

# Phonology

601.764

4/13/23

# Phonetics

- ❖ Linguistic branch about how humans produce/receive sounds

# Phone

- ❖ Distinct speech sound
- ❖ Not critical to the meaning of words

# Phoneme

- ❖ Speech sound
- ❖ In a given language
- ❖ Can change meanings of words
- ❖ Phones language agnostic
- ❖ Phonemes language specific

# Allophone

- ❖ Multiple phones that can be a single phoneme
- ❖ Hit
- ❖ Tip
- ❖ Little
- ❖ <https://www.britannica.com/topic/allophone>

2,400-2,600  
years ago

पाणिनि

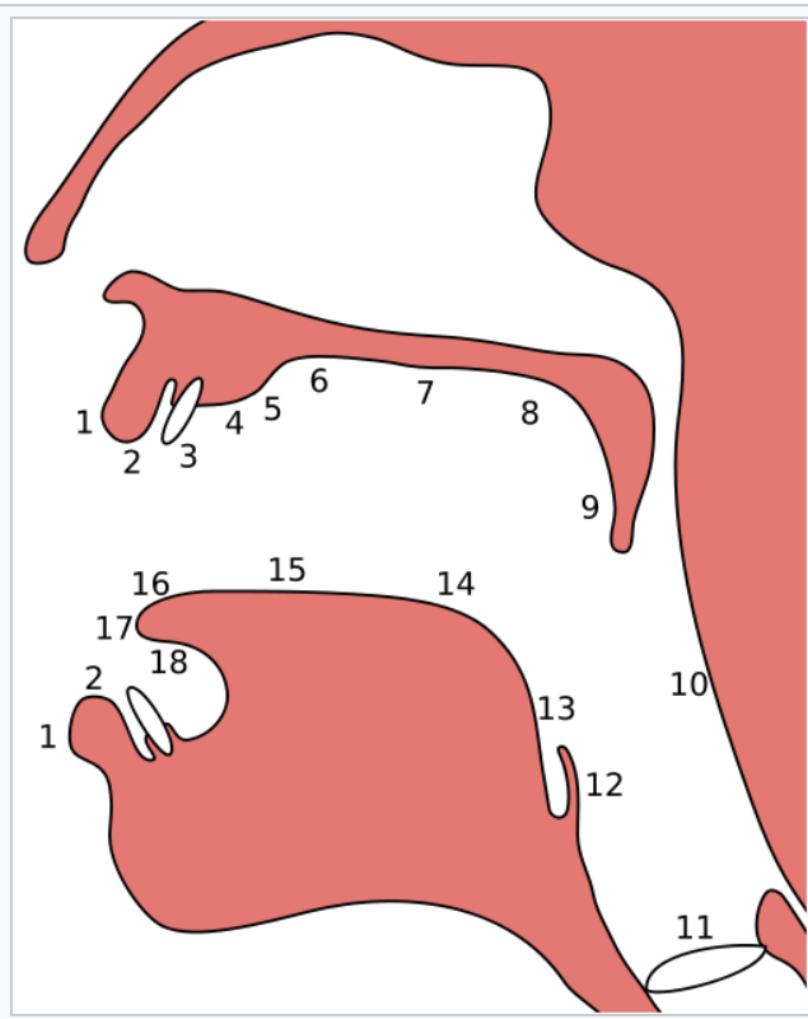


A representational statue of Pāṇini  
at Panini Tapobhumi, Argakhanchi  
District of Nepal.

Wikipedia. Accessed 4/13/23

# अष्टाध्यायी

अदिरंतेनसंहतामेनविधिस्तदेतस्योद्दिर्यस्याचामादिसद्गुरुंत्यदादीनि ॥१॥ वार्षदेशो॥  
 ॥२॥ व्यद्विराद्यतवद्यथीभावप्रत्ययस्यलुक्यमेवदशः ॥ इतिप्रथमोन्यायस्य  
 गाहूकुट्टादिश्चौच्छिन्निलिविजड्डविभाष्णीः सार्वधातुकमपिताऽज्ञसंगोगालिट्टकित्तर्थभ  
 वत्तभ्यांचामृउमृद्युधकुषक्षिशवदवस्कारुद्विदमृषग्रहस्वपिप्रदः संश्वाइकोअत्तरा  
 हलंताच्चालिउर्शिचाचामनेपद्मुषु उश्चाचागमः हनः सेन्योगमांधनोविभाषोपयमनोरमोद्या  
 रिच्चानक्षासेष्टानिष्ठार्षाइस्तिदिविद्यषः मृषमितिद्यायो ॥३॥ उद्युपधाङ्गावादिक  
 भणोरन्योतरस्योपातः क्लाचामोपधाल्फांताद्वावोलितुंयुतश्चात्पिम् अक्षेः काश्यपस्य  
 रलोच्युपधाङ्गादिः संश्वाक्लालेइवस्वदीर्घपूतः ताचात्प्राप्तेस्तातः नीचेरनुपातःस्य  
 माहास्वरितः तस्यादितुदात्मर्थद्वृत्योंस्कश्चिद्गृहस्तुद्वेष्टोयत्तु भैरवन्यूर्खस्वसाम  
 ॥४॥  
  
