant it is half long as in short (bat)

III. Short open o as in not. It is identical with a in short. Before voiceless final consonant it is half long.

dog

Orthography.

I. Long diphthongic o is written

1) o

a) in open syllables: -

α) at the end of a syllable and before a vowel: - no, so, go, boy
Exceptions are to, do, two, who.

β) in the last syllable of all words ending in silent e: - hall, alone, rose, three, noble

Exceptions are more, prove, lose, where, gone, shone

γ) in close syllables in the following words: - motion, holy, over, taller, open, stolen, frozen, chosen, spoken, oval, moment

b) In close syllables: -

roll, old, bold, folk, grove, ghost, write, post, took, both, corn, only, daunt

2) oa: oak, moan

3) ow: bow, crow

flow, grow, know, low, row, show
 slow, snow, sow, throw. Howard
 own, flown, grown, grown, snowton

4. ou dough, though, soul, mowed
 shoulder, poultry

5. ew sew, shew

6. eo yeoman

7. oo brooch

8. au hauboy

9. ean bear, bureau

II. Long open o or a is written: -

1) au land

2) aw draw, saw, law

3) a all, withall, jackall
 Bengal, also, always,
 almost, already, walnut
 balk, falcon, almost
 halm, balsam, was
 water, wharf, wart, wrote

4) o in ~~active~~ form
 off, after, soft, moss
 post close

5) oa oar, board, broad

6) oo dove, floor

7) ou four, pour, court, course
 source, ought, cough
 cloister

III. Short open o is written: -

1. o drop, gone, shore, confident
 body, copy, tonic, solid
 foreigner, polish, profit
 model, paper, scalar, model
 produce, product, proofs
 province, ominous

2. a war, what, quash, Warwick
 yacht, halt, fact

3. au earli flower, lural

4. ou lough

5. ow knowledge, acknowledge

The first part of the diphthong oi is
 also short open o: -
 oil, boy

57. The o sounds in French. There are 4
 o sounds.

I. Close long o: - ou

II. " Short o: - ô (sigar)

III. Open long o: - ô

IV. Open short o: robe

Orthography.

I. Close long o

1) o: rose, zone, fosse

2) ô: hôte

3) au: aune (feet)

4) eau: épeautre

II. Close short o:

1) o: mot, rose, motion

2) ô: tot, cote

3) au: défaut, aussi

4) eau: rideau (curtain)

III. Open long a:

1) a: or, en cor, bord
dage

2) au: Laure

IV. Open short a

1) a: es, robe

2) au: auel, aurai

3) in Latin termination

um: album

§ 37. The a sounds

In pronouncing a the mouth is generally opened more widely than

in pronouncing other vowels.

In a neutral a (as in Japanese) is uttered with a moderate raising of the middle back of the tongue. By raising the tongue higher the sound becomes clearer (ai), by raising it not quite to the height of neutral a, the sound becomes deeper (a). By drawing back the tongue + rounding the lips, we get the sound (ä); by putting more frontward we get the shades between a' & a (ä)

§ 39. a sounds in German

German a is a neutral a; in north Germany the sound is a little clearer (more palatal), in middle Germany a little deeper.

We distinguish:

I. Long a (ā) which in unaccented syllables is a little shortened

II. Short a

Orthography

Long a is written:

1) a: da, klar, laden, strasse, map, sprache

x hard, spatz, magd, adler, papst
mal, malleu
(The a is sometimes pronounced shortly
in the following words). —

bad, glass, gas, rat, schlag
mal

2. aa oral, brown, dass, fann, pauer,
dane, rant, rickert.

3. ah: naf, yaf, turrisim, fufusim
maffun

4. ho after t: Thal, that, Mute, thal
thoran

5. i after o: i. words borrowed from French: —
Londons, memoiren

6. aw: 'shawl'

II. Short a written: —

a: alle, werten, fuffen
platzem;

: ab, an, das, hat, man
was (Dann) walrus,
as, Rap:

Finke, fufus, uttorjen
metapher, grab, wate R
Zahn.

Da + nu are pronounced as short a

a short a is also the first com-
ponent of the diphthongs ai + au.
The former one is written ai, ay, ei, ey

1. ai: — Gai, Lai, R. dipst
mai, M'aid, Roin (meat)
maid, Laib (loaf), Laib-
(string) K'air, Larkai
(servant) Moir, Ditoril.
(Fr.)