 सुउच्चेसरांवावषक्तारः विभाषालृद्विसानसुब्रह्मण्यायांस्वरितस्याद्वात्मवत्त्रहमणोरनुदान  
 अस्वरितात्मदिनायाभन्ददानो उदात्मवितपरम्यमनतरः ॥५॥ अष्टकैकाल्प्रत्ययः तत्पु  
 रषः समानाधिकरणः कर्मारयः प्रथमानिर्दिष्टमासप्रसर्जन्नः एकविभक्तिं चौपूर्वनिपा  
 तेऽपर्थवदधातुरप्रत्ययः प्राप्तिपदे कंठनद्वितसमाप्ताश्वाह्नस्वेनपुंसकं प्राप्तिपदिकस्या  
 गोच्छियोरुपसर्जन्मयतुक्षितलुकिद्वेष्टोयाः लयियुक्तवद्वक्षिवचेनाविशेषणानाच  
 जानेः तदशिष्यं संज्ञाप्रभाष्यतात्मुच्योगप्रव्यानात् योगभ्रमाणेवतदभावेऽर्शनस्यात्प्रधा  
 नश्चल्यार्थवन्मर्थस्यान्यप्रभ्रमाणत्वात् कालोपसर्जनेचनुत्याजात्यारव्यायामेकस्मिन्  
 बहुवचनसंन्यतरस्याऽपरमोद्योश्चाकल्यनीप्रोष्ठपदानांचनक्षत्रे ॥६॥ अष्टकैकाल्प्रत्ययो  
 रैकवचनं विभाषयत्प्राप्तिपुनर्वस्वोर्नस्तद्वृद्वेष्टवचनस्यद्विवदः ॥७॥ अष्टकैकाल्प्रत्ययो



Places of articulation (passive & active):  

1. Exo-labial, 2. Endo-labial, 3. Dental, 4. Alveolar, 5. Post-alveolar, 6. Pre-palatal, 7. Palatal, 8. Velar, 9. Uvular, 10. Pharyngeal, 11. Glottal, 12. Epiglottal, 13. Radical, 14. Postero-dorsal, 15. Antero-dorsal, 16. Laminal, 17. Apical, 18. Sub-apical

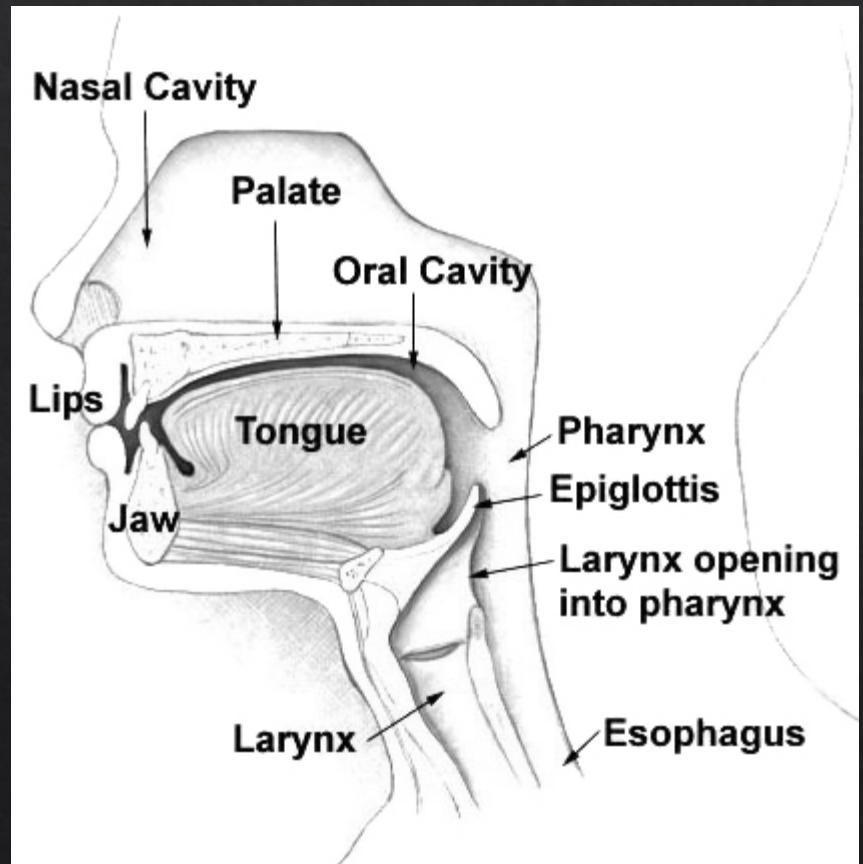
# Places of Articulation

CONSONANTS (PULMONIC)

© ⓘ ⓘ 2020 IPA

|                     | Bilabial | Labiodental | Dental | Alveolar | Postalveolar | Retroflex | Palatal | Velar | Uvular | Pharyngeal | Glottal |
|---------------------|----------|-------------|--------|----------|--------------|-----------|---------|-------|--------|------------|---------|
| Plosive             | p b      |             |        | t d      |              | t d       | c ʃ     | k g   | q ɢ    |            | ? ʔ     |
| Nasal               | m        | m̪          |        | n        |              | n̪        | n̪      | ŋ     | ɳ      |            |         |
| Trill               | B        |             |        | r        |              |           |         |       |        | R          |         |
| Tap or Flap         |          | v̪          |        | f̪       |              | t̪        |         |       |        |            |         |
| Fricative           | ɸ β      | f v̪        | θ ð    | s z      | ʃ ʒ          | ʂ ʐ       | ç j     | xɣ    | χɣ     | h ɦ        | h ɦ     |
| Lateral fricative   |          |             |        | ɬ ɭ      |              |           |         |       |        |            |         |
| Approximant         |          | v̪          |        | ɹ̪       |              | ɻ̪        | ɻ̪      | j     | w̪     |            |         |
| Lateral approximant |          |             |        | l̪       |              | ɬ̪        | ɬ̪      | ɻ̪    | L̪     |            |         |

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.



<http://training.seer.cancer.gov/head-neck/anatomy/overview.html>

# Articulation Video

- ❖ [https://en.wikipedia.org/wiki/File:Real-time\\_MRI\\_-\\_Speaking\\_\(English\).ogv](https://en.wikipedia.org/wiki/File:Real-time_MRI_-_Speaking_(English).ogv)



# International Phonetic Association

ɪntə'naɛʃənəl fə'nætɪk ə'sousɪ'eɪʃn

- ❖ The International Phonetic Association (IPA) has been established as a Private Company limited by guarantee in the United Kingdom (incorporated on 30 June 2015).
- ❖ International Phonetic Alphabet (IPA) .....

# Presidents of the IPA

|                                |  |
|--------------------------------|--|
| 2019-:                         | Michael Ashby  |
| 2015-19:                       | Patricia Keating   |
| 2011-15:                       | John Esling  |
| 2010-11:                       | none   |
| 2007-10:                       | Gösta Bruce (d. 2010)  |
| 2003-07:                       | John Wells   |
| 1999-03:                       | Klaus Kohler   |
| 1995-99:                       | John Ohala   |
| 1991-95:                       | John Laver   |
| 1985-91:                       | Peter Ladefoged  |
| 1984-85:                       | A. C. Gimson (d. 1985)   |
| 1977-83:                       | none listed in JIPA issues   |
| 1969-77:                       | S. K. (Suniti Kumar) Chatterji (d. May 1977)   |
| 1967-69:                       | none listed in <i>Le Maître Phonétique</i> (MF) issues   |
| 1950-67:                       | Daniel Jones   |
| 1940-50:                       | none listed in MF issues   |
| 1927-40:                       | Paul Passy (d. 1940)   |
| 1917-27:                       | none   |
| (MF was not published 1915-22) |  |
| 1888-1917:                     | Wilhelm Viëtor (d. 1917) [Henry Sweet, Honorary President, 1888-1912]  |
| 1886-88:                       | Paul Passy [E. Oswald Kenyon, President of the Phonetic Teachers' Association (FTA), from January to April 1888] |

# Paul Passy

- ❖ Founder of IPA
- ❖ Helped create IPA
- ❖ Collins & Mees (1998, p. 48)



# Otto Jespersen

in their articles. The idea of establishing a phonetic alphabet which should be applicable to all languages was first put forward by OTTO JESPERSEN in a letter to PAUL PASSY which was reproduced in *Dzi Fonètik Titcer*, June, 1886. This idea was taken up with enthusiasm



"The Principles of the International Phonetic Association: 1949". *Journal of the International Phonetic Association*. 40 (3): 299–358. 2010.

Supplément au journal l'**Instituteur sténographe**.  
4, rue des Feuillantines, Paris

ðe

# fonetik titcær

ði orgæn av ðe fonetik titcærz esoucieicæn

þoerd jir. — 7-8. — ðgæst-septembær 1888

256. **Froeken A. Arwedson**, skoleførerestondarinna, Linköping, Sverige (Palmgren).
257. **Dr. Schweingel**, cand. phil., Marburg, Deutschlant (Vietor).
258. **Adamovitch**, professeur, 31 B<sup>e</sup> S. Michel, Paris (P. Passy).
259. **Gust. Bentfeldt**, catedrático de idiomas del Atenco, Tudescos 39, Madrid, Espana (P. Passy). — L
260. **J. H. Long**, Prinsipal ov the Collegiate Institute, Peterboro, Ontario, Canada (A. Hamilton).
261. **Alfred Westholm**, fil. kand., Vesterfernebo. Vestmanland, Sverige (D. Elfstrand).
262. **Baseler**, realschullehrer, Hanau, Deutschlant (M. Walter).
263. **Miss Laura Soames**, member ov the Brighton Scool Board, Marine Parade, Brighton, England (P. Passy).
- 264.

aur ridærz wil etwæns si ðæt wi v teikn ðe greit step ov dœblin ðe saiz ov ðe f. t., end ov tceinþin aur moud av trænskripcan. ðæt færst impruvment iz, þærhæps, ounli əpærænt ðis taim, far ðis icu ov ðe f. t. wil hæv ta dû servis far tú mœnhs. hweðar ða fæloin icuz wil hæv 8 or 16 peidziz mœst dipend apon ða nœmbør av njú sabskripcænz wi get; hæt wi þink aur ridærz mei rekn apon a 16-peidz peipar, regjularli, far nekst jir.

ði ælfabit, wi þink, iz nau setld fainali, ær far ær ða væljuz av ðe letærz gou. ðæt ceips øvkors admit av færðer impruvment : ðei wil dipend on ða rizælt av aur sabskripcæn, far hwitc st bilou.

wi mœst nau giv a mor ditéild əkaunt ov

## aur rivæizd ælfabit.

in teûzin bitwin ðæt verjæs propouzlz ðæt hæv bin meid far rivæizin aur ælfabit, wi v bin gaidid bai ða fæloin prinsiplz, hwitc wi þink er admittid bai *moust* av aur ridærz ær isèncl tu a *præktikl* sistæm av fonetik spelin :

1° ðær cad bi a seprit sain far itc distintiv saund; ðæt iz, far itc saund hwitc, biin jùzd insted av anæðær, in ðæt seim længwidz, kæn tceinz ðæt minin av a wœrd.

2° hwen eni saund z faund in sevral længwidz, ðæt seim sain cad bi jùzd in ɔl. ðis əplaiz ɔlso tæ veri similer ceidz av saund.

3° ði ælfabit eud kœsist ær mœtc ær posabl ev ði ordinari letærz ev ðæ roumen ælfabit; ær fjú njú letærz ær posabl blin jùzd.

4° in æsainin væljuz tæ ðæ roumen letærz, intærnæcænl jùzidz cæd disæid.

5° ðæ njú letærz cæd bi sæðestiv ev ðæ saundz ðei reprizent, bai ðær rizæmlans tæ ði ould wænz.