2. ay: — Mungu

3. ei: — Fein, Feil, ni, Duit
Loni, H'rip, win
Mim, Laib, Fui,

4. ey: — Mungu

40. The a sounds in English: — (London
pron.)

I) Long clear a as in father

II. Short a as in nut (nut)

London short a is in the parts of England
replaced by a mixed sound ae; as
in nut = naet

Orthography

I Long a is written: -

- 1. a: - far, arc, star, arc, calm, calf, 'father', rather, half, bath, after, glass, post, castle, cost, ask, grasp, answer, dance, sample, demand, grant, drama, 'sharade', 'chimchimati'
- 2. au: - laugh, 'brought', laundry, laundry
- 3. e before r: - clerk, sergeant, heart, 'in', 'derby', Berkeley
- 4. ea: - heart, heart
- 5. ah: - ah

II Short a is written:

- 1. u: - but, nut, butter, must, son, ton, won, one, done, wine, money, part, London, Monday, month, window, sponge, some, bomb, come, comfort, company, compass, tongue, cover, govern, bottle, mistake, other, nothing, dozen, twopenny

(d'apans)

- 3. ou: enough, rough, tough, courage, flourish, nourish, double trouble, couple, cousin, housewife (haizif), country, young, touch
- 4. oo: blood, flood
- 5. oe: does

The first element in the diphthongs ai and au is short a:

- 1) ai: lie, idol, bite, sacrifice, crocodile, mica, kind, pint, choir [kwai a], fly, sign, type, height, aisle (ai), eye (jo), buy

- 2) au: out, plough, now, how, Cautehone

§ 41. A-sounds in French:

French has 4 a-sounds:

- I Long neutral a: âme, faller, miracle, cadavre, base, passer

II. Short neutral *i* : *pus*; in the termination
ation *f. ex. nation*.

III. Long clear (palatal) *ā* (*ā*): *vage*, rare

IV. Short palatal *i* : *femme etc*
These *i* & *a*-sounds occur also with pre-
ceding *w* so that a diphthong come into exis-
tence which is mostly written *oi* or *oy*.

I a) *wā* : *coire etc*

II a) *wā* : *roi, froid, fois, mois*

III a) *wā* : *vois, fois*

IV. a) *wā* : *moi, toi, soi, poir, douane*

B. Palatal Vowels.

§ 42. The *e*- and *ae*-sounds.
^{a) not rounded.}

The *e* and *ae* sounds occupy an in-
termediate position between the *i* &
a sounds, just as the *o* occupy an
intermediate position between the
u and *a* sounds. The distance be-
tween the articulation of *i* and *a*, *e*
& *a* is however larger than that between
the articulations of *u* & *a* and *o* & *a*,
as may be seen in the table appended
to § 28. The lip opening and angle

of jaw in pronouncing *e* is smaller than
in pronouncing *o* & *a* & become so
much closer, the nearer the sounds
approach;

In general we distinguish close *e* (*e'*),
intermediate *e*, which is a little open,
open *e* and *a* sound rather near palatal
a (*ae*)

§ 43. The *e*-sounds in German

I. long open *e* (*e*)

II short " *e* (*e*)

III long close *e* (*e'*)

Orthography.

I Long open *e* is written:

1. *ä* : *Leio, foim, Juffvial, Dufarf,*
Opmerf, reifen, Thier

2. *ief* : *miefen, Biefen*

3. *fo* after *t* : *Hütten, Hütten, unter,*
Hünig, Hünne

4. *oi* : (French) *palais, affaire*

5. *u* : (") *Lavinson, Suppat*

II Short open *e* is written:

1. *e* : *fett, felten, helfen, mieden,*
kenig, wro, us, Dus, Jotul, ulund, Dapof

Orthographie etc.

2. i : Fünf, fünf, Lände,
fünde, fünf

III. Long close i written:

1. i : Luffen, Luff, Luffen,
muff, Luff

in the French termination etc:
Luffen, Luffen

2. ui : Ruf, Luffen, Luffen,
Luff

3. ux : Luffen, Luffen, Luffen,
Luff, Luffen, Luffen,
Luff, Luffen,
Luff, Luffen

4. fu after t : Luff

§ 44. The e sounds in English

I. Long close e which however a diphthong the second element of the diphthong being a short sound between i + e (ei)

II Short open e

III Wide open long e (ae) which approaches palatal a.

II. Wide open short e (ae)

Orthography.