6° daiækritik marks cæd bi əvæidid, biin traïn for ði aiz on træblsæm tæ rait.

in ekordæns, ær mœtc ær posabl, wið ðiz prinsiplz, wi v tæouzn ðæ fæloin list ov sainz (ðæ letærz markt wið a star\* er proviðænl ceips, on wil bi ripleist hwen serkæmstæsiz wil elau).

| ceip | vælju   |                    |         |                                     |
|------|---------|--------------------|---------|-------------------------------------|
|      | iNglic  | frænc              | dæermæn | æðer længwidz                       |
| p    | az in   | put                | pas     | pferd                               |
| b    |         | but                | bas     | boot                                |
| t    |         | ten                | tant    | tot                                 |
| d    |         | den                | dent    | da                                  |
| k    |         | kind               | képi    | kuh                                 |
| g    |         | good               | gai     | gut                                 |
| m    |         | my                 | ma      | mein                                |
| n    |         | no                 | non     | nein                                |
| N    |         |                    | règne   | ital. regno.                        |
| 'N   | thing   |                    | ding    | ital. anche.                        |
| l    | full    | la                 | lang    |                                     |
| 'f   |         | fille (in ðæ sauð) |         | sp. llano, ital. gli.               |
| r    | red     | rare               | rot     | (tœn-point r)                       |
| R    |         | rare               | rot     | (bak r). — dan. træ                 |
| U    |         |                    | quer    | flem. wrocht, span. bibir.          |
| Q    |         | buis               |         |                                     |
| w    | wel     | oui                |         | ital. questo                        |
| f    | full    | fou                | voll    |                                     |
| v    | rain    | vin                | wein    |                                     |
| θ    | thin    |                    |         | span. razon                         |
| ð    | then    |                    |         | dan. gade                           |
| s    | seal    | sel                | weiss   |                                     |
| z    | zeal    | zèle               | weise   |                                     |
| 'c   | she     | chat               | fisch   | swed. skæl, dan. sjæl, ital. lascia |
| ɔ    | leisure | jeu                | genie   |                                     |
| ç    |         |                    | ich     |                                     |
| j    | you     | yak                | ja      | swed. ja, ital. jena.               |
| x    |         |                    | ach     | span. jota                          |
| q    |         |                    | wagen   |                                     |

|            |                                   |        |                         |
|------------|-----------------------------------|--------|-------------------------|
| h          | high                              | (haut) | hoch                    |
| u          | full                              | cou    | nuss                    |
| o          | soul                              | pot    | soll                    |
| ɔ          | not                               | note   | ital. notte             |
| A          |                                   | pas    | vater swid. sal         |
| *a         | father                            |        | ital. mano, swid. mann. |
| a          | eye, how                          | palte  | mann                    |
| æ          | man                               |        |                         |
| r          | air                               | air    | bær                     |
| e          | men                               | né     | nett                    |
| i          | pit                               | ni     | mit                     |
| *œ         | but, fur                          |        |                         |
| œ          |                                   | seul   | kennen                  |
| *œ         |                                   | peu    | søhne                   |
| y          |                                   | nu     | dünn                    |
| *ü         |                                   |        | für                     |
| ə          | never                             | je     | gabe                    |
| .          | glotl kætc                        |        |                         |
| -u, u-,    | wik strest u                      |        |                         |
| -u, u', û, | STRON strest u                    |        |                         |
| u:,        | lon u                             |        |                         |
| æ          | neizl œ (ør eni œðær vauel)       |        |                         |
| û          | lon æn næro u (ør eni œðær vauel) |        |                         |
| hl, lh     | voislis l (ør eni œðær konsanænt) |        |                         |
| :          | mark øv lenθ.                     |        |                         |
|            |                                   |        | ðiz mððifikeicænz       |
|            |                                   |        | əplai                   |
|            |                                   |        | tu ɔl letærz            |

in júzin ðis ælfabit, aur körispóndants wil pliz ber in maind ðe fóloin points.

1°. — Ðouz mððifikéicænz øv saundz ðæt ør *nesisri* in eni givn pozicæn in eni længwidð ør kænsidærd øz *implaid*. Ðæs ðæ gløtl kætc iz *implaid* bisfør eni infcl vauel in dðærmæn. Ðæ mark øv lenθ in *implaid*, in inglec øn dðærmæn, astor “e”; in inglec astor “a”, in dðærmæn astor “A”; in frenc, astor aksentid vauelz bisfør fainl *v*, *z*, *ʒ*, *j*, *r*, øn bisfør œðær fainl konsanænts astor o, A, œ, ð, ã, ē, œ; in itæljæn, astor evri aksentid vauel in ø cæt silæbl.

2°. — Stres, hwen not œðærwiz markt, iz səpouzd ta bi øn ðæ færst silæbl øv a wærd ør stres-grúp in inglec øn dðærmæn, øn ðæ last in frenc; øn ðæ bisfør-last in spænic and itæljæn.

3°. — Itc ðæt iz not ounli elaud, bæt invætid ta júz hiz oun ørðoeipi. In ðis wei wi houp ta faind a definit ansæt ta ðæ vekst kwæstionænz: daialekt ør næcanl prænænsieicæn? hwitc daialekt? hwitc stændord øv næcanl pro-

nænsieicæn? ful strest ør wærd formz øv wærdz? wærd diviðæn ør stres diviðæn? itsétræ.

Wi beg aur körispóndants tu interpret ðis ræl in its moust libral sens. Wi cæd laik skótemæn tæ rait *mft*, *mék*, *nbt*, *pùl*, *hfr*, *pùr*, *môr*, øn leñdænerz tæ rait *mijt*, *meik*, *nout*, *puwl*, *hið*, *puø*, *mðø*. Pærizjæn mait rait *pase*, *RAR*, *fij*, *tskaje*, *geR*, *om*, *fij*; soðærerz *pase*, *rarø*, *tskalje*, *gerrø*, *ðmø*, *fñø*. In editorjæl artiklz, itsétræ, wi intènd, øz mætc øz posabl, tæ fælo ø midl kors bitwin ikstrim prænænsieicænz, øz wi v ðlwiz traid tæ dñ hiðærtu.

### sæbskripçæn

før kastin njú taips

|                                 |          |
|---------------------------------|----------|
| Dr. F. Beyer, Weissenfels.....  | 2 fr.    |
| Herr Max Walter, Wiesbaden..... | 2 fr.    |
| C. E. Dormer, London.....       | 6 fr. 25 |
| P. Passy, Neuilli.....          | 5 fr.    |
| Miss L. Soames, Brighton .....  | 25 fr.   |

Ðæ taips wi intènd tæ hæv kast ør ful-saizd e, n wið øteil, roumænaizd a, lon s (før c), krøst o (før œ). Wi houp tæ hæv ø part øv ðiz redi bai nekst icu.

### aur treðæræ.

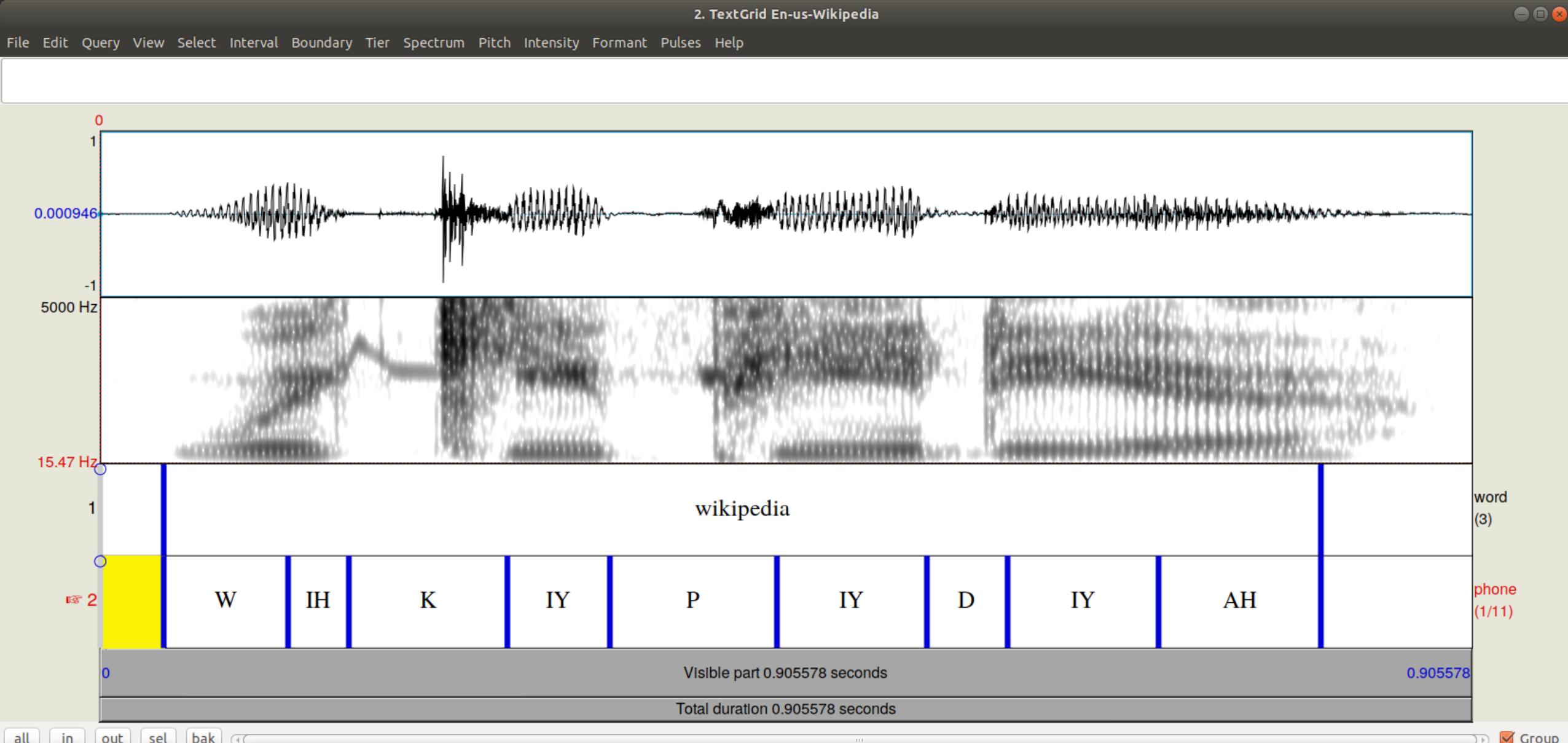
Wi v nou læk wið aur treðæræ, ðis jir : astor Mr. Bruce, Mr. Kenyon iz abaut tæ liv øes. ðis iz hwæt hi raits :

Paris, dðulái ðæ 21<sup>st</sup> 1888,  
dir sær,  
æz ai m in deili ekspektéicæn øv blin rikold tæ leñdæn, ai m særí tæ bi oblaiddø tæ giv øp ðæ treðæræcip øv ðæ fonætik tilcærz æsouciéicæn.

jorz feiðfeli,

E. OSWALD KENYON.

In konsækwæns, ði editær øv ðæ f. t. hez teikn in hænd ðæ mæniz øv ðæ f. t. a., øn wil kip ðæm øentil ø njú treðæræ bi øpointid. Tæ him, ðen, sæbskripçæn cæd bi sent, fær ðæ preznt. ði øpointin øv ø njú treðæræ mæs bi put øf til astor ði holidiz.



The waveform, spectrogram, and transcription of the word "wikipedia" pronounced by an American English speaker viewed in Praat running on Ubuntu 18.04.3. The settings for the spectrogram are a view range from 0 to 5000 Hertz, a window length of 0.005 seconds, and a dynamic range of 50 decibels.

The audio comes from [File:En-us-Wikipedia.ogg](#). The transcription comes from the Carnegie Mellon University Pronouncing Dictionary and the individual sounds are time-aligned with the audio.