I Long close e (ei) written:

1. a : shade, waste, fate, lame,
chate, labour, angel, strange,
awful, ancient, half-penny (hæp pæni)

2. ai : aid, maid, afraid,
pain,

3. ay : may, day, say,

4. ei : vein

5. ey : grey

6. ea : bear, steak, great

7. ao : gaol (= jail)

8. au : ^{average} ~~grew~~

I. Short open e (= German short open)

1. e : let, petal, pencil, merit,
rephew, tenor, valley, record

legacy, special, discretion

2. ea : breast, health, wealth, realm,
measure, spread, falcon,
zealous, sweat

3. eo : leopard, peoff

4. ei : Leicester

- 5. a : any many Themes Pall mall
- 6. ai : again, said, waistcoat, gainst
- 7. ay : says
- 8. ie : friend
- 9. u : bury
- 10. ae : Aetna (foreign words)

III. Wide open long e (ae)

- 1. a : care, share, scarce
- 2. ai : pair, ^{weave}
- 3. ea : bear, pear, tear, swear
- 4. e : when, where, m^{er}e r' ^{er}
- 5. ii : his, theirs
- 6. ey : eyre
- 7. ay : mayot

IV. Wide open short e is written

- 1. a : have, palace, cabin
famine, habit, valour
gaster, travel, balloons
station, natural
- 2. ai : plaid

§ 45. e sounds in French

- I. Close e short or half long
- II. Long open e

II. Short open e orthography

I. Close e is written

- 1. e and é : parler, aller, nez,
pied (foot), flé (comb),
né (tone)
- 2. ai : j'ai, and in the termination
ai 'in the future of the verbs
j. in. aurai, finirai
gai

II. Long open e is written

- 1. e, è, ê : fer (iron), vert, terre
père, mère, rêve (dream)
flèche
- 2. ai : air, chaise Française
- 3. ei : neige (snow), peine (pain)

III. Short open e is written e :

- tel, until, bel, chef
- also è é ey.

The i sounds

§ 46. The i sounds in German :

- I. Long close i } just the same as u
- II. Short open i } sounds

Orthography.

I. Long close i is written:

1. i in words borrowed from foreign languages

gaffel

2. *ix*: *bin, fix, linen, fiction*

3. *if*: *if, ifn, ift*

4. *iel*: *fine, finit*

II Short open e is written

1. *i*: *kill, bin, ift, gift, in, mit*

Beipol, Lelille, Discussion

Lyntromp

2. *ix*: *Bin und thinzger, Binzig*
vielbrift.

The letter y in Greek words is by some people pronounced like short i

f-i. *Diptam*, but it ought always to be pronounced *ü* (rounded)

§ 347. The i sounds in English:

I Long diphthongic i It begins with open

II i and goes over to consonantal i

III half long & a little more open than

I, only before r

IV short open i

V short wide open i (e)

Orthography.

I Long diphthongic i is written:

1. e he, be, me, we, equal, eve, the

2. ee hee, meet,

3. ea sea,

4. ie field, piece,

5. ei conceive, leisure

6. ey key,

7. eo people

8. ay away

9. i (loan words) machine, marine,

fatigue, suite, caprice

10. ae Caesar

II half long i is written.

1. e here, mere,

2. ee career, beer, deer, engine,

3. ea dear, spear, here, ear

wary, dreary

4. ie pier, earlier

III Short open i is written

1. i in, miss, mist, give, live

Widerance sit

2. y, system, Plymouth

3. ee three pence, been

Greenwich

- 4. ie sieve
- 5. ui build
- 6. u busy
- 7. o women

IV. Short wide & open i is written

- 1. y in terminations: busy, city
- 2. ey: alley, honey
- 3. ay: Monday, Sunday
- 4. ie in (b) plural terminations: cities & in the termination of the past participles of verbs in y: loved

- 5. i: deity, divorce, ambiguity, prolific, Danish
- 6. e: repose, poet, ash, ore
- 7. ei: foreign, perfect, overliege
- 8. ai: captain, fountain
- 9. a: cabbage, outrage, fate, mate, purchase

§ 48. i sounds in French

- I Close long i
- II " short i
orthography

I Close long i is written

- 1. i, î, lire, die, tirer (to draw), abîme (abyss)
- 2. y: lyre (lyer)

II short i is written

- 1. i: ami, sorti
- 2. y: hymen (marriage) tyrant
- 3. ie: amie, sortie, vie

C Rounded palatal vowels

§ 49. The ö sounds in German

ö in German is pronounced with the tongue articulation of e & lip rounding of o.

I Long close ö

II Intermediate short ö

orthography

I Long close ö is written: -

- 1. ö: pö, köpfe, öpe
- 2. öf: föhle, föpfe
- 3. ö after t, töpfe
- 4. ü in French loan words: adieu

In German

II Short ö is always written with ö

- fö, köpfe, öpfe
- mörde, können, fölle

öppe