# THE INTERNATIONAL PHONETIC ALPHABET (revised to 2020)

## CONSONANTS (PULMONIC)

|                     | Bilabial | Labiodental | Dental | Alveolar | Postalveolar | Retroflex | Palatal | Velar | Uvular | Pharyngeal | Glottal |
|---------------------|----------|-------------|--------|----------|--------------|-----------|---------|-------|--------|------------|---------|
| Plosive             | p b      |             | t d    |          | t̪ d̪        | c j       | k g     | q ɣ   |        | ?          |         |
| Nasal               | m        | n̪          |        | n        |              | ɳ         | jn̪     | ɳj    |        | N          |         |
| Trill               | B        |             |        | r        |              |           |         |       |        | R          |         |
| Tap or Flap         |          | v̪          |        | r̪       |              | ʈ̪        |         |       |        |            |         |
| Fricative           | f̪ β̪    | f v̪        | θ̪ ð̪  | s z̪     | ʃ̪ ʒ̪        | s̪ z̪     | ç̪ j̪   | x̪ ɣ̪ | χ̪ ʁ̪  | ħ̪ ʕ̪      | h̪ ɦ̪   |
| Lateral fricative   |          |             |        | ɬ̪ ɺ̪    |              |           |         |       |        |            |         |
| Approximant         |          | u̪          |        | ɹ̪       |              | ɻ̪        | ɻ̪      | ɻ̪    | ɻ̪     |            |         |
| Lateral approximant |          |             |        | l̪       |              | ɻ̪        | ɻ̪      | ɻ̪    | ɻ̪     |            |         |

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

## CONSONANTS (NON-PULMONIC)

| Clicks           | Voiced implosives  | Ejectives              |
|------------------|--------------------|------------------------|
| ʘ Bilabial       | b̪ Bilabial        | ,                      |
| Dental           | d̪ Dental/alveolar | p̪ Bilabial            |
| ! (Post)alveolar | f̪ Palatal         | t̪ Dental/alveolar     |
| ǂ Palatoalveolar | g̪ Velar           | k̪ Velar               |
| Alveolar lateral | g̪' Uvular         | s̪' Alveolar fricative |

## OTHER SYMBOLS

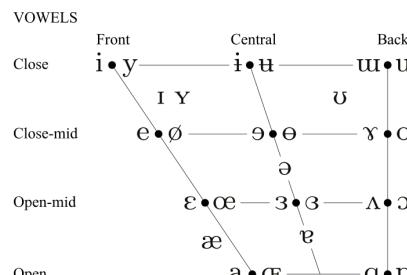
|                                     |   |
|-------------------------------------|---|
| ʍ Voiceless labial-velar fricative  | ç ʐ Alveolo-palatal fricatives  |
| W Voiced labial-velar approximant   | ɿ Voiced alveolar lateral flap  |
| ɥ Voiced labial-palatal approximant | ʃ ʂ Simultaneous ʃ and X  |
| H Voiceless epiglottal fricative    | Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. |
| ɸ Voiced epiglottal fricative       |   |
| ʢ Epiglottal plosive                |   |

## DIACRITICS

|                   |         |                               |                                       |                      |         |
|-------------------|---------|-------------------------------|---------------------------------------|----------------------|---------|
| ° Voiceless       | n̪ d̪   | .. Breathy voiced             | b̪ a̪                                 | □ Dental             | t̪ d̪   |
| ~ Voiced          | s̪ t̪   | ~ Creaky voiced               | b̪ a̪                                 | □ Apical             | t̪ d̪   |
| h Aspirated       | t̪ʰ d̪ʰ | ~ Linguolabial                | t̪̩ d̪̩                               | □ Laminal            | t̪̩ d̪̩ |
| ɔ More rounded    | ɔ̪      | ~ Labialized                  | t̪ʷ d̪ʷ                               | ~ Nasalized          | ɛ̪      |
| ɔ Less rounded    | ɔ̪      | ɔ̪ Palatalized                | t̪ɔ̪ d̪ɔ̪                             | □ Nasal release      | d̪ʰ     |
| + Advanced        | u̪      | Y̪ Velarized                  | t̪Y̪ d̪Y̪                             | □ Lateral release    | d̪¹     |
| - Retracted       | e̪      | f̪ Pharyngealized             | t̪f̪ d̪f̪                             | ~ No audible release | d̪⁷     |
| ** Centralized    | œ̪      | ~ Velarized or pharyngealized | œ̪                                    |                      |         |
| ✗ Mid-centralized | ɛ̪      | ~ Raised                      | ɛ̪ (ɛ̪ = voiced alveolar fricative)   |                      |         |
| ˩ Syllabic        | n̪      | ~ Lowered                     | e̪ (β̪ = voiced bilabial approximant) |                      |         |
| ⓘ Non-syllabic    | e̪      | ⓘ Advanced Tongue Root        | ɛ̪                                    |                      |         |
| ⓘ Rhoticity       | ə̪ ə̪   | ⓘ Retracted Tongue Root       | ə̪                                    |                      |         |

Some diacritics may be placed above a symbol with a descender, e.g. ڻ

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Where symbols appear in pairs, the one to the right represents a rounded vowel.

## SUPRASEGMENTALS

|                                |              |
|--------------------------------|--------------|
| ' Primary stress               | founə́ tʃən̪ |
| '' Secondary stress            |              |
| ː Long                         | eː           |
| ˑ Half-long                    | eˑ           |
| ˑ Extra-short                  | é            |
| Minor (foot) group             |              |
| Major (intonation) group       |              |
| · Syllable break               | .xi.ækt      |
| ˍ Linking (absence of a break) |              |

## TONES AND WORD ACCENTS

| LEVEL  | CONTOUR        |
|--------|----------------|
| é or ߱ | Extra high     |
| ߲      | High           |
| ߳      | Mid            |
| ߴ      | Low            |
| ߵ      | Extra low      |
| ߶      | Downstep       |
| ߷      | Upstep         |
| ߸      | Rising         |
| ߹      | Falling        |
| ߻      | High rising    |
| ߻ߴ     | Low rising     |
| ߻ߵ     | Rising-falling |
| ߸߶     | Global rise    |
| ߷ߵ     | Global fall    |

## CONSONANTS (PULMONIC)

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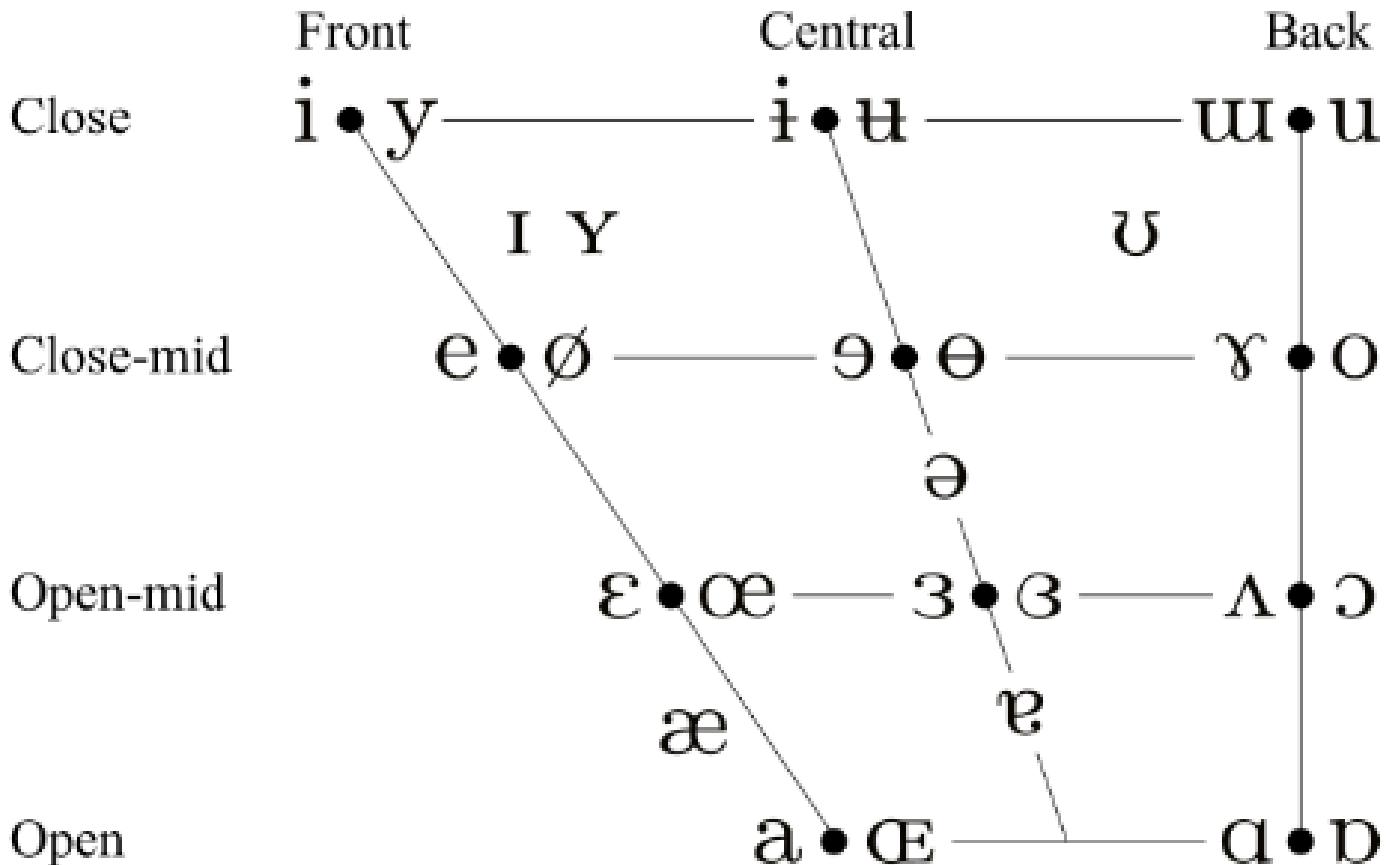
|                     | Bilabial | Labiodental | Dental | Alveolar | Postalveolar | Retroflex | Palatal | Velar | Uvular | Pharyngeal | Glottal |
|---------------------|----------|-------------|--------|----------|--------------|-----------|---------|-------|--------|------------|---------|
| Plosive             | p b      |             |        | t d      |              | t d       | c j     | k g   | q G    |            | ?       |
| Nasal               | m        | m̪          |        | n        |              | n̪        | n̥      | n̫    | N      |            |         |
| Trill               | B        |             |        | r        |              |           |         |       | R      |            |         |
| Tap or Flap         |          | v̪          |        | f        |              | t̪        |         |       |        |            |         |
| Fricative           | ɸ β      | f v         | θ ð    | s z      | ʃ ʒ          | s z̪      | ç j     | x y   | χ w    | ħ ʕ        | h f̪    |
| Lateral fricative   |          |             |        | ɬ ɺ      |              |           |         |       |        |            |         |
| Approximant         |          | v̪          |        | r̪       |              | ɻ         | j̪      | w̪    |        |            |         |
| Lateral approximant |          |             |        | l̪       |              | ɭ         | ɻ̪      | L̪    |        |            |         |

Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

## CONSONANTS (NON-PULMONIC)

| Clicks           | Voiced implosives | Ejectives             |
|------------------|-------------------|-----------------------|
| ʘ Bilabial       | b Bilabial        | ' Examples:           |
| Dental           | d Dental/alveolar | p' Bilabial           |
| ! (Post)alveolar | f Palatal         | t' Dental/alveolar    |
| ǂ Palatoalveolar | g Velar           | k' Velar              |
| Alveolar lateral | G Uvular          | s' Alveolar fricative |

## VOWELS



Where symbols appear in pairs, the one to the right represents a rounded vowel.

# Rounded

- ❖ Lips rounded
- ❖ Toon
- ❖ Teen

# velarization

## phonetics

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⋮

Written and fact-checked by [The Editors of Encyclopaedia Britannica](#)

Last Updated: [Article History](#)

**velarization**, in [phonetics](#), secondary articulation in the [pronunciation](#) of consonants, in which the [tongue](#) is drawn far up and back in the mouth (toward the velum, or [soft palate](#)), as if to pronounce a back [vowel](#) such as *o* or *u*. Velarization is not phonemic in English, although for most English speakers the *l* in “feel” is velarized, but the *l* in “leaf” is not. It is distinctive in some languages (*e.g.*, Arabic). Velarized consonants may be distinguished from velar consonants, in which the primary [articulation](#) involves the back of the tongue and the velum; in velarized consonants there must always be some other primary articulation.

**Related Topics:** [articulation](#) • [velar consonant](#)

[See all related content →](#)

# Vowels

Show English Vowels Only

Show All Vowels

|  |  | Front | Central | Back |
|--|--|-------|---------|------|
|  |  | i     |         | u    |
|  |  | I     |         | ʊ    |
|  |  | e     |         | o    |
|  |  | ɛ     | ə       | (ɔ)  |
|  |  | æ     | a       |      |

# Consonants

Show English Consonants Only

Show All Consonants

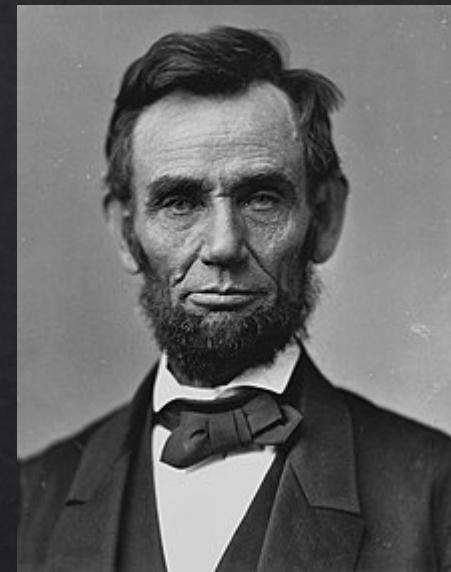
|                     | Bilabial | Labiodental | Dental | Alveolar | Postalveolar | Palatal | Velar | Glottal |
|---------------------|----------|-------------|--------|----------|--------------|---------|-------|---------|
| (Oral) Stop         | p b      |             |        | t d      |              |         | k g ? |         |
| (Nasal) Stop        | m        |             |        | n        |              |         | ŋ     |         |
| Tap or Flap         |          |             |        | r        |              |         |       |         |
| Affricate           |          |             |        | tʃ dʒ    |              |         |       |         |
| Fricative           | f v      | θ ð         | s z    | ʃ ʒ      |              |         | h     |         |
| Approximant         | w        |             |        | j        |              |         | j w   |         |
| Lateral approximant |          |             |        | l        |              |         |       |         |

# Online Example

- ❖ <https://www.cambridge.org/features/IPAchart/>

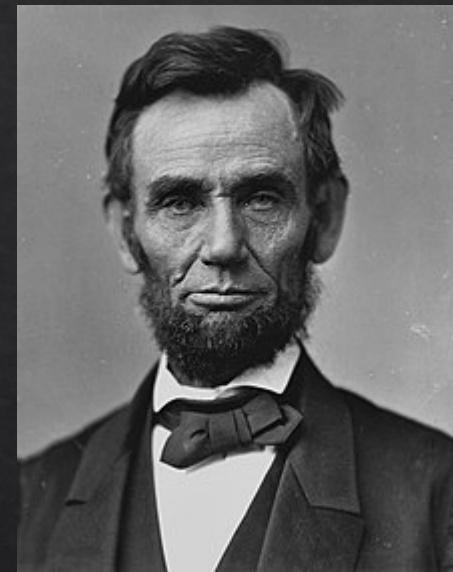
# Let's Try it Out

❖ Lincoln



# Let's Try it Out

- ❖ Lincoln
- ❖ /'lɪŋkən/



# Let's Try it Out

❖ Baltimore

Baltimore

Independent city



The [Inner Harbor](#) skyline



[Fell's Point](#)



[Baltimore City Hall](#)



[Emerson Tower](#)



[Washington and Lafayette Monuments](#)



[National Aquarium](#)

# Let's Try it Out

- ❖ Baltimore
- ❖ /'bɔltmɔ:r/

Baltimore

Independent city



The [Inner Harbor](#) skyline



[Fell's Point](#)



[Baltimore City Hall](#)



[Emerson Tower](#)



[Washington and Lafayette Monuments](#)



[National Aquarium](#)

# Let's Try it Out

❖ Condoleezza



# Let's Try it Out

- ❖ Condoleezza
- ❖ /kəndə'li:zə/



# Let's Try it Out

❖ Emmanuel Macron



# Let's Try it Out

- ❖ Emmanuel Macron
- ❖ [emmanuel makʁɔ̃]



# Let's Try it Out

❖ Link

# Let's Try it Out

- ❖ [https://en.wikipedia.org/wiki/File:Rishi\\_Sunak\\_Pronunciation.ogg](https://en.wikipedia.org/wiki/File:Rishi_Sunak_Pronunciation.ogg)
- ❖ /'rɪʃi 'su:næk/



# Let's Try it Out

❖ Link

# Let's Try it Out

❖ La Belgique (/bɛlʒik/)

**Royaume de Belgique**

(n1) ***Koninkrijk België***

(de) ***Königreich Belgien***



Drapeau de la Belgique



Armoiries de la Belgique

Let's Try it Out

# Let's Try it Out

❖ ['svæ̊rjə]



Let's Try it Out

# Let's Try it Out

- ❖ narendra damodar das modi:

