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Natural Phonetics

Vowels & Vocoids
Consonants & Contoids (1)
Consonants & Contoids (2)
Phonic Peculiarities
Official IPA

*can*IPA Natural Tonetics

from ¶ 7-11 of the book

Natural Phonetics & Tonetics

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Articulatory, auditory, & functional

8. Vowels & vocoids

8.1. In this chapter, we will explain –in depth– the articulations of vowels. We refer to vowels as VOCOIDS, or *vowel phones*, when looking at them from an exclusively phonetic point of view. Instead, when we speak of their distinctive role in a particular language, we will call them VOWELS, or *vowel phonemes*. In the case of graphic symbols, we will again speak of VOWELS, or of *vowel graphemes*. It should be clear, in the first place, that the *matter* (ie SOUNDS) and *substance* (ie PHONES) must be fully grasped, given that these elements constitute the essence of vowel articulations. Everything else is necessarily secondary, including the *form* (ie the phonemes of a given language).

The characteristic quality of vocoids depends on the shape assumed by the ARTICULATORY CHANNEL while they are being formed. Specifically, we mean their *position*, determined by the raising and forward–backward movement of the back of the tongue, as well as by the shape imparted to the *lips*. Acoustic and radiographic phoneticians give too much importance to the inevitable and objective fact that the pharyngeal cavity is wider with front vocoids, since the tongue mass has been moved forwards. As vocoids move farther and farther back, the dimensions of the pharyngeal cavity automatically become smaller, all the way to the point of true back vocoids.

It is true that this change implies a difference in the shape of the 'articulatory channel', and that this difference, in turn, produces alterations in the physical (but not physiological) processes which affect the sound wave. The result is a change in the acoustic measurements; but all this has little relevance to the actual articulatory intentions, as should be quite clear.

Thus the production of vocoids has three fundamental components, not counting the expiratory air which makes them possible and gives them VOICING, by vibrating the vocal folds (at least in the case of the more common vocoids). As a matter of fact, it will be seen later that further modifications of vocoids are possible, potentially regarding articulation ‰ phonation, particularly in certain specific languages.

For now, however, we will discuss the *three* fundamental components of vocoids (naturally returning to other topics which have already been mentioned): *vertical* RAISING of the back of the tongue (in cooperation with movements of the jaw), in the direction HIGH–LOW; *horizontal* FORWARDS–BACKWARDS MOVEMENT along the FRONT–BACK direction: and finally, *lip* ROUNDING, according to the alternation ROUND–SPREAD. Therefore, the components can be summarized in TONGUE POSITION (both vertical and horizontal, of the back of the tongue), and LIP SHAPE.

8.2. The older, prescientific method of describing the 'vowels' of a foreign language typically involved making vague references to the sounds 'hypothesized' for

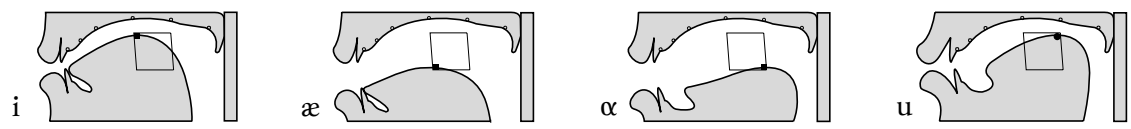
one's own language, together with occasional comparisons with some other 'better-known' widely-spoken European languages, for significantly different sounds. It was not realized that the vocoid systems of two languages never correspond satisfactorily. Also neglected was another point which is clear to us today: that no two people speak the same language in exactly the same way, since there are individual, regional, and sociocultural differences of pronunciation which are often quite notable.

It is therefore necessary to analyze the vocoids of a language by following a scientific approach, working independently of any particular language while nonetheless making solid connections to the precise inventories of a great number of natural languages. This approach is called the PHONETIC METHOD. The first step in the method involves understanding the vocoids of one's mother tongue (which does not necessarily coincide with the national or official language). With this beginning, it is then possible to move on to pronouncing any vocoid in any language.

8.3. VOCOIDS are by nature in opposition to the other category of segmental sounds, the *contoids*. In fact, vocoids are distinguished particularly by being (relatively) STATIC, by a fair amount of DISTANCE between the articulators, and also by having their articulation restricted to a LIMITED physical area within the oral space (constituted effectively by the area ranging from the zone of the PREVELUM to the boundaries of the palate and the velum, as can be seen in *fig* 5.1 and *fig* 8.1). Their static nature, articulatory distance, and limited range, are in contrast to the *movement,* articulatory *proximity*, and *extended* range of articulations characteristic of the contoids. In fact, these last can be produced in every possible articulatory zone, including very peripherical ones, such as the lips, the teeth, the pharynx, the larynx, &c.

For vocoids, the *position* (or *shape*) imparted to the LIPS is also essential (as already stated above). This component of the articulation is independent and non-contiguous with respect to that of the back of the tongue. Moreover, the involvement of the glottis is usually assumed to be part of the articulation, and the result is VOICING. Voicing gives greater substance and resonance to vocoids, thereby making them easier to distinguish and recognize in their particular timbres, 52 in all, together with further nuances which are equally perceptible and recognizable, and reproducible as well. On the other hand, voiceless vocoids are also possible, even though here the individuality of the particular timbres is naturally diminished. Voiceless vocoids can even be used distinctively as phonemes in certain languages, opposing the more 'normal' voiced phonemes (*cf* § 11.18).

fig 8.1. Articulatory space for vocoids.



8.4. Therefore, VOCOIDS are phones in which the expiratory air passes freely out of the mouth, moving along the middle part of the back of the tongue. The tongue position is (relatively) rather stable throughout the duration of the phone. More-

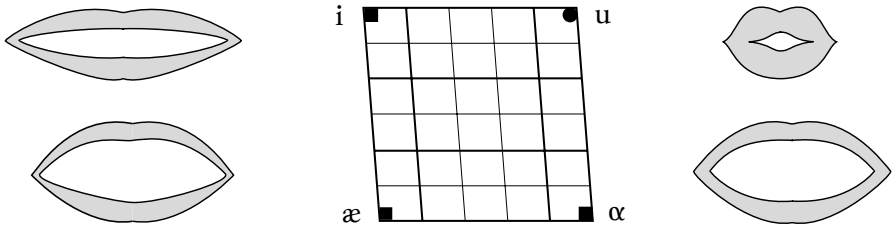
over, the opening of the jaw (and naturally, also the space between the back of the tongue and the palate) is never less than that found in dorsal approximants, such as [j, ɥ; ɯɥ, w]. As was seen in § 5.5-6, this last group is characterized by a less stable and quicker articulation than the corresponding vocoids, [i, y; ɯ, u]. For the various positions of the back of the tongue and of the lips, in the course of vocoid articulations, *cf fig* 8.6-9.

There exist vocoids with greater jaw opening as well, passing through intermediate stages until reaching the level of true open vocoids. It will be immediately seen that it is helpful to classify the different vocoids in six degrees of jaw opening, organized into three groups. We see now –once again– that vocoids have a limited zone of production, in terms of the height of the tongue and the jaw. The mouth must be appropriately open, but not too much, so that a natural articulation which combines fluidly vocoids and contoids is possible. The opening should not be overly narrow either, since otherwise unhelpful friction and noises would be produced (which would also be annoying while communicating with others).

Moreover, there needs to be enough space between the OPEN and CLOSE degrees to make it possible to distinguish cleanly the intermediate levels, which are variously used by the different languages. Therefore, for purposes of classification, this space is subdivided into three horizontal zones: CLOSE, MID, and OPEN. Each one of these is in turn subdivided into an upper or lower part, thereby allowing further internal distinctions.

In this manner, one obtains the following six –successively greater– degrees of tongue/jaw opening for vocoids: HIGH, LOWER-HIGH; HIGHER-MID, LOWER-MID; HIGHER-LOW, LOW; whose existence can also be demonstrated experimentally with, for example, *x*-ray photographs or films.

fig 8.2. Vocograms and labiograms of vocoids in the extreme positions.



8.5. In order to investigate the natural limits of the area of vocoid articulations, the author used *x*-rays and a small metal chain, with a coated lead ball in the center. The chain was then extended along the longitudinal groove of the tongue so that the lead ball would coincide in position with the center of the back of the tongue (the position of the lead ball is shown in *fig* 8.1, where it is magnified so as to be more evident, and it is furthermore represented with a *square* marker, but a *round* one for [u]). In this way, it is possible to detect the horizontal and vertical movement of the tongue, together with its shape with respect to various fixed points on the palatal vault, while various vocoids are being articulated. In order to ensure that the articulations were natural, photographs of speech made with and without the chain were compared (as well as the corresponding magnetic or electronic recordings).

The essential point, therefore, is to succeed in identifying accurately the full range of (horizontal and vertical) movement of the lead ball, during the articulation of the most extreme possible vocoids, uttered in a natural way. One such result is that the highest and frontest possible vocoid is [i] (*fig* 8.1, where we give precisely those points on the vocogram which are most extreme and peripheral). Raising the tongue further, we inevitably pass (through the palatal approximant [j], *fig* 5.1 & *fig* 10.6.1, towards the end of the first part of the figure) to a point where friction is produced, resulting thereby in the voiced palatal constrictive contoid, [ʝ] (*fig* 10.5.1, at the beginning of the last but three row). Moving the tongue forward, as well, the quality of vocoids would be lost, resulting in a timbre more like that of a contoid.

[Especially non-phoneticians will frown on this (perfectly grammatical superlative) *the frontest*, preferring 'the most forward', or even 'the most front'. The same holds true of *the backest*, in comparison with 'the most retracted/back', and of the corresponding comparatives: *fronter*, *backer*.]

The highest and backest vocoid possible is [u] (*fig* 8.1). Raising the tongue further, the resulting phone passes through the velar rounded [w] (*fig* 5.1 & *fig* 10.6.1, at the beginning of the last but two row), before yielding the voiced velar (rounded) constrictive [ɣ̂] (*fig* 10.5.1, third orogram in the last but two row); while moving the tongue farther back, the result would be the uvular rounded constrictive, [ʁ̂] (*fig* 10.5.1, the first in the last but one row).

The lowest and backest vocoid possible is [ɑ] (*fig* 8.1). Moving the tongue farther back, the result would be the prepharyngeal approximant contoid, [ʕ] (*fig* 10.6.1, the first in the last row), and moving still farther, we encounter the prepharyngeal constrictive, [ʢ] (*fig* 10.5.1, the last one in the last row), where both of these are voiced.

Combining the level of jaw opening characteristic of [ɑ] and the forward position of the tongue found in [i], we come to the lowest and frontest possible vocoid, [æ] (*fig* 8.1), which constitutes the articulation most different from that of the contoids, with which it in fact has no natural connection or similarity (unlike in the other cases mentioned here). We (the author and many others) have already explained that [æ] is actually a *low* front vocoid (even though the *[off]IPA* continues to describe this vowel as higher than it actually is), as the acoustic analyses themselves clearly demonstrate.

8.6. Joining together these four points, in a schematic way in order to be more practical, and enlarging the figure, we arrive at the vocoidal quadrilateral, or VOCOGRAM (*fig* 8.2), into which all vocoid phones possible in any language can be placed. (Concerning possible modifications of these, *cf* § 11.17-19.)

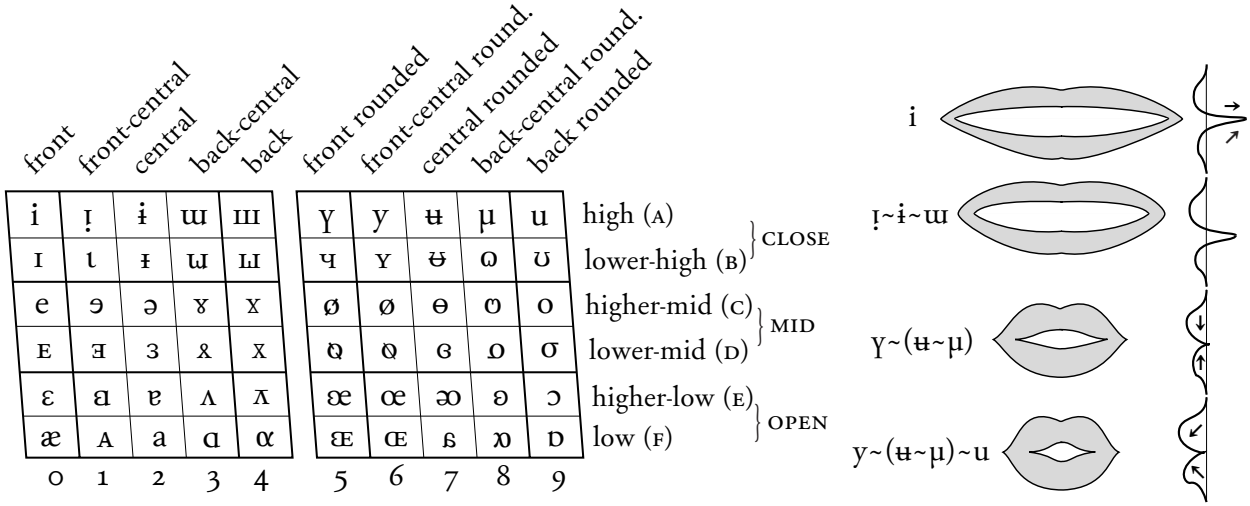
The left side of the vocogram is thus the front limit of the articulatory area for vocoids, while the right side is the back limit. The space between these two limiting barriers can be usefully divided into five columns. On the ends, we have the FRONT and BACK vocoids; in the middle, there are the CENTRAL ones. Since it has been proved worthwhile to use specific markers also for phones in the areas comprised between these strips, the two other vocoid columns are referred to as FRONT-CENTRAL and BACK-CENTRAL respectively.

Observing the vocogram of the phones which are *unmarked* (in the sense of being unrounded – *fig* 8.3, first vocogram, columns 0-4), we see that in the back region, the four closed and mid boxes have their vocoid symbols placed in parentheses. This is due to the fact that when back unrounded vocoids are found in languages (mostly Eastern Asian ones), these vocoids, ([ɯ, ɯ̟, ɤ, ɤ̞]), are articulated farther forward than [u, ʊ, o, σ].

They are therefore more accurately defined as BACK-CENTRAL vocoids, rather than purely back ones. If, one day, a language should be found possessing vocoids in the area of these four boxes, an appropriate symbol can always be brought into use. These supplementary symbols, prepared according to the principles leading to the expansion of this present *handbook*, are, in fact: [ɯ̽, ʊ̟, ɤ̟, ɤ̞].

We move ahead, now, to the vocogram of the rounded phones, which are *marked* because they are produced with lip rounding (*fig* 8.3, second vocogram, columns 5-9). Here it can be seen that, corresponding inversely to what occurs with unrounded vocoids, the four mid and low front boxes have symbols placed in parentheses. In fact, the vocoids [y, ʏ; ø, ɵ; œ], occurring in languages such as French and German, are articulated farther back than [i, ɪ; e, ɛ; ɛ], and are therefore defined more accurately to be FRONT-CENTRAL vocoids. If symbols for truly front rounded vocoids in these areas should become necessary, it could be possible to use [ø, ɵ, œ, ɛ̞].

fig 8.3. The 52 vocoids of *canIPA* (with the 8 'potential' ones) and labiograms for the high ones.



Instead of looking at just the position of the lead ball for vocoids, we can also consider the entire surface of the tongue, with respect to the palatal vault. From this point of view, we see that the position is practically the same as that found in less tense realizations of [j, w] (*cf fig* 8.1). For this reason, it might seem more logical to define the two vocoids [i, u] as 'palatal' and 'velar rounded', respectively, like the corresponding contoids. This would have the advantage of maintaining a (useful) connection between vocoids and contoids. However, there are three canonical 'places of articulation' for contoids in this area: palatal, prevelar, and velar (together with rounded versions of each of these); while there are necessarily five

corresponding areas for vocoids (to be objective). One approach might be to name five different places of articulation, which could therefore be: palatal, postpalatal, prevelar, provelar, and velar (as, in fact, will be done later, when we seek to indicate nuances and distinctions relating to medial approximants –articulated with the medium-dorsum of the tongue– and similar contoids articulated nearby, *cf* § 10.13 and *fig* 10.12, by comparing them to the space of vocoids).

But it seems preferable to follow the terminology proposed above: FRONT, FRONT-CENTRAL, CENTRAL, BACK-CENTRAL, and BACK, in addition to the correspondent ROUNDED forms. In fact, it is appropriate to treat vocoids by means of the vocogram, both for learning and for teaching purposes.

Also alpha(nu)meric indications, using the numbers 0-4 and 5-9 together with the six heights, denoted with A-F, can be a useful way to refer to particular vocoids. This is particularly the case while speaking on the telephone, or while writing e-mail messages (without having to use attachments, which require both people to have the same fonts or being able to write and read *pdf* files). For example, we can write [a] = 2F, [i] = 0A, [u] = 9A, [ø] = 6C and [ə] = 2C…

{Looking carefully, it can be seen that there is a certain difference between the roman 'zero': 0, and the letter *o* written in small capitals: ᴏ. The letter has a somewhat greater height than the numeral, and a different thickness, more like that of the roman lower case: o, differently from the numerals (which have much more homogenous shapes, and, in the case of the more traditional roman form of *1*, namely 1, a more evident serif, with respect to *i* in small capitals: ɪ).

These numerals –0 1 2 3 4 5 6 7 8 9– are referred to as *lower case*, or *high and low*, or *traditional*, or *refined*, or also *typographic characters*, and they are definitely more elegant than the *upper case*, or *high*, or *modern*, or *common*, or *school characters* – 0 1 2 3 4 5 6 7 8 9.}

Other less useful classifications

8.7. However, if one wished to remain completely faithful to the indications of the *x*-ray photograms, the result would be a complementary and rather different classification of the vocoids. According to the point of greatest closure of the articulatory channel, the vocoids would be apportioned into at least six places of articulation, and ten would not be by any means impossible. These would or could be: 'palatal, (postpalatal,) prevelar, (provelar,) velar, (postvelar,) uvular, uvulopharyngeal, (prepharyngeal,) pharyngeal'! In order to express the degree of progressive opening, the diagram would resemble a wheel hub with spokes coming out of it, pivoting on the area of [ɜ].

The result would be that, for example, from [i] to [ɛ], vocoids would be considered 'palatal'; from [u] to [ə], 'velar'; and from [æ] to [ɑ], 'pharyngeal'! But, a classification of this sort has no practical advantage, even as regards the complex phenomena of assimilation and coarticulation.

Rather, the subject would become needlessly complicated. Furthermore, the same 'love of the truth', if applied rigidly, could induce one to think of [i] (and the

full series, even including [ɯ]) as 'bidental' vocoids; and also [u] (and the full series, even including [ɣ]) as bilabials, since the narrowest point of passage for the air in the articulatory channel is actually between the teeth, or between the lips, respectively. At this point, one would encounter the fresh problem of trying to come up with new terms, in order to distinguish between the members of these new and 'alien' series! Therefore, we will not speak of this classification any more – yet certain people, working exclusively with machines, seemed to consider it a more scientific approach.

In the meantime, the full validity of the articulatory (and auditory) classification has been fully and convincingly demonstrated. In fact, neither the 'highest point' of the tongue, nor the point of 'narrowest passage' between the articulators are particularly important for practical purposes. *Acoustically*, the shape of the articulatory channel determines the GLOTTOMETRICAL instrumental measurements; however, these are more speculative than practical. Instead, the GLOTTOGRAPHICAL data furnished by NATURAL PHONETICS (that is *articulatory* and *auditory*, as well as *functional*) give precious and essential information and descriptions, which are absolutely indispensable in learning and teaching.

But the fact of considering the 'highest point' of the tongue in the *x*-ray prints as the truly fundamental aspect led to a series of problems. In fact, the undeniably brilliant idea of Daniel Jones (to which the experiments of previous phoneticians also contributed) became manifested in a sort of deformed trapezoid, with the upper part much longer than the lower part, and the back part less long than the front part. The reasons for these asymmetries lie in precise physical barriers: the tongue is in fact more mobile in the high-front area than in the low-back area. It would have been better to adopt a partially different criterion with respect to that useful for contoids, for which a global articulation is decidedly more important.

Considering, instead, a *constant point*, namely the CENTER OF THE MEDIUMDORSUM (*ie* the absolute center of the back of the tongue, where the lead ball on the chain was placed during our early experiments), the resulting figure is similar to a much more regular quadrilateral. With modern technology, it is no longer necessary to use the chain and lead ball – better and more 'natural' results can be obtained with a few simple considerations and certain particular substances.

Even though any diagram with sharp corners is rather unnatural, it is still helpful to make the figure as schematic and regular as possible. Although simplified in this way, the diagram retains all of its usefulness in practical contexts, as will be seen in applications to languages and dialects.

8.8. Another defect was the attempt to subdivide the internal spaces between the four 'cardinal' points in the quadrilateral by means of an 'auditory equidistance', instead of continuing with ARTICULATORY SUBDIVISIONS, naturally, aided by AUDITORY FEEDBACK. It is quite clear that something which is purely auditory cannot be faithfully transmitted without a direct contact with the source or producer of the sound. In this manner, even the learning and training of specialized phoneticians has suffered, and the results have inevitably included undesired and unappreciated discrepancies, with respect to the articulatory method assisted by auditory feedback.

Those who have not become blinded uncritically in the conviction that the lowest and frontest vowel is '[a]', but instead try to do (articulatory ‰ acoustic) phonetics without preconceptions and irrational biases, and to see directly what is going on, will necessarily arrive at the conclusion that the lowest and frontest possible vowel is certainly [æ]. For the sake of precision, given the partial difference between the two approaches in question, we should mention that the 'cardinal' value of '[a]' corresponds, in practice, to our [ᴀ] ([[ᴀ˃]]), which, in any case, is different both from [æ] and from [a] (given that it is practically halfway between these two vocoids, according to our classification).

Of course, it is not our responsibility to convince everyone that this is true, given that it would be simple and sufficient for anyone (even minimally) competent in the subject to check the matter personally, once the idea has been explained clearly. Nonetheless, we cite here some sources, who –with different principles and methods– have come to the same logical (and objective) conclusions: Delattre *et al.* (1951), Hyman (1975), Chapman *et al.* (1988[3]), without mentioning various contributions of the present writer. All things considered, it has been known for a ('relatively' short) time that the Earth is *not* flat and that the Sun does *not* revolve around it! Just a question of 'points of view'?

8.9. At any rate, as the tongue is moved so as to produce successively all of the most external vocoids (those which are most PERIPHERAL in the diagram), the resulting figure is somewhat circular, a sort of lopsided oval. This can be seen in *fig* 6.1, where we move gradually from the more realistic to the more schematic, due to the practical reasons mentioned above.

Afterwards, we will see the orograms of all of the vocoids, in their medial values. By 'medial values', we mean the central position in their box, within the vocogram. It is useful to work from these values as starting points, which can be considered BASIC, FUNDAMENTAL, or CANONICAL. The 'cardinal' values used by Jones were instead as peripheral as possible in the vowel trapezoid, and as far from one another as possible. The Jonesian cardinal vowels (recorded on discs, *cf* Jones 1956), in all, were only 18 in number. They were subdivided into 'primary' cardinal vowels and 'secondary' ones: 'primary' [i, e, ɛ, a, ɑ; ɔ, o, u], and 'secondary' [y, ø, œ, ɶ, ɒ; ʌ, ɤ, ɯ], together with [ɨ; ʉ].

Moreover, the vowels of Jones were organized by reference to their frequency in the different languages of the world, with particular emphasis on the European languages. For this reason, the rounded and the more 'normal' unrounded vowels are 'mixed' together, instead of being presented in two homogeneous series, as in our approach. In any case it is unquestionably true that the *primary vowels* are more widely used in the various languages of the world, and that the *secondary vowels* are only added afterwards in learning phonetics (even if there are certainly exceptions, unless all the differences are leveled away in the context of a very abstract form of phonology).

In any case, in common practice, 8 additional vowels were usually added to the 18 'cardinal' ones: [ɪ/ɪ, ʏ, ʊ/ʊ; ə, ɵ, ɜ; ɐ; ӕ] (in practice, there were two notational variants, shown here separated by slashes, while [œ] was omitted –until the reform

of 1979– because of not being documented in the descriptions of real languages). The trapezoid of the most recent reform (finished in 1996) adds [ɘ, ɞ] and makes [ɪ, ʊ] official, thereby rejecting [ɩ, ɷ]. However, the value of each symbols has been made (even more) vague, within a fairly theoretical and 'potential' trapezoid; this is particularly true in the case of [ə].

The official location of [a] still suffers from the original limited use of symbols, for phonemic purposes, when it was enough to be able to distinguish two kinds of *a*, in respect of only one graphemic symbol. Therefore, one of the two extremes was denoted 'normally', with [a], while for the other a graphical variant of this symbol was used, whether derived from cursive script (as in the case of *a* [ɑ]), or from Greek, or from horizontal or vertical reflections of roman letters in some other cases. In certain types of intraphonemic transcription used for English, [æ] /æ/ was symbolized by '/a/', while [ɑː] /ɑː/ was simplified into '/aː/', and likewise [ɪ, ɷ] /ɪ, ʊ/ became '/i, u/', in opposition to [ɪi, ʊu/µu] /ii, uu/ represented (still today! – as has already been mentioned) with '/iː, uː/', as if the difference was only one of length.

The real problem of the 18 'cardinal vowels' (unlike our various canonical *canIPA* vocoids) is highlighted by the fact that they are not easy to be adequately reproduced even for trained phoneticians (not to speak of makeshift phoneticians, perhaps on the Internet). In fact, the *CV* (as they currently are) are just the pursuit of (almost) *unnatural boundaries* (obtained mostly auditorily, sometimes even for the four initial *CV*!).

Instead, we have to find those *articulatory positions* which can be *easy* for everyone to produce through their own organs, with no stressful excess (which, of course, does not mean that people are allowed to freely use the vocoids of their own language!). In addition, even the internal subdivisions must *not* be an (auditory) *imitation* of an absolute model, to be just reproduced parrot-fashion. On the contrary, they have to correspond to precise *articulatory gradations*, which must be calibrated for the mouth of each person, without 'cheating' (perhaps even unintentionally) by introducing *paraphonic* characteristics (precisely as voice imitators do), and playing with secondary tones or using supplementary modifications of the pharyngeal and labial cavities (exceeding what is natural).

More about vocoids

8.10. We have instead 52 symbols (or 60, including the eight available for articulations which had not yet been found in the languages of the world), and we use a vocogram with more rigorous subdivisions and clearly demarcated areas, which makes precision *obligatory*. In fact, it is not enough (for us, at least) to dump symbols here and there all over the diagram. Proceeding in this way, there is a serious risk of ending up with the common problem (unfortunately, seen in a great number of books) of trapezoids of the same language (and the same accent), which seem to be referring to very different languages, instead of just one. This problem occurs in the case of trapezoids made by different authors, but it can al-

so occur with those of a single author (sometimes even within a single book). One cause is, of course, the excessively indeterminate nature of the official diagram, in which there are practically no internal subdivisions.

To present our vocoids, we use two separate vocograms, depending upon whether the lips are rounded or not (*cf* *fig* 8.3, *fig* 8.8, & *fig* 8.9). Of course, this separation is only methodological. In fact, while describing languages, vocoids should be given together, regardless of the shape of the lips. The shape of the lips is not ignored, however (as often happens, even with the official trapezoid), but is instead clearly marked by the shape of the markers placed in the positions of the relevant phones. Thus ROUNDED VOCOIDS have a CIRCULAR MARKER, while UNROUNDED ONES have a SQUARE one. This convention can be seen in all our vocograms, and in those in Ꝋ 16-23, but in particular in those in *HPr*.

When vocoids occur with the lips in a position halfway between the two of these, that is HALF-ROUNDED, they are indicated by markers in the form of lozenges, or equiangular rhombi (thus, a square, rotated by 45°, *ie* a sort of diamond shape).

Therefore, in theory, we could have 26 vocoids more, by counting the half-rounded ones (and potentially 30, with the extra 4 unrounded vocoids not yet found in languages, but see § 8.29-31, as well).

So far, the most common ones have been: [i̜, ɨ̜, ʉ̜; ɪ̜, ʏ̜, ʊ̜; ə̜, ɘ̜, ɤ̜; ɜ̜, ɞ̜; ɐ̜, ʌ̜; æ̜, a̜, ɑ̜]. Labiograms for half-rounded vowels are shown in the central column of *fig* 8.9. In the same figure, it is also possible to see the differences between the two main types of lip rounding: the types with and without some protrusion of the lips. In the case of high vowels, where the differences are more evident, we have: with protrusion, [y, u], while without protrusion, [ʏ], and with half-rounded lips, [i̜, ɨ̜, ʉ̜]. In the case of [ʉ̟, ɯ̟], we have more commonly the type of rounding without protrusion; but the type with protrusion is also possible. Occasionally, rounding without protrusion can occur even with [y, u], in particular languages.

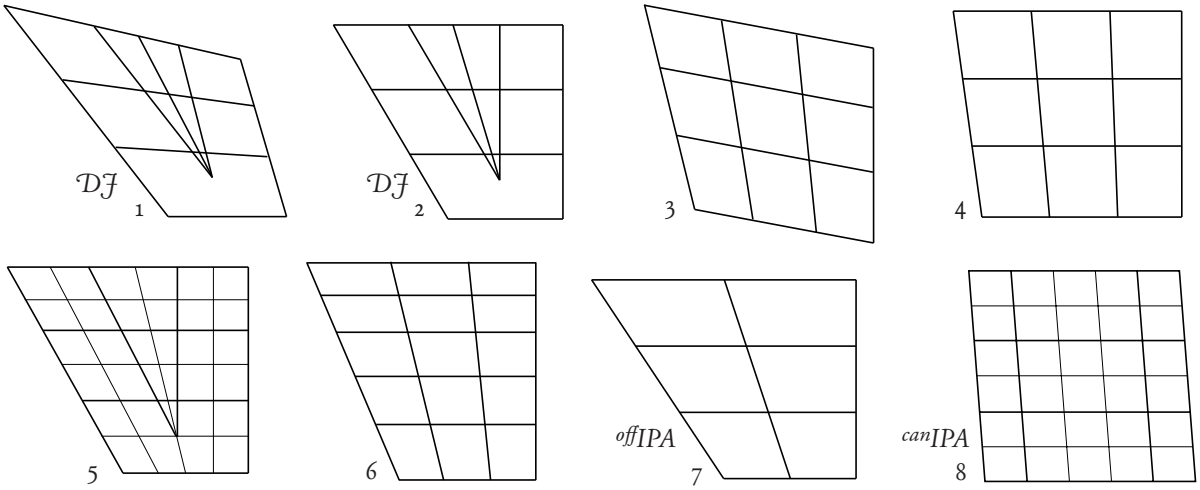
As has already been mentioned, the orograms (or sagittal cross-sections) also contain a sort of skeleton of the vocogram (the vowel quadrilateral). This 'skeleton' can then function as a reference for comparisons and contrasts, as well as for acquiring the vocoid in question. In the description of actual and particular languages, only the large vocogram needs be used (and possibly multiple ones, if one alone is insufficient for the task of showing clearly all of the realizations possible).

In *fig* 8.4.1, we give a variety of vocoid diagrams (vocograms). The first two are those given by *Daniel Jones* (the first of these suffers, as can be seen by its shape, from the unfortunate fact of having considered as primary the 'highest point of the tongue', instead of a *fixed point*, *ie* the center of the mediumdorsum). The next four represent successive *developments* of these original diagrams. The seventh is the *official* diagram, given in the most recent reform (*offIPA*). The eighth is our own *quadrilateral* (*canIPA*), which is for us the VOCOGRAM *par excellence*, also seen, in a smaller size, in the orograms of *fig* 8.1, and, enlarged, in *fig* 8.2.

In order to make a useful comparison with the canonical *canIPA* vocoids (9 of which are different: 5 unrounded and 4 rounded), we have placed in *fig* 8.4.2(.1) the 18 official *cardinal vowels* of Daniel Jones. Here we list the latter in italics, to avoid any possible confusion: [*i*, *e*, *ɛ*, *a*, *ɑ*, *ɔ*, *o*, *u*], [*y*, *ø*, *œ*, *ɶ*, *ɒ*, *ʌ*, *ɤ*, *ɯ*], [*ɨ*, *ʉ*].

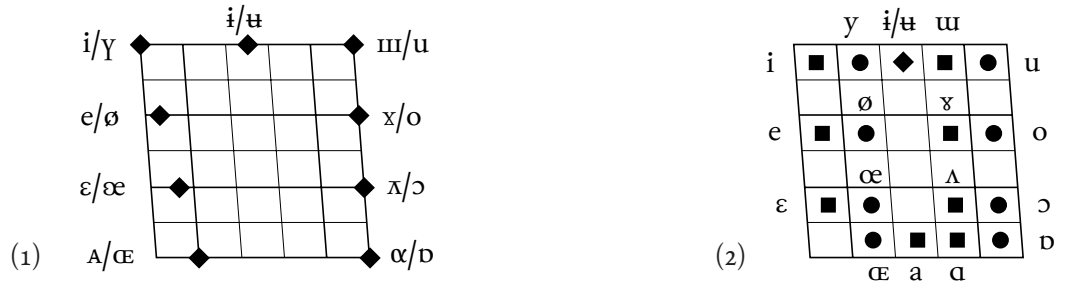
Were we to follow our own habitual ordering (which keeps the unrounded and rounded vocoids separate), we would have: [*i*, *e*, *ɛ*, *a*, *ɑ*, *ʌ*, *ɤ*, *ɯ*; *ɨ*], [*y*, *ø*, *æ*, *œ*, *ɐ*, *ɔ*, *o*, *u*; *ʉ*], that is *canIPA*: [i, e, ɛ, a, ɑ, ʌ, ɤ, ɯ; ɨ], [ʏ, ø, æ, œ, ɒ, ɔ, o, u; ʉ].

fig 8.4.1. Different types of diagrams for vocoids.



In *fig* 8.4.2(.2), again using *canIPA* symbols, we show the values most commonly attributed to these (official) symbols in phonetics treatises: [i, e, ɛ; ɨ, a; ɯ, ɤ, ʌ, ɑ], [y, ø, œ, ɶ; ʉ; u, o, ɔ, ɒ]; while the theoretical and peripheral values (which are found much more rarely, if at all) are better represented by other symbols (which, nevertheless, suggest their values): [ɐ, ɑ, ʌ, ɤ, ɯ], [ʏ, ø, æ], *fig* 8.4.2(.1).

fig 8.4.2. The *cardinal vowels* of Jones placed upon our vocogram using *canIPA* symbols (1) and *canIPA* values referring to 'cardinal' symbols (2).



The markers placed in *fig* 8.4.2(1) are those which, in our convention, are used for representing vocoids with 'intermediate' lip position, that is, half-rounded lips. The only purpose is to indicate simultaneously the two different articulations, rounded and unrounded, which were intentionally produced in the same points. The markers are located in the most extreme points, according to the criteria followed by Jones – in fact, their purpose was to bound the space of vocoids. In *fig* 8.4.2(2), instead, we have placed the appropriate markers in the centers of the relevant boxes, so that they will have our canonical values. In this way, the spirit of the two approaches to the vocoids of the world's languages can be better compared.

We have included *fig* 8.5 as well (for Spanish and for British English), in order

to show two triangular vocoidal schemes which are decidedly not advisable, given that they do not respect the phonetic reality of the articulatory apparatus in various languages of the world. These are given in A.1-2, and despite their defects (the first is actually upside-down), they continue to be used. We have also provided the more common acoustic scheme (based on the first two formants, F_1 and F_2; note that 25 = 2500 Hz, 2 = 200 Hz) for Spanish (A.3, as in the stressed vowels of *uno, dos, tres, cuatro, cinco*) and for the 12 monophthongs of British English (B.1, as in: *city*, *to bring*, *to eat*, *book*, *beck*, *lack*, *luck*, *mark*, *mock*, *four*, *fur* [ˈsɪʈi, ʈhəˈbɻɪŋː, ʈhμˈɪiʈ, ˈbʊk, ˈbɛk, ˈlæk, ˈlɐk, ˈmɑːk, ˈmɒk, ˈfɔː, ˈfɜː]. They are not derived from a triangle, but rather from a quadrilateral with the upper right corner part tilted to the right (although English /u/ is actually back-central rounded). In this it differs from our quadrilateral, where that part tilts to the left (B.3), and from the current official compromise trapezoid (B.2), where that part is vertically straight. In this last case, it is easy to see the vagueness concerning subdivision, and the markers placed upon it which are always black and always round (regardless of lip position and stress). We have placed there the 12 vocoids (corresponding to 12 monophthongs) of neutral British English, which are then given again in our own faithful vocogram (B.3), together with all of its inherent advantages.

fig 8.5. Different ways of showing vocoids (5 Spanish and 12 British English monophthongs).

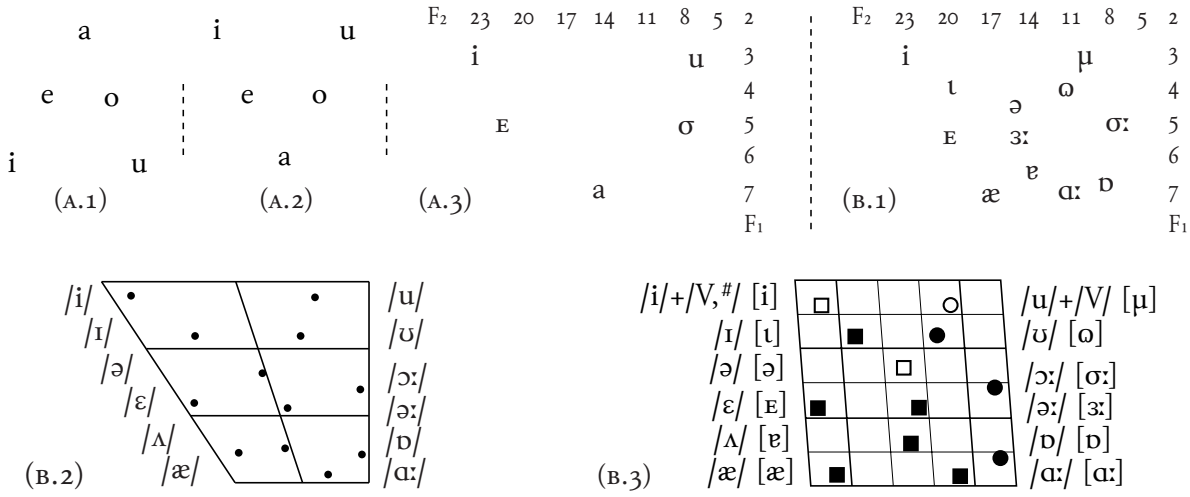


fig 8.6-7 show, respectively, the orograms and labiograms of the 12 *vocoids* found in neutral British English, [i, ɪ, ɛ, æ, ɐ, ɑː, ɒ, ɔː, ʊ, μ, ɜː, ə] (corresponding to the actual *monophthongs* of English, excluding thus cases such as *tea*, *two* /ˈʈii, ˈʈuu/ [ˈʈhɾi, ˈʈhμu], which –clearly– are diphthongs, as we like to repeat).

8.11. With even a cursory examination of some of the vocograms in the phonosyntheses (and those for the 12 languages in *HPr*), it can be seen that a great level of precision is possible. Inside each box in the vocogram, the markers can be found located in a variety of different positions, even along the boundary lines at the border between two or more boxes. By simplifying somewhat, however, we can say that each vocoid has at least *nine* possible locations within a given box. Thus,

besides a central [a] in its box, [a˥, a˖, a˧, a˗, a˩, a˨, a˦, a˨], as well. For instance, it is quite easy to hear different kinds of [a]-sounds in the first elements of the diphthongs /aɛ, aʊ/, as in *height*, *house* /ˈhaɛɪ̯, ˈhaʊs/ [ˈhaəɪ̯, ˈhaɒs]. In regional pronunciations, they can vary as far as [ʌ, ʌ, ɑ, ɒ] &c for /aɛ/, and [æ, ɑ, ʌ, ʌ, ɑ] &c for /aʊ/.

fig 8.6. Orograms of the vocoids of the 12 neutral British-English true monophthongs.

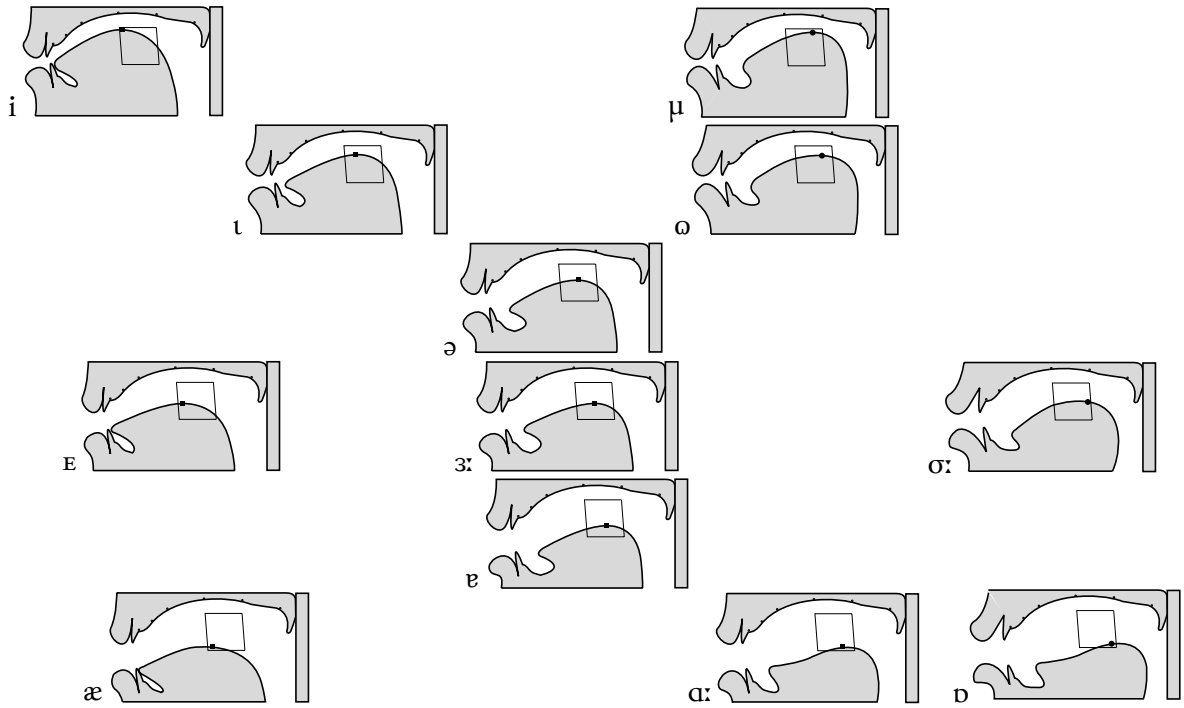
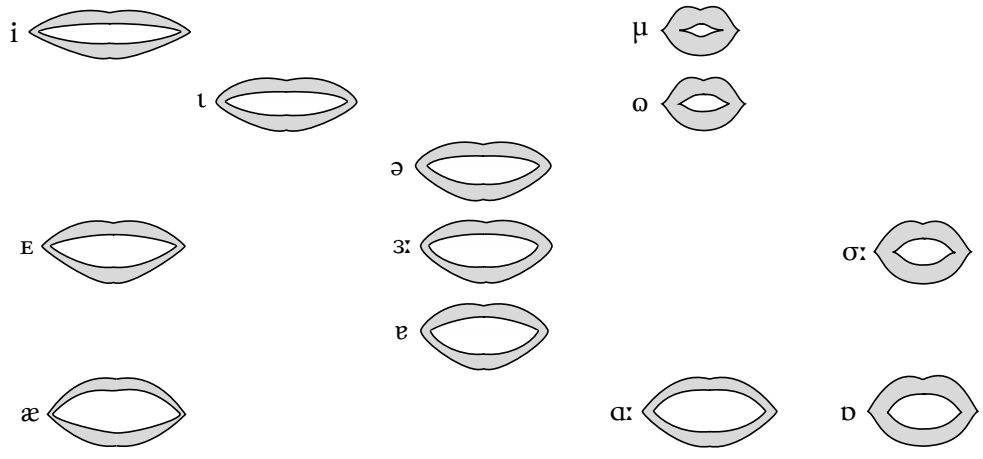


fig 8.7. Labiograms of the vocoids of the 12 neutral British-English true monophthongs.



The central location is fundamental, although it is not necessarily the most frequent or 'normal' one (just as the peripheral 'cardinal' locations of Jones were not the most common, either). Besides this, there is the possibility of shifting in a high–low direction, or in a front–back direction. Combinations are also possible, such as high–front, low–back, low–front, high–back.

While listening to recordings in order to analyze a particular language, it is

definitely helpful to use diacritics of DISPLACEMENT, especially while making notes by hand. Thus, a point, [̣], can be placed (or a double underlining [͟] as with contoids, § 9.5) generally underneath a vocoid to indicate (fairly) central position within the box [e̤, a̤, i̤, ẏ]. It would also be possible not to use any diacritic, considering the central position as the default one. For this approach to work, absolute consistency is necessary, so that later on, it will not become necessary to wonder whether the absence of a point underneath meant simply the refusal to take a firm position on the exact location of the vocoid (as could happen when indicating a mere opposition with other vocoid symbols, such as [e], with respect to [ɪ], or [ɛ], or [ɘ]…).

The other diacritics indicate a direction of displacement, which is the direction in which the middle 'prong' is pointing: [˕, ˔; ˗, ˖; ˃, ˂; ˄, ˅] (here in opposing pairs). Thus the first denotes raising, while the second refers to lowering, as in [o̝, o̞]; the third indicates displacement forwards, while the fourth refers to backwards movement, as in [o̟, o̠]; the fifth denotes raising and fronting together, &c. They can also be combined: *two of the same diacritic symbol* (for example, [˖˖]) indicate a displacement all the way to the edge, or even slightly beyond, while a single diacritic, *placed within parentheses*, ([(˖)]), denotes a lesser degree of displacement.

For particular (descriptive or teaching) purposes, icons of the type ⊠, and ⊠, ⊠, ⊠, ⊠, and ⊠, ⊠, ⊠, ⊠, may be useful, in order to indicate the nine general positions within a particular box.

It is clear, however, that there are many more than nine positions actually possible – at least twenty or so per box, even continuing to simplify a bit. To give a round number, there are somewhere from 500 to 1000 possible vowel sounds, which are then representable by the 52 vocoids (although with different locations inside the vocogram). On the other hand, according to the language spoken, an average speaker typically only distinguishes 5 to 15 of these (even if the phonemes may be more, thanks to the addition of length, or nasalization, &c).

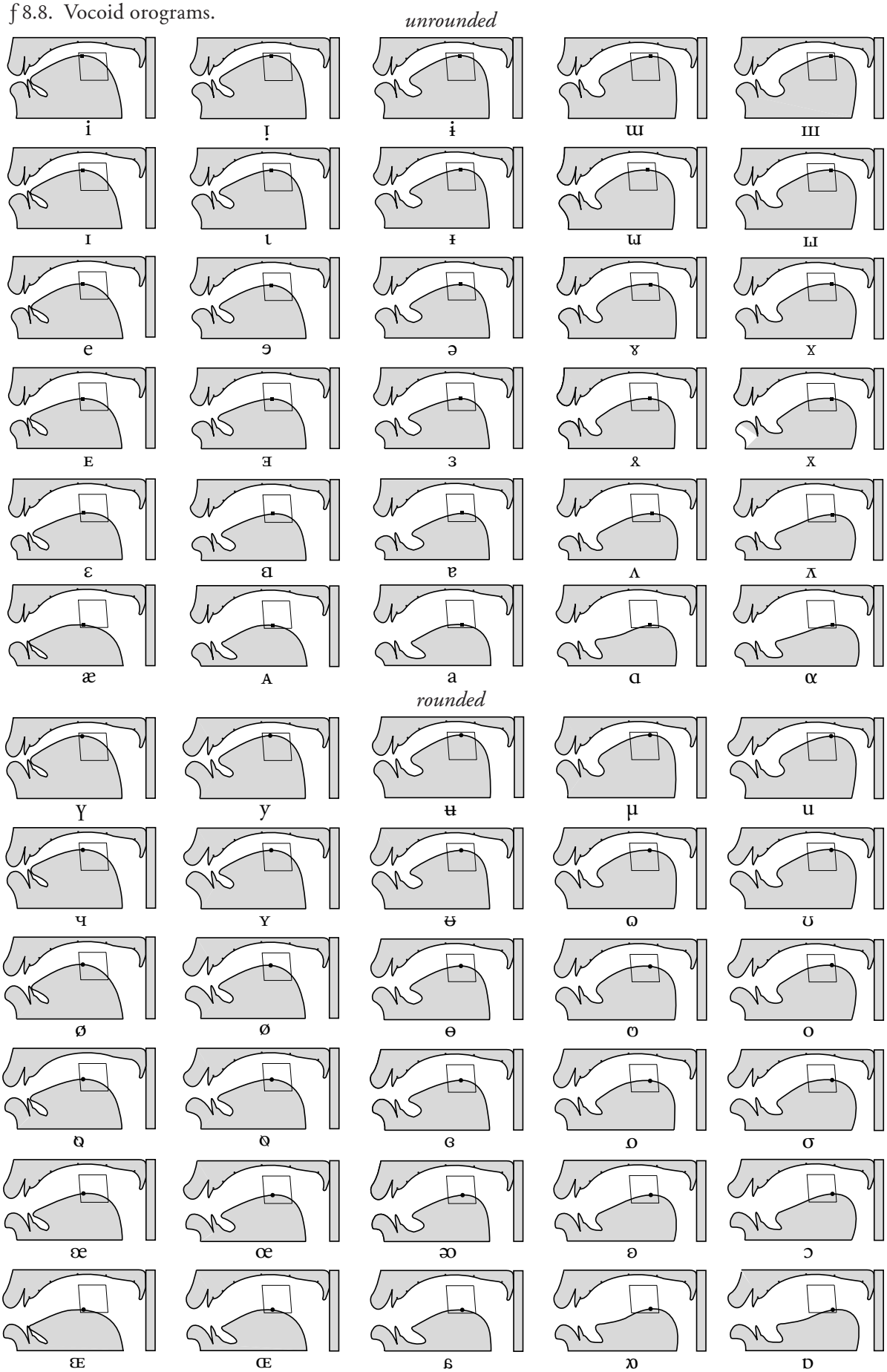
8.12. But let us now move on to a consideration of all of the vocoid articulations. We will proceed vertically, according to places of articulation, starting with the more simple vocoids, namely those without lip rounding (*fig* 8.8, upper part). For the sake of completeness, the 'virtual' vocoids are also present – with no gray background – with their symbols placed in double parentheses. The lower part of *fig* 8.8 gives the rounded vowels (30 in all, too, four of which are in parentheses).

To begin, we should observe the figures carefully; we will then provide examples. As can be seen readily, all of them are different from one another! Vowel orograms should not be considered hurriedly, lest important details be missed. For each one, the reader should seek to reach a sufficient level of competence in kinesthesia, so that they can be articulated while the figures are being inspected.

fig 8.9 shows the labiograms of the different vocoids. The reader should note that the first column, that of front vowels, is articulated with *spread* lips: [i, ɪ, e, ɛ, ɛ̞, æ]; all of the other unrounded vocoids have the lips in the *neutral* position. In the central column, we find the labiograms of the *half-rounded* vocoids, such as [i̜, ɞ].

While we are on the topic of rounding, we note that there are two different

ƒ 8.8. Vocoid orograms.



types of rounding. The more common one involves the addition of a certain amount of lip *protrusion* (*cf fig* 8.3 and *fig* 8.9), and is typical of the front-central rounded vocoids (such as [y]) as well as the back rounded ones (such as [u]). The other type is a sort of ‹*vertical*› rounding (as can be seen in *fig* 8.3 [*cf fig* 8.9, as well]). It is typical of front rounded vocoids (such as [ɣ]). Central rounded vocoids (such as [ʉ]) and back-central rounded ones (such as [µ]) can be articulated in either of the two ways, according to the language. For this reason, in the illustrations mentioned, these vocoids are placed in both categories (in brackets). In *fig* 8.9, the half-rounded vocoids also appear in brackets (and, in fact, they are not extremely common), while the 8 ‘virtual’ vocoids are placed in double brackets.

It will not be superfluous to emphasize that the *offIPA* vocoids, located as they are in their ‘potential’ trapezoid, without true subdivisions and with only a meager number of symbols available, seem to have been ‘forced’ together due to an anxiety for generalizations. This organization is responsible for the (not unduly scientific) ‘beliefs’ that [y], in reality, is merely [i] with rounding (the vocoid we denote [ɣ]), and that [ɯ] is actually [u] without rounding (the vocoid we denote [ɯ̽]). Instead, phonetic reality shows that [y] is a front-*central* rounded vocoid, while [ɯ] is back-*central* (unrounded).

8.13. For the purpose of learning and rationally memorizing the value and location of all of the elements of our vocogram, we will proceed through the various symbols, explaining their origin as well when this is useful. We will begin with the symbols for the 18 Jonesian cardinal vowels, considering *fig* 8.3 (and relying upon the orograms already provided, as well). These symbols will be considered according to the conventions of use which have developed over the course of time – particularly the practice of denoting the most widely used and most frequent sounds with the most normal symbols. In fact, at this point, some of the cardinal symbols have ceased to represent the sound they (theoretically) had originally, and now denote the values that were more commonly attributed to them (often including more than one of our boxes), because of being commoner in the languages of the world.

As other symbols are added, it becomes necessary to maintain the connections between the new symbols and the old ones, within the limits posed by keeping them clearly distinct and by the necessity of allowing them to be (relatively) easily written, by hand as well.

Given that the Latin alphabet served as a starting point, it was natural for the five vowel letters to represent the most frequent and normal sounds: [i, e, a, o, u]; these are used by many languages in stressed and unstressed syllables. In order to indicate the most frequent variants of [e, a, o], it was decided, logically enough, to denote more open vocoids, with respect to [e, o], with the symbols [ɛ, ɔ] (and, in fact, these symbols are literally *open*). In Portuguese, German, Italian and many other languages, we encounter ‘closed’ phonemes /e, o/ and ‘open’ ones /ɛ, ɔ/. (This terminology refers to the relationships between the two *e*’s and the two *o*’s, not to the extreme points on the vocogram which are *high* and *low* – officially *close* and *open*.)

A timbre different from [a] was shown by a variant in ‘cursive’, which was then

wisely 'straightened' and adapted to the type of character which is technically referred to as *roman*, or *plain*, or *non-italic*. The resulting character was [ɑ]. In the traditional pronunciation of French, it was important to distinguish between two different kinds of *a* sounds, a 'front' one and a 'back' one (but in reality, one is front-central, [ɐ], and the other back-central, [ɑ]), although in modern pronunciation, the phonemic nature of the distinction has been done away with, because the second timbre has been eliminated. In neutral English, whether American or British, the front *a* is a truly front vocoid, [æ], in opposition to [ɑː]. (For English and French as well, in regional variants, or even in pronunciations widely used in the media, the actual realizations can be notably different, *cf HPr* Ch 2 & 4.)

8.14. Continuing to pass through the symbols, the grapheme *y* was used, very intelligently (and with the inspiration of some northern European languages), for the front-central rounded vocoid [y], found in French *flûte*, [y], or in German *über*, [yː]. This freed the alphabet, finally, from the handicap of previous 'phonetic alphabets' (and some later ones as well!), namely, the use of diacritics to denote TIMBRES, instead of MODIFICATIONS OF TIMBRES, as would be more than logical. For this reason, 'symbols' such as '*/ü, ö, ä, ë, ï/*' are absurd, without mentioning 'masterpieces' like '*/õ̤/*', in place of [ˈœ̃ː].

Taking the graphemes *ø*, *œ* from European alphabets as well, it was then possible to represent the other two front-central rounded vowels which are most commonly found, [ø, œ]: in French *bleu* /ø/, *œuf* /œ/, and in German *schön* /øː/, *löschen* /œ/. To these, a small capital version was added, for the open vocoid, [œ] (which is often omitted from tables and lists due to its rareness, or because it was thought to be absent from real languages).

In the back region, the unrounded vocoids theoretically corresponding to [u, o, ɔ] were denoted, in this case as well with quite positive results, by [ɯ, ɤ, ʌ]. In reality, rather than being 'back' vocoids (as they would be theoretically), they are *back-central*, given that in the back region it is difficult to produce unrounded vocoids (since they would sound rather similar, while requiring a greater effort).

The cardinal symbols become 18 in all, with the simple, but clever, addition of [ɨ, ʉ], for the high central vocoids.

8.15. The next additions involved other distinctions which were important for the relative openness of several vocoids already present. In these cases, small capitals were used (wisely adapted to the dimensions of lower-case characters, even if the difference, though real, was not obvious; however, *noblesse oblige!*).

In this way, the lower-high vowels [ɪ, ʏ, ʊ] were obtained, corresponding to [i, y, u] (even though, in place of [ɪ, ʊ], the optional variants [ɪ, ʊ] were frequently found; we use these last for other, similar values, as will be seen shortly). With this expansion of symbols (and, naturally, in accord with the actual timbres of the vocoids), [ɪ, ʏ, ʊ] represent well the sounds of neutral German in *List*, *fünf*, *Lust* /lɪst, fʏnf, lʊst/. As it happens, [ʊ] is not a true small capital, (which would be '[ᴜ]', and this last is actually used by publishers who do not have the real symbol), but it is decidedly more conspicuous than the small capital, and also easier to write by hand.

The emaciated central area of the vocogram received three more elements, which are fundamental in British English, namely [ə, ɜ, ɐ], progressively opener (*ie* lower), as in *the murder* [ðəˈmɜˑɖɐ]. To these, [æ] was added, as in *hat* [ˈhæʈ]. As is well-known and as we have emphasized, this vocoid constitutes today the lower front limit of the modern scientific vocogram, even though the official trapezoid obstinately places '[a]' in this corner, while putting '[æ]' above it. The value of [ɐ] is clearly connected, in its shape as well, to that of our central [a]. In fact, if one were to use the official trapezoid rigorously, but rather blindly, [ɐ] would need to be used for Spanish or Italian *casa* (even for the stressed syllable!), since –among the few official symbols– [ɐ] is the one which is closer to the timbre in question. However, phonetics is an artistic, and also human, science and thus is capable of common sense (and of the possibility of expansion and adaptation), notwithstanding ridiculous and anachronistic refusals to move forward.

8.16. In the latest reform, three other vocoids have been added to the official trapezoid. One is the rounded vocoid corresponding to [ɜ], namely [ɞ] (which, appropriately, is similar to the unrounded symbol, while being closed off, given that the vocoid is rounded). This vocoid occurs, for example, in neutral New-Zealand English, as in *fur* [ˈfɞː], while British English has [ˈfɜː]. (In the early periods of the reform, from 1989 to 1993, the symbol was mistakenly flipped horizontally – in place of [ɞ], there appeared '[ə]', which in our system *canIPA* is used with a different value.) Another symbol is [ɵ], which represents a rounded vocoid, as is logical from the shape, with the addition of the horizontal line characteristic of central high vocoids. We find an example in the Netherlands Dutch *lus* [ˈlɵʂ]. In our vocogram, this new symbol corresponds completely to the SCHWA (/ˈʃwɑː/) [ə], naturally with rounding.

Officially, the other new symbol, [ɘ], ought to represent the unrounded vocoid corresponding to [ɵ]. However, given that in the official trapezoid, [ə] is extremely vague and generic (which denotes, more than anything else, 'not being on the periphery', and can refer to fully 17 of our symbols, in transcriptions of different languages by different authors!), we prefer to give [ə] its more normal and frequent value, which is the value officially attributed to '[ɘ]'. In this way, we can reserve the front-central value (not just central, but certainly higher-mid) for [ə], which, given its relationships of symmetry with other symbols, fits well between [e] and [ə]. It is used, very usefully, for the second element in the English diphthong of words like *fly* [ˈflaˑə] (rather than '/flaɪ/'; or '/flai/', which was very commonly used in a still earlier period).

canIPA vocoids

8.17. At this point, we move on to additional vocoid symbols, found in *canIPA*. These represent quite precise vocoids which are in no way secondary to those already treated. Beginning, again, with the *unrounded* ones, we have, between [i] and [ɨ], the high front-central vocoid, [ɪ̟], whose shape is clearly linked to that of

[i], but with a bit of difference. This vocoid occurs in Somali: *inan* [ˌɪ̣ːnan], or also in the Italian dialect of Bologna: *finîr* [fɪ̣ˈnɪ̣ir]. Below [ɪ̣], we find [ɪ], which is very common in English, for example in *lisp* [ˈlɪsp]. This symbol resembles the lower part of [e] (as is logical, given that the vocoid is similar to [e, ə] from an auditory point of view).

In the central box of the lower-high vocoids, we find the small capital version of [ɨ], namely [ɤ], as in German: *bitte* [ˈb̥ɪtɤ], which fits in well into the series of [ɪ, ʏ, ʊ]. At this point, however, the visual pattern of small capitals (which had to be interrupted earlier by [ɪ]), continues, to a certain extent, with [ɯ̟], clearly related to [ɯ], given that it is the lowered variant of this last. This vocoid occurs in Turkish: *karı* [kʌˈɾɯ̟].

A small-capital *e* (adapted perfectly, as always, to the correct dimensions) provides an ideal way to fill the urgent need for a front phone, halfway between [e] and [ɛ], which is therefore [ᴇ], as in English: *yes* [ˈjᴇs].

8.18. The mirror image of [ᴇ], that is [ɜ], can certainly be linked up to the parallelism between [e, ə], as can be seen from the vocogram. An example can be found in Mandarin Chinese: *rén* [ˊʐɜn]. The higher-low front-central vocoid, [ɐ], maintains a clear relationship with [ɛ], while naturally remaining distinct from it. We find this vocoid in Arabic: *walad* [ˈwɐlɐd]. The last element of this series is [ᴀ], as in French: *papa* [pᴀˈpᴀ], or Mandarin Chinese: *wān* [ˉwᴀn]. Frankly, it might seem, given the general pattern of the small capitals used elsewhere, that it would make more sense to use this symbol for the value we denote here by [a], thereby forming a (perhaps more 'harmonious') series '[a, ᴀ, ɑ]'. However, as we have already mentioned, the central value is for *a* by far the most normal and frequent one, in the languages of the world. For this reason, the order [ᴀ, a, ɑ] is fully legitimate, and logical as well. The back-central lower mid vocoid, [ɤ̞], clearly resembles both [ɤ] and [ʌ], which are on either side of it, vertically. We find this vocoid, for example, in Mandarin: *fēng* [ˉfɤ̞ɴ], and in Russian: *vodka* (*водка*) [ˈvɷ̟ɵtkɤ̞]. We represent the value theoretically denoted by '[ʌ]', that is, higher-low back, with the vocoid [ʌ], whose shape is similar to that of [ʌ] , given that the sounds are similar, though not identical. We encounter this vocoid in the Netherlands Dutch: *koud* [ˈkʌʊt], or in the Tyrolese dialect spoken in Alto Adige (in northeastern Italy): *wasser* [ˈßɒˢsʌ].

The actual cardinal value of '[ɑ]', in the trapezoid and in the records provided by Jones, is the rarely occurring [ɑ], which is found in Dutch: *Amsterdam* [ˌɑmsṭɛ̟ˈdɑm]. Instead, we use the symbol [ɑ], more logically, for the value found, for example, in British English: *car* [ˈkhɑː], in American English: *car* [ˈkhɑːɹ], and in very many other languages. The link between [ɑ] and [ɑ] is made even stronger by the fact that certain publishers, due to typographical limitations, would substitute [ɑ] with [ɑ].

8.19. We now move on to the *rounded* vocoids, pronounced with rounding of the lips. We mention again that the theoretical '[y, ø, œ, ɶ]' are in reality, front-central rounded vocoids; thus, it is appropriate to leave them with the values they have always had in practice. All that is left is to complete the sequence (including

[ʏ]), by adding the intermediate [ɷ], similar to [ø], but not identical, as with the other flipped or rotated symbols. We find it in French: *seulement* [sɷlˈmɔ̃].

If we move on to the true front rounded vocoids, we find only the two close ones, [ɣ, ɥ], as in Swedish: *ny* [ˈnɥɣ] (/ˈnyy/). The shapes, irrespective of any graphemic value for the second symbol, resemble one another (as lower-case and small capital, respectively), but are also similar to the nearby [y, ʏ]. It is therefore more useful and 'natural' to consider the more frequent ([y, ʏ]) as more 'canonical', and to derive [ɣ, ɥ] from these (instead of the other way round), by moving the tongue forward by an average of a couple of millimeters.

Moving on to the central rounded vocoids, it is logical to fill the gap between [ʉ, ɵ] by adding [ʊ̈], which can be found in Icelandic: *unna* [ˈʔʊ̈nⁿa]. Just as motivated, in its phonic value as well, is the use of [ɞ] for the higher-low vocoid in the series, as in Parisian and mediatic French: *bonne* [ˈbɞn], or in Swedish: *dörr* [ˈdɞɾ]. The low vocoid, [ɐ] sounds like an [a] with a sort of darkening added. This is caused by the rounding, which is necessarily not very strong, given that the vocoid is (so) low. This vocoid occurs in the rather broad English accents of Cardiff or Truro (Cornwall), as in *on* [ˈɐn]; or in the Dutch accents of Amsterdam or Leiden (or mediatic Flemish, as well): *kan* [ˈkɐn]; or in the broad accent and dialect of Bari (in southern Italy): *sante* [ˈsɐʌn̪d̪ə]. For these reasons, the connection with [a] is fairly solid and natural. Our symbol is preferable to the more bulky '[ɜ]', decidedly difficult to write by hand (the reader should try, if in doubt!), even though this last might seem more 'logical', in a series.

8.20. In the back rounded series, the addition of [σ] deserves some comment. It was added to fill in the lower-mid position, as in the other series. However, the shape of [o] cannot be effectively modified by rotations or reflections, nor by creating a small capital. For this reason, the only way to maintain the connection with the normal letter *o* was to use the Greek letter sigma (σ, disregarding its completely different value in Greek). Therefore, [σ] represents the timbre halfway between [o, ɔ], as found in English: *pour*, [ˈphσː(ɹ)] ([ɹ] is for the American pronunciation), or in Spanish: *moda* [ˈmσˑδa].

All of the back-central rounded series, [ɯ, ɷ, ʊ, ɒ, ɵ, ɤ], is nothing other than a modification of the back rounded series, and (some more, some less) all of the symbols resemble the others. For example, [ɯ] and [u]; [ɷ] resembles the corresponding unrounded vocoid ([ɯ], with the same location) as well, not just [ʊ]; [ʊ] resembles both [ɷ] and [o]; [ɒ] is derived from [σ], as well, by 180° rotation; finally, both [ɵ] and [ɤ] resemble, respectively [ɔ] and [ɒ], with modifications chosen from among the few still possible at this point.

Although phonemic transcriptions (but also those which seek to be phonetic) of French, by using /u, o, ɔ/, create the idea that this language has vocoids similar to those of Portuguese, or Italian, or German, the reality is quite different. In fact, in French (in 'modern' pronunciation), we find examples of all six of the back-central rounded vocoids, as in *pourtour* [pɷɤ̟ˈtɯːɤ̟], *monôme* [mɒˈnɷːm], *bonne* [ˈbɵn], *cent* [ˈsɤ̃]. In English, the symbol [ɷ] is necessary in words such as *look* [ˈlɷk].

In Tuscany as well, the Italian phonemes /u, o, ɔ/ are actually pronounced [ɯ,

ʊ, ɘ], at least as the basic form, with forwards or backwards diphthongizations possible in certain areas (as can be seen from the Tuscan phonosyntheses, for Florence, Siena, Pisa, Livorno/Leghorn, and Piombino, in ℭ 16). Here are a few examples in the pronunciation of Florence: *luna*, *dopo*, *modi* [ˈlμːnʌ, ˈdʊːɸʊ, ˈmɘːdi].

8.21. Now, keeping in mind the 52 orograms of ʃig 8.8 (placed at the end as an appendix for purposes of referral and checking, and with the 8 currently 'theoretical' ones as well), we will present briefly the symbols together with languages using these vocoids. The examples are not complete, since for now it is sufficient to run through the vowel phones quickly. In ℭ 15-23, the phonosyntheses of 320 tongues (ɨe languages, dialects, and variants are given). Further examples can be found there, as well as reliable information for beginning a rigorous study. *HPr* gives systematic treatments of the twelve languages there considered (together with variants of these): English, Italian, French, German, Spanish, Portuguese, Russian, Arabic, Hindi, Chinese, Japanese, and Esperanto.

Unrounded vocoids:

[i] *vivir* Spanish
[ɪ] *Kind* German
[e] *sete* [ˈseːte] Italian
[ɐ] *settecento* [ˌsɐt-] Italian
[ɛ] *sette* [ˈsɛtː-] Italian
[æ] *hat* English

[ɪ̟] *inan* [_ɪ̟ːnan] Somali
[ɪ] *bit* English
[ɘ] *bite* [ˈbaɘʈ] English
[ɜ] *bèn* Mandarin Chinese
[ɑ] *walad* [ˈwɑlɑd] Arabic
[ʌ] *lac* French

[ɨ] *ty* (= *мы*) Russian
[ɤ] *bitte* [-tɤ] German
[ə] *to be* [ʈə-] English
[ɜ] *fur* British English
[ɐ] *lover* [ˈlɐvɐ] British English
[a] *datar* Spanish

[ɯ] *zì/zǐ* Mandarin Chinese
[ɯ] *hammock* [-ɯk] English
[ɤ] *cè* Mandarin Chinese
[ɤ̞] *céng* Mandarin Chinese
[ʌ] *love* American English
[ɑ] *hot* American English

[ʌ] *paus* [ˈpʌʊʂ] Neth. Dutch
[ɑ] *kans* Neth. Dutch

Rounded vocoids:

[ɣ] *ny* [ˈnɣː] Norwegian
[ɥ] *ny* [ˈnɥɣ] Swedish

[y] *lune* French
[ʏ] *Glück* German
[ø] *deux* French
[ɷ] *sœurette* [sɷ-] French
[œ] *sœur* [ˈsœːʁ] French
[ɶ] *sœur* [ˈsɶɐ̯ʁ] Canadian French

[ʉ] *null* Norwegian
[ʊ̹] *nul* Flemish Dutch
[ɵ] *nul* Neth. Dutch
[ɞ] *fur* New Zealand English
[ɔ̹] *dörr* Swedish
[ɒ] *kan* [ˈkɒn] some Dutch accents

[μ] *vous* French
[ɷ] *look* English
[ʊ] *beau* French
[ɔ] *bonnet* [bɔ-] French
[ɘ] *bonne* French
[ɒ] *ân* [ʔɒːn] Persian

[u] *susurro* Spanish
[ʊ] *und* German
[o] *sotto* [ˈsotːto] Italian
[ʊ̟] *ottocento* [ˌʊ̟t-] Italian
[ɔ] *otto* [ˈɔtː-] Italian
[ɒ] *hot* British English

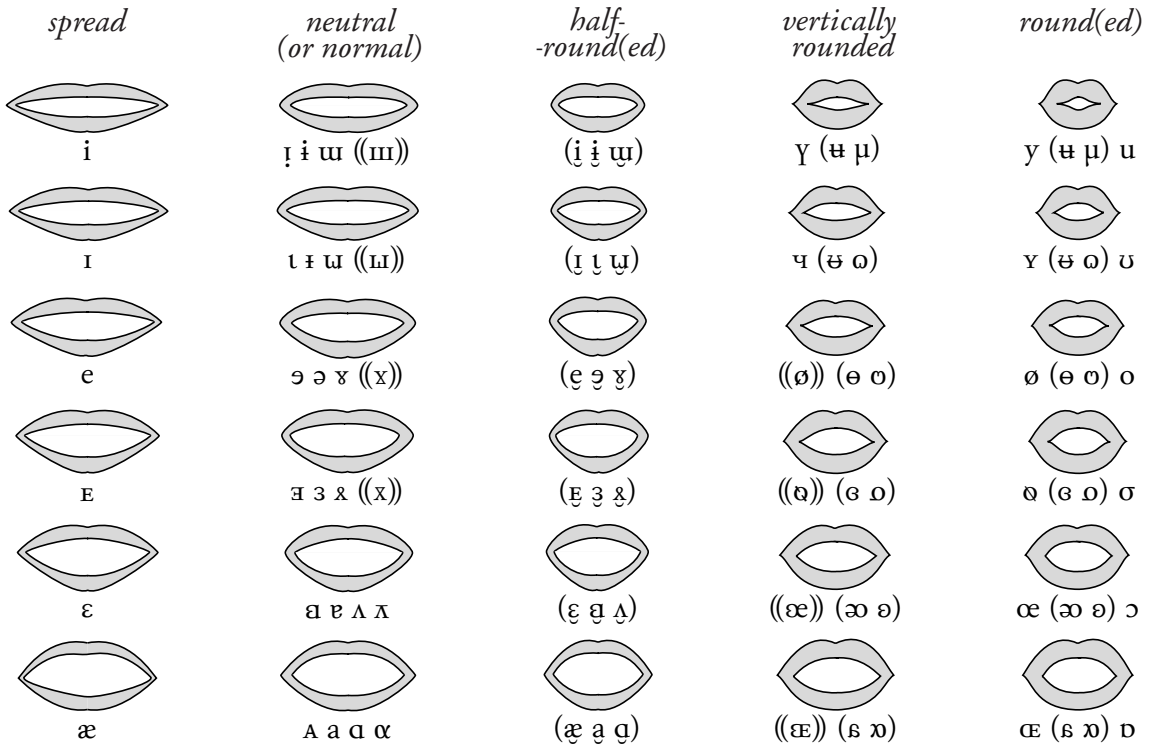
We will proceed according to places of articulation, rather than by manners – therefore, vertically, along the columns. (Here we give as well, in parentheses, the symbols for possible vocoids in the eight boxes which are currently empty.) We have, therefore: *front* [i, ɪ, e, ɛ, æ], *front rounded* [ʏ, ɥ, (ø, ɞ, œ, ɶ)], *front-central* [ɪ̟, ɪ, ɘ, ɜ, ɐ, ʌ], *front-central rounded* [y, ʏ, ø, ɞ, œ, ɶ], *central* [ɨ̟, ɨ, ə, ɜ, ɐ, a], *central rounded* [ʉ̟, ʉ, ɵ, ɞ, ɔ̹, ɐ], *back-central* [ɯ̟, ɯ, ɤ̞, ɤ̟, ʌ, ɑ], *back-central rounded* [µ, ɷ, o̞, o̟, ɘ, ɔ], *back* [(ɯ̠, ɯ̟, χ, χ̟), ʌ̠, ɑ], *back rounded* [u, ʊ, o, ʊ̠, ɔ, ɒ].

At any rate, it is naturally also useful to produce the horizontal series (by manners), as an exercise: *high* [i, ɪ̟, ɨ̟, ɯ, (ɯ̠)], [ʏ, y, ʉ̟, µ, u], *lower-high* [ɪ, ɪ, ɨ, ɯ, (ɯ̟)], [ɥ, ʏ, ʉ, ɷ, ʊ], *higher-mid* [e, ɘ, ə, ɤ̟, (χ)], [(ø), ø, ɵ, o̞, o], *lower-mid* [ɛ, ɜ, ɜ, ɤ̞, (χ)], [(ɶ), ɶ, ɞ, ɔ̹, ʊ̠], *higher-low* [ɛ, ɐ, ɐ, ʌ, ʌ̠], [(œ), œ, ɔ̹, ɘ, ɔ], *low* [æ, ʌ, a, ɑ, ɑ̠], [(ɶ), ɶ, ɤ̞, ɔ̹, ɒ].

8.22. The phonetic method makes it possible to conquer (with a bit of practice, that is, getting into the spirit of the method) the sounds of other languages and dialects, by starting from one's own. For this reason, we will now observe at least the *orograms* of the *twelve* vocoids which are the realizations of the actual monophthongal phonemes of present-day neutral British English (*fig* 8.6, with unstressed /i, u/, as in *react*, *influenza*), in order to provide an objective starting point (even though almost every native speaker has a regional pronunciation, at least to some degree). We give *labiograms* as well (*fig* 8.7, without showing the teeth), which are more functional and to the point, since they allow the viewer to concentrate on the essential elements without distractions.

While, for the languages indicated in § 8.21, the reader is referred to the *phonosyntheses* or to *HPr*, where they are dealt with, for the somewhat simplified *voco-*

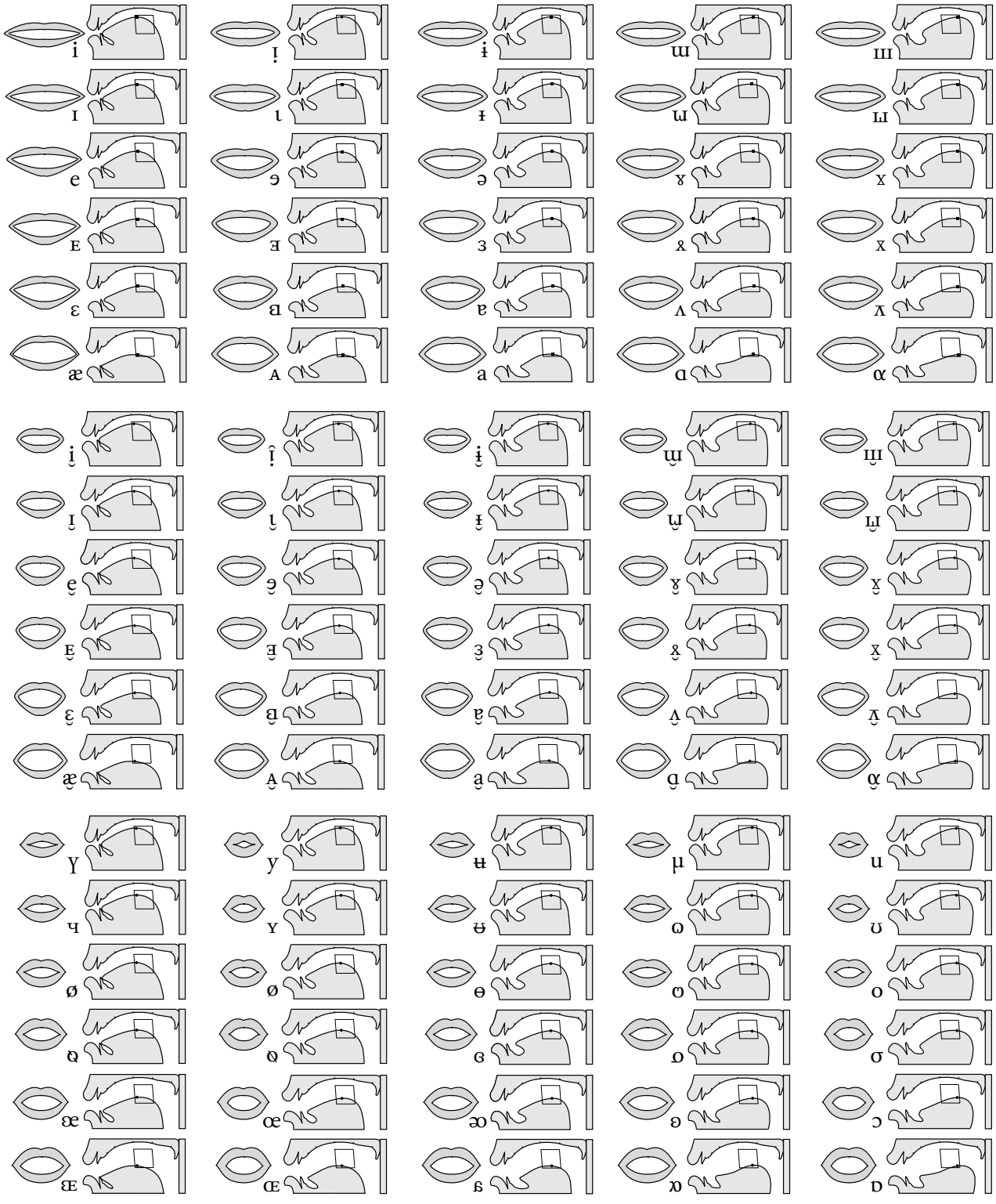
fig 8.9. Labiograms of the vocoids, including distinct (and intermediate) states.



grams of British English, we direct the reader back to *fig* 6.1.2 (and to ℭ 2 of *HPr*, for a fuller treatment of various English accents, with variants).

And now (*cf* 8.8), let us examine the 52 *orograms* necessary for describing adequately the languages and dialects of the world (with the 8 theoretical ones added as usual). It would naturally be helpful to look at the *vocograms* in the various pho-

fig 8.10. Labio- and orograms of all the vocoids, including distinct (and intermediate) states.



nosyntheses (and in *HPr*), and not just for study, but also to satisfy a simple (but legitimate, and healthy) scientific and human curiosity.

fig 8.9 gives *labiograms* for the vocoids, many of which naturally coincide (since different vocoids can have the same lip position). It will be useful to consider all of them carefully, proceeding with kinesthesia as necessary in order to produce each articulation, working from the more familiar to the less common ones. There are 5 types of lip position, with 2 which are more normal (*ie* neutral and rounded), and 3 complementary ones (*ie* spread, half-rounded, and vertically rounded).

For the sake of greater completeness, we give in *fig* 8.10 all of the possible vocoids, including both the 8 potential ones and also the 30 with intermediate lip positions (halfway between neutral and rounded), that is, half-rounded (shown by the appropriate diacritic).

Articulatory practice

8.23. Once the most common (or familiar, for a given person) vocoids have been located in the vocogram, it is necessary to find out their true positions, not just what one thinks they ought to be. It is also necessary to be able to pass from one sound to another, initially starting with the more familiar ones (as always).

To use kinesthesia to feel the different positions of the tongue and of the lips, it is singularly useful to articulate the sounds slowly, with great patience and care. It is particularly important to learn to articulate them *silently* – without letting air out and without 'voicing', or in other words without letting the vocal folds vibrate, even in the reduced manner present while murmuring. As it happens, voicing covers over and masks the essential movements, thereby distracting from the full sensation of kinesthesia. Whispering (voiceless lenis phonation) will be used later, as a compromise between the useful artifice of silent articulation and normal phonation of real speech.

It is only necessary to make a single attempt in order to see how our ability to perceive movements of the tongue and lips becomes incredibly expanded, if we concentrate only on the sounds, without any sort of phonation. (Of course, this does not mean that we should stop breathing.)

This is the practice of *silent introspection*, and it helps us to discover many unexpected and unsuspectable things. It is possible to add, instead of exhalation, a voiceless *inhalation* (performed in a noiseless way). In fact, if we articulate a phone (whether a vowel or consonant, but required to be *continuous*, *ie* without occlusion), and then inhale while maintaining the position of the phone, we become better able to perceive the point of articulation, because we are aided by the sensation of breeze caused by the incoming air. In the case of constrictive contoids, this sensation is naturally even more evident.

In the case of vocoids, one should try to practice pronouncing phones which are between those already known (including new ones that have already been learned well). Here again, silent introspection is a good method, in alternation with inhalation, whispering, and full voicing.

It is necessary to reach the point (at the beginning, with the help of a handheld mirror) where one is capable of feeling fully all of the *movements* of the *lips*, the *tongue*, and the *jaw*.

8.24. If we use neutral British English as a starting point, and continue to make reference to the general vocograms (*fig* 8.3 & *fig* 8.8-9), it will be possible to learn to produce phones which are near [ɪ] = [ɪ, ɨ], or [ɪ̞, ə]; near [ʊ] = [ʊ, ʉ̞], or [µ, ʊ]; near [ɛ] = [e, ɛ; ɜ]; near [σ] = [o, ɔ; ɒ]; near [æ] = [ɛ, a, ʌ]; near [ɒ] = [ɔ, ɐ, ɒ̝]; near [ɑ] = [a, ʌ, ɑ]; near [ɐ] = [a, ɜ] or [ʌ, ɑ]; near [ə] = [ɨ, ɜ], or [ɘ, ɤ]; near [ɜ] = [ə, ɐ], or [ɜ, ɻ]. Lip rounding can be added, while taking care not to change the position of the tongue, in cases like: [ɪ] → [ʏ]; [ə] → [ɵ]; [ɜ] → [ɞ], &c. Rounding can also be taken away, such as in: [ʊ] → [ɯ]; [ɒ] → [ɑ], &c.

Then, one can isolate the members which form the diphthongs of British English: [ɪi, ɛɪ, aə, σə, aʊ, ɜʊ, µu], [i, ɪ, ɛ, a, ə, ɜ; σ, ɒ, ʊ, µ, u], and then change their lip positions: [ɣ, ɥ, ɷ, ʁ, ø, ɞ; χ, ɻ, ɯ, ɯ, ɯ].

If we have already learned, or *phonetically felt* [y, ø, œ], or [ɯ, ɤ, ʌ], perhaps we instinctively articulate them as front-central rounded vocoids (and not *front* rounded ones, [ɣ, ø, œ]) and as back-central ones (not *back* unrounded ones, [ɯ, χ, ʌ]), respectively.

In the context of this exercise, it would be useful to succeed in producing even vocoids not currently found in any analyzed language, since the result would be progress in disciplining one's articulatory movements. At the same time, it is naturally clear that in languages such as French and German, front rounded vocoids ([ɣ, ɥ, ø, ɷ, œ]) should not be accepted in place of [y, ʏ, ø, ɷ, œ]; just as [ɯ, ɯ, χ, χ, ʌ] would not be appropriate in languages (Asian or otherwise), which have [ɯ, ɯ, ɤ, ɻ, ʌ].

Other exercises, which should also be carried out calmly and patiently (and in the beginning in silence, following one's progress carefully on the vocograms), involve producing homogeneous and gradual sequences of vocoids (at the initial, perhaps incomplete ones). Thus, it is possible to move along the columns, from the top to the bottom (and vice versa), as well as horizontally, from front to back (and vice versa). We have: [i, ɪ, e, ə, ɛ, æ], [u, ʊ, o, σ, ɔ, ɒ], [y, ʏ, ø, ɷ, œ, ɶ], [ɯ, ɯ, ɤ, ɻ, ʌ, ɑ], &c. Also: [æ, ɛ, ɛ, e, ɪ, i], [ɒ, ɔ, σ, o, ʊ, u], [ɶ, œ, ɷ, ø, ʏ, y], [ɑ, ʌ, ɻ, ɤ, ɯ, ɯ], &c. And still: [i, ɪ̞, ɨ, ɯ, (ɯ)], [ɪ, ɪ, ɨ, ɯ, (ɯ)], [e, ɘ, ə, ɤ, (χ)], [ɛ, ɜ, ɜ, ɻ, (χ)], [ɛ, ɑ, ɐ, ʌ, ɤ], [æ, ʌ, a, ɑ, ɑ] (and vice versa).

It is possible to do the exercises along diagonal movements, even though this is a bit trickier, since two parameters change each time instead of just one. For example: [i, ɪ, ə, ɻ, ɤ], [ɪ, ɘ, ɜ, ʌ, ɑ], or: [ɣ, ʏ, ɵ, ɒ, ɔ], [ɥ, ø, ɞ, ɐ, ɒ], &c. An exercise such as: [i, ʏ, ə, ɒ, ɤ], [ɪ, ø, ɜ, ɐ, ɑ] would be yet more complicated, but certainly not useless; here changes in all three parameters occur together.

Another exercise, which is quite a bit less difficult, but certainly not useless, involves alternating the two fundamental positions of the lips, while moving vertically and horizontally (in the two directions; and, as always, in silence at the outset): [i → ɣ], [ɪ → ɥ]; [ɨ → ʉ̞]; [ɪ̞ → y], [ɪ → ʏ], [ɘ → ø], [ɜ → ɷ], [ɑ → œ]; [ɯ → µ], [ɯ → ʊ], [ɤ → ʊ], [ɻ → ɒ], [ʌ → ɐ], [ɑ → ɒ̝]; and [ɒ̝ → ɑ], [ɐ → ʌ], [ɒ → ɻ], [ʊ → ɤ], [ʊ → ɯ],

[μ → ɯ]; [œ → ɐ], [ɷ → ɜ], [ø → ɵ], [ʏ → ɪ], [y → ɪ̟]; [ɥ → ɪ], [ɣ → i]; [ɧ → i̟], &c. Clearly, checking the position of the lips and of the tongue (when possible), in a mirror, can be a great help.

In the case of the lips, however, it is certainly practical to start with the vocoids of one's own language, even if not a neutral variety. From this point, rounding can be taken away (or added, depending on the case), as we have already seen above. And still more exercises can be imagined...

8.25. There are various quantitative dimensions associated with the articulations of vocoids: the opening of the jaw with respect to the front teeth, the distance from the palate to the back of the tongue, as well as the distance between the lips in the case of rounded and unrounded vocoids. We can give average measure ments in these cases, to be found in *fig* 8.11 (in correlation with the six adjoining bands of *fig* 8.3).

fig 8.11. Average measurements for the different vocoids.

vocoids	*lips, for rounded V*	*lips, for un-rounded V*	*between the teeth*	*from palate to tongue*	*reference to the boxes*
high	4 mm	6 mm	4 mm	6 mm	5-7 mm
lower-high	6 mm	9 mm	5 mm	8 mm	7-9 mm
higher-mid	8 mm	12 mm	6 mm	10 mm	9-11 mm
lower-mid	10 mm	15 mm	7 mm	12 mm	11-13 mm
higher-low	12 mm	18 mm	8 mm	14 mm	13-15 mm
low	14 mm	21 mm	9 mm	16 mm	15-17 mm

But, on the other hand, it is apparent that we can pronounce [i, ɪ, ɪ̟, ɘ, ɛ, æ, a, ɐ, ɜ, ə, ɑ; ɒ, ʊ, ɔ, ɷ, μ, u] fairly clearly, both with our teeth together, as well as with two fingers placed between the teeth, to create an artificial opening of at least 30 mm. In fact, the mouth uses various compensatory adjustments to continue to speak in a satisfactorily comprehensible way.

It is sufficient to remember that we generally are understood even when speaking (bad-manneredly) with food in our mouth, or (more tolerably) while sucking on a candy. The mouth uses appropriate adjustments also when certain consonants are found near the vowels. In order to produce the grooved consonants /s, ʃ/, as in *sassy*, *shush!* [ˈsæsi; ˈʃɐʃ, ˈʃʌʃ], or in Italian *sasso* and *Sciascia* [ˈsasːso, ˈʃaʃːʃa], there has to be very little jaw opening – in fact, the teeth are quite close together (as can be seen in *fig* 6.12 & *fig* 9.1 as well). Now, in order to produce [s, ʃ] with an [æ, a] in the middle, it is natural for the [æ, a] to become adapted to these circumstances, by being pronounced with less opening (as can be easily seen with a handheld mirror).

Naturally, the physical structure (of the articulatory apparatus) of the speaker makes the picture more varied, as we move from the average case to particular ones. A small child and a big man almost 7 ft tall will have correspondingly different measurements, which can be different (smaller for the child, bigger for the man) by as much as 50%. This is without considering other communicative variables – if a person yells in anger, or two lovers speak softly together, the configuration of the phonoarticulatory apparatus changes radically, and this change is also

due to the paraphonic characteristics which are added (cf Ch 14).

Human language is so complex and organized, but at the same time adaptive, that any 'speaking' machine (both for encoding and, especially, for decoding messages) remains far away from being convincing, or even from being able to communicate effectively. This is true even without taking into account the more complicated and remarkable semantic and conceptual aspect of the problem.

Diphthongs: one phoneme or two?

8.26. The question of whether diphthongs should be considered *mono*-phonemic or *bi*-phonemic is easily resolved by considering the facts of the matter, not just theoretically, but according to practical phonemics.

Beforehand, we observe that it is appropriate to use the Latin prefix (*bi-*) instead of the Greek one (*di-*) – even though the opposition is with *mono-* (Greek). The reason is to avoid uncertainties and ambiguities with related terms, such as *diphonic*, which refers to pairs of phone(me)s with the same articulation (in place and manner), but with different sorts of phonation: *eg* [p, b] /p, b/.

The other similar term, but only lexically, is *diaphonemic*, which refers to functional entities belonging to a given system, but showing differences with regard to accents. In a single language, it is frequently important to differentiate social or geographical accents. This occurs, for example, in the case of British and American English – from a diaphonemic transcription such as /ˈgɔʊ, ˈsuup, ˈhɐt, ˈlæ̝st, ˈlɒ̝st, ˈhə˞i, ˈkɑ:ɻ, ˈbɛɾə̝ɻ, ˈnjuu/ &c (*go*, *soup*, *hut*, *last*, *lost*, *hurry*, *car*, *better*, *new*), it is then possible to derive the British phonetic transcription ([ˈgɜ˖ʊ, ˈsμup, ˈhɐɾ, ˈlɑ˖sɾ, ˈlɒsɾ, ˈhɐɻi, ˈkhɑ:, ˈbɛɾɐ, ˈnjμ˖u]), and the American one ([ˈgɔ˖ʊ, ˈsʊup, ˈhʌɾ, ˈlæsɾ, ˈlɔ˖sɾ, ˈhɻ˖i, ˈkhɑ:ɹ, ˈbɛɽɻ, ˈnʊ˖u]).

In Italian, as in Spanish and many other languages, diphthongs are sequences, which are also as such in writing, by combining the normal symbols which are available: they are, consequently, *biphonemic* sequences. These sequences are formed by simply combining the various vowel phonemes, with their normal realizations (subject only to certain limitations on which combinations are possible, due to historical and contingent reasons). The most frequent Italian diphthongs (the true diphthongs, correctly excluding sequences of /CV/, as in /jɛ, wɔ, ja, wa/, cf § 5.2-3) are: /ai, ia, ie, io, au/, followed by: /ɛa, ɛe, ɛi, ɛo, ɔi/, and: /ɛu, eu, ei, oi/. The diphthongs /ae, ɔa, ɔe, ea, ua, ue, ao, ɔo, eo, oa/ are decidedly less frequent, while /oo, ui, iu, ii, ee, aa/ are still rarer. If we do not restrict ourselves to words, but count phrases and sentences as well, Italian has examples of all phonic diphthongs possible, including /ɔu, ou, uu/ (cf § 5.1.2-3 of *M^{a}PI*).

We will give only a few examples, from the most to the least common: *partirai*, *fattoria* /partiˈrai, fattoˈria/ [ˌpaɾtiˈra˖i, ˌfattoˈri˖a] (both with three syllables), *sono urgenti* /sonourˈʤɛnti/ [ˌsonourˈʤɛn:ti] (sequence of four syllables).

The choice of whether to indicate diphthongs explicitly or not depends naturally on functional and statistical factors, not just distributional and structural ones.

Thus, in Italian (and in similar languages, such as Spanish and Portuguese, &c),

it is normally possible to avoid making lists of all the diphthongs (or vowel sequences) available. Equally, one generally does not make lists of all of the consonant sequences, among other reasons, because it would not be easy to be certain of giving really complete lists (or tables). The only way to be sure of the results would be to manage to consider all the scientific, technical, and rare words, while including only 'official' words, but leaving out connected utterances.

8.27. The Germanic languages, instead, have systematic inventories of diphthongs, even though the orthographies are normally not so systematic, often presenting multiple ways of writing restricted and recognizable phonemic entities (for reasons having to do with the historical evolution of languages).

For example, within words in English, we have the following diphthongs: [ɪi, ɛɪ, aə, aʊ, ɜʊ/ʊʊ, µu/ʊu, ʊə] (excluding, for now, cases like *hear*, *care*, *hears*, *cares*, *hearing*, *caring* /ˈhɪəɻ, ˈkɛəɻ; ˈhɪəɻz, ˈkɛəɻz; ˈhɪə̯ɹɪŋ, ˈkɛə̯ɹɪŋ/, in order to avoid complicating excessively our development – given in diaphonemic transcription). These diphthongs are clearly *mono-phonemic*, first of all because they are paradigmatically in opposition both to other diphthongs, and to simple /V/, as in: *leak* [ˈlɪik], *lake* [ˈlɛɪk], *like* [ˈlaɔk], *Luke* [ˈlµuk/ˈlʊuk], *look* [ˈlʊk], *lick* [ˈlɪk], *lack* [ˈlæk], *lock* [ˈlɒk/ˈlɑk], *luck* [ˈlɐk/ˈlʌk] (where the slashes are used to separate British and American pronunciations).

Secondly, they are mono-phonemic also because their phonetic *realization* is not derived from the individual symbols within each diphthong, but globally. Should we go on to consider other English accents (such as the more than 200 given in E*Ps*), the phenomenon would become even clearer, as many variations are encountered which depart considerably from the (dia)phonemic representation (cf the examples given in § 1.5).

Moreover, in English it is not possible to find examples of single segments or symbols, such as /a, ɔ/, but only /ɑː, ɔː/, unless we should go back to obsolete notations, such as /a, aː, ɔ, ɔː, ai, au/ for /æ, ɑː, ɒ, ɑː, aɛ, aʊ/. The last two of these are still given today as /aɪ, aʊ/, even though the real and normal articulation is [aə, aɒ]; but this is the maximum amount of precision and refinement to be found, for the time being, in internationally printed works.

We will briefly, as an example, look into the case of /ɪəɻ, ɪə̯ɹ/, which presents a complication due to the existence of two fundamental types of neutral English accents, British and American. As elsewhere, the problem is resolved diaphonemically. American English is 'rhotic', or in other words *r* is pronounced in all cases, not just when transcribed /ɹ/ (*ie* in front of vowels), but also as the diaphoneme /ɻ/ (*ie* in word-final position, or before a consonant): *hear*, *hears*, *hearing* /ˈhɪəɻ, ˈhɪəɻz, ˈhɪə̯ɹɪŋ/ [ˈhrːɻ, ˈhrːɻz̩, ˈhɹɪŋ]. British English, on the other hand, has not been rhotic for about the last three centuries, and has therefore become 'non-rhotic': [ˈhɪːɐ, ˈhɪːəz̩, ˈhɪəɻɪŋ]. From the transcriptions, it can be seen that British English has diphthongs in these cases as well (and in the case of /ɛəɻ, ɛə̯ɹ; ɷəɻ, ɷə̯ɹ/, too).

8.28. It is certainly true that in English, there are also other vowel sequences, which form triphthongs. However, in these cases we are always dealing with com-

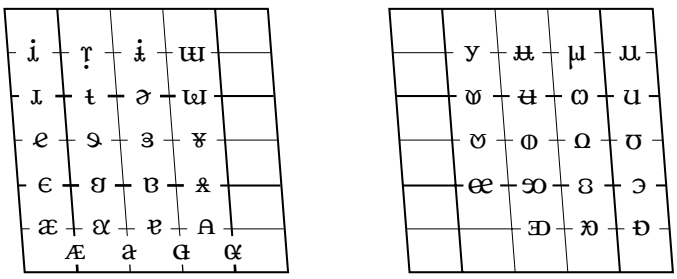
binations of elements which have already been seen elsewhere. For example, British English has: *higher* /ˈhaɛəɻ/ [ˈhaəɐ], *tower* /ˈʈaʊəɻ/ [ˈʈhaʊɐ], *slower* /ˈslʊɷəɻ/ [ˈslɜɷɐ], and in both accents we have: *Hawaii* /həˈwaɛi, -ˈwɑːi, -ˈwɑːii/ [hɯˈwaəi, -ˈwɑˑi, -ˈwɑˑii], *Haweis* /ˈhʊːɪs, ˈhʊɛs/ [ˈhɔˑɪs^{a}, ˈhʊˑɪs^{b}, ˈhʊəs], *Louis* /ˈluuɪs, ˈluuəs, ˈluui/ [ˈlʊuəs^{a}, ˈlɻuɪs^{b}, ˈlʊui^{a}, ˈlɻui^{b}]; also, in the word *idea*, the neutral British pronunciation is generally: /aɛˈdɪə/ [aəˈɖˑɐ], while the American one is: /aɛˈdiiə/ [aəˈɖɪiʌ].

German has three *monophonemic* diphthongs: /ae, ao, ɔʏ/ [ae, ao, ɔʏ], which have, inevitably, many different realizations in different accents. These can be seen in ℭℌ 5 of *HPr*, or especially *German PronunciationS*, and also in the dialect phonosyntheses of ℭℌ 17, in *NPT*: Alsatian, (Munich) Bavarian, Luxembourger, Mocheno German (Italy), (South Tyrol/Alto Adige) Tyrolese (Italy), Viennese, (Zurich) Swiss German. In these other dialects, other diphthongs can be found, of a centralizing type, which can be generically described as /iə, yə, uə/. Phonetically, there is much more variety than the phonemic or graphemic notation of many descriptions would encourage one to think.

For the sake of simplicity, we now consider the typical realizations of the three canonical phonemes in just the broad regional accents of Vienna and Zurich. Given the examples *Eis*, *Haus*, *neun* /ˈaes, ˈhaos, ˈnɔʏn/, in neutral German, we have: [ˈʔaes, ˈhaos, ˈnɔʏn], while in the accent of Vienna: [ˈɛəs/ˈæɜs, ˈhəʊs/ˈhɒɒs, ˈnɔə̯n/ˈnʌʏn/ˈnɐɞn] (also [ɔø, œø])], and in that of Zurich: [ˈʌiz̥, ˈhɐɻz̥, ˈnɞin/ˈnəin]. If we were, for the sake of hypothesis, to consider the three diphthongs as bi-phonemic, that is, formed from combinations of five independent elements, such as /e, a, ɔ, o, ʏ/, the diaphonemic aspect of the transcription would be lost, thereby rendering this sort of transcription of no utility.

8.29. As happens with contoids, also for vocoids some special *halfway* symbols may be necessary, if we want to avoid having to decide almost on the toss of a coin which symbol to use, as when within *^{off}IPA*, two different transcribers might chose either [e] or [ɛ], [o] or [ɔ], [a] or [ɑ], for actual [ɐ, ʊ, a]. These further *^{can}IPA* symbols can be useful, when we want to highlight articulatory nuances between different accents of one language, as well. For Spanish and Italian, for instance, it could be expedient to use symbols which are astride two (or even four, ɕf *fig* 8.15) others: [e/ɐ] ⟦ɐ⟧, [ɐ/ɛ] ⟦ɛ̞⟧; [o/ʊ] ⟦ʊ̞⟧, [ʊ/ɔ] ⟦ɔ̞⟧; [ʌ/a] ⟦a̞⟧, [a/ɑ] ⟦ɑ̞⟧; even astride: [i/ɪ] ⟦ɪ̞⟧, [ɪ/e] ⟦ɪ̞⟧, [u/ʊ] ⟦ʊ̞⟧, [ʊ/o] ⟦ʊ̞⟧. This last series might be useful for variants of German as well, together with [y/ʏ] ⟦ʏ̞⟧ and [ʏ/ø] ⟦ʊ̈⟧. Besides, the following could come in handy as well [ɛ/æ] ⟦æ̞⟧, [æ/ʌ] ⟦æ̝⟧, [ɑ/ɑ̈] ⟦ɑ̈⟧; and [ɔ/ɒ] ⟦ɒ̞⟧.

fig 8.12. Possible 'special' symbols for intermediate *^{can}IPA* vocoids.



For the sake of completeness, *fig* 8.12 shows the 42 halfway symbols for vocoids which could actually be useful. As a matter of fact, it concerns cases where any decision to use either symbol between more normal ones could conceal some important realities. These symbols can resolve this dilemma over the best way to render nuances accurately, avoiding troublesome and ugly diacritics (and, indeed, ambiguous ones), just as we decided to do also for certain contoids, which are typical of particular languages or variants).

The first vocogram shows the unrounded 'halfway' vocoids; the second, the rounded ones. But it is recommended to use (some of) them in cases of real necessity and, above all, if one actually knows how to do it. Otherwise, 'normal' *canIPA* symbols –or even *offIPA*– should be sufficient. In certain books and websites one can even find official quadrilaterals very much alike for different languages (with markers absurdly placed exactly on *cardinal* points).

*can*IPA vocoids & correspondent *off*IPA symbols

[i] '[i]' (=)
[ɪ] '[ɪ]' (≡)
[e] '[e]' (=)
[ɐ] '[e̞] or [ɛ̝]'
[ɛ] '[ɛ]' (=)
[æ] '[a]' (≠)

[ɪ̈] '[i̽], [ï] or [ɨ̞]'
[ʊ] '[ɪ̽] or [ɪ̈]'
[ɘ] '[e̽], [ë] or [ə̞]'
[ɜ] '[ɛ̆] or [ĕ]'
[ɑ] '[å] or [ë], [ɛ̽]'
[ʌ] '[ä] or [a̽]'

[ɨ] '[ɨ]' (=)
[ɤ] '[ɨ̞] or [ə̽]'
[ə] '[ə] or [ə̞]'
[ɜ] '[ɜ]' (=)
[ɐ] '[ɐ]' (=)
[a] '[ä] or [ɐ̞]'

[ɯ] '[ɯ̈], [ɯ̟]'
[ɯ] '[ɯ̆], [ɯ̟̆], [ɯ̟̈] or [ɤ̈]'
[ɤ] '[ɤ̞] or [ɤ̈]'
[ɤ] '[ʌ̆], [ʌ̈] or [ɤ̆], [ɤ̈]'
[ʌ] '[ʌ̟], [ʌ̈]'
[ɑ] '[ɑ̟], [ɑ̈]'

[ɯ] '[ɯ]' (≠)
[ɯ] '[ɯ̟] or [ɤ̟]'
[ɤ] '[ɤ]' (≠)

[ɣ] '[ɣ]' (≠)
[ʏ] '[ʏ]' (≠)
[ø] '[ø]' (≠)
[ɵ] '[ø̞] or [œ̝]'
[œ] '[œ]' (≠)
[ɶ] '[ɶ]' (≠)

[y] '[ÿ], [ȳ]'
[ʏ] '[ÿ], [ʏ̄]'
[ø] '[ö], [ø̄]'
[ɵ] '[ŏ̞], [ö̞] or [ŏ], [ø̞̈]'
[œ] '[ö̞], [œ̄]'
[ɶ] '[ö], [ɶ̄]'

[ʉ] '[ʉ]' (=)
[ɵ] '[ʉ̞] or [ɵ̞]'
[ɵ] '[ɵ]' (=)
[ɞ] '[ɞ]' (=)
[ø] '[ɵ̞]' (≠)
[ɐ] '[ɞ̈]' (≠)

[μ] '[ü], [u̟]'
[ʊ] '[ü], [u̟]'
[ʊ] '[ö], [o̟]'
[ɔ] '[ɔ̆], [ɔ̟̆] or [ŏ], [ŏ̟]'
[ɘ] '[ɔ̈], [ɔ̟]'
[ɒ] '[ɒ̈], [ɒ̟]'

[u] '[u]' (=)
[ʊ] '[ʊ]' (≡)
[o] '[o]' (=)
[ʊ] '[ɔ̟] or [o̟]'
[ɔ] '[ɔ]' (=)
[ɒ] '[ɒ]' (=)

[i̽] '[i̽] or [y̽]'
[ɨ̞] '[ɨ̞] or [ʉ̞]'
[ɯ̟] '[ɯ̟̆] or [ŭ̟]'

[ɪ̽] '[ɪ̽] or [ʏ̽]'
[ʊ̽] '[ɪ̽̄] or [ʏ̽̄]'
[ɯ̟] '[ɯ̟̆] or [ŭ̟]'

[e̽] '[e̽] or [ø̽]'
[ə̞] '[ə̞̄], [ë̞] or [ɵ̞̄]'
[ɤ̟̈] '[ɤ̟̆], [ɤ̟̈] or [ɵ̞̆], [ɵ̞̈]'...

[ɛ̽] '[ɛ̽] or [œ̽]'
[ɐ̞] '[ɐ̞̄] or [œ̞̄]'
[ʌ̟] '[ʌ̟̆], [ʌ̟̈] or [ɔ̞̆], [ɔ̞̈]'

[æ̽] '[ă̞] or [ɶ̞̆]'
[a̽] '[ä̽] or [ɐ̞̈] or [œ̞̈]'
[ɑ̟] '[ɑ̟̆], [ɑ̟̈] or [ɒ̞̆], [ɒ̞̈]'.

8.30. We now present systematically our 60 vocoids (omitting the 'special' ones) and their correspondents among the 28 official ones; this task will obviously require adding a fair amount of diacritics to the official ones, if they are not to remain generic and vague. We give the eight potential vocoids as well, so that the differences can be better understood – in fact, as we have already mentioned, in our system the more normal and natural values are given to the traditional symbols. We include 18 with intermediate lip position, as well. We show by (=) perfect coincidence in the use of symbols, by (≡) an approximate coincidence, and by (≠) a conflict between the two systems.

8.31. Going back to *canIPA* vocoids, let us notice that with [e̹, o̹] we indicate backing or fronting of the dorsum (whereas *offIPA* uses [e̠, o̠] for this purpose, but [e̹, o̹] for the so-called 'retracted/advanced tongue root'. Instead, in our system [_] indicates spread or neutral lip-position, as in the general symbol [V̲]. (Let us also observe that paraphonically ⟨V̲⟩ indicates an added smile while speaking; whereas ⟨V̲⟩ shows pouting, *cf fig* 8.14.)

We have seen (*cf fig* 8.9-10) that, when using actual –not generic– symbols, it can be useful to be able to indicate an intermediate lip-position between neutral (and spread as well) vocoids and rounded ones, as in [ɘ, ɵ̞, ø] or [ɤ, ɤ̞, ɔ], *cf fig* 8.13. However, it could be important to be able to also distinguish further degrees such as [ɘ, ɵ̞, ø̞, ø, ø̟] or [ɤ, ɤ̞, ɔ̞, ɔ, ɔ̟]. In fact, sometimes it is useful to show *slightly* delabialized phones, such as the third elements in the series just given, [ø̞, ɔ̞], or else *slightly* labialized phones, such as the second ones, [ɵ̞, ɤ̞]. When these notations are useful and used, we have to explicitly indicate that it is not the plain intermediate position between unrounded and rounded vocoids, *ie* half-rounded ones (*fig* 8.13), as can be seen from *fig* 8.14. In addition, if necessary, the last elements of the series given above are used to indicate that (already) rounded vocoids are over-rounded, [ø̟, ɔ̟] (*fig* 8.14).

Also for central approximants, above all, it could be useful to distinguish degrees of labialization, as for instance in: [ʉ̜, ʉ̟, w̜, w, w̟].

fig 8.13. Scale of *three* labial positions.

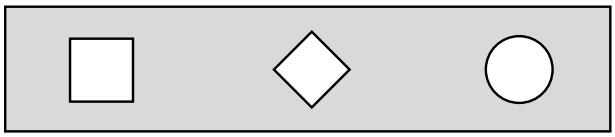
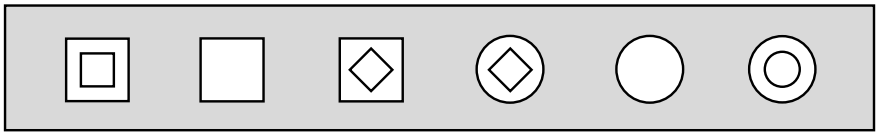


fig 8.14. Scale of *six* labial positions (the first is paraphonic as the last one can be).

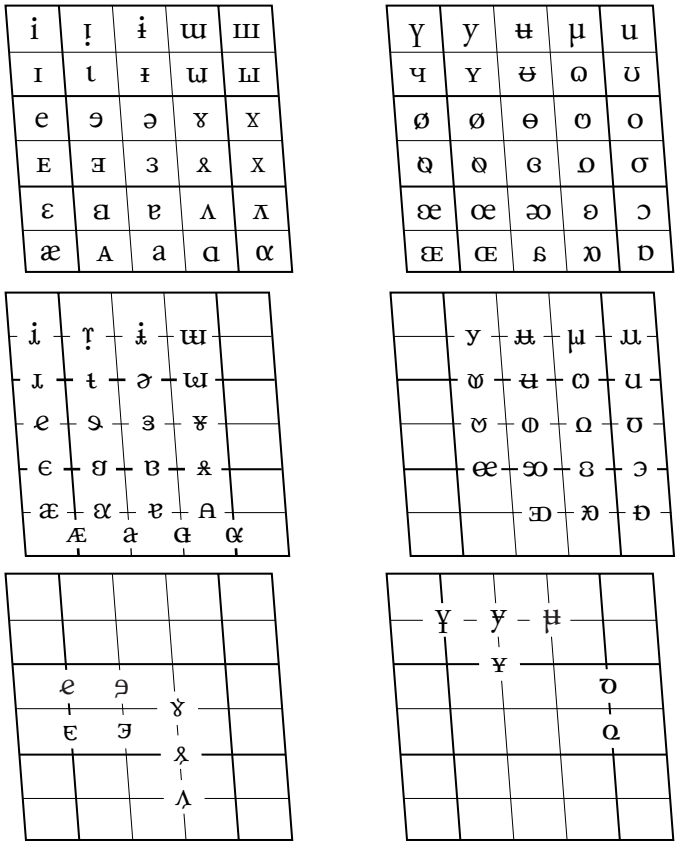


Appendix

Intermediate vocoids

8.32. Considering *fig* 8.12, let us expand a bit the number of possibilities for 'special' –or halfway– symbols for intermediate *canIPA* phones. For easier comparisons, we show normal *canIPA* vocoids, followed by those of *fig* 8.12 (mostly for vertical insertions), adding a further possible set of special intermediate vocoids (for crosswise insertions, between two or four other symbols). Of course, these are not really necessary. But, indeed, they could be useful to distinguish between accents of a same language, when other 'special' symbols are already used to show timbre nuances, which might be important not to ignore.

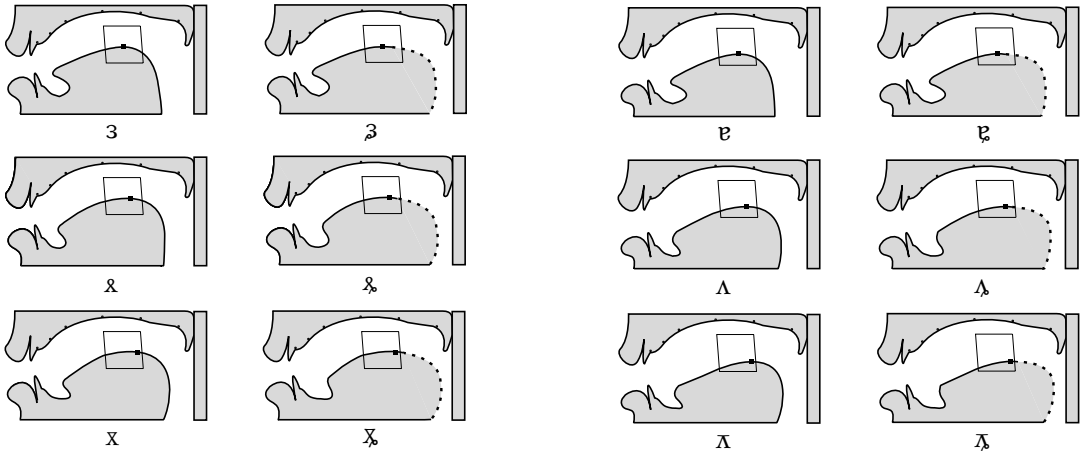
fig 8.15. Further possible 'special' symbols for crosswise intermediate *canIPA* vocoids.



Uvulo-pharing(e)alized vocoids

8.33. To accurately describe certain pronunciations of German, for instance, we need to identify at least six such vocoids, that we show side by side with their plain correspondent vocoids.

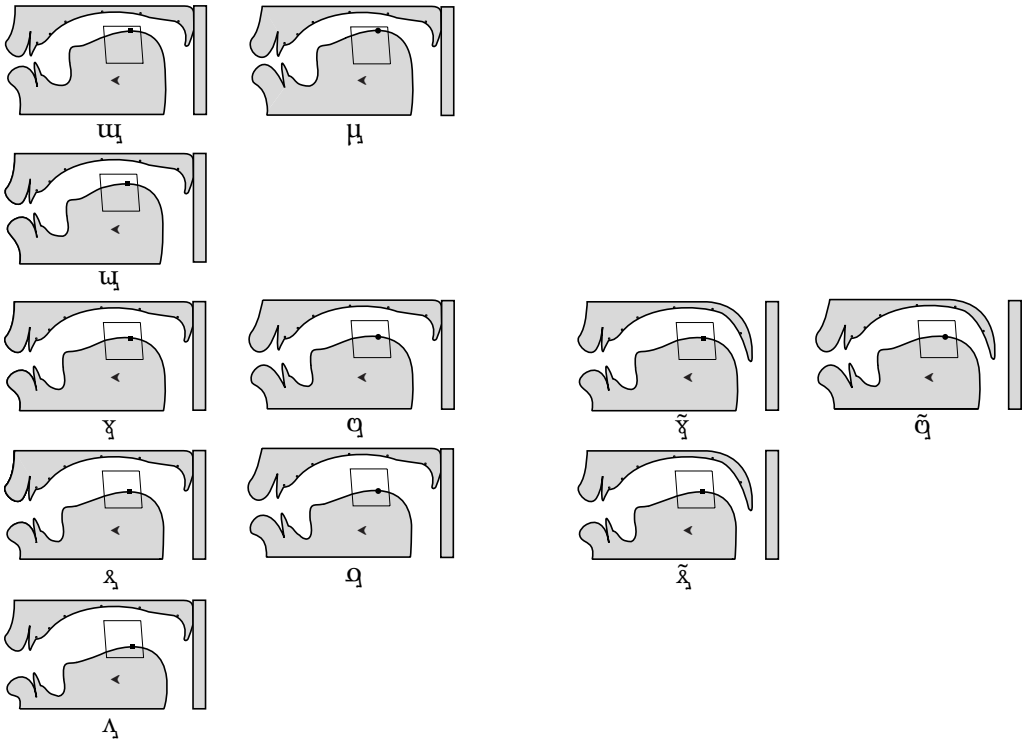
fig 8.16. Some uvulo-pharyng(e)alized *canIPA* vocoids.



Lateralized (or latero-contracted) vocoids

8.34. Equally, to accurately describe the neutral pronunciation of Mandarin Chinese, we need to identify at least eleven such vocoids, that we show side by side with their plain correspondent vocoids.

fig 8.17. Some lateralized (or latero-contracted) *canIPA* vocoids.

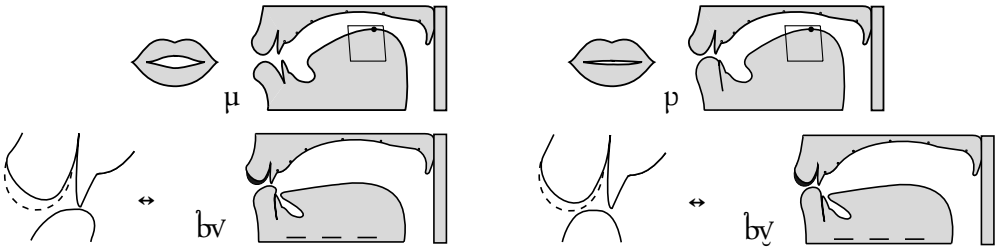


Labiodentalized vocoids

8.35. To describe the mediatic accent of the Netherlands, we need at least a labiodentalized vocoid taxophone, [ɒ], that we compare with its plain rounded counterpart, as a general vocoid, [ɯ] (though Netherlandic has [u] for /u/). It can occur for /VuV/, mostly /Vuə/, which often becomes [VʊV, Vʊə], and thus [VɒV, Vɒə], as in *duwen*. (By the way, let us notice that /ʊ/, in International Netherlandic, is rather /β/, and that it is no good idea at all to show it as /w/.)

In the same mediatic accent, before *V* (not necessarily between *V*), /ʊ/ can typically be realized as a voiced labiodental *semi*stop-*semi*(con)strictive by detension (with possible bilabialization, too, that we add in ƒig 8.18, although it would be more logical, perhaps, to show and treat it in Ch 10): [ᵬv, ᵬv̞], as in *wie*.

ƒig 8.18. A labiodentalized *canIPA* vocoid (and two contoidal taxophones).



Semi-velarized vocoids

8.38. Up to now, one single semi-velarized vocoid has been found (ƒig 8.19): an '[i]' sound with a strong dark coloring: [ɨ̟], which will not be confused with central [ɨ], either as a sound (or as a symbol, if an analogy between [l] and [ɬ] is clearly drawn).

This new modified vocoid, in fact, sounds as a combination of [i] and [ɨ], and occurs in the broad accent of Berlin, for /i:/, as in *sieben* ['zɨ̟ɨ̟bm̩], instead of ['zi:bm̩].

ƒig 8.19. Orogram & palatogram of the semi-velarized vocoid [ɨ̟] (the dotted lines indicate normal [i]).

Palatograms of *canIPA* vocoids

8.37. Let us observe very carefully the palatograms of our vocoids, also by comparing them with those of contoids (shown in *fig* 10.9.12-13, as well).

fig 8.20. Vocograms with *canIPA* vocoids.

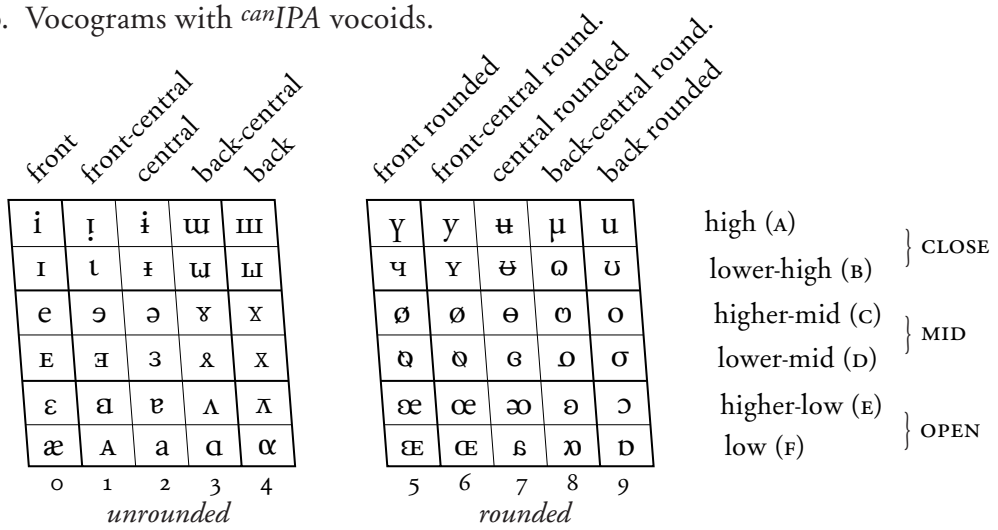
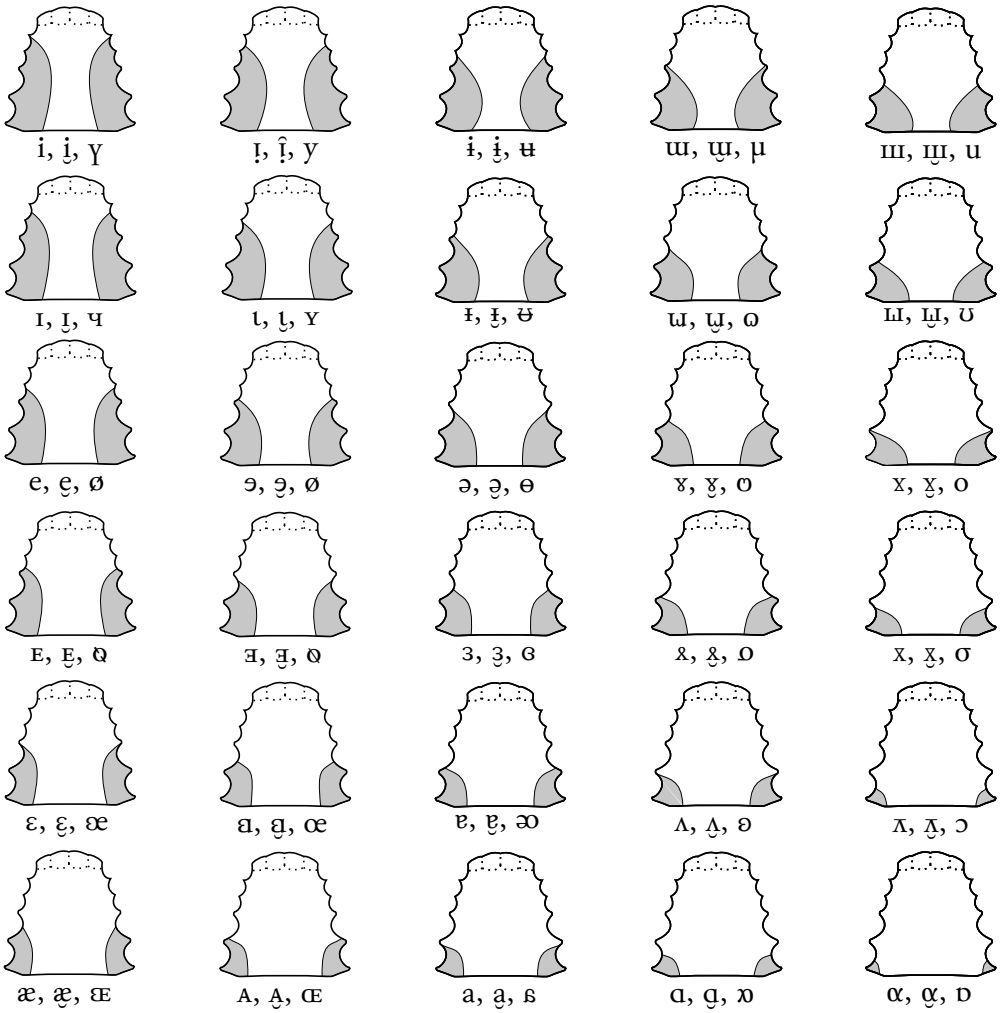


fig 8.21. Palatograms of *canIPA* vocoids.

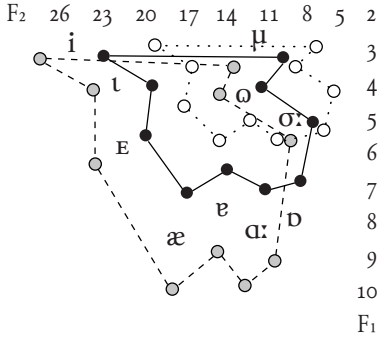


Differences in vocoids for male, female, and child voices

8.38. The human ear can normally distinguish between male and female (and, indeed, infant) classes of voices, in an easy and automatic way, by spontaneously compensating and calibrating all the actual differences that we all can perceive.

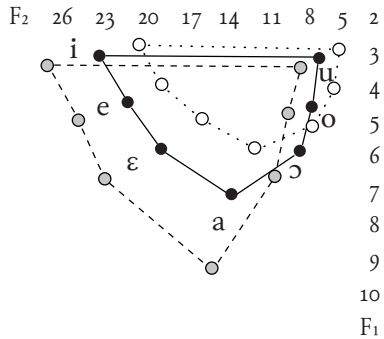
However, acoustically this cannot be done in such a natural and immediate way, as *fig* 8.22 clearly shows, although these diagrams result from an average of several voices. Instead, each single voice would inevitably show many surprising and puzzling peculiarities.

fig 8.22. The acoustic way of 'showing' phonic things.



British English: differences between male, female, and child voices for some monophthongs (incl. unstressed /i, u/).

● male
◉ female
○ child



Italian: differences between male, female, and child voices for the seven stressed monophthongs.

Bad ways of dealing with vowels & vocoids

8.39. It is clear, by now, that Phonetics is not for anyone, to say nothing about Tonetics. This is true both for learners and would-be teachers, owing to lack of interest or skill. In this case, they generally just neglect what they cannot appreciate and use. But, in the case of would-be authors, who actually happen to write a book on the subject, without having the gift for doing it, things become very serious and dangerous, too. Unfortunately, there are very many cases of this calamity.

As for the treatment of vowels, there are five frequent ways to cause damage. The *first* one consists in not using any diagram at all, but showing only symbols, possibly very general ones, in a list, just with a written example for each phoneme. Thus abandoning the readers to themselves, with no useful explanation. This commonly happens in current language dictionaries.

The *second* way consists in still using very general symbols, but putting them in an unsatisfactory kind of table of little help, with few or no explanations, as for instance in *The Oxford Dictionary of Pronunciation for Current English*.

The *third* way of dealing badly with vowels consists in using some kind of more or less official diagram, such as the *IPA* quadrilateral, but still considering the symbols used as a kind of spelling. Thus putting them exactly on the cardinal points, and wast-

ing any opportunity of being really useful, as did C.M. Wise in his books (and so many after him, as well).

The *fourth* bad way consists still in using generic symbols and putting them in quadrilaterals, but with poor skill and with little correspondence to actual sounds, especially for '/iː, uː/', as it happens in *The Longman Pronunciation Dictionary* and the *Cambridge English Pronouncing Dictionary*, too. In addition, as they refer to the same kind of pronunciation, they should, at least, be more uniform and coherent in their way of putting the symbols on the diagrams.

The *fifth* way consists in showing quadrilaterals, drawn simply from written reported descriptions by other authors, without actually having listened to these sounds. This is what used to do, for instance, Jack Windsor Lewis, for scores of languages, with no clear distinction between phonemes, phones, and taxophones. Not rarely, even some phonemes were lacking in his diagrams, and taxophones were very incoherently shown, producing unreal and risible figures.

9. Consonants & contoids (1)

9.1. In this chapter we will thoroughly deal with consonantal articulations, which we call CONTOIDS when we consider them from an exclusively phonetic point of view, or *consonant phones*. Instead, when we speak of their distinctive function, in some languages, we will call them CONSONANTS, or *consonant phonemes*. When we refer to their orthographic aspect, we will call them *consonants* again, or *consonant graphemes*.

As we already know, even the characteristic qualities of contoids –as those of vocoids– depend on the shape given to the ARTICULATORY TRACT during their production. However, the areas involved are decidedly much wider than that of vocoids (which is very restricted, as we have seen in § 8.1-6). As a matter of fact, from the lips to the larynx, each place can be decisive to articulate a contoid. And there are also complex articulations, with both different simultaneous or sequential places, as we will not fail to see below.

However, even for contoids there are three fundamental components for their production, which are made possible by the expiratory air that gives them ‹voice›. This is produced by the presence of vibrations of the vocal folds, as far as (the most) normal contoids are concerned. In fact, we will then see that for certain contoids (used in some languages) some articulatory ‰ phonatory modifications are possible, including the activation of non-pulmonic mechanisms.

For the moment, though, we will deal with the *three* fundamental components (by taking them up again from § 6): the MANNER OF ARTICULATION, from nasal to lateral (according to our own preferred order, based directly on articulatory considerations), with further internal subdivisions, which are necessary to specify some manners or their combinations more clearly.

Then, the PLACE OF ARTICULATION, from bilabial to laryngeal, with an even greater number of further internal subdivisions, which are also necessary, to be able to explain differences (which can be slight but not at all unimportant). They are determined by minor changes or by combinations of one or more places together.

Finally, for contoids their PHONATION TYPE is paramount, as it generally makes it possible to double the number of contoids, with the possibility of opposing –even functionally in various languages– voiced and voiceless contoids, as in *lagging*, *lacking* or *view*, *few* /ˈlægɪŋ, ˈlækɪŋ; ˈvjʊu, ˈfjʊu/.

9.2. Also for contoids there was an older, prescientific, method of describing the ‹consonants› of a foreign language by making vague reference to the sounds ‹hypothesized› for one's own language, with occasional cross-reference to some other ‹better-known› widely-spoken European languages, without ever using articulatory figures, like orograms –mostly– which must be analyzed in the smallest de-

tail (of course when they are clearly reliable) for useful and necessary comparisons.

This is needed exactly in order to be able to *see* the differences, even before being able to *perceive* them auditorily and kinesthetically (*ie* through an appropriate awareness of the movements of the various articulators, during the production of different contoids).

Therefore, it is necessary to analyze even the contoids of a given language with a scientific method, which must be unrelated to any language, although firmly based on a precise inventory of a considerable number of natural languages. Thus, the (aforementioned) PHONETIC METHOD is the answer. As for vocoids, the first stage consists in becoming aware of the contoids of one's own *mother tongue* (which does not necessarily coincide with the national or official language). Starting from these contoids, afterwards it will be possible to pronounce any other contoid belonging to any language.

9.3. By nature, CONTOIDS contrast with the other category of segmental sounds – *vocoids* (as already said). In fact, contoids are mainly distinguished by having the following essential characteristics for articulatory organs: MOVEMENT, APPROACH (between parts, which is quite evident, even up to full contact) and EXTENSION to all possible articulatory areas, even very peripheral ones, which go from the lips and teeth to the pharynx and larynx, with any possible intermediate and combined positions.

All this is contrasted –for vocoids– with their relative *staticity* and considerable *distance* between the articulators, and the *limited* physical area within the oral space, which is necessary for their articulation (substantially constituted by the area ranging from the zone of the *prevelum* to the boundaries of the palate and the velum, as can be seen in *fig* 8.1).

Contoids can have their timbres modified by the intervention of the LIPS; but generally with no actual influence on the possibility of really changing a phone into a phoneme, within one language. These are mostly just phonetic nuances (not phonemic differences), which must absolutely not be neglected, however, neither in descriptions nor in learning/teaching. In fact, even for French or Mandarin Chinese /j, ɥ/, at least another difference is always present. As a matter of fact, neutral French has /j/ [j̞], a palatal *semi-constrictive*, ʊs /ɥ/ [ɥ], a *post*palatal *rounded approximant*, while French variants and Mandarin have /j/ [j], a *palatal* approximant (ʊs /ɥ/ [ɥ], a *post*palatal *rounded* approximant). See, however, § 17.56 for Croatian [ʧ, ʤ; ʧ̑, ʤ̑].

Therefore, since *repetita iuvant*, contoids are phones characterized by movement, where expiratory air does not go out of the mouth very freely and often produces very important noises (which are typical mainly for certain articulation manners, as the constrictive [or ‹fricative›] one).

9.4. In order to obtain the possible range of contoids (used –or usable– by the world's different languages), we made *x*-ray photos and films, and palatograms obtained using both a mechanic and electronic artificial palate. This is a kind of toothless denture (expressly prepared for every particular phonetician's palate)

which is put into one's mouth in order to observe the points of contact between the tongue and the hard parts of the palatal vault. The mechanic type is more pioneering and requires full commitment and considerable skill. In fact, overlooking more specific particulars, after a given phone has been articulated, the artificial palate must be drawn out in order to immediately observe the contact points between parts of the tongue with parts of the palate.

Obviously, the phones must be articulated in the most natural possible way. The operation has to be repeated several times, by simultaneously tape-recording every item, in order to be able to verify their actual naturalness, even later on.

The electronic artificial palate is much more modern (and expensive too). It has a great number of microsensors, arranged on the whole surface and connected to very thin wires (coming out from the mouth angles) that are plugged into a computer. In this way it is possible to see on the display all the points of contact or approach during actual articulations, not only those of a single phone but of whole utterances as well. Every movement is shown on the display in real time. Therefore, it is possible to use the display too, in addition to kinesthesia and self-listening, in order to have continuous feedback on the articulations produced, to modify them and immediately verify the effects. Of course, it is possible to store and print everything (both for contoids and vocoids).

9.5. For phonetic notations, above all when handwritten, during the analysis of a language while listening to some recordings, it is certainly convenient to use the diacritics of DISPLACEMENT. Therefore, *contoids* are double-underlined, [a͟], to show a (more or less) basic, or canonical element (instead of the dot used for *vocoids*, since in our notation system a dot beneath a voiceless contoid symbol indicates voiceless lenition, as in [t̤, s̤]). Also displacements are then indicated, as: [x̟, β̞, β̠, ɹ̟, w̞, ɻ̟, ɻ̠], following the same criteria used for vocoids, in reference to the most typical places and manners, and some tiny [˒, ˓, ˒, ˓] can be used as well. Therefore, even for contoids, according to particular (descriptive or teaching) purposes, icons like ⊠ (and ⊡, ⊠, ⊠, ⊠ and ⊡, ⊠, ⊠, ⊠), can also be useful in order to be able to show up to *nine* general positions, starting from the characteristics of each articulation manner.

A canonical value will be indicated by ⊠, to be rigorous and coherent, even for the stop manner. As a matter of fact, the tiny cross must not be interpreted as a point of contact, rather as the essence of each contoid. Thus, for instance, ⊡ will not necessarily be a stop, but simply a more energetic articulation, which means that when it is applied to a stop, it will indicate a firmer and tenser occlusion; when applied to a constrictive, or an approximant, it will have a closer approach than normal, which is fairly different for constrictives (with noise) or approximants (almost without noise). The opposite nuance is indicated by ⊠; whereas, ⊠ and ⊠ will indicate more advanced or retracted articulations, respectively, always in relation to those that are considered to be canonical. Finally, ⊡, ⊠, ⊠, ⊠ will indicate combinations. Of course, all these icons can be referred to any articulation manner, again starting from the typical and canonical value each one has. On the other hand, we need not resort to these indications, unless their actual utility is thought to be really important…

9.6. *fig* 9.1 shows the most peculiar labiograms for various contoids, typical of some well-known languages. Realizations with extra rounding are also added, in order to highlight differences (which are visible in the three orograms given at the bottom).

Besides, *fig* 9.2.1 presents further perspectives, with linguograms which help to distinguish grooved from slit contoids, and those with different types of lateral contraction: bilateral, unilateral, and constrictive unilateral.

fig 9.1. Contoid labiograms (and five orograms for the lips again).

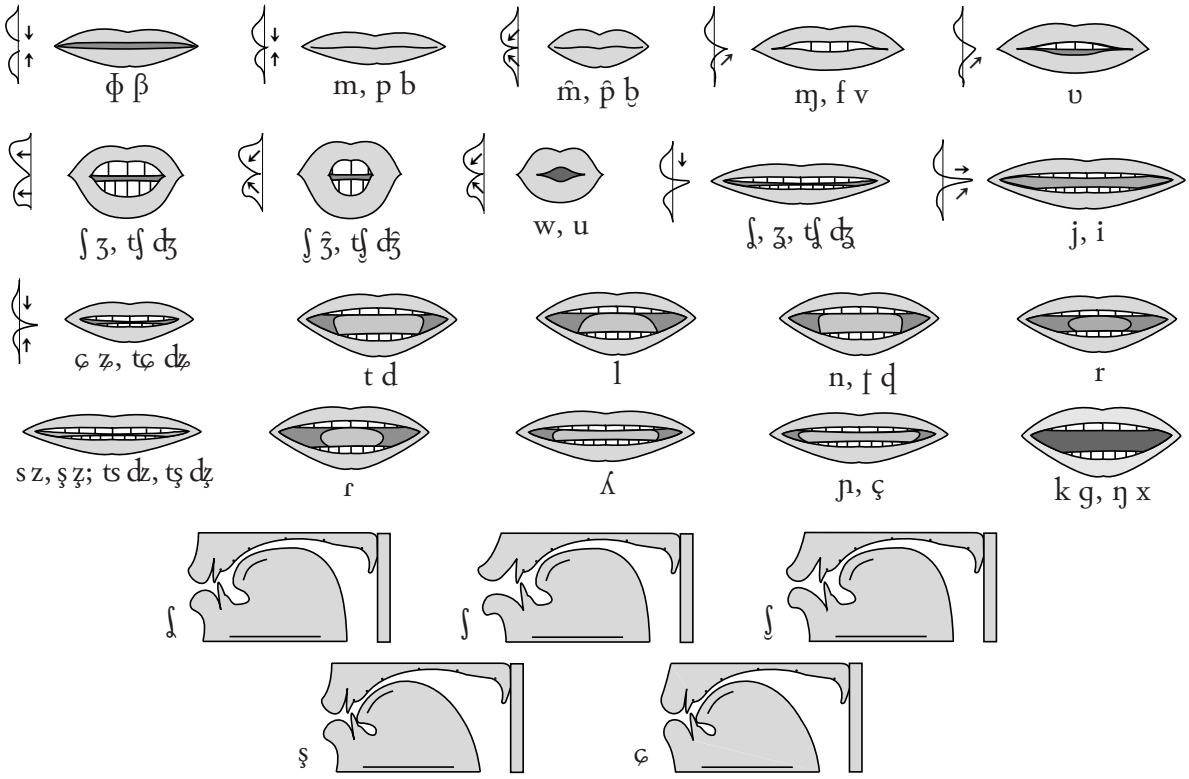


fig 9.2.1. Contoid linguograms.

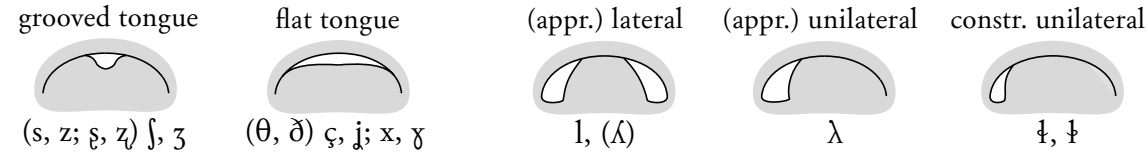


fig 9.2.2. Contoid palatograms.

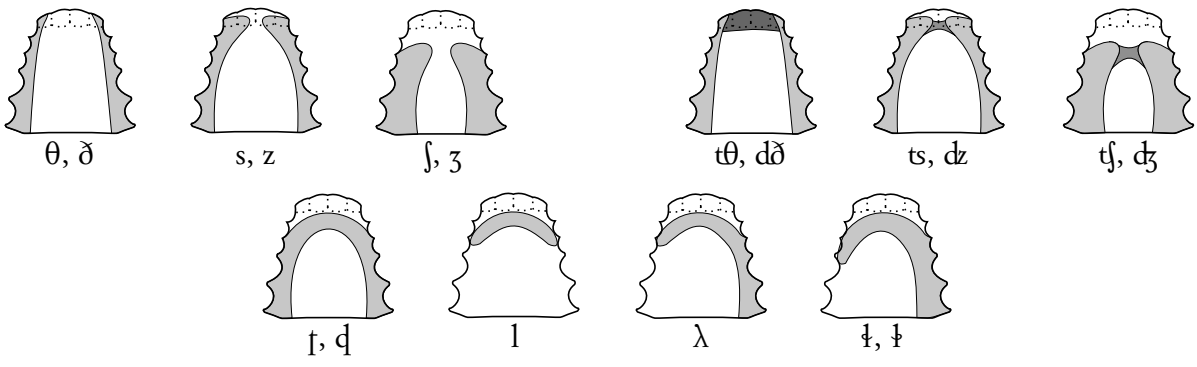
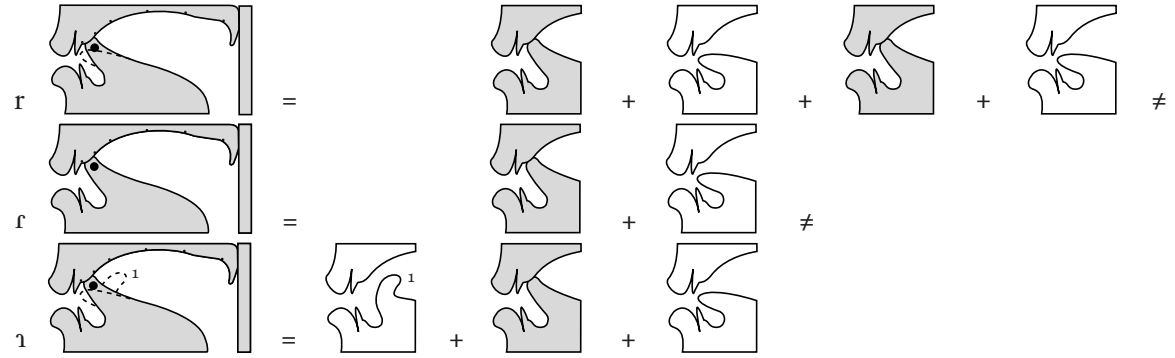


fig 9.2.2 also provides some revealing palatograms, which contribute to further clarifying the differences between some manners of articulation.

In addition, *fig* 9.2.3 shows the fundamental difference between *trills* (here, the voiced alveolar is given, which has two rapid tappings, [r]), *taps* (again the voiced alveolar is given, [ɾ], with just one tapping), and *flaps* (still voiced alveolar, [ɹ], with one tapping, but of a different kind, since the tip of the tongue is first brought behind the alveolar ridge, and then, while it moves forwards, it rapidly strikes the ridge and ends in a front position, from where it will soon pass to the next phone in the word).

fig 9.2.3. Difference between (alveolar) trill [r], tap, [ɾ], and flap, [ɹ].



Although they are already presented here, by means of definitions and phonetic symbols, in Ch 10 all the contoid orograms considered in this book will be seen in a systematic way. Of course, we will proceed according to manners of articulation, by going horizontally across the table in *fig* 10.1 (which contains the 321 commonest or most useful articulations, among the 464 found, which are given however in the lists and orogram tables in Ch 10, with their 774 phones).

First of all, let us carefully observe the figures (although not all of them together!); then, we will give some examples.

9.7. Going back to the basic contoids, which were given for each manner of articulation in § 6.3.0-7, let us now consider neighboring articulations, which present slight differences or some combinations of places of articulation. The figures that accompany our exposition must be analyzed very very carefully, in order to perceive the differences. It is important here to really know actual articulations, and to reflect, not only on the symbols, but also on the figures. In this way, one can KINESTHETICALLY comprehend all the components indeed, and then *reproduce* every single phone, although by trials (of course), until one can *produce* it naturally. It would certainly be useful to be able to make constant reference to languages and dialects, which use those sounds. However, even without them –and even without specific examples– it is fundamental to start finding their correspondences, by helping oneself with any available means. In order to see concretely how languages may be analytically described, readers are referred to the 12 languages dealt with in *HPr*, beginning from those one knows ‹better›, to ‹discover› what one may have always been able to do, but has never thought about, using the advantageous guidelines and terms of the PHONETIC METHOD.

Nasals (cf § 10.2)

9.8. Similar –but obviously not identical– to (*bilabial*) [m], we find (with secondary coarticulations, in the sense of incomplete articulations, of an approximant type, which are less evident, although perfectly perceptible): [m̂], *bilabial rounded*, with rounding added to the complete contact between the lips; [m̟], *palatalized bilabial*, with the back of the tongue raised towards the palate; [m̠], *uvularized bilabial*, with the back raised towards the uvula.

With regard to the apical articulation, we have the *alveolar* nasal contoid, [n], and its *rounded* version, [n̂]; in addition: *velarized* or *uvularized alveolar*, both represented with [n̠] (which can be rounded, shown by [ˆ]), and even the *semi-velarized* or *semi-uvularized alveolar*, [n̠̆], produced with a minor raising of the back towards the velum or uvula, in comparison with [n̠].

Before meeting these articulations, by proceeding from the outside towards the inside, that is from the lips towards the uvula, we find: *dental*, [n̪], [[n̪]], with the same possible coarticulations, and, before that, *labiodental*, [ɱ], also with labialization, [m̂ʲ], palatalization, [m̟ʲ], or uvularization, [m̠ʲ] (and possible further combinations, as the *alveolarized labiodental*, [ɱ̍], which combines the normal labiodental phone with the alveolar one, simultaneously). Further possible articulations are: *labial-apical*, [[m̼]], with the tip in contact with the upper lip, and *denti-alveolar*, [[n̪͡n]].

The labiodental articulation, [ɱ], cannot stop the air completely, since there is some free passage between the teeth and at the corners of the mouth, as well. However, it is possible to produce a more energetic articulation, although more wearing, which can be represented with [ɱ̞]. (It could seem to be more correct to exchange these two symbols, since the curly tail is typical of semi-nasals, § 9.9, but not exclusively. In addition, the most common and frequent realization in so many languages is [ɱ].)

Besides, there are other nasals, with two simultaneous articulations: *dental–bilabial* [n̪͡m], or *alveolar–bilabial*, [n͡m], ie a dental/alveolar and a bilabial one. In addition: *postalveolar–bilabial*, [n̠͡m]; *velar–bilabial* [ŋ͡m] (it is advisable to write these terms by using an *n-dash*, and pronouncing them with two stresses, for instance: /ˈvɪilə‿ɪ baɛˈlɛɪbjəɬ/).

Furthermore, we find a series with bilabialization, that is with a bilabialized coarticulation, but with no complete closure, i͍e with a simple vertical approach (*vertical rounding*). We then have the following articulations: *bilabialized dental/alveolar*, [n̪ʷ], with the possible addition of palatalization (*palato-bilabialized dental/alveolar*), [n̪ᶣ].

Slightly behind the alveolar place, we find the *postalveolar* nasal, [n̠] (apico-postalveolar), also with labialization, [n̠̂] (*postalveopalatal rounded*); and *(sub)apico-palatal*, [n̺] (even with labialization: *apico-palatal rounded*, [n̺̂]).

9.9. Subsequently, we find laminal articulations, which concern the part of the tongue just behind the tip (cf fig 4.2 [: A, 11]), with secondary coarticulations at the palate or velum: *postalveo-palatal*, [n̟], [[n̟]], and *postalveo-velar*, [n̟̠], [[n̟̠]].

In addition to the *palatal* articulation, [ɲ] (and *palatal rounded*, [ɲ̂]), we have

the *prepalatal* nasal, [n̠], and the *uvularized palatal*, [ɲʶ] (with uvular coarticulation). Also a *postpalatal* is possible, [[n̺]], which is intermediate between palatal and prevelar. The fourth fundamental nasal contoid, is *velar*, [ŋ], with its *prevelar* variant, [[ŋ̟]] (usually simply transcribed as [ŋ]); then, *uvular*, [ɴ], and *pharyngealized uvular*, [ɴˤ]; they can also have additional rounding, [n̂, ɴ̂, ɴˤ̂].

In addition, there are nasals with labiodental coarticulations: *labiodentalized bilabial* [[mʩ]], *labiodentalized alveolar* [[nʩ]], *labiodentalized velar* [[ŋʩ]].

We also find nasal contoids which do not stop the passage of expiratory air at all (even less than [ɱ], since they have no contact with the roof of the mouth). They are *semi-nasals* (or *semi-… nasals*): the most frequent is provelar, which we define *semi-provelar*, [ŋ̞]. It is very important in Japanese, for instance, where it is a phoneme too (cf § 12.2.1.1-2 of *HPr*); and it is typical of many northern regional accents of Italian, for /nC/.

We then have the *semi-palatal*, [ɲ̞], which can be the typical realization of /ɲ/ in some languages, especially African ones, as Tupuri, or in regional accents or dialects (as in some Brazilian pronunciations). Actually, these two semi-nasals, with incomplete contact with the roof of the mouth, are *diaphones*, since in addition to the two points indicated (*ie* provelar and palatal), they oscillate quite a lot. In fact, the palatal one has a range of possible realizations going from the *prepalate* (along the *palate*), to the *postpalate* – with nasalized approximant versions [j̃, ɲ̟̃, ɲ̃, ɲ̠̃], as well.

Equally, the prevelar oscillates from the *prevelum* (along the *provelum*), to the *velum* – with nasalized approximant versions [ŋ̟̃, ŋ̈̃, ŋ̃, ŋ̠̃]. We add two further semi-nasals, which are possible in various languages, especially in fast speech, particularly between *V* (and in weak syllables, even by dissimilation): *come on!* [khɯmɐˈɒˑn, -ˈɑˑn], *how many times* [ˈhaɒməɲi ˈɟhaˑəmz̥]. Also these two are diaphones, since their realizations can oscillate between (nasalized) versions of bilabial approximants or constrictives, [β̞, β̞̃] (or labiodental sometimes, [ʋ̞, ʋ̞̃]) on the one hand, and between (nasalized) versions of alveolar approximants, [z̞̃], or taps, [ɾ̃], or even dental/alveolar semi-constrictives, [z̪̞̃], on the other hand. The four of them –plus the postalveolar one, [ɹ̠̞] ([ʒ̞̃, ɹ̠̞̃])– are necessary for accurate transcriptions of Hindi, for /n/ followed by continuous *C* (cf § 10.2.1.1-2 of *HPr*).

Lastly, we provide a choice for voiceless nasal contoids, which can be useful (since they differ from simple devoicing, indicated by the diacritic [̥], as in [m̥, n̥, ɲ̊, ŋ̊]): [m̊, ɱ̊, n̊, ɳ̊, n̠̊, ɲ̊, ŋ̊, ɴ̊, ɴˤ̊]; they are fully voiceless, although they are still nasal approximants.

A fair number of voiced nasals are also used as *intense* contoids (as in English, but most of all in German, cf § 5.2.1-7 of *HPr*): [m̩, n̩, ŋ̩, ɴ̩]…

Stops (cf § 10.3)

9.10. Let us now consider the stop manner of articulation. In the *labial* area, we find, of course, the *bilabial* diphonic pair, [p, b], with its ‹variations›: *bilabial rounded*, [p̂, b̂]; *palatalized bilabial*, [pʲ, bʲ]; *uvularized bilabial*, [pʶ, bʶ].

Before meeting the specific apical or laminal articulations, we find the following pairs with two simultaneous contacts: *dental–bilabial*, [t͡p, d͡b]; *alveolar–bilabial*, [ɟ͡p, ɖ͡b] (please note the difference in comparison with the symbol [ɸ]); *bilabial–postalveolar*, [ʈ͡p, ɖ͡b]; and *labio-apical*, [p̪, b̪], with a single contact.

Following are the two very important pairs: *dental*, [t, d] and *alveolar*, [ɟ, ɖ], which must definitely be kept separated and indicated with different symbols, at a phonetic level, although from a phonemic point of view they are both rendered with /t, d/, unless the two articulations are actually opposed phonemically. Equally firm is the decision to assign the unmarked symbols, [t, d], to the dental pair, which is the most frequent and widespread in the languages of the world, although in English (which is the most transcribed language of the world, certainly also because of the poor correspondence between its traditional spelling and actual pronunciation) they are alveolar, [ɟ, ɖ] (unfortunately still rendered as ‹[t, d]›).

The possible variations of [t, d] are: *labiodentalized dental*, [t̪ʷ, d̪ʷ]; *predorsal dental* (or *predental*) [t̪, d̪]; *denti-alveolar*, [t̪̺, d̪̺]; *dental rounded*, [t̪͡ɕ, d̪͡ʑ]; *uvularized dental*, [t̪ˁ, d̪ˁ]; and the variations of [ɟ, ɖ] are: *alveolar rounded*, [ɟ͡ɕ, ɖ͡ʑ]; *velarized alveolar*, [ɟˠ, ɖˠ].

Next comes the *(apico)postalveolar* place of articulation, with [ʈ, ɖ], and its variants: *(apico)postalveolar rounded*, [ʈ͡ɕ, ɖ͡ʑ]; *velarized apico-postalveolar*, [ʈˠ, ɖˠ] and *velarized apico-postalveolar rounded*, [ʈ͡ɕˠ, ɖ͡ʑˠ]; *apico-palatal*, [ʈ̠, ɖ̠] and *apico-palatal rounded*, [ʈ͡ɕ̠, ɖ͡ʑ̠].

9.11. Moving to dorsal articulations, we also find –near the *palatal* place, [c, ɟ] (which is one of the most frequent representative)– the following versions: *palatal rounded*, [c͡ɕ, ɟ͡ʑ] and *uvularized palatal*, [cˁ, ɟˁ] (besides the *postpalatal* one, [c̟, ɟ̟], [[c̟ʶ, ɟ̟ʶ]], which is slightly more retracted, but not yet prevelar); before these, we have the *prepalatal*, [c̠, ɟ̠], and *prepalatal rounded*, [[c̠ʶ, ɟ̠ʶ]], pairs.

At the velum, of course, there is the very important *velar* pair, [k, g], with its variants: *prevelar*, [[k̟ʶ, g̟ʶ]] (generally transcribed [k, g]) and *velar rounded*, [k͡ɕ, g͡ʑ] (which is different from *velar–bilabial*, [k͡p, g͡b]); further back, there are the pairs: *uvular*, [q, ɢ] and *pharyngealized uvular*, [qˤ, ɢˤ], and their rounded versions: *uvular rounded*, [q͡ɕ, ɢ͡ʑ] and *pharyngealized uvular rounded*, [qˤ͡ɕ, ɢˤ͡ʑ].

In addition, we find the *pharyngeal* pair, [ʔ̞, ʕ̞]; lastly, we have, but not as a diphonic pair (because of objective impossibilities, since the vocal folds cannot vibrate, nor can they let air pass freely, being firmly tightened up), the *laryngeal* stop, [ʔ], with its *rounded* version, [ʔ͡ɕ], and also: *palatalized laryngeal*, [ʔʲ], and *uvularized laryngeal*, [ʔˁ].

As can be seen in § 10.3.4, some stop-strictive articulations with incomplete contact are also possible.

Constrictives (*cf* § 10.5 – ‹fricatives›)

9.12. We must always keep in mind an important difference which is typical of certain constrictives: between *grooved* and *slit* (the latter being the ‹normal› one). In fact, the lamina (or the tip) of the tongue is apt to form a furrow along its sur-

face. The parts near the furrow are put in close contact with the hard palate: teeth, alveolar and postalveolar regions, and palate. This last is then an apical articulation (not dorsal), and the furrow is in this case not along the tip but along the lamina. However, it adds its characteristic peculiarity, all the same.

Therefore, the furrow becomes a real tunnel, within which the expiratory air is forced, *constricted*, so that a characteristic hiss or whistle is produced. Once we know that the corona can produce this furrow (and with the help of *orograms* and *palatograms*), it is simpler to experiment and identify –by constant auditory feedback– the various articulations, which can actually present it.

We have to clarify one further point. It is extremely important not to unduly extend the concept of sulcalization. In fact, although [f, v] are necessarily numbered among slit contoids, it would be utterly wrong to describe them as articulated with ‹ungrooved› lamina, since for labiodentals (as [f, v] certainly are) the lamina is not involved at all.

Therefore, only for apical or laminal contoids (concisely called *coronals*), is it possible to have (phonemic) opposition, as in English: *thing* ['θɪŋ:], normal (or *non-grooved*) and *sing* ['sɪŋ:], which is *grooved*. So, when [θ] is described as a dental constrictive (with a raised tip of the tongue, or denti-alveolar) and *slit* is added, this is done to be sure to avoid confusing it with [s], ⟦s̪⟧, which is a dental constrictive (with a raised tip of the tongue) but *grooved*.

The places of articulation, for which the furrow can actually be the only difference in order to phonemically distinguish other slit (or more ‹normal›) constrictives, are: *dental* (either with a lowered or raised tip), *uvularized dental*, *alveolar*, *apico-postalveolar*.

9.13. If *grooved* contoids are considered *marked*, it is understood that the others are unmarked, and (ungrooved) unmarkedness need not be mentioned (indeed it is definitely better not to, unless it is to avoid ambiguity). Simply, marked contoids have an *extra* articulation feature, for *coronal* contoids.

Starting from the most outer ones, we find the following pairs: *bilabial*, [ɸ, β] and *bilabial rounded*, [ɸ̂, β̂]; *labial-apical*, [ɸ̪, β̪]; *labiodental*, [f, v], and *labiodental rounded*, [f̂, v̂]; *palatalized labiodental*, [f̡, v̡]; *uvularized labiodental*, [f̴, v̴], and *uvularized labiodental rounded*, [f̴̂, v̴̂]; *predorsal-dental,* [θ̻, ð̻]; *dental*, [θ, ð] (in the case of a more forward articulation, with the tip of the tongue slightly protruding, we could have an *interdental* –or *pro-dental*– pair, ⟦θ, ð⟧, although normally it is simply [θ, ð]).

However, the term ‹interdental› runs the risk of being misleading for those who might actually try to produce a sound by keeping the tip between the upper and lower teeth. Normally, even if the tongue is protruding, only approaching the upper teeth *is* important, while the lower teeth might even be completely missing. In addition: *dental rounded*, [θ̪̂, ð̪̂]; *uvularized dental*, [θ̴, ð̴]; *alveolar*, [s, z]; *alveolar rounded*, [ŝ, ẑ]; *(apico)postalveolar*, [s̺, z̺]; *(apico)postalveolar rounded*, [ŝ̺, ẑ̺].

Moving on to GROOVED constrictives, we find the pairs: *dental* (with a lowered tip) [s̪, z̪], *denti-alveolar* (with a raised tip) ⟦s̪, z̪⟧, but normally written [s, z]; with the variants: *labiodentalized dental*, [s̴̪, z̴̪]; *dental rounded*, [ŝ̪, ẑ̪]; *uvularized den-*

tal, [ʂ, ʐ]; *alveolar*, [ʃ, ʒ], *alveolar rounded*, [ʃ̂, ʒ̂], and *alveolar protruded*, [ʃ̂, ʒ̂] (note the difference, although slight: in the last cases the rounding diacritic is fused with the symbols, thus becoming *protrusion*; however, the case is different for [x̫, ɣ̫], which are probably to be preferred to [x̂, ɣ̂], although for simple labialization, since they can be more frequently used in languages such as Spanish); *velarized alveolar*, [ʃ̴, ʒ̴].

Therefore, for some of the places of articulation we have just seen, pairs are distinguished by the presence or absence of the lingual groove: FLAT, [θ̫, ɸ̫; θ, ð; θ̴, ð̴; ɕ, ʑ]; GROOVED, [s, z; ʂ, ʐ; ʃ, ʒ; ʃ̴, ʒ̴]. We have to add a constrictive pair which is both (slit) *alveolar* and a *tap* as well, [ɾ̝, ɽ̝]; it is thus distinct from both (slit) [ɕ, ʑ] and (grooved) [ʃ, ʒ]. We also find a pair of *grooved dental semi-constrictives* with a lowered tip of the tongue, [ʂ̪, ʑ̪] (which is not the only one [cf § 9.14, half-way through it]).

Continuing with GROOVED contoids, we find the following pairs: *(apico)postalveolar*, [ʂ̺, ʐ̺], and *(apico)postalveolar rounded*, [ʂ̺̂, ʐ̺̂]; *velarized (apico)postalveolar*, [ʂ̴̺, ʐ̴̺], and *velarized (apico)postalveolar rounded*, [ʂ̴̺̂, ʐ̴̺̂]; *apico-palatal*, [ʂ̻, ʐ̻], and *apico-palatal rounded*, [ʂ̻̂, ʐ̻̂]; *velarized apico-palatal*, [ʂ̴̻, ʐ̴̻], and *velarized apico-palatal rounded*, [ʂ̴̻̂, ʐ̴̻̂].

To complete the survey of grooved constrictives, we have the pairs: *postalveo-palatal*, [ʃ̠, ʒ̠], and *postalveo-palatal protruded*, [ʃ̠̫, ʒ̠̫] (also with a *postalveo-palatal hyperrounded* version, [ʃ̠̂, ʒ̠̂]); *postalveo-prevelar*, [ʃ̠˖, ʒ̠˖], and *postalveo-prevelar protruded*, [ʃ̠˖̫, ʒ̠˖̫] (also *hyperrounded* [ʃ̠˖̂, ʒ̠˖̂]); *postalveo-velar*, [ʃ̠˗, ʒ̠˗], and *postalveo-velar protruded*, [ʃ̠˗̫, ʒ̠˗̫] (also *hyperrounded* [ʃ̠˗̂, ʒ̠˗̂]); *prepalatal*, [ʂ̟, ʐ̟], and *bilabialized prepalatal*, [ɕ̟, ʑ̟] (or *prepalatal rounded* [ɕ̟̂, ʑ̟̂]). Lastly, we also have a pair of grooved *postalveo-palatal semi-constrictives*, [ʂ̠̯, ʐ̠̯] (also with the *protruded* version, [ʂ̠̯̫, ʐ̠̯̫] as well, although with a greater degree of labial and oral opening), but this is not the only one (cf § 9.14).

9.14. Moving back to *slit* constrictives, we have the pairs: *palatal*, [ç, ʝ], and *palatal rounded*, [ç̫, ʝ̫]; *uvularized palatal*, [ɕ, ʑ]. Often, the actual pronunciation of [ʝ] is halfway between constrictive and approximant, therefore *semi-constrictive*, which is better represented with a more specific symbol, [ʝ̞] (not given in ⟦ ⟧, because it is usefully and frequently used). Also the *postpalatal* constrictives ⟦ɕ, ʑ⟧ may be of use.

Besides, we have two further groups of pairs: *velar*, [x, ɣ], and *velar rounded*, [x̫, ɣ̫] (‹philographically›, the symbols [x̫, ɣ̫] might be preferable; they are extendible to other cases as well, but not so easily to all, especially for different places of articulation, particularly grooved ones), with a *prevelar* variant, ⟦x̟, ɣ̟⟧ (normally rendered with [x, ɣ]). Then, *uvular*, [χ, ʁ], and *uvular rounded*, [χ̫, ʁ̫]; *pharyngealized uvular*, [χˤ, ʁˤ], and *pharyngealized uvular rounded*, [χ̫ˤ, ʁ̫ˤ]; in addition: *prepharyngeal*, [ʜ, ʢ]; *pharyngeal*, [ħ, ʕ], and *pharyngeal rounded*, [ħ̫, ʕ̫]. Lastly: *laryngeal*, [ʜ̴, ʢ̴], and *laryngeal rounded*, [ʜ̴̫, ʢ̴̫] (there are also *laryngeal semi-constrictives*, ⟦ʜ̞, ʢ̞⟧).

There is also a new important category of contoids, *semi-constrictives*, which is formed by phones which are intermediate between constrictives and approxi-

mants. It contains ten diphonic pairs, five of which are slit, and five grooved. In this last case, of course (as these articulations are intermediate), the furrow is less evident than in constrictives; however, its presence is equally perceptible.

Thus we have the following pairs – slit: *labiodental*, [ⱱ̟, ⱱ]; *dental*, [θ, ð]; *palatal*, [ɧ, ʝ]; *velar*, [ʜ, ɣ]; *velar rounded*, [ʜʷ, ɣʷ]; and grooved: *dental*, [s̪, z̪]; *postalveolar*, [s̠, z̠]; *postalveo-palatal*, [ʃ, ʒ]; *postalveo-palatal protruded*, [ʃ̫, ʒ̫]; *prepalatal*, [ʂ, ʐ] (in addition to two voiced phones: *postpalatal rounded*, [[ɻʷ]], and *prevelar*, [[ɣ̟]]) cf § 10.5.4-5.

Sometimes, for semi-constrictives, we find actual oscillation between the constrictive and approximant types. Also for this reason, it may be important to have this intermediate category available – possibly, even for other places of articulation, in comparison with the ten more ‹canonical› ones given here. Their importance increases also because of the stop-semi-constrictives, which derive from them, as we will see in § 9.18.

In addition to the pair of *constrictive trills* (seen above, [ʀ, ʁ]), some further ones, which are articulated in further back positions and are different from those we have just considered: *uvular*, [ʞ, ʀ], and *uvular rounded*, [ʞʷ, ʀʷ]; *pharyngealized uvular*, [ʞˤ, ʀˤ]; *pharyngeal*, [ʚ, ʛ] (they are all ‹stronger› than: [χ, ʁ; χʷ, ʁʷ; ʁˤ, ʕˤ; ħ, ʕ]), which means that they are produced with greater force, because of an increased amount of expiratory air used).

There are also some *constrictive laterals*; the most widespread pair is the first we give: *alveolar*, [ɬ, ɮ] (possibly also *dental*, [[ɬ̪, ɮ̪]]); *postalveolar*, [ɬ̠, ɮ̠]; *prepalatal,* [ɬ̟, ɮ̟] (possibly also *postalveo-palatal*, [[ɬ̠̟, ɮ̠̟]]); *palatal*, [ʎ̝, ʎ̝]; *velar*, [ʟ̝, ʟ̝]; *uvular*, [ʟ̝̠, ʟ̝̠].

In a general *table*, the trills and laterals which are constrictive as well will appear more appropriately within their own manners of articulation (rather than with constrictives proper), with the additional feature of constrictive markedness.

Stop-strictives (cf § 10.4 – ‹affricates›)

9.15. Methodologically, it is correct to present stopstrictive contoids after stops and constrictives as well, since they are derived from the (temporal) fusion of these two (homorganic) manners. In fact, their first part is a stop, whereas their second part is a constrictive contoid. Nevertheless, their total *duration* corresponds to that of a simple segment: [tʃ] lasts as long as [t] or [ʃ]. However, in the table of a given language, or in a general table, the correct collocation of stopstrictives is, of course, between stops and constrictives.

In our simplified table of consonant sounds (fig 6.2), we have placed one pair of stopstrictives: *postalveo-palatal protruded*, [tʃ, dʒ], which has greater variations, as the version without labialization, *postalveo-palatal*, [tʃ, dʒ]; besides, *postalveo-velar protruded*, [tʃ, dʒ], and *postalveo-velar*, [tʃ, dʒ]. For the first two pairs given here, we find a variant with a raised tip of the tongue as well, which can be represented as [[tʃ, dʒ; tʃ, dʒ]], whenever it is thought to be useful. There can also be the need to transcribe a hyperlabialized version of [tʃ, dʒ], ie *postalveo-palatal hyperrounded*, [tʃʷ, dʒʷ] (if necessary, [[tʃʷ, dʒʷ]], too).

Geminated stopstrictives are rendered by doubling their whole symbols: [ʧʧ, ʤʤ; ʨʨ, ʥʥ; ʧʃ, ʤʒ; ʨʂ, ʥʐ]… However, if for any reason, we thought it convenient to show that the first part of a geminate has no audible offset, so that in reality it becomes a true stop (unreleased and definitely homorganic to the successive stopstrictive), we ought to resort to some special symbols that show –for the first elements– only the occlusion without the typical characteristic of stopstrictives (*ie* the combination of a first part, which is a *stop* articulation, with a second one, which is a *constrictive*, in the same place of articulation).

Therefore, in a more meticulous –but not necessary– transcription, we would have: [[ʃʧ, ʒʤ; ʂʨ, ʐʥ; ɟʧ, ʝʤ; ʄʨ, ʞʥ]], &c (by introducing special symbols for stops that, in actual fact, would almost exclusively occur only in such cases, since the hold of the first phone continues into the second one, with an offset –or explosion– occurring only at the end of the sequences given. It is true, however, that in Hindi the stop variant is possible for postalveo-dorsal stopstrictives, *cf* § 10.3.2 of *HPr*).

9.16. On the other hand, it is extremely misleading (and even quite unsuitable) to transcribe the first parts of geminated stopstrictives, belonging to this group, by using the symbols [t, d], as too often is still the case: ‹[ttʃ, dʤ]›. But it is just as misleading to render simple stopstrictives as if they were sequences (among other things, heterorganic, according to the symbols used), as ‹[tʃ, dʒ]›! Still, even today (when, at last, we can transcribe whatever we want, and really need, thanks to simple programs to produce fonts), authors and publishers, too often, content themselves with transcriptions like the following (where we show Italian examples because of gemination) ‹/ˈfattʃe, ˈrɛddʒe/›, or even ‹/fˈatːʃe, rˈɛdːʒe/› (rather: ‹/f’at:ʃe, r’ɛd:ʒe/›, also by changing ‹prevocalic› stress and ‹chronemes›, /:/, into ordinary apostrophe and colon (‹/’, :/›), for /ˈfatʃʧe, ˈrɛdʒʤe/ *facce*, *regge*…

Strictly speaking, though, the most appropriate symbols for stopstrictives would be some –even ‹more special›– monograms; this does not mean [ʧ, ʤ; ʨ, ʥ], which is a combination of [t, d] with [ʃ, ʒ; ʂ, ʐ], but more typical and original ones, such as [[ʧʧ, ʤʒ; ʨʨ, ʥʐ]]. However, this choice would inevitably bring us to use dozens and dozens of new symbols (and even more, including various diacritics) &c.

Instead, it is more than sufficient to have a generic indication of the *three* main *macro-places of articulation* (together with the indication of voicing as well): *labial*, [p, b]; *prelingual*, [t, d]; and *postlingual*, [k, g]. Their being combined into monograms (which renders reading and writing –even by hand– definitely easier) automatically implies that they are –quite naturally– homorganic. And this is determined by their constrictive element, to which the stop element perfectly adapts: [pf, bv; ts, dz; kx, gɣ].

Although we have not yet introduced the other most recommendable symbols, for the various necessary stopstrictives (which we will see afterwards), here we provide a choice of them, both to show their complexity and to highlight the advantages of the other *canIPA* symbols, in comparison with the seeming simplicity of the *offIPA* ones. The latter, actually, fail to show several things, which are far from being superfluous! Here are the most important ones: [pf, bv; t͡s, d͡z; c͡ç, ɟ͡ʝ; q͡χ, ɢ͡ʁ],

which are decidedly less recommendable than [pf, bv; ʦ, ʣ; kç, gʝ; kχ, gʁ]. On the other hand, they would still be better than plain and ambiguous (and misleading) digrams [pf, bv; ʦ, ʣ; kç, gʝ; kχ, gʁ]… (even than [pf, ɒv; ʧ, ʤ; cç, ɟʝ; qχ, ɢʁ]).

9.17. Going back to the survey of stopstrictive contoids (and continuing from the beginning of the articulatory tract), we now consider the following diphonic pairs: *bilabial*, [pɸ, bβ], and *labiodental*, [pf, bv]; then, slit *dento-predorsal* (or predental, or dental with a lowered tip), [t̪θ, d̪ð], *dental*, [tθ, dð], *alveolar*, [tɹ, dɹ], and *alveolar rounded*, [tɹ̂, dɹ̂]; besides, *(apico)postalveolar*, [tɻ, dɻ], and *(apico)postalveolar rounded*, [tɻ̂, dɻ̂]. For these four pairs it is fundamental to specify that the tongue is slit, since the corresponding grooved articulations exist too, as we will see shortly.

Notice that, strictly speaking, the stop phase of [pf, bv] is produced by the contact between the *internal* part of the upper lip and the *external* part of the lower lip. However, the true and typical articulation remains *labiodental* –and the same is true of the correspondent stop contoids [ƥ, ɓ], § 9.10– as can be seen from *fig* 10.3.1 & 10.4.1.

Usually, in general tables (for constrictives, as well, of course), *grooved* articulations are explicitly indicated, which are the marked ones since they have an additional peculiar characteristic: to be precise the furrow along the ‹corona› (*ie* tip *or* lamina). Consequently, all other articulations altogether are defined *slit*, although they include the bilabial and labiodental pairs (just seen), for which it would be absurd to think of the lingual furrow, or of its absence as well, since the tongue is not involved at all in the articulation of these contoids (as we have already said).

The grooved stopstrictives corresponding to the areas of the slit ones (just seen) are above all those of the following diphonic pairs: *dental*, [ʦ, ʣ] (with a lowered tip), and *denti-alveolar* (with a raised tip, in which case the symbols ⟦ʦ, ʣ⟧ can be used, if necessary), with the variants: *dental rounded*, [ʦ̂, ʣ̂], and *labiodentalized dental*, [ʦʷ, ʣʷ]. For grooved contoids in the alveolar area, we have the *alveolar*, [ʦ, ʣ], and *alveolar rounded*, [ʦ̂, ʣ̂], pairs.

We have to add here a slit alveolar pair which is both a *stopstrictive* and a *tap* too, [tɽ, dɽ] (it is more rarely a *trill*, [tɽ, dɽ]). Thus, it is different from both [tɹ, dɹ] and [ʦ, ʣ].

9.18. We continue then with the pairs: *velarized alveolar*, [ʦˠ, ʣˠ], and *velarized alveolar rounded*, [ʦ̂ˠ, ʣ̂ˠ]; *(apico)postalveolar*, [ʦ̠, ʣ̠]; *(apico)postalveolar rounded*, [ʦ̠̂, ʣ̠̂]; *velarized apico-postalveolar*, [ʦ̠ˠ, ʣ̠ˠ]; *apico-palatal*, [ʦ̺, ʣ̺]; *apico-palatal rounded*, [ʦ̺̂, ʣ̺̂].

Completing the aforementioned pairs with a lamino-postalveolar component (*cf* § 9.15), we have: *postalveo-palatal*, [ʧ, ʤ], and *postalveo-palatal protruded*, [ʧ, ʤ] (also with the *postalveo-palatal hyperrounded* variant, [ʧ, ʤ]); *postalveo-prevelar*, [ʧ, ʤ], and *postalveo-prevelar protruded*, [ʧ, ʤ] (also *hyperrounded* [ʧ, ʤ]); *postalveo-velar*, [ʧˠ, ʤˠ], and *postalveo-velar protruded*, [ʧˠ, ʤˠ] (also *hyperrounded* [ʧˠ, ʤˠ]); and *prepalatal*, [ʦ̻, ʣ̻], and *bilabialized prepalatal*, [ʦ̻ᵝ, ʣ̻ᵝ] (or *prepalatal rounded* [ʦ̻̂, ʣ̻̂]). Lastly, we have to mention a *grooved postalveo-palatal stop-semi-constrictive* pair, [ʦ̻̠,

ɖʐ] (also with its *protruded* variant, [tʂ, ɖʐ]), but it is not the only one, cf § 10.4.5-6.

Going back to slit pairs, we find: *palatal*, [kɕ, gʝ]; *palatal rounded*, [kɕ̂, gʝ̂]; *uvularized palatal*, [kɕ̴, gʝ̴]; *prevelar*, [[kɤ, gɣ]] (normally rendered as [kɤ, gɣ]). Then we have: *velar*, [kɤ, gɣ], and *velar rounded*, [kɤ̂, gɣ̂]; *uvular*, [kχ, gʁ], and *uvular rounded*, [kχ̂, gʁ̂]; *pharyngealized uvular*, [kʯ, gʯ], and *pharyngealized uvular rounded*, [kʯ̂, gʯ̂].

In addition to the alveolar stop-strictive pairs (seen at the end of § 9.17): *tap(ped)*, [ɽ, ɖɻ], and *trill(ed)*, [ɽ, ɖʃ], we also have the *uvular trill(ed)* one, [kʀ, gʀ], also with rounding, [kʀ̂, gʀ̂].

There are also some stopstrictives with *lateral explosion*, which are composed of a constrictive lateral with a homorganic stopped first part, that is LATERAL STOPSTRICTIVES. Our symbols are such that we need not pre-empt those of lateral constrictives (which are easily obtainable). The most widely used pair is the first we give: *alveolar*, [tɬ, dɮ] (possibly also *dental*, [[tɬ, dɮ]]); *postalveolar*, [tɬ̠, dɮ̠]; *prepalatal,* [tɬ̟, dɮ̟] (possibly also *postalveo-palatal*, [[tɬ̟, dɮ̟]]); *palatal*, [kʎ, gʎ]; *velar*, [kʟ, gʟ], and *uvular*, [kʟ̠, gʟ̠].

Lastly, we have a group of *stop-semi-strictives* (which is somehow intermediate between stops and stopstrictives). They are produced with semi-constrictives as second elements, cf § 9.14: [pɬ, bʋ; tθ, dð; kɻ, gʝ; kɻ, gɣ; kʜ, gw] and [ts, dz; tʂ, dʐ; tʂ, dʐ; tʂ, dʐ; tʂ, dʐ].

It is certainly useful to consider another particular group: that of SEMI-STOPSTRICTIVES (which is intermediate between stopstrictives and constrictives). In fact, the first part of the phone is less evident, because it is either less occlusive (*ie* articulated with a less energetic closure), or shorter than normal (in which case, the second element is generally slightly longer, let us say: 1st ≡ ⅓ and 2nd ≡ ⅔). The most appropriate notation for semi-stopstrictives is with a superscript first element, always combined into monograms (to avoid ambiguities), as in: [ᵖf, ᵇv; ᵗθ, ᵈð; ᵏç, ᵍʝ; ᵏx, ᵍɣ; ᵏx̂, ᵍɣ̂] and [ᵗs, ᵈz; ᵗʂ, ᵈʐ; ᵗʃ, ᵈʒ; ᵗʃ, ᵈʒ; ᵗʂ, ᵈʐ]. These phones can be useful either for actual articulations with reduced first elements, or for fluctuations, which are quite possible. Thus they function as diaphones, too.

Approximants (cf § 10.6)

9.19. Also for this manner of articulation, we will put the various phones into coherent groups. Starting from the lips, we find the diphonic pairs: *bilabial*, [ɸ, β], and *bilabial rounded*, [ɸ̜, β̜] (with the addition of rounding); *palatalized bilabial*, [ɸ̟, β̟]; and *uvularized bilabial*, [ɸ̴, β̴]; besides: *labiodental*, [ɾ, ʋ], and *labiodental rounded*, [ɾ̂, ʋ̂]; *palatalized labiodental*, [ɾ̟, ʋ̟]; *uvularized labiodental*, [ɾ̴, ʋ̴].

For prelingual (or coronal) contoids, we have the pairs: *dental*, [θ̪, ð̪] (with a raised tip); *alveolar*, [ɕ, ʑ]; *(apico)postalveolar*, [ɕ̠, ʑ̠], and *(apico)postalveolar rounded*, [ɕ̠̂, ʑ̠̂]; *apico-palatal*, [ɕ̟, ʑ̟], and *apico-palatal rounded*, [ɕ̟̂, ʑ̟̂]. As for the dorsum (or back of the tongue), we find the diphonic pairs: *prepalatal*, [ʜ, ɻ], and *prepalatal rounded*, [ʜ̜, ɻ̜]; *palatal*, [ɧ, j], and *palatal rounded*, [ɧ̜, ɥ]; *uvularized pala-*

tal, [ɻ̟, j̟]; besides, *prevelar*, [ɻ, j̠], and *prevelar rounded*, [ɻ̟ʷ, ɥ̟]; *velar*, [ɻ, ɰ], and *velar rounded*, [ɻʷ, w].

For precise transcriptions, sometimes we need symbols for voiced approximants with *intermediate* articulation places: *postpalatal*, [[j̠]], and *postpalatal rounded*, [ɥ]; *pro-velar*, [ɰ], *pro-velar rounded*, [[w]]. Obviously, as can be seen, the symbols officially known as ‹labial-palatal, [ɥ]›, and ‹velar, [ɰʷ]›, in actual fact are *postpalatal rounded* [ɥ] and *provelar* [ɰʷ] (exactly as the corresponding vocoids: [y, ɯʷ]).

Let us draw attention to the difference between *pre*-velar and *pro*-velar, in the series: palatal, (postpalatal), prevelar, (provelar), velar. As the two intermediate terms (given in brackets) were needed, rather than a hypothetical ‹postprevelar›, nothing better has yet been found. Obviously, they also correspond to the classification of vocoids (in their much more limited space): front, front-central, central, back--central, and back.

Furthermore, we have the following pairs: *uvular*, [ʁ, ʁ̠], and *uvular rounded*, [ʁ̂, ʁ̂ʷ]; *pharyngealized uvular*, [ʁˤ, ʁ̠ˤ], and *pharyngealized uvular rounded*, [ʁ̂ˤ, ʁ̂ʷˤ]; *prepharyngeal*, [ɖ̠, ʕ̟]; *pharyngeal*, [ɖ̟, ʕ], and *pharyngeal rounded*, [ɖ̟ʷ, ʕʷ]. Finally, we have the pairs: *laryngeal*, [h, ɦ], and *laryngeal rounded*, [hʷ, ɦʷ]. We also have a series of approximants which are often the realizations of /h/ with various assimilatory colorings. They have an intermediate phonation type between [h, ɦ]: [ɦ̞, ɦ̠, ɦ̟, ɦʷ, ɦ̠ʷ]. Lately, it has been necessary to add two ‹front› voiced semi-approximants: *bilabial*, [β̞], and *dental*, [ð̞] (which are important for certain varieties of Spanish, too).

To the previously examined real approximants it is useful to add some more *attenuated* articulations than the canonical ones, though they are sufficiently perceptible as different (and, clearly, different from a ‹phonic zero›, [ ], [[ø]], as well!). They are ‹*semi-*...› approximants, for which the dorsum's approach is less than normal (and the same is true of the lips in *rounded* contoids): *semi-palatal*, [ɻ̞]; *semi-prevelar*, [ɻ̟̞]; *semi-provelar*, [ɰ̞]. We must also add: *semi-postpalatal rounded*, [[ɥ̞]], *semi-prevelar rounded*, [[ɥ̟̞]], *semi-velar rounded*, [ɷ]. Especially those shown in [ ] are quite useful. However, *offIPA* contents itself with just four contoid symbols in the phonetic space of vocoids (and only after the second-last reform, in 1979, has been added [ɰ]).

Obviously, *semi-constrictives* are in an intermediate position between real constrictives and approximants. And our scale continues, since we also need a certain number of *semi-approximant* contoids (cf § 10.6.2), which are intermediate between approximants and a complete lack of any contoid articulation (but this does not imply that we move on to vocoids articulations, which are a different category). For semi-approximants, the terminology can oscillate; in fact, with scientific rigor, we can speak of the ‹palatal [ɻ] (or velar rounded [ɷ]) *semi*-approximants›, or we can also speak –with communicative effectiveness– of ‹the *semi*-palatal [ɻ] (or of the *semi*-velar rounded [ɷ]) approximant›.

9.20. Still among approximants, we find a series of *lateralized approximants*, which are different from normal *lateral approximants*, generally called simply LATERALS (as [l, ɬ, ʎ]). Their articulation is typically approximant, that is with quite a slight approaching on the part of the articulatory organs with the addition of a lat-

eral contraction of the body of the tongue, which fairly changes the overall timbre of lateralized phones. The ‹novelty› of this category is that it includes composite phones, as far as manner of articulation is concerned; although, essentially, the actual novelty is a more rigorous and scientific approach, since these phones have always existed: they were simply described in an inappropriate way, without understanding their true nature. Therefore, they were confused with other phones, which are similar but *not* identical! Mostly, various languages use these phones in their voiced version (although it is obviously possible to produce the voiceless corresponding ones, too).

By starting from the outside, as always, we meet the following *lateralized approximants* (that is [laterally] *contracted*, which means with *lateral contraction of the tongue*, as for true laterals, but with no central contact with the upper part of vocal tract). We group them in homogeneous series: *dental*, [ɺ], *alveolar*, [ɪ], *uvularized alveolar*, [ɻ], *(apico)postalveolar*, [ɭ], *velarized (apico)postalveolar*, [ɻ̴]. The last two also have the corresponding slightly rounded phones: *(apico)postalveolar rounded*, [ɭʷ], and *velarized (apico)postalveolar rounded*, [ɻ̴ʷ]. Two further ones are added: *postalveolarized prevelar rounded*, [ɹ], and *uvulo-postalveolarized velar rounded*, [ʁ]. There is also a combination of [ɭ] and [ʊ], with lateralization, which produces the *labiodentalized postalveolar rounded* variant, [ɭ̪].

Two different symbols are useful too, mainly for accurate descriptions of certain variants of American English, for voiced contracted *semi*-approximants (which are weaker than normal correspondent ‹rounded› phones, [ɪ, ʁ]): *postalveolarized semi-prevelar*, [ɪ], and *uvulo-postalveolarized semi-velar*, [ʁ], practically with no rounding (cf § 10.6.6).

Some of these are also used as *intense* contoids: [ɺ̞, ɻ̞, ɹ̞, ʁ̞]...

Trills, taps & flaps (cf § 10.7)

9.21. The ‹trill› category of contoids is actually composed of three partially different manners: true *trills* (or ‹rolls›, a less satisfactory auditory term, instead of the preferable articulatory one), that is those with –at least– two rapid tappings of the movable organ (*ie* tip [of the tongue], uvula, or lips), *taps* (those with just one tapping), and *flaps* (which have a more complex mechanism, with a tapping during its movement forwards).

The most common *trills* are: *alveolar*, [r], and *uvular*, [ʀ]; both can be rounded, too: *alveolar rounded*, [r̂], *uvular rounded*, [ʀ̂]. More rarely, a *dental* articulation is found, [r] (so that a different symbol is not needed); besides: *velarized alveolar* or *uvularized alveolar*, [ʁ] (once again, one symbol is sufficient); also: *(apico)postalveolar*, [ɽ], *apico-palatal*, [ɽ̠], and *prepalatal*, [ɽ̟]. Another place of articulation, for a rarer trill, is *bilabial*, [ʙ].

As we have already seen (§ 9.14), there are also some *constrictive trills*, in diphonic pairs: [ɻ, ʀ; ɻ̂, ʀ̂; ɻ̠, ʀ̠; ɻ̟, ʀ̟]. For the alveolar place, taps, [ɾ, ɽ], are more frequent than trills, [ɾ, ɽ] (which are more complex).

9.22. Among *taps*, the most frequent is *alveolar*, [ɾ], which can also be rounded: *alveolar rounded*, [ɾ̂]. More rarely, a *dental* articulation is possible as well, [ɾ] (but another symbol is not necessary); besides: *velarized* or *uvularized alveolar*, [ɾ̴] (again, one symbol is sufficient); also: *(apico)postalveolar*, [ɽ], *prepalatal*, [ɾ̡], and *uvular*, [ʀ̆], in addition to *bilabial*, [ʙ̆] (notice the difference).

There is also a series of *lateralized taps* (ie taps articulated with the addition of a simultaneous lateral contraction of the tongue): *alveolar*, [ɺ]; *(apico)postalveolar*, [ɻ̊]; *apico-palatal*, [ɭ̆].

FLAPS are: *labiodental*, [ʋ]; *alveolar*, [ɹ]; *(apico-)postalveolar*, [ɻ]; *apico-palatal*, [ɭ̆]; *prepalatal*, [ɻ̡]. The most frequent, though, is *alveolar,* [ɹ], (also) *lateralized*: [ɻ].

Whenever *voiceless* symbols for this category are needed, the following can be used (here we give some trills, taps, and flaps, in diphonic pairs, where the most ‹normal›, ie voiced, are given second): [ᴘ, ʙ̥; ʳ, r̥; ɽ, ɽ̥; ɾ̡, ɾ̡̊; ʀ̆, ʀ̥̆; ɾ, ɾ̥; ɽ, ɽ̥; ʀ̆, ʀ̥̆; ɹ, ɹ̥; ɻ, ɻ̊; ɭ̆, ɭ̥̆].

Some trills or taps can be *intense*, as: [r̥ˈ, ɾ̥ˈ, ʀ̥̆ˈ] (which are more energetic, not longer; thus, [r̥ˈ] remains different from both [r̥ː] and [r̥r̥, ɾ̥r̥]).

Laterals (*cf* § 10.8)

9.23. Contoids included in the *lateral* manner are generally *(bi)lateral* (and *approximant* as well). In fact, the expiratory air passes at the sides of the tongue, without producing any appreciable noise. However, there are also some *unilateral* phones (still *approximant*), whereas others are *constrictive unilaterals*. These produce an evident friction noise.

The most important LATERAL is *alveolar*, [l] (less frequently, *dental*, with the possible special symbol [[l̪]], or *denti-alveolar*, [[ɬ̪]]). It has a number of variants: *alveolar rounded*, [l̂]; *velarized alveolar*, [ɫ]; *semi-velarized alveolar*, [ɬ]; *uvularized alveolar*, [ɬ̴]. In addition: *(apico)postalveolar*, [ɭ]; *velarized (apico)postalveolar*, [ɭ̴]; *apico-palatal*, [ɭ̆]; *prepalatal*, [ɭ̡] (or even *postalveo-palatal*, with the same symbol or with [[ɭ̡]]); *palatal*, [ʎ]; *velar*, [ʟ]; *uvular*, [ʟ̆]. Finally, also the curious *labial-apical*, [ɺ]. Rounded articulations are also possible, as: [l̂, ɬ̂, ɭ̂, ɭ̡̂, ʎ̂, ʟ̂]…

Unilateral (approximant) contoids are: *alveolar*, [ʟ̠], *prevelarized alveolar*, [ʟ̠̈], and *velarized alveolar*, [ʟ̴] (also *uvularized alveolar,* [ʟ̴̆]). The diphonic pairs of *constrictive unilaterals* are: *alveolar*, [ɬ̠, ɮ̠] (possibly also *dental*, with the same symbols, or with [[ɬ, ɮ]]); *(apico)postalveolar*, [ɭ̠̊, ɭ̠]; *prepalatal*, [ɭ̡̠̊, ɭ̡̠] (possibly also *postalveo-palatal*, with the same symbols, or with [[ɭ̡̊, ɭ̡]]); *palatal*, [ʎ̝̊, ʎ̝]; *velar*, [ʟ̝̊, ʟ̝]; *uvular*, [ʟ̝̆̊, ʟ̝̆].

There are also *semi-lateral* contoids (or *lateralized approximants*), which correspond to [j, ɟ, ɥ]: *palatal*, [ʎ̠̈], *prevelar*, [ɫ̠̈], and *velar*, [ɫ̠]; with possible rounded versions, as *velar rounded*, [ɫ̂]. Obviously, [ɫ] –*lateralized velar*– must not be confused with the *velar lateral* phone, [ʟ] (which has only one contact between the postdorsum and the velum, but not at the sides of the tongue), nor with *velarized* laterals (with the tip of the tongue in contact with the alveolar ridge, and the postdorsum approaching the velum): *velarized alveolar*, [ɫ], or *semi-velarized alveolar*, [ɬ]. However, they have articulatory and auditory relationships, although they are

different phones. An alveolar semilateral occurs, too, [ɭ].

Whenever *voiceless* symbols for this category are needed, the following can be used: [l̥, ʎ̥, ʟ̥, ɺ̥]…

Some laterals can be *intense*, as: [l̪, ɬ̪; ɬ, ɬ̂].

Memorizing

9.24. It would be useful to be able to learn the value and the placement of all the contoids presented in *HPr*, including the less important and rarer ones. However, we are well aware that it is not an easy operation, especially considering their substantial, and not superfluous, number, in order to be able to analyze, describe, and learn–teach, in an effective and convincing way. This task has to be undertaken enthusiastically, not unwillingly: not as a duty, but as a pleasure.

Obviously, at the beginning, it is most important to know where (and how) to look – in the sense of symbols, orograms, tables… In fact, the first step towards succeeding in finding what one is looking for is to know that these elements exist (and where they can be found).

Therefore, even for contoids, in order to rationally memorize, we procede –in successive steps– however, not beginning from the symbols of our first table (*cf fig* 6.2, with its 19 basic articulations), but from the official one (*cf fig* 7.1), to arrive –at last– at our own *canIPA* table, given in *fig* 10.1[.1-3] (and at the lists and orograms which follow and complete it, even for the 137 articulations which do not appear in the table, not to further complicate it, since it contains 319 articulations out of 462 [for 527 contoids out of 772]). To do that, we will follow the same criteria we use for vocoids, by commenting and observing the symbols.

Thus, by excluding the six letters –of the Roman alphabet– which are used for vocoids, that is [i, e, a, o, u, y], the nineteen remaining letters –quite rationally– have received their phonic values, according to their use in the main European languages; while, the non-*IPA* alphabets which use ‹[y]› for the contoid [j], are obviously obliged to use ‹[ü]› for [y].

9.25. Although, for the moment, we refer to the official table, we follow our own order for articulation manners, which seems to be more logical and more useful.

Thus, by considering the NASALS, we can see that more normal are indicated by [m, n], as in *man* [ˈmæˑn]. In the official table, five more appear, including the (non-phonemic) labiodental, [ɱ], as in *inferior*, *emphasis* [ɪɱˈfɜː, ɪɱˈfɪ̪ː; ˈɛɱfəsɪs]; the postalveolar (called ‹retroflex›), [ɳ], as in British English *entry* [ˈɛɳt̪ɪ]; the palatal, [ɲ], as in Spanish *doña* [ˈdσˑɲa]; the velar, [ŋ], *song* [ˈsɒˑŋ, ˈsɔːŋ]; and the uvular, [ɴ], in German: *Dehnung* [ˈd̥eːnʊɴ]. As can be seen, the new necessary symbols were obtained by the addition of a leftward small tail for three symbols: in one case it has been attached to the last leg of [m], to obtain the labiodental variant, [ɱ]; by attaching it to the last leg of [n], in imitation of [g], which is equally velar, [ŋ]; in the third case, [ɲ], the tail has been attached to the first leg of [n], in imitation of [j] (so that it is different even from [ŋ]). The fourth case of tail addition, pres-

ents a rightward small tail, [ɳ], in imitation of the whole postalveolar (‹retroflex›) series, with [ʈ] &c. For the uvular place (of articulation), the prevailing characteristic is the use of small capitals (further adapted by slightly reducing their actual size and somewhat modifying their shape), which produces [ɴ].

9.26. For the *stop* manner, highly logically, we have [p, b], as in *beep* [ˈbɪip]; [t, d], as in Spanish *tender* [tenˈdɛɾ]; and [k, g], as in *keg* [ˈkhɛˑg]. The avoidance of ‹[g]› will be deeply appreciated, although many –not particularly careful– authors and publishers use it instead of [g], which is obtained from an italic form of *g* (as for [ɑ], from *a*). In fact, [g] integrates better into the series [p, b; d; q], avoiding strange shapes, too; besides, it is easier to write by hand. Lastly, the uvular stop is rendered with [q], logically accompanied by a small cap for the corresponding voiced phone, [ɢ], as in Somali: *qìiq* [ˈɢ̥iːq].

The other official stops are: postalveolar (‹retroflex›), coherently in British English (and in all varieties with postalveolar [ɻ], for /ɹ/) we have *train* [ˈʈhɻɛˑɪn], *dry* [ˈɖɻaˑə]. Quite rationally, palatal stops are rendered with [c, ɟ], as in Czech: *sít'* [ˈsiːc], *podíl* [ˈpʊɟiːɬ] ([ɟ], while actually being an overturned [f], recalls [j]; but in the commercial version of the ugly font used in the official chart, many phoneticians and publishers have accepted a very badly made symbol, without considering its typographic origin, which is [ɟ]). The last stop is glottal, [ʔ] (which recalls the apostrophe of transliterations, ‹'›), as in Arabic: *sa"aal* [sɑʔˈʔɑːl].

9.27. Momentarily setting aside *stopstrictives* (‹affricates›, which do not appear in the official table, because of the bad habit of erroneously considering them a mere juxtaposition –instead of a combination– of a stop and a constrictive, ‹fricative›), we will now see the symbols of the constrictive manner (of articulation). They are more numerous, also because of some wrong collocations, due to an original underestimation or unawareness of the difference between constrictives and approximants.

True *constrictives* are: labiodental, [f, v], in *five* [ˈfaˑəv̝]; slit dentals (or ‹interdental›, [θ, ð], in *the thing* [ðəˈθɪŋː]; grooved dental, [s, z], in *size* [ˈsaˑəz̝]; postalveo-palatal protruded (‹postalveolar›), [ʃ, ʒ], in *dilution* [ɖɪˈlɪuʃn̩, ɖaə-] (Am. [ɖəˈlʊuʃən]), *delusion* [ɖɪˈlɪuʒn̩] (Am. [ɖəˈlʊuʒən]), obtained with an ancient convenient deformation of [s, z]. (However, in one of the ‹provincial› phonetic alphabets used in Italy, ‹[ʃ], [ʒ]› correspond to [z], [dz]; they are also used in some dictionaries of Italian, which do not use transcriptions, but graphemes with diacritics or modifications.)

Then come true postalveolar constrictives (the sadly notorious ‹retroflex›), regularly indicated with [ʂ, ʐ], as in Mandarin Chinese: *shū* [¯ʂu] and in Taiwanese pronunciation of Mandarin: *rén* [ˊʐən] (which in Mandarin is [ˊʐən], *ie* a real approximant, even if traditionally represented with ‹/ʐ/›, for lack of appropriate symbols). Then palatal, [ç, ʝ], as in Greek: *chéri* (χ̟ώ̟ρι) [ˈçɛˑɾi], *géiso* (γεσο) [ˈʝiˑʂσ]; obviously [ʝ] recalls [j], although it shows a difference which is not small, even if ignored by many; while, [ç] is immediately associated with palatality, within *IPA*, so that we –and others too– have chosen [ˌ] as the element to indicate ‹palatalization›, as in [ɲ, ʈ, ɖ, ʈʂ, ɖʐ, ʂ, ʐ, ɻ]…

After, we find: velar, [x, ɣ], in American Spanish: *jefe* [ˈxɛˑfe], in Spanish: *pegar* [peˈɣaɾ]; and uvular, [χ, ʁ], in Iberian Spanish: *jefe* [ˈχɛˑfe], in German: *Ring* [ˈʁɪŋ]. For these symbols, it would be more ‹logical› to form pairs as ‹[x, ʁ]› and ‹[χ, ɣ]›; but, [x] and [ʁ] are so frequent (and so widely used, since the beginning of the *IPA*) that it was simpler to accept [x, ɣ] and [χ, ʁ]. However, often, in certain languages /x/, /ɣ/ are used phonemically (even for [χ], [ʁ], not necessarily in pairs, though). The last true constrictive in the official table is voiceless pharyngeal (‹epiglottal›), [ħ], as in Arabic: *fariħ* [ˈfaɾɪħ].

9.28. It is better to move the other five –[ɸ, β], ‹[ʕ]›, [h, ɦ]– into the approximant manner, since in most languages, where these symbols have been used they actually correspond to approximants, as in Japanese *fune* [ˈɸɯ̟.nɛ], in Spanish *lobo* [ˈlσˑβo], in Arabic: *fa“aaliiya-h* [ˌfaʕʕaˈliːjɑ]. Note that for homogeneity we mark all pharyngeals (‹epiglottal›) with a horizontal stroke, whereas we indicate prepharyngeals with other symbols, including the voiced one, [ʕ]. In this way, the laryngeal stop [ʔ] (or ‹glottal stop›) is differentiated better from the (voiced) pharyngeal approximant [ʕ], which is certainly more widespread than the pre-pharyngeal (‹pharyngeal›) one. Too often, even in books, the two symbols [ʔ, ʕ] are confused and misused!

Here are examples of the laryngeal approximants, [h, ɦ]: *hit* [ˈhɪt̚], and *behind* [bɪˈɦaˑənd̪, bə-, -h-]. Should it be really necessary to indicate laryngeal constrictives, in the *canIPA* alphabet we have some symbols derived from these, which recall them fairly easily (as we will see below, in the more systematic part: ☙ 10, with all the orograms).

9.29. The official table gives a diphonic pair of ‹lateral fricatives› or rather *constrictive laterals*, that is lateral contoids with a tighter stricture which produces noise. The official symbols are ‹[ɬ, ɮ]›, but we prefer [ɬ, ɬ̬], since we have a whole series of constrictive laterals, which otherwise would be difficult to use coherently. We find [ɬ, ɬ̬] in Zulu: *umlhaba* [ʊmˈɬaˑaˌ’ba], *indlala* [ɪnˈɬaˑaˌla]; in Welsh: *Llanelli* [ɬaˈnɛɬi] (with local variants, [ɬ̠, ɬ́, ɬ̪]).

Among other things, the phoneticians of long standing, who have followed all the developments since the beginning of the *IPA*, know quite well that the original voiced symbol was not ‹[ɮ]›, but ‹[ɮ]›, with explicit advice not to consider the symbol a combination of [l] and [ʒ]. In 1888, the present writer was not yet born; but soon after his birth, in 1947, he began doing practical phonetics (as everyone, anyway, but has never stopped since). He started doing it with books and special recordings when he was 12 years old – shortly after the 1951 reform. However, he retraced all the phases from the beginning, thanks to the issues of the phenomenal *Maître Phonétique*, and very soon he joined the International Phonetic Association and subsequently attended University College London, where the *IPA* had been based for generations. In his school days, even in class, he used to read books on languages and phonetics, so as not to waste time… and he learnt English by himself with the aim of reading the great books on Phonetics, starting from *The Principles of the International Phonetic Association*.

9.30. For *approximants*, the official table provides five (voiced) elements, [ʋ], ‹[ɹ, ɻ]› (which will be dealt with at the end of this section), [j, ɥ], plus two more, added among the ‹other symbols›, [ɥ, w] (respectively called ‹labial-palatal› and ‹labial-velar› for our *postpalatal rounded* and *velar rounded*). Thus we have the labiodental, [ʋ], as in Dutch: *wad* [ˈʋɑt]; [j, ɥ; ɯ̟, w], palatal, postpalatal rounded, provelar and velar rounded, corresponding to the vocoids [i, y; ɯ, u]; we find them in *yes* [ˈjɛs] and *wet* [ˈwɛʈ]; in French *nuit* [ˈɲɥi]; and in Japanese *kawari* [ˌkɐˈɰɐˑɻi].

In the table, although in a different order, we find three TRILLS, in opposition to two TAPS. The latter, as already seen (§ 6.3.6 & § 9.22), have a single tapping, whereas the former have at least two, or more. The trills are: bilabial, [ʙ], as in Asua (spoken in Zaire): *ɓo'e* [ˌʙɔˀɛ]; alveolar, [r], as in Italian *re* [ˈre]; and uvular, [ʀ], as a possible variant in French and German: *rein* [ˈʀɑ̃], *recht* [ˈʀɛçt], respectively. The only true tap in the official table is alveolar, [ɾ], as in *caro* in Spanish [ˈkaˑɾo], or Italian [ˈkaːɾo], or Portuguese [ˈkaˑɾu], respectively, compared with *carro*, Spanish [ˈkaɾrːo], or Italian [ˈkarːɾo] – let us carefully observe the order of each phone: [ɾrː] (Sp.) and [rːɾ] (It.). (In Portuguese *carro* is [ˈkaˑʁu], and in Brazilian Portuguese [ˈkaˑχu].)

To be rigorous, postalveolar ‹[ɽ]›, which has been put in the table (obviously as ‹retroflex›), is not a real tap, but a FLAP, as we will see below (§ 10.7 & *fig* 10.6). Besides, we prefer a different symbol, [ɺ], since ‹[ɽ]› has too often been used like a jack of all trades, even for ‹[ɹ, ɻ]›, especially before ‹[ɻ]› was introduced.

In the *canIPA* alphabet, for English ‹/r/› (rather, interphonemically, /ɹ/), we use [ɻ] for British and [ɹ] for American pronunciation (contrary to the widespread antiphonetic use based not on sounds, but on terms to define them, and on outdated fallacies). Thus, *red* /ɹɛd/ is [ˈɻɛˑd̥] in British English, and [ˈɹɛˑd̥] in American English. However, in the *canIPA* alphabet, [ɽ] also appears (and [ʁ̞] as well), but as a real trill, since it is possible to produce such kind of phones, although they are used in few lesser known languages.

9.31. Lastly, we find four LATERAL approximants: *alveolar*, [l], as in *lily* [ˈlɪli]; *postalveolar* (‹retroflex›), [ɭ], as in Swedish: *Karl* [ˈkhɒɔɭ]; *palatal*, [ʎ], as in Italian *paglia* [ˈpaʎːʎa], Castilian Spanish *olla* [ˈoˑʎa], and *velar*, ‹[ʟ]› – not to be confused with the more frequent *velarized* (*alveolar*) [ɬ], as in *Bill* [ˈbɪɬː]. We prefer to use [ʟ], for the velar symbol (and reserve [ʟ] for the uvular one, for homogeneity within series), as in Somali: *lo'* [ˈʟo̞ʔ].

We omit the contoids given under ‹other symbols›, which have already been mentioned in § 7.2-3, § 7.7 and § 9.30.

Equally, we leave the analysis of the other parts of the official chart to the reader's initiative and interest, including non-pulmonic contoids (which, however, we will treat scientifically presently, in § 11.10-16, by showing the official symbols as well, which are not satisfactory) and segmental and prosodic diacritics (which we find only partially acceptable), but we will deal with all the diacritics belonging to our *canIPA* version.

Articulatory practice

9.32. Obviously, also for consonants, it is very useful to train oneself as much as possible, to manage to appropriately grasp all the differences and characteristics of every single phone. *Silent introspection* (cf § 8.23) is very important for all contoids too, including *inhalation* while an articulation is being sustained (except, of course, for stops and for the non-continuant phase of stopstrictives).

In the same way as for vocoids, also for contoids one must be able to feel exactly all the *movements* of the *lips*, *tongue* and *jaw* (at first with the help of a hand-mirror).

In order to feel the *movement of the velum*, it is advisable to start with a long voiceless [mːː] that is [m̥ːː]; then, while lengthening it, we have to think of a series of [p]'s, which have to be inserted into the sequence, obtaining [m̥pm̥pm̥p]. Afterwards, the same has to be done with voicing, which produces [mbmbmb]. At this point, the feeling of the velum, which raises and lowers, is quite evident while it closes and opens the passage into the nasal cavity again.

Soon afterwards, the same effect must be practiced at other places of articulation, until one definitely succeeds in keeping the movements under control. In fact, they have to become intentional.

It is extremely important to become well aware of the difference between [i, u] and [j, w] (cf *fig* 5.1), by starting from two series of [aːː], that is [ˈaːːaːː]; they have to be joined by inserting [iːː], which produces [ˈaːːiːːaːː], then [ˈaːːiːaːː], and [ˈaːːiaːː], [ˈaːia], [ˈaia]; finally, [ˈaːːjːjaːː] and [ˈaːːjjaːː] will be uttered, and then [ˈaːːjaːː], [ˈaːja], [ˈaja]. It is necessary to become aware of the difference through silent introspection (without using the air coming from the lungs), then with a whispered voice (as for [lenis] voiceless sounds) and, lastly, with a full voice (as for voiced sounds). Further experiment drills can be done freely with any other contoids, or pairs, or sequences.

To produce a *velar lateral*, [l], it is sufficient to start from palatal [ʎ] and slightly retract the tongue, without removing the dorsal contact, but firmly keeping the typical lateral contraction. Those who (still) lack [ʎ] can begin articulating the stop [g] and laterally contracting the tongue (cf *fig* 9.2, [l, (ʎ)]), while the place of articulation is being maintained. It could also be useful to pass through an intermediate phase, by producing instead a velar lateral stopstrictive, [gɬ]; then, the lateral constrictive part has to be lengthened, [ɬ], and transformed into the corresponding approximant, [l], by slightly opening the jaw and augmenting the lateral contraction.

9.33. Furthermore, silent introspection of all the kinds of /r/, that the different languages use, would certainly be interesting, ranging from [r, ɾ] to [ʀ, ʁ, ʁ̆], to [ɹ, ɻ], &c. Those who do not have an appropriate articulation of [r] or [ʀ] are advised to start from the corresponding voiceless phones, [rʳ, ʀ̥]. In fact, without the vibrations of the vocal folds, the undertaking is favored by a greater quantity of expiratory air, which is typical of voiceless phones, in comparison with voiced ones (for which the air encounters an obstacle at the glottis). Therefore, a greater a-

mount of air and force manages to move the tip of the tongue or the uvula more easily (as a matter of fact, it is only a matter of mechanical physics, certainly not of intentional commands).

In addition, it is paramount to be able to relax all the muscles of one's own mouth and to use diaphragmatic breathing (cf *fig* 4.3), so as not to thwart the experiment. Also drinking some water can help. Besides, it can be useful to lean back (or even lie down) to continue the drill better.

In the case of speakers whose language lacks a phonemic opposition between /l/ and some kind of //r// (*eg* Chinese, Japanese, Korean), there are still greater problems. In fact, they have no awareness of the importance of such a difference, to the extent that they actually can not perceive the two different sounds, since their language has only one distinctive entity (a sole phoneme) in that phonic space.

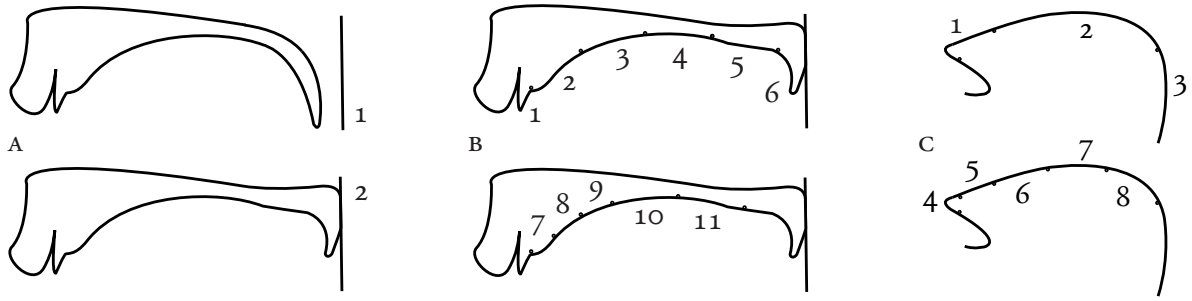
Therefore, at first it is paramount to try to clearly identify the two entities (which are different from both a phonetic and phonemic point of view, in Western languages and many more).

Often, such Oriental speakers articulate [l], both for [l] and [ɾ], thus unifying their characteristics into a sole phone, instead of taking advantage of their differences in order to become able to differentiate them adequately. In fact, one must *just* be a lateral, [l], while the other must *just* be a tap, [ɾ].

Thus, it is fundamental to distinguish and reproduce them, in order to then be able to produce them intentionally, in their appropriate contexts, without confusing words (and concepts) like *Halley* /ˈhæli/ [ˈhæli] and *Harry* /ˈhæɹi/ [ˈhæɻi, -ɹi], or *long* /ˈlɒŋ/ [ˈlɒˑŋ, ˈlɔːŋ] and *wrong* /ˈɹɒŋ/ [ˈɻɒˑŋ, ˈɹɔːŋ], or even *wall* /ˈwɔːɫ/ [ˈwɔːɫ, ˈwɔːɬ] and *war* /ˈwɔːɻ/ [ˈwɔː, ˈwɔːɹ]. However, there is a greater difference between [l] and [ɻ, ɹ], than between [l] and [ɾ], so these Orientals can succeed better in English than in Spanish or Italian. These examples are crucial: Spanish *mal* /ˈmal/ [ˈmal] and *mar* /ˈmaɾ/ [ˈmaɾ], or *alma* /ˈalma/ [ˈalma] and *arma* /ˈaɾma/ [ˈaɾma]; Italian *male* /ˈmale/ [ˈmaːle] and *mare* /ˈmare/ [ˈmaːɾe], or *alto* /ˈalto/ [ˈalːto] and *arto* /ˈarto/ [ˈarːto]. In unstressed syllable, it is still more difficult, especially in Italian, since /ɾ/ is [ɾ]: *per parlare* /perparˈlare/ [ˌperpaɾˈlaːɾe].

fig 9.2.4. In order to be able to make the best use of the articulatory terminology utilized in the next chapter, it is advisable to pay close attention to the following indications.

A *positions of the velum* (lowered 1, or raised 2). Subdivisions of the articulatory organs in the *oral cavity*. B *palatal vault*, primary: (upper) dental 1, prepalatal 2, palatal 3, prevelar 4, velar 5, uvular 6; and secondary: alveolar 7, postalveolar 8 (together they are prepalatal: 2), postpalatal (between palatal and prevelar) 10, provelar (between prevelar and velar) 11. Point 9 is (sub)apicopalatal, or propalatal. C subdivisions of the *tongue*, primary: coronal 1, dorsal 2, radical 3; and secondary: apical 4, laminal 5, predorsal 6, (mid)dorsal 7, postdorsal 8.



10. Consonants & contoids (2)

10.01. For the sake of thoroughness and to facilitate finding and memorizing the various consonantal articulations, we have to consider some *lists*, which may not be considered just entertaining, but are however something necessary. By grouping them into seven sections, with internal subdivisions, we will provide some 500 articulations (although there can certainly be others, by combining further places and manners of articulation). They will appear after the rich, but partial, table (*fig* 10.1).

Obviously, diphonic pairs count as one articulation, not as two. Therefore, in practice, every articulation can produce a diphonic pair, with two contoids which are distinguished only by their phonation type (*ie* voiced or voiceless).

In the table of *fig* 10.1 (which is long and therefore divided into three parts, to avoid reducing it too much and make it indecipherable), we will give only the (more than) 300 'commonest' or most 'important' articulations (out of the almost 500 included in the lists), depending on vertical and horizontal axes, for more than 500 contoids (out of the some 800 included in *NPT*, and in *fig* 10.2-8). The signs › (which alternate with the names of the manners provided, on the left side) indicate the 'intermediate' manners, which do not appear in the table. Thus, the table of contoids, although occupying three pages (*fig* 10.1), is merely indicative, giving only about 70% of all articulations. And, of course, the orograms show much better than definitions their real articulations, also by comparing similar orograms.

Table of the main *canIPA* contoids

10.02. We will now give the *table* of the main *contoids* belonging to the *canIPA* alphabet. It will emerge rather clearly that unitary symbols are preferable to the official ones which need so many diacritics in order to be exact.

However, the way they are placed in the table is quite sufficient to make their values clear (as happens to the vocoids in the vocogram), especially if they are coupled with their orograms (which are to be analyzed very carefully).

canIPA contoids (displayed according to articulation manners)

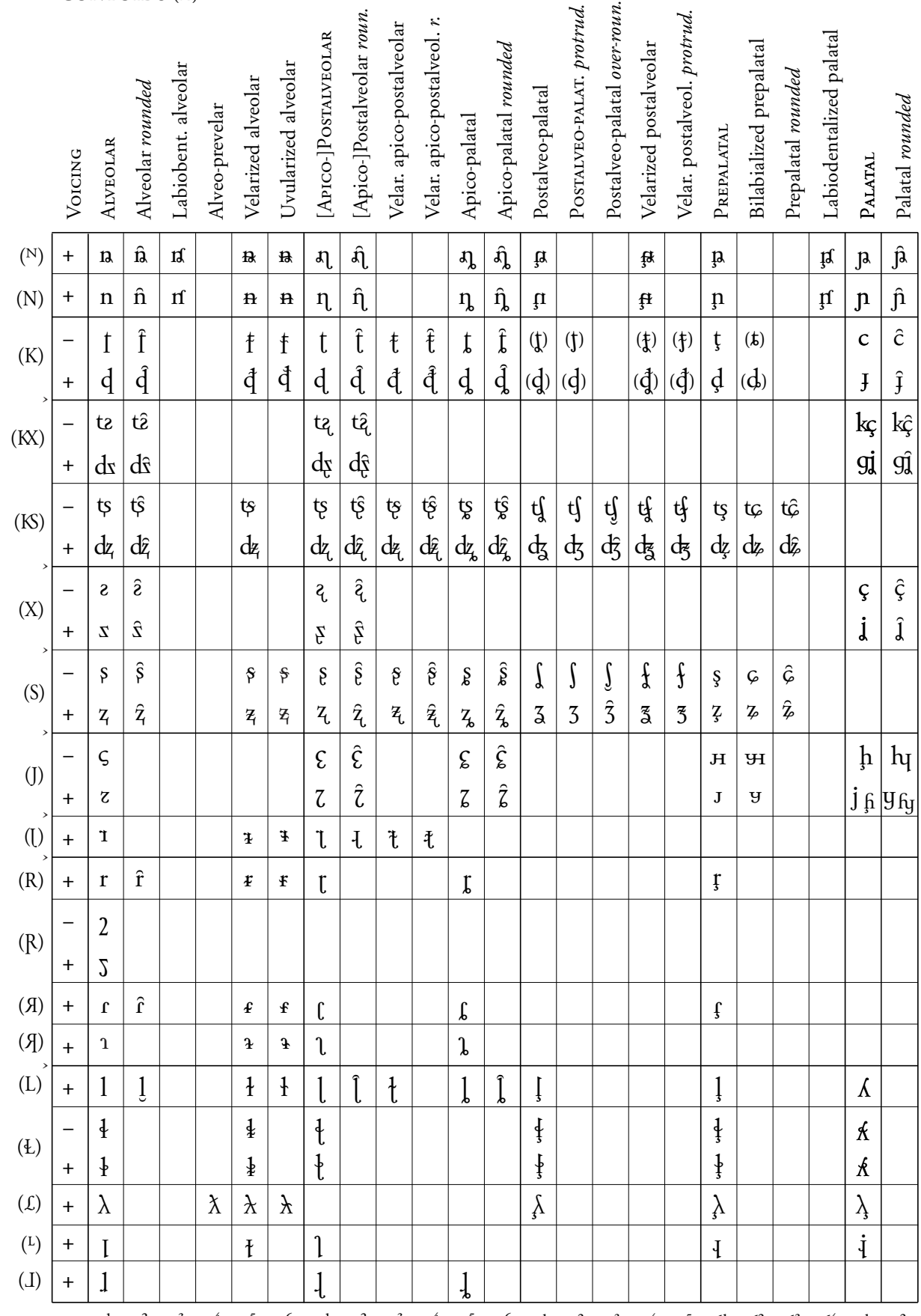
10.1. In our lists, in double square brackets, less common –but more precise– symbols appear, which can be rendered with more 'normal' symbols, given in simple brackets – in less sophisticated transcriptions, once their exact articulations are clearly known.

fig 10.1. *canIPA* contoids (more than 300 *articulations* out of almost 500, and more than 500 *phones* out of almost 800, *cf fig* 10.1-7).

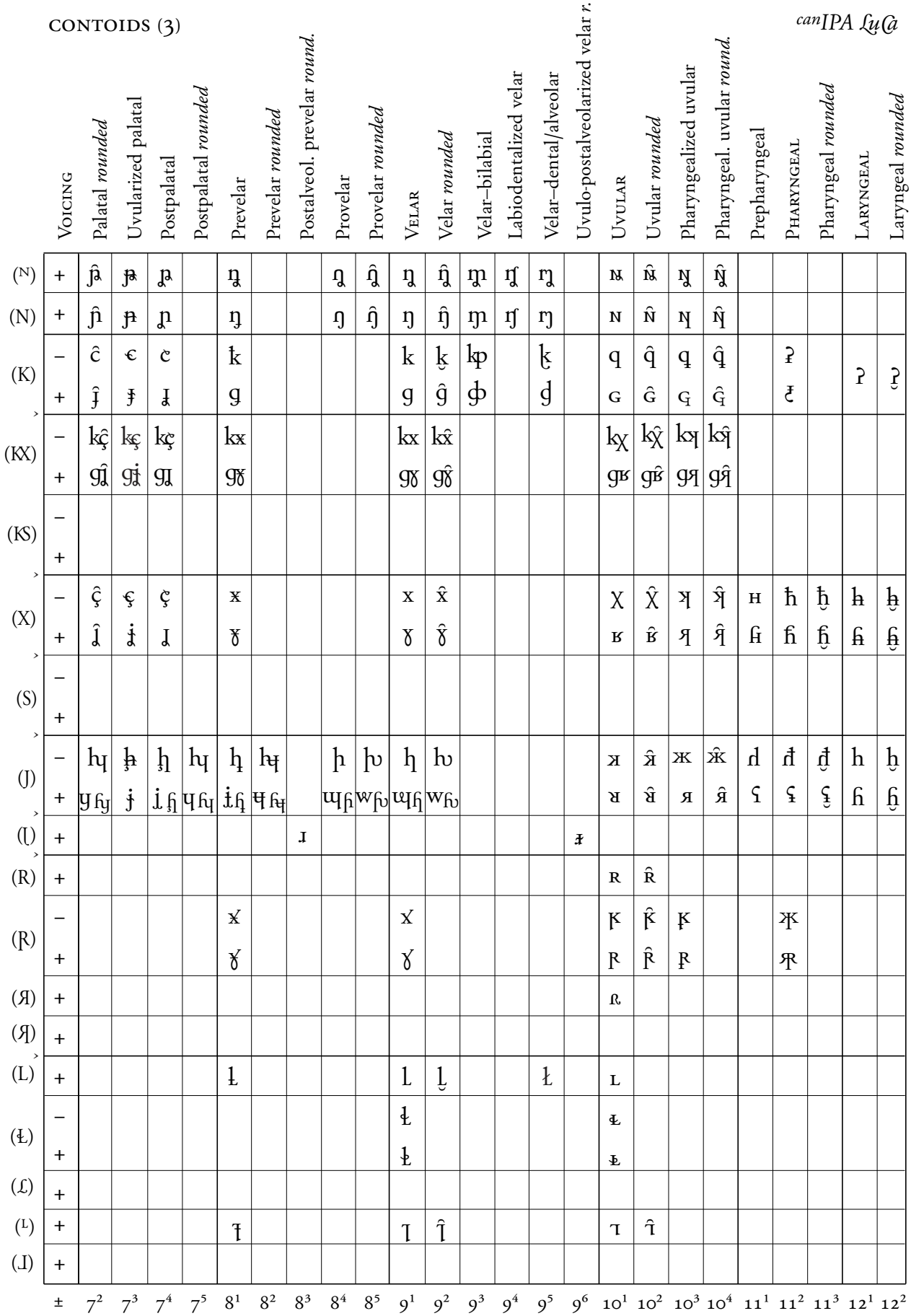
CONTOIDS (1)

	Voicing	Bilabial	Bilabial *rounded*	Palatalized bilabial	Uvularized bilabial	Labial-apical	Labiodental	Labiodental *round.*	Palatal. labiodental	Uvular. labiodental	Dental–bilabial	Pre-dental	Pro-dental	Dental	Dental *rounded*	Labiodent. dental	Uvularized dental	Denti-alveolar	Alveolar
Semi-nasal (N)	+	m̥	m̥̂	m̠̥	m̰̥	m̼̥	ɱ̊	ɱ̂̊	ɱ̠̊	ɱ̰̊	ɱ̪̊	n̪̊		n̥	n̥̂	n̪̊	n̰̊	n̼̊	n̥
Nasal (N)	+	m	m̂	m̠	m̰	m̼	ɱ	ɱ̂	ɱ̠	ɱ̰	ɱ̪	n̪		n	n̂	n̪	n̰	n̼	n
Stop (K)	−	p	p̂	p̠	p̰	p̼	p̪				t̪p̪	t̪		t	t̂	t̪	t̰	t̼	ʈ
	+	b	b̂	b̠	b̰	b̼	b̪				d̪b̪	d̪		d	d̂	d̪	d̰	d̼	ɖ
Stop-strictive (KX)	−	p͡p	p͡p̂				p͡f					t̪θ		t͡θ	t͡θ̂		t͡θ̰		ʦ
	+	b͡β	b͡β̂				b͡v					d̪ǫ		d͡ð	d͡ð̂		d͡ð̰		ʣ
grooved stop-str. (KS)	−											(t̪s̪)		t͡s	t͡ŝ	t͡s̪		t͡s̼	ʦ
	+											(d̪z̪)		d͡z	d͡ẑ	d͡z̪		d͡z̼	ʣ
Constrictive (X)	−	ɸ	ɸ̂	ɸ̠	ɸ̰	ɸ̼	f	f̂	f̠	f̰		θ	θ̼	θ	θ̂		θ̰		ɕ
	+	β	β̂	β̠	β̰	β̼	v	v̂	v̠	v̰		ǫ	ð̼	ð	ð̂		ð̰		ʑ
grooved constric. (S)	−												s̼	s	ŝ	s̪	s̰	s̼	ʂ
	+												z̼	z	ẑ	z̪	z̰	z̼	ʐ
Approximant (J)	−	ɸ̞	ɸ̞̂	ɸ̞̠	ɸ̞̰		ʏ	ʏ̂	ʏ̠	ʏ̰				ʊ̞					ɕ
	+	β̞	β̞̂	β̞̠	β̞̰		ʊ	ʊ̂	ʊ̠	ʊ̰				ð̞					ʑ
lateralized app. (l)	+													ɻ					ɹ
Trill (R)	+	ʙ												(r)					r
constrictive trill (ʀ)	−																		ʡ
	+																		ʖ
tap (ʁ)	+	ɾ̥					ⱱ̊							(ɾ̞)					ɾ
flap (ʁ)	+						ⱱ												ɹ
Lateral (appr.) (L)	+					ɺ̥								l̪	l̪̂		l̰	l̼	l
lateral *constrictive* (ɬ)	−													ɬ̪					ɬ
	+													ɮ̪					ɮ
*uni*later. (appr.) (ʟ)	+													ʟ̪					ʟ
*semi*lateral (ʟ)	+																		l
lateral *tap* (ɺ)	+																		ɺ
	±	0¹	0²	0³	0⁴	0⁵	1¹	1²	1³	1⁴	1⁵	2¹	2²	2³	2⁴	2⁵	2⁶	2⁷	3¹

CONTOIDS (2)


Voicing
Alveolar
Alveolar *rounded*
Labiobent. alveolar
Alveo-prevelar
Velarized alveolar
Uvularized alveolar
[Apico-]Postalveolar
[Apico-]Postalveolar *roun.*
Velar. apico-postalveolar
Velar. apico-postalveol. *r.*
Apico-palatal
Apico-palatal *rounded*
Postalveo-palatal
Postalveo-palat. *protrud.*
Postalveo-palatal *over-roun.*
Velarized postalveolar
Velar. postalveol. *protrud.*
Prepalatal
Bilabialized prepalatal
Prepalatal *rounded*
Labiodentalized palatal
Palatal
Palatal *rounded*
(N)
(K)
(KX)
(KS)
(X)
(S)
(J)
(l)
(R)
(ʀ)
(ʁ)
(ʀ)
(L)
(ɬ)
(ʃ)
(ʟ)
(ɾ)
±

CONTOIDS (3) *canIPA ʟuɢa*



For *sonant* (or *sonorant*, *cf* § 11.21) phones, which are more often voiced, we will indicate the rarest voiceless phones in round brackets (in the lists). Instead, we will indicate less frequent articulations, which are given near more normal ones (and represented by the same symbols), by putting them in round brackets (in the figures).

When no symbol is given in square brackets, it is substituted with /. For voiceless phones this appears first, while it is shown last for voiced phones. Thus, any possible ambiguity is avoided. Obviously, a symbol appearing alone stands for a laryngeal stop (or a phone with mixed phonation, or else with the phonation type indicated by the corresponding laryngogram).

An eight-pointed asterisk, *, placed before the lips of a given orogram, highlights the few canonical articulations, which constitute the frame of the official consonant inventory (although, somehow, *canIPA* and *offIPA* symbols do not fully correspond). Finally, a small ring, °, indicates that that articulation does not appear in the table of *fig* 10.1 (which –otherwise– would become impossible to handle and see adequately).

In these synopses, we will use the most precise symbols, to couple each articulation exactly with its symbol, although for some of these, generally, commoner symbols can be used (as can be seen in § 10.2-8).

For all our articulations (with their unitary symbols), we thought it useful to add the corresponding *offIPA* 'transcriptions' (given within ' '), in order to show their 'composition' (almost as in chemical or algebraic formulae).

This will be useful both to understand the combinations of the few basic symbols with so many diacritics (even if we did not use all those which could have been necessary for absolute precision), and to highlight that it is unthinkable to do 'diacritical transcriptions', as all other 'phonetic alphabets' do.

Among the fundamental criteria of the original *IPA*, in fact, was also that of avoiding articulatory diacritics. Let us recall that it is paramount to carefully observe the orograms, to constantly compare them, and to find similarities between symbols too, by starting from the official ones, from which the others have been derived (although with useful modifications and some necessary substitutions). Obviously, not all the *offIPA* diacritics we are forced to use combine well (and some are also left out).

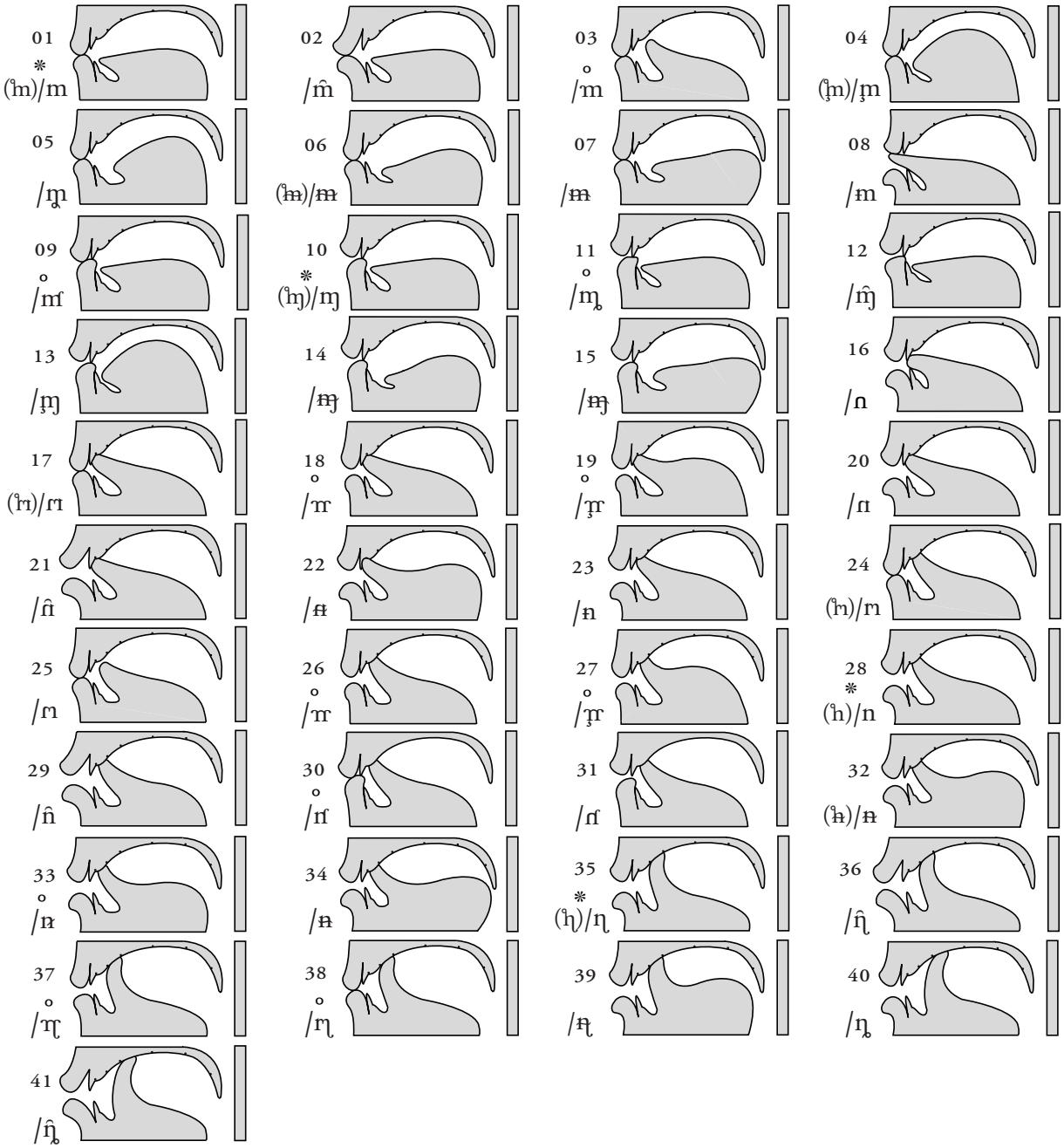
Nasals /N/ [N, ᴺ] (115)

10.2. These include three synopses grouped into 'front', 'back', and 'semi-nasal' (which have no complete occlusion between the articulators).

10.2.1. *Front* nasals [N] (41).

[(ɬm), m]01 bilabial (= between the lips) '[m̥, m]' (≠, =)
[/, m̂]02 bilabial rounded (= bilab. with lip rounding) '[mʷ]'
[[/, m]]03 alveolarized bilabial (= bilab. w. tip approach. alv. ridge, without contact) '[m͡n̪̊]'
[(ʆm), ɲm]04 palatalized bilabial '[m̥ʲ, mʲ]'
[/, ɱ]05 prevelarized bilabial '[m̥˖, m˖]'
[(ʬm), ʍ]06 velarized bilabial '[m̥ˣ, mˣ]'
[/, ʍ]07 [[ʍ]] uvularized bilabial '[mˣ̬]'
[/, ⱻ]08 labial-apical (= between the upper lip and the tip of the tongue) '[m̪]'
[[/, ɱ]]09 [m] labiodentalized bilabial '[mᵛ]'
[(ɬɱ), ɱ]10 labiodental (= between the lower lip and the upper teeth) '[m̥̪, ɱ]' (≠, =)
[/, ɱ̟]11 hyper-labiodental (= labiodent., w. firmer contact, no air passes betw. teeth) '[m̟̪]'
[/, ɱ̂]12 labiodental rounded (= labiodent. + lip rounding) '[ɱʷ]'
[/, ɲɱ]13 palatalized labiodental '[ɱʲ]'
[/, ʍɱ]14 velarized labiodental '[ɱˣ]'
[/, ʍɱ]15 [[ʍɱ]] uvularized labiodental '[ɱˣ̬]'
[[/, n]]16 pre-dental '[n̪]'
[[(ɬn), n]]17 [(ɬn), n] dental–bilabial (= *simult.* dent. & bilab.) '[m͡n̪]'
[[/, nʷ]]18 bilabialized dental (= with secondary labialization) '[n̪͡m̥ʷ]'
[[/, nʲ]]19 bilabialized palatalized dental (= with secondary labializ. & palataliz.) '[n̪͡m̥ʲʲ]'
[[/, n]]20 [n] dental, or prodental (= dent. with a *lowered* or *raised* tip) '[n̪] or [n̺]'
[[/, n̂]]21 [n̂] dental rounded '[n̪ʷ]'
[[/, ʬ]]22 [ʬ] uvularized dental '[n̪ˣ̬]'
[[/, n]]23 [n] denti-alveolar (or postdental, or prealveolar) '[n̪]'
[(ɬn), n]24 alveolar–bilabial (= *simult.* alveol. & bilab.) '[n̥ʷ, nʷ]' or '[n̥͡m, n͡m]'
[/, n]25 alveolarized bilabial '[m̥ⁿ, mⁿ]'
[[/, nʷ]]26 bilabialized alveolar '[n͡m̥ʷ]'
[[/, nʲ]]27 labio-palatalized alveolar (= with second. labializ. & palataliz.) '[n͡m̥ʲʲ]'
[(ɬ), n]28 alveolar (= between the alveoli and the tip of the tongue) '[n̥, n]' (≠, ≡)
[/, n̂]29 alveolar rounded '[nʷ]'
[[/, nɱ]]30 [n] labiodental–alveolar '[n͡ɱ]'
[[/, nⱻ]]31 [n] labiodentalized alveolar '[nᵛ]'
[(ʬ), ʬ]32 velarized alveolar '[nˣ, nˣ]'
[[/, ʬ]]33 [ʬ] semi-velarized alveolar (with very slight velariz.) '[nˣ˖]'
[[ʬ]]34 [ʬ] uvularized alveolar '[nˣ, nˣ˖]'
[(ɬ), ɳ]35 postalveolar: (apico-)… (= not laminal) '[n̥̠, ɳ]' (≠, =)
[/, n̂]36 postalveolar rounded: (apico-)… '[ɳʷ]'
[[/, ɳ]]37 labialized postalveolar '[ɳ͡m̥ʷ]'
[[/, ɳ]]38 postalveolar–bilabial: (apico-)… (= *simult.* postalveol. & bilab.) '[ɳ͡m]'
[[/, ʬɳ]]39 velarized postalveolar: (apico-)… '[ɳ͡mˣ]'
[/, ɳ̠]40 apico-palatal (= between the [hard] palate and the tip) '[n̠̈]'
[/, n̠̂]41 apico-palatal rounded (with lip rounding) '[n̠̈ʷ]'.

fig 10.2.1. *Front* nasal orograms (41).

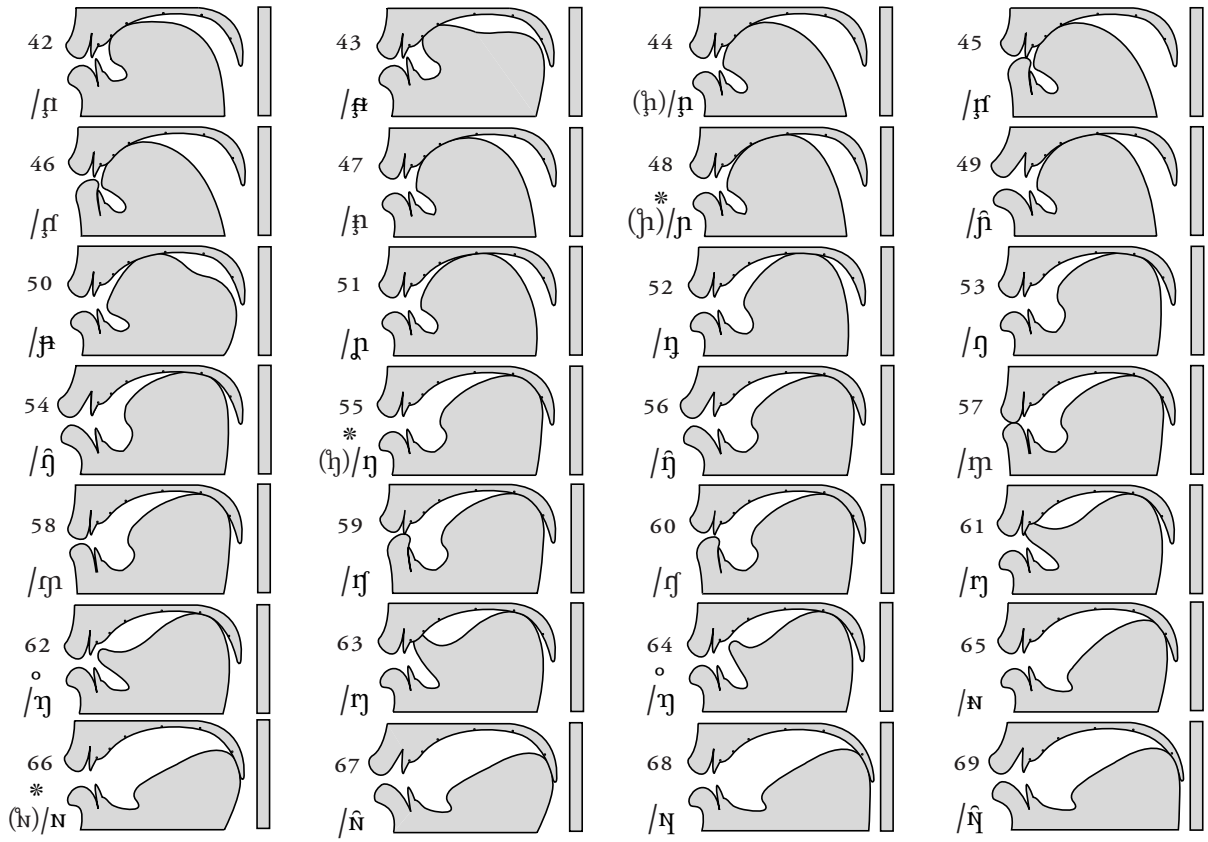


10.2.2. *Back* nasals [N] (28).

[[/, ɲ̟]][42]	[ɲ̟] postalveo-palatal: (lamino-)… ‘[n̻̊, n̻]’
[[/, n̪ʲ]][43]	[n̪ʲ] velarized postalveo-palatal: (lamino-)… ‘[n̻ˠ]’
[(ɲ̠), ɲ]][44]	pre-palatal: (lamino-)… (= between the prepalate and the lamina) ‘[n̻̊ʲ, n̻ʲ]’
[[/, ɲ̠ʲ]][45]	labiodental–pre-palatal: (lamino-)… ‘[n̻ʲɱ]’
[[/, ɻˡ]][46]	labiodentalized pre-palatal: (lamino-)… ‘[n̻ʲᵛ]’
[/, ɲ̺]][47]	pro-palatal (= between prepalatal and palatal) ‘[ɲ̟]’ (≠)
[(ɲ̠), ɲ]][48]	palatal (= between the [hard] palate and the [medio]dorsum) ‘[ɲ̊, ɲ]’ (≠, =)
[/, n̂]][49]	palatal rounded ‘[ɲʷ]’
[/, ɲ̪]][50]	[[ɲ̪] uvularized palatal ‘[ɲ̝ˠ]’

[[/, ɻ̟]][51] [ɻ] postpalatal (= retracted palatal or advanced prevelar) '[ɻ̟]'
[[/, ŋ̟]][52] [ŋ] prevelar (= between the prevelum and the [post]dorsum) '[ŋ̟]'
[[/, ŋ̠]][53] [ŋ] provelar (= between prevelar and velar) '[ŋ̠]' (≠)
[[/, ŋ̠̂]][54] [ŋ] provelar rounded '[ŋ̠ʷ]' (≠)
[(ʔŋ), ŋ][55] velar (= between the velum and the [post]dorsum) '[ŋ̊, ŋ]' (≠, =)
[/, ŋ̂][56] velar rounded (with lip rounding) '[ŋʷ]'
[/, ŋm][57] velar–bilabial (= *simult.* velar and bilabial) '[ŋ͡m]'
[/, ɱ][58] bilabialized velar '[ŋʷ]'
[[/, ŋ̍]][59] [/, ŋ] labiodentalized velar '[ŋᵛ]'
[[/, ɱ]][60] [/, ŋ] labiodentalized velar '[ŋᵛ]'
[/, ŋn][61] velar–dental (= *simult.* velar and dental) '[ŋ͡n̪]'
[[/, ŋ̪]][62] dentalized velar (with secondary dentalization) '[ŋ̪̊͡n̪]'
[/, ŋn][63] velar–alveolar (= *simult.* velar and alveolar) '[ŋ͡n]'
[[/, ŋ]][64] alveolarized velar '[ŋ̪͡n̪]'
[/, ɴ̟][65] preuvular '[ɴ̟]'
[(ʔɴ), ɴ][66] uvular (= between the uvula and the [post]dorsum) '[ɴ̊, ɴ]' (≠, =)
[/, ɴ̂][67] uvular rounded '[ɴʷ]'
[/, ɴ̝][68] pharyngealized uvular '[ɴˤ] or [ɴ̝]'
[/, ɴ̝̂][69] pharyngealized uvular rounded '[ɴˤʷ] or [ɴ̝ʷ]'.

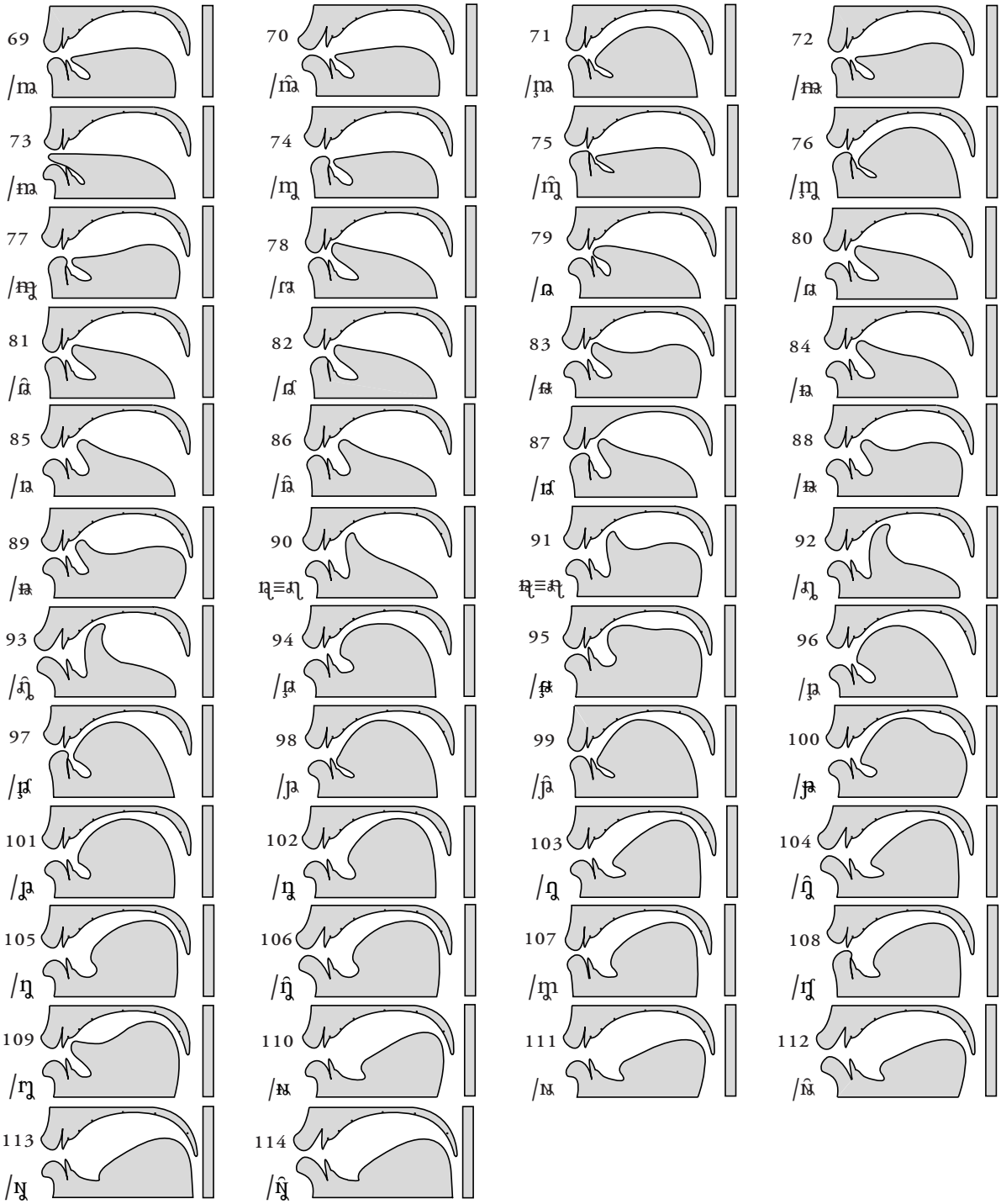
fig 10.2.2. *Back* nasal orograms (28).



10.2.3. *Semi-nasal* (46).

[[/, m̥]][70] [m] bilabial *semi*-nasal (= bilabial, but with no full contact) '[m̥]'
[[/, m̥̫]][71] [m] bilabial *semi*-nasal rounded '[m̥ʷ]'

fig 10.2.3. Semi-nasal orograms (46).



⟦/, m̫̰⟧[72] palatalized bilabial *semi*-nasal '[m̰ʲ]'
⟦/, m̪̰⟧[73] velarized bilabial *semi*-nasal (= bilabial, with no full contact & velarization) '[m̰ˠ]'
⟦/, m̪̰⟧[74] labial-apical *semi*-nasal '[m̰̪]'
⟦/, n̪̰⟧[75] [ɲ] labiodental *semi*-nasal (= labiodental, with no full contact) '[n̰̪]'
⟦/, n̪̰̂⟧[76] labiodental *semi*-nasal rounded '[n̰̪ʷ]'
⟦/, n̟̪̰⟧[77] palatalized labiodental *semi*-nasal '[n̰̪ʲ]'
⟦/, n̫̪̰⟧[78] [ɲ] velarized labiodental *semi*-nasal '[n̰̪ˠ]'

⟦/, ɾ̪̃⟧[79] dental-bilabial *semi*-nasal '[ɾ̪̃ʷ]'
⟦/, ñ̪⟧[80] pre-dental *semi*-nasal '[ñ̪]'
⟦/, ñ̪⟧[81] [n] dental-bilabial *semi*-nasal (= dental, with no full contact) '[ñ̪]'
⟦/, ñ̪ʷ⟧[82] dental-bilabial *semi*-nasal rounded '[ñ̪ʷ]'
⟦/, ñ̪ᵛ⟧[83] labiodentalized dental *semi*-nasal '[ñ̪ᵛ]'
⟦/, ñ̪ɣ⟧[84] velarized dental *semi*-nasal '[ñ̪ɣ]'
⟦/, n̆̃⟧[85] [n] denti-alveolar *semi*-nasal '[n̆̃]'
⟦/, ñ̪⟧[86] [n] alveolar *semi*-nasal (= alveolar, with no full contact) '[ñ̪]'
⟦/, ñ̪ʷ⟧[87] [n] alveolar *semi*-nasal rounded '[ñ̪ʷ]'
⟦/, ñ̪ᵛ⟧[88] labiodentalized alveolar *semi*-nasal '[ñ̪ᵛ]'
⟦/, ñ̪ɣ⟧[89] alveolar velarized *semi*-nasal '[ñ̪ɣ]'
⟦/, ñ̪ʁ⟧[90] alveolar uvularized *semi*-nasal '[ñ̪ʁ]'
⟦/, ɳ̃⟧[91] (or ⟦ɳ̃⟧) [ɳ] *semi*-postalveolar *semi*-nasal (= postalveolar) '[ɳ̃]'
⟦/, ɳ̃ɣ⟧[92] (or ⟦ɳ̃ɣ⟧) [ɳ] velarized *semi*-postalveolar *semi*-nasal (= postalveolar…) '[ɳ̃ɣ]'
⟦/, ɲ̃⟧[93] apico-palatal *semi*-nasal '[ɲ̃]'
⟦/, ɲ̃ʷ⟧[94] apico-palatal *semi*-nasal rounded '[ɲ̃ʷ]'
⟦/, ñ̠ʲ⟧[95] postalveo-palatal *semi*-nasal '[ñ̠ʲ]'
⟦/, ñ̠ɣ⟧[96] velarized postalveo-palatal *semi*-nasal '[ñ̠ɣ]'
⟦/, ñ̪ʲ⟧[97] [n] prepalatal *semi*-nasal (= prepalatal, with no full contact) '[ñ̪ʲ]'
⟦/, ñ̪ʲᵛ⟧[98] labiodentalized prepalatal *semi*-nasal '[ñ̪ʲᵛ]'
⟦/, ɲ̆̃⟧[99] [ɲ] palatal *semi*-nasal (= with no full contact) '[ɲ̆̃]'
⟦/, ɲ̆̃ʷ⟧[100] palatal *semi*-nasal rounded '[ɲ̆̃ʷ]'
⟦/, ɲ̆̃ʁ⟧[101] uvularized palatal *semi*-nasal '[ɲ̆̃ʁ]'
⟦/, ɲ̃⟧[102] apico-palatal *semi*-nasal '[ɲ̃]'
⟦/, ŋ̃⟧[103] pre-velar *semi*-nasal '[ŋ̃]'
⟦/, ŋ̃⟧[104] pro-velar *semi*-nasal (between prevelar & velar) '[ŋ̃]'
⟦/, ŋ̃ʷ⟧[105] pro-velar *semi*-nasal rounded (between prevelar & velar) '[ŋ̃ʷ]'
⟦/, ŋ̃⟧[106] [ŋ] velar *semi*-nasal '[ŋ̃]'
⟦/, ŋ̃ʷ⟧[107] [ŋ] velar *semi*-nasal rounded '[ŋ̃ʷ]'
⟦/, ŋ̃m⟧[108] velar–bilabial *semi*-nasal (= *simult.* velar and bilabial) '[ŋ̃m̃]'
⟦/, ŋ̃ᵛ⟧[109] labiodentalized velar *semi*-nasal '[ŋ̃ᵛ]'
⟦/, ŋ̃ñ̪⟧[110] velar–alveolar *semi*-nasal '[ŋ̃ñ̪]'
⟦/, ɴ̃⟧[111] [ɴ] preuvular *semi*-nasal '[ɴ̃]'
⟦/, ɴ̃⟧[112] [ɴ] uvular *semi*-nasal (= uvular, with no full contact) '[ɴ̃]'
⟦/, ɴ̃ʷ⟧[113] uvular *semi*-nasal rounded '[ɴ̃ʷ]'
⟦/, ɴ̃ˤ⟧[114] pharyngealized uvular *semi*-nasal '[ɴ̃ˤ]'
⟦/, ɴ̃ˤʷ⟧[115] pharyngealized uvular *semi*-nasal rounded '[ɴ̃ˤʷ]'.

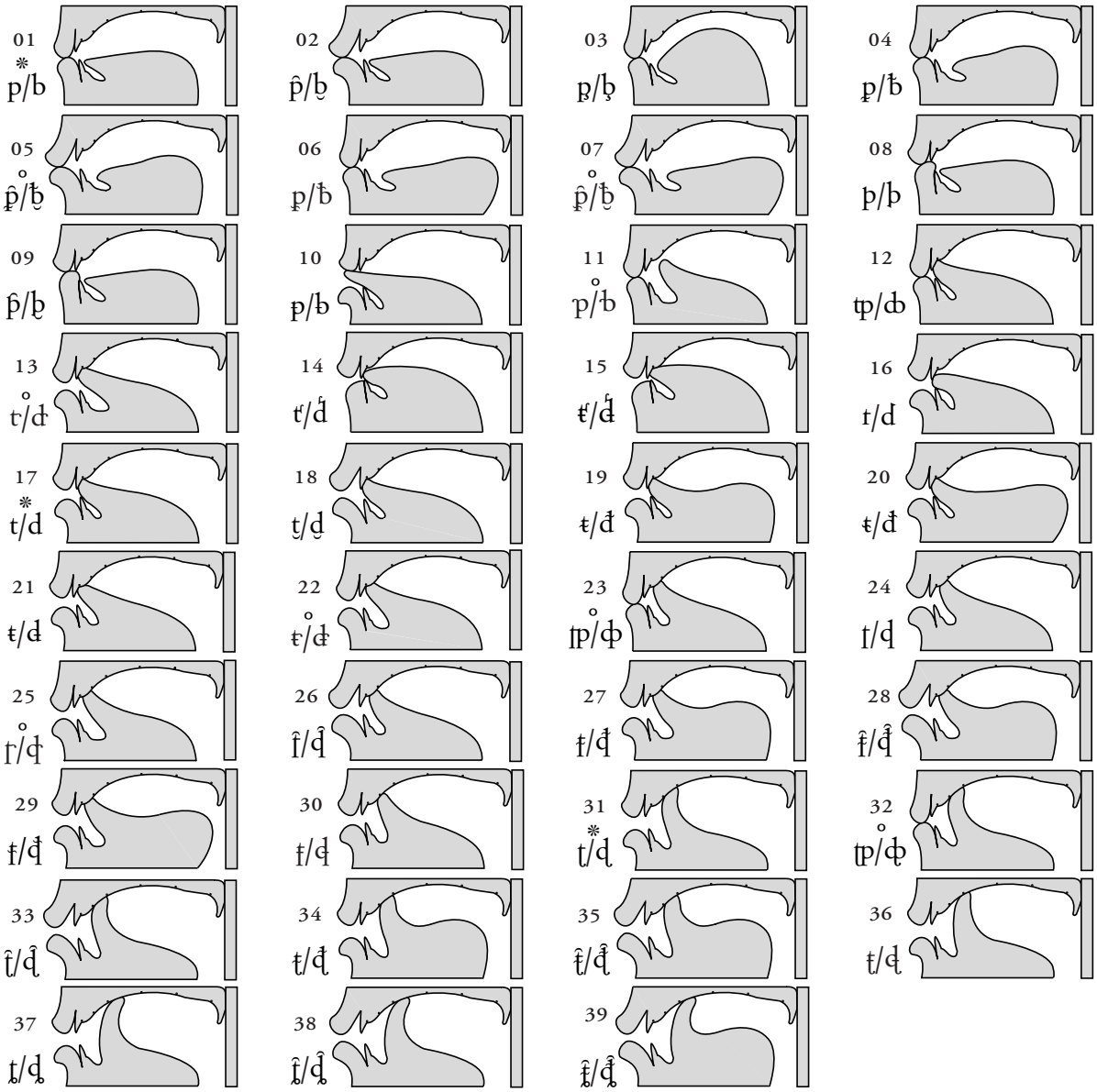
Stops /K/ [K, ᴷ] (78)

10.3. These include four synopses: front, back, and laryngeal; with the addition of some 'semi-stops'.

10.3.1. *Front* stops [K] (39).

[p, b]⁰¹ bilabial (= between the lips) '[p, b]' (=)
[p̂, b̂]⁰² bilabial rounded (= bilabial with lip rounding) '[pʷ, bʷ]'
[p̡, b̡]⁰³ palatalized bilabial '[pʲ, bʲ]'
[p̠, b̠]⁰⁴ velarized bilabial '[pˠ, bˠ]'
[p̠̂, b̠̂]⁰⁵ velarized bilabial rounded '[pˠʷ, bˠʷ]'
[p̠, b̠]⁰⁶ [[p̠, b̠]] uvularized bilabial '[p̠˕, b̠˕]'
[p̠̂, b̠̂]⁰⁷ [[p̠̂, b̠̂]] uvularized bilabial rounded '[p̠˕ʷ, b̠˕ʷ]'
[[p, b]]⁰⁸ [p, b] labiodental (=between the lower lip and the upper teeth) '[pᵛ, bᵛ]'
[[p̂, b̂]]⁰⁹ [p, b] labiodental rounded (=between lower lip and upper teeth) '[pᵛʷ, bᵛʷ]'
[p̪, b̪]¹⁰ labial-apical (= between the upper lip and the tip of the tongue) '[t̪, d̪]'
[[p, b]]¹¹ semi-alveolarized bilabial (= bilab. with tip approaching alveoli, no contact) '[p͡t̪, b͡d̪]'
[t̪p, d̪b]¹² dental–bilabial (= *simult.* dent. & bilab.) '[t̪͡p, d̪͡b]'
[[t̪, d̪]]¹³ semi-labialized dental (= with secondary labialization) '[t̪͡p̪, d̪͡b̪]'
[[t̪̊, d̪̊]]¹⁴ [t, d] labiodentalized dental (with a *lowered* tip) '[t̪ᵛ, d̪ᵛ]'
[[t̪̊, d̪̊]]¹⁵ [[t̪̊, d̪̊]] [t, d] labiodentalized denti-alveolar (with a *raised* tip) '[t̪̊ᵛ, d̪̊ᵛ]'ɬɖ
[[t, d]]¹⁶ [t, d] dental, or predental (with a *lowered* tip) '[t̪₊, d̪₊]'
[t, d]¹⁷ dental, or lamino-dental (with a *raised* tip) '[t̪, d̪]'
[t̪, d̪]¹⁸ dental rounded '[t̪ʷ, d̪ʷ]'
[t̪, d̪]¹⁹ velarized dental '[t̪ˠ, d̪ˠ]'
[t̪, d̪]²⁰ [[t̪, d̪]] uvularized dental '[t̪˕, d̪˕]'
[[t̪, d̪]]²¹ [t, d] denti-alveolar (or postdental, or prealveolar) (with *raised* tip) '[t̪̊, d̪̊]'
[[t̪, d̪]]²² semi-labialized denti-alveolar (with no firm bilabial contact) '[t̪̊͡p̪, d̪̊͡b̪]'
[tp, db]²³ alveolar–bilabial (= *simult.* alveol. & bilab.) '[t͡p, d͡b]'
[t, d]²⁴ alveolar (= between the alveoli and the tip of the tongue) '[t̻, d̻]'
[[t, d]]²⁵ semi-labialized alveolar (with no firm bilabial contact) '[t̻͡p̪, d̻͡b̪]'
[t̂, d̂]²⁶ alveolar rounded (with lip rounding) '[t̻ʷ, d̻ʷ]'
[t̠, d̠]²⁷ velarized alveolar '[t̻ˠ, d̻ˠ]'
[t̠, d̠]²⁸ [[t̠, d̠]] uvularized alveolar '[t̻˕, d̻˕]'
[t̠̂, d̠̂]²⁹ velarized alveolar rounded '[t̻ˠʷ, d̻ˠʷ]'
[t̠, d̠]³⁰ back-alveolar: (apico-)… (= not laminal) '[t̺, d̺]'
[ʈ, ɖ]³¹ postalveolar: (apico-)… (= not laminal) '[ʈ, ɖ]' (=)
[ʈp, ɖb]³² postalveolar–bilabial: (apico-)… (= *simult.* postalveol. & bilab.) '[ʈ͡p, ɖ͡b]'
[ʈ̂, ɖ̂]³³ postalveolar rounded: (apico-)… '[ʈʷ, ɖʷ]'
[ʈ̠, ɖ̠]³⁴ velarized postalveolar: (apico-)… '[ʈˠ, ɖˠ]'
[ʈ̠̂, ɖ̠̂]³⁵ velarized postalveolar rounded: (apico-)… (with lip rounding) '[ʈˠʷ, ɖˠʷ]'
[t̠, d̠]³⁶ back-postalveolar: (apico-)… (= not laminal) '[t̺, d̺]'
[c̻, ɟ̻]³⁷ apicopalatal (= between the [hard] palate and the tip) '[c̻, ɟ̻]'
[ĉ̻, ɟ̻̂]³⁸ apicopalatal rounded (with lip rounding) '[c̻ʷ, ɟ̻ʷ]'
[ĉ̠̻, ɟ̠̻̂]³⁹ velarized apicopalatal rounded (with lip rounding) '[c̻ˠʷ, ɟ̻ˠʷ]'.

ƒig 10.3.1. *Front* stop orograms (39).

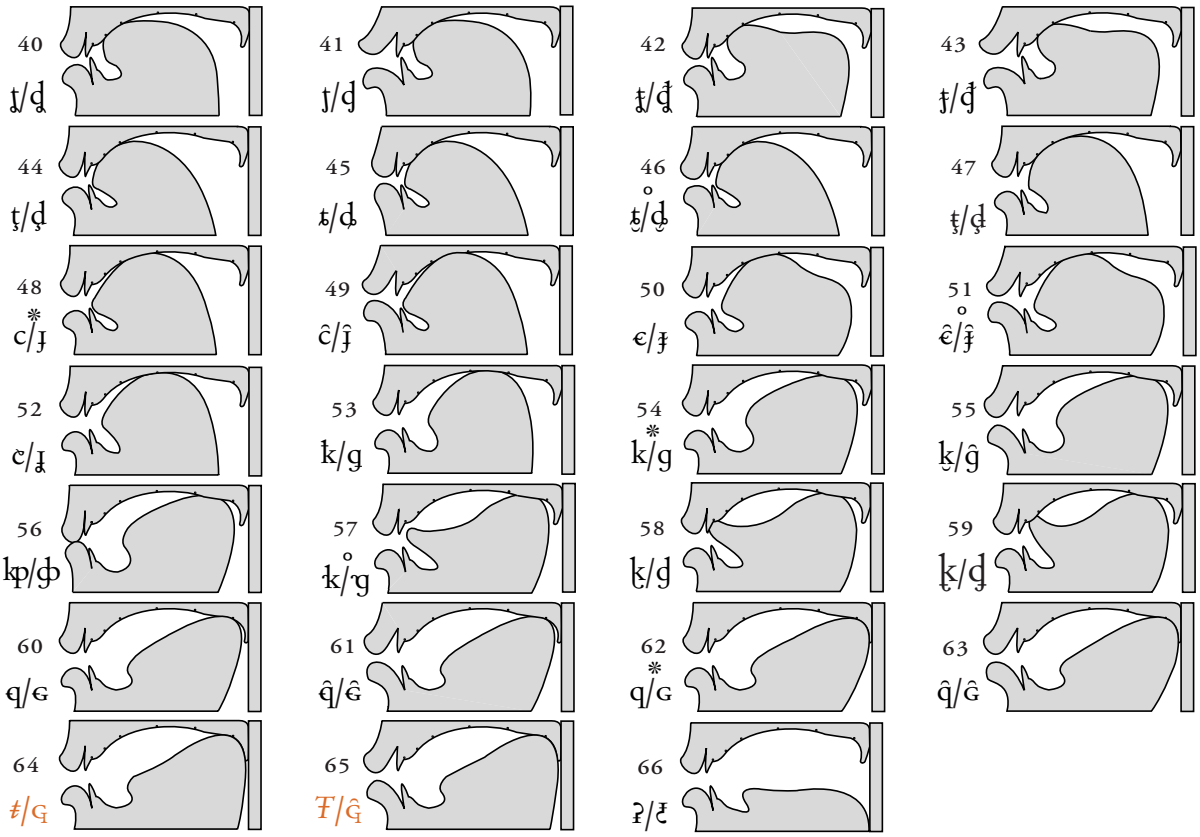


10.3.2. *Back* stops [K] (27).

[[k̟, g̟]][40]	postalveo-palatal: (lamino-)… '[k̟̪ʲ, g̟̪ʲ]'
[[k̠, g̠]][41]	postalveo-palatal protruded: (lamino-)… '[k̟̪ʲʷ, g̟̪ʲʷ]'
[[k̟̠, g̟̠]][42]	postalveo-velar: (lamino-)… '[k̟̪ʲɣ, g̟̪ʲɣ]'
[[k̠̟, g̠̟]][43]	postalveo-velar protruded: (lamino-)… '[k̟̪ʲɣʷ, g̟̪ʲɣʷ]'
[k̠, g̠][44]	pre-palatal: (lamino-)… (= between the prepalate and the lamina) '[k̟̪ʲ, g̟̪ʲ]'
[ʞ, g̠][45]	labialized prepalatal (with vertical labialization): (lamino-)… '[k̟̪ʲβ, g̟̪ʲβ]'
[k̠̟, g̠̟][46]	pre-palatal rounded: (lamino-)… '[k̟̪ʲʷ, g̟̪ʲʷ]'
[k̟̠, g̟̠][47]	pro-palatal (= between prepalatal and palatal) '[c⁺, ɟ⁺]' (≠)
[c, ɟ][48]	palatal (= between the [hard] palate and the [medio]dorsum) '[c, ɟ]' (=)
[ĉ, ĝ][49]	palatal rounded '[cʷ, ɟʷ]'
[c̸, ɟ̸][50]	[[c̸, ɟ̸]] uvularized palatal '[c̸ˠ, ɟ̸ˠ]'
[ĉ̸, ĝ̸][51]	[[ĉ̸, ĝ̸]] uvularized palatal rounded '[c̸ˠʷ, ɟ̸ˠʷ]'

⟦c, ɟ⟧[52]	[c, ɟ] postpalatal (= retracted palatal or advanced prevelar) '[c̠, ɟ̠]'
⟦k, g⟧[53]	[k, g] prevelar (= between the prevelum and the [post]dorsum) '[k̟, g̟]'
[k, g][54]	velar (= between the velum and the [post]dorsum) '[k, g]' (=)
[k̠, g̠][55]	velar rounded (with lip rounding) '[kʷ, gʷ]'
[kp, gb][56]	velar–bilabial (= *simult.* velar and bilabial) '[k͡p, g͡b]'
⟦k, ɡ⟧[57]	semi-dentalized velar (with tip approach. the teeth, but with no contact) '[k͡t̪, g͡d̪]'
[k̠, g̠][58]	velar–dental (= *simult.* velar and dental) '[k͡t̪, g͡d̪]'
⟦k̠, g̠⟧[59]	[k̠, g̠] velar–alveolar (= *simult.* velar and alveolar) '[k͡t̠, g͡d̠]'
⟦q, ɢ⟧[60]	preuvular '[q̟, ɢ̟]'
⟦q̂, ɢ̂⟧[61]	preuvular rounded '[q̟ʷ, ɢ̟ʷ]'
[q, ɢ][62]	uvular (= between the uvula and the [post]dorsum) '[q, ɢ]' (=)
⟦q̂, ĝ⟧[63]	uvular rounded '[qʷ, ɢʷ]'
⟦q̠, ɢ̠⟧[64]	pharyngealized uvular '[qˤ, ɢˤ]'
⟦q̠̂, ĝ̠⟧[65]	pharyngealized uvular rounded '[qˤʷ, ɢˤʷ]'
[ʔ, ʡ][66]	pharyngeal (= between the lower pharynx and root of tongue, 'epiglottal') '[ʔ, ʡ̰]'.

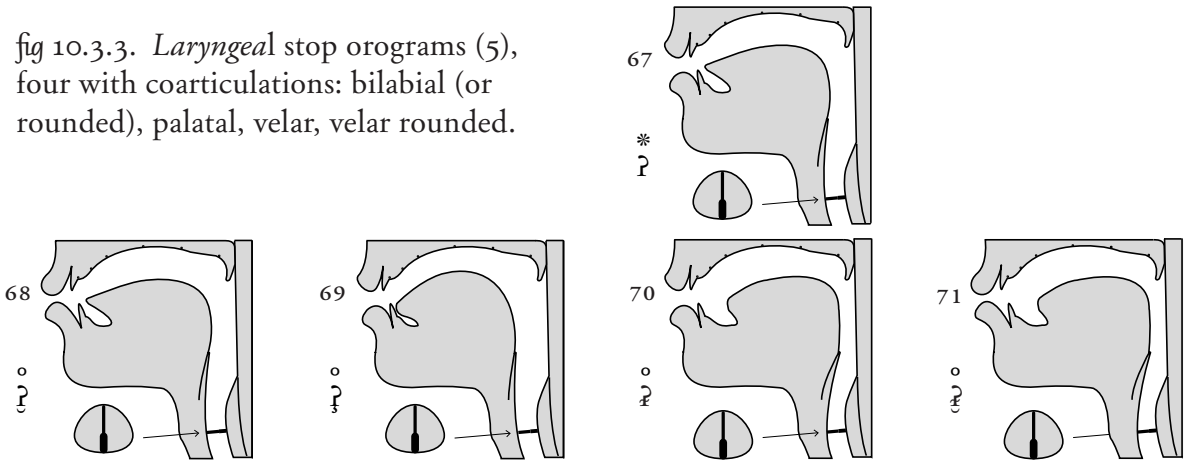
fig 10.3.2. *Back* stop orograms (27).



10.3.3. *Laryngeal* stops [ʔ] (5) – voiceless (or a-voiced, by definition).

[ʔ][67]	laryngeal (= between the vocal folds, including the arytenoid cartilages) '[ʔ]' (=)
⟦ʔ̂⟧[68]	[ʔ] laryngeal rounded (with lip rounding) '[ʔʷ]'
⟦ʔ̠⟧[69]	[ʔ] palatalized laryngeal (with the dorsum *raised* towards the [hard] palate) '[ʔʲ]'
⟦ʔ̡⟧[70]	[ʔ] velarized laryngeal (with the [post]dorsum *raised* towards the uvula) '[ʔˠ]'.
⟦ʔ̡̂⟧[71]	[ʔ] velarized & labialized laryngeal '[ʔˠʷ]'.

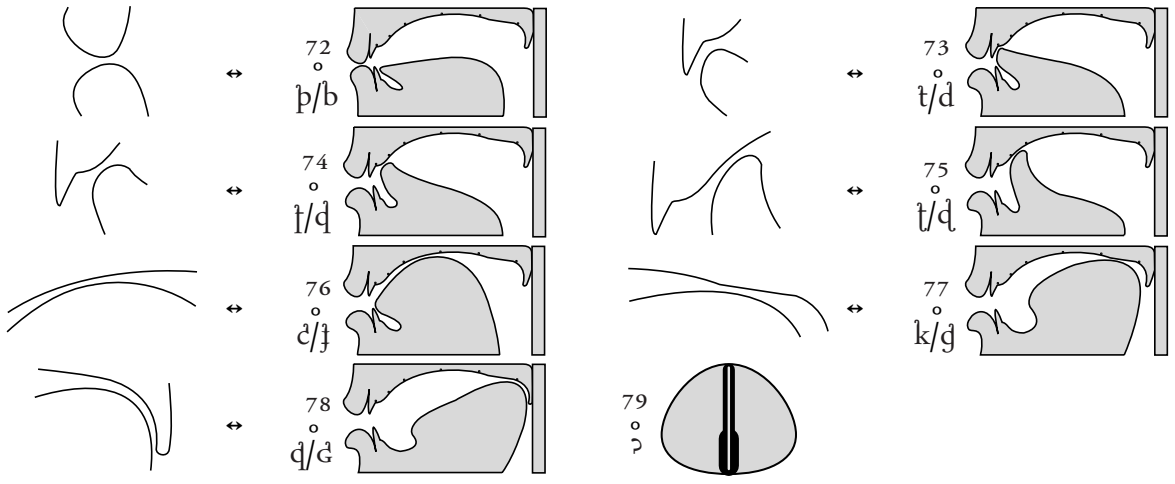
fig 10.3.3. *Laryngeal* stop orograms (5), four with coarticulations: bilabial (or rounded), palatal, velar, velar rounded.



10.3.4. Some '*semi*-stops' are also possible, which are less firmly articulated (*ie* with partial occlusion). They remain different both from very tense constrictives and very lax stopstrictives. We will indicate here only those produced at the most important places of articulation, practically the official ones (8). Their generic symbol is [ᴷ], whereas they can be represented with the diacritic shown. It is important to observe well (in the nearby enlargements) the non-contact at the articulation places. For the laryngeal phone *cf fig* 10.3.3, but most of all *cf fig* 4.4.B.

⟦ƥ, ɓ⟧ or	[ṗ, ḃ][72]	[p, b] bilabial (with no full contact) '[p̆, b̆]'
⟦ƭ, ɗ⟧	[ṭ, ḍ][73]	[t, d] dentale (with no full contact) '[t̪, d̪]'
⟦ʈ, ɖ⟧	[ṫ, ḋ][74]	[ɾ, ɖ] alveolar (with no full contact) '[t̆, d̆]'
⟦ʧ, ʤ⟧	[ṭ̠, ḍ̠][75]	[ʧ, ʤ] postalveolar (with no full contact) '[ʧ̆, ʤ̆]'
⟦ƈ, ɟ⟧	[ċ, ɟ̇][76]	[c, ɟ] palatal (with no full contact) '[c̆, ɟ̆]'
⟦k, ɡ⟧	[k̇, ġ][77]	[k, g] velar (with no full contact) '[k̆, ɡ̆]'
⟦ɋ, ɢ⟧	[q̇, ɢ̇][78]	[q, ɢ] uvular (with no full contact) '[q̆, ɢ̆]'
⟦ʔ⟧	[ʔ̇][79]	[ʔ] laryngeal (with no full contact) '[ʔ̆]'.

fig 10.3.4. *Semi*-stop diagrams (8).



Stop-strictives /K͡Σ/ [K͡X, K͡ˣ, K͡S, K͡ˢ, K͡Ɬ, K͡ʀ, ᴷX, ᴷS] (still called 'affricates' – 114)

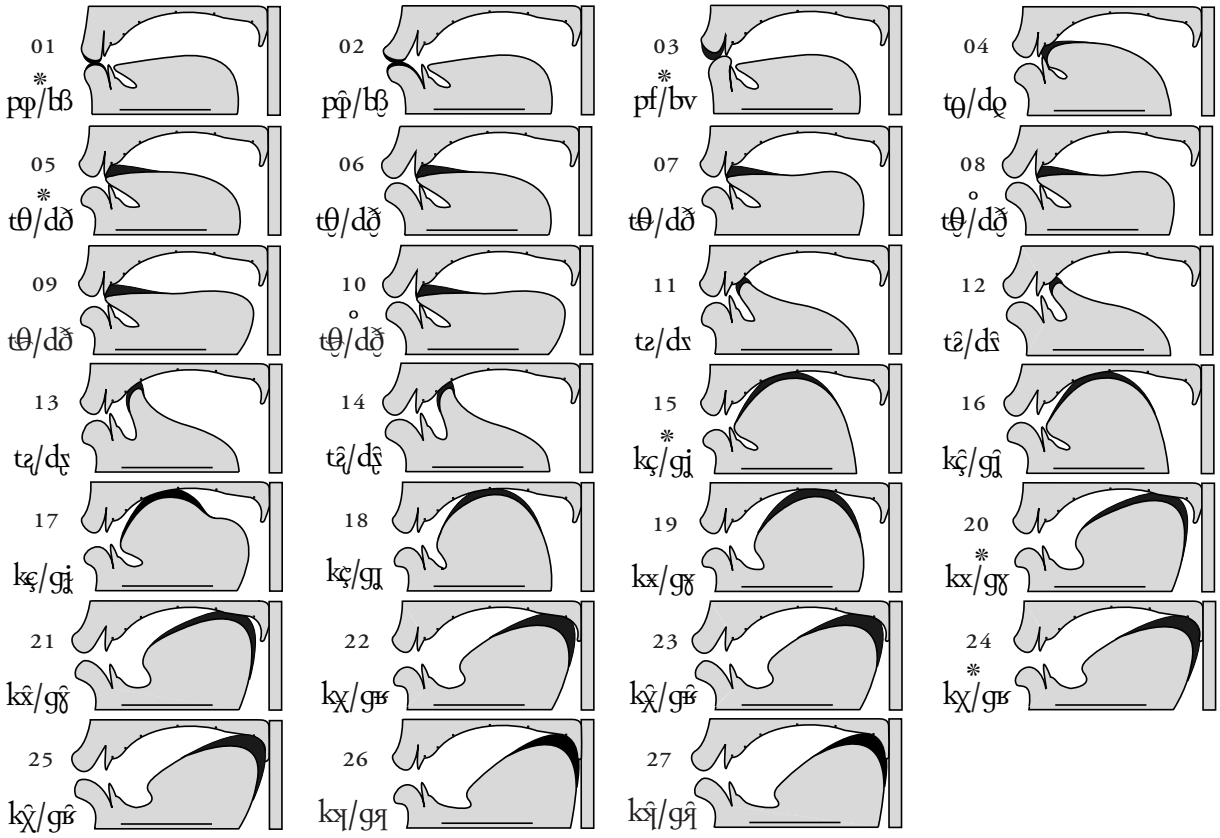
10.4. These include ten synopses of plain (or 'slit', or un-grooved) and grooved phones. Of course, *grooved* refers to the actual groove which can be formed on the tip and lamina of the tongue. Also some laterals and trills are given, since for these phones a stopstrictive manner is frequent.

We include the synopses of stop-*semi*strictives (or stop-*semi*constrictives, with a *semiconstrictive* second element, § 10.4.5-6) and also the synopses of *semi*-stop--strictives. There are two kinds of semistop-strictives: by *detension* and by *proportion*. Those by detension have, as their first element, a semistop (§ 10.3.4 & § 10.4.7-8). Those by proportion have a very short stop as their first element.

10.4.1. Stop-strictives /K͡X/ [K͡X] (27).

[p͡ɸ, b͡β]01 bilabial (= between the lips) '[p͡ɸ, b͡β]'
[p͡ɸ̞, b͡β̞]02 bilabial rounded (= bilabial with lip rounding) '[p͡ɸ̞ʷ, b͡β̞ʷ]'
[p͡f, b͡v]03 labiodental (= between the lower lip and the upper teeth) '[p͡f, b͡v]'
[t͡θ̠, d͡ð̠]04 dental, or pro-dental (with a *lowered* tip) '[t͡θ̠ , d͡ð̠]'
[t͡θ, d͡ð]05 dental, or lamino-dental (with a *raised* tip of the tongue) '[t͡θ, d͡ð]'
[t͡θ̪, d͡ð̪]06 dental rounded (with *raised* tip of the tongue) '[t͡θ̪ʷ, d͡ð̪ʷ]'
[t͡θ̻, d͡ð̻]07 velarized dental (with *raised* tip) '[t͡θ̻˞, d͡ð̻˞]'
[t͡θ̪̻, d͡ð̪̻]08 velarized dental rounded (with *raised* tip) '[t͡θ̪̻˞ʷ, d͡ð̪̻˞ʷ]'
[t͡θ̻, d͡ð̻]09 ⟦t͡θ̻, d͡ð̻⟧ uvularized dental (with *raised* tip) '[t͡θ̻ˠ, d͡ð̻ˠ]'
[t͡θ̪̻, d͡ð̪̻]10 ⟦t͡θ̪̻, d͡ð̪̻⟧ uvularized dental rounded (with *raised* tip) '[t͡θ̪̻ˠʷ, d͡ð̪̻ˠʷ]'

fig 10.4.1. Stop-strictive orograms (27).



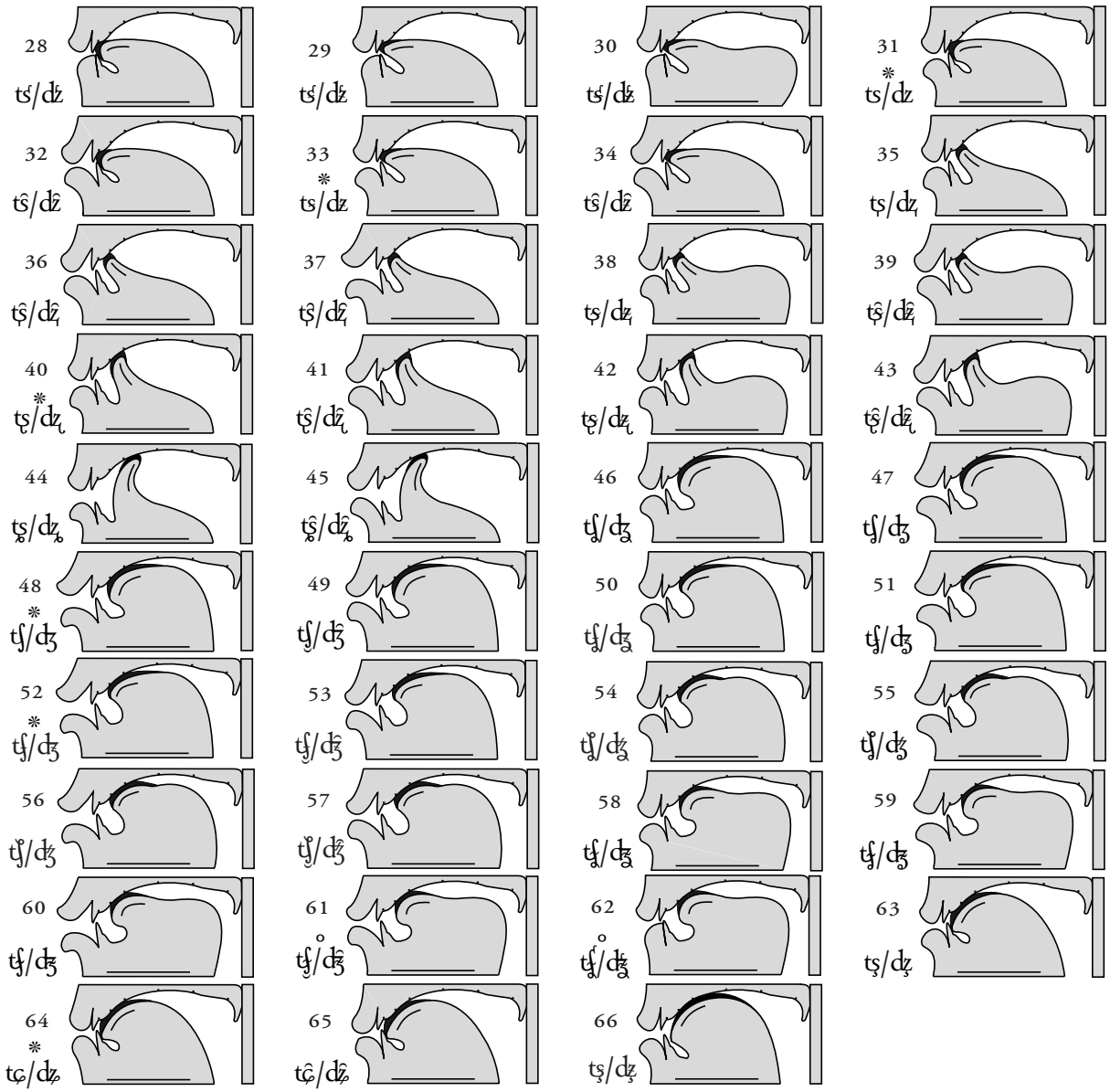
[tɾ, dɾ][11] alveolar (= between the alveoli and the tip of the tongue) '[t̪̆, d̪̆]'
[tɾ̂, dɾ̂][12] alveolar rounded (= alveoalr with lip rounding) '[t̪̆ʷ, d̪̆ʷ]'
[tɻ, dɻ][13] postalvelolar: (apico-)… (= not laminal) '[t̺̆, d̺̆]'
[tɻ̂, dɻ̂][14] postalvelolar rounded: (apico-)… '[t̺̆ʷ, d̺̆ʷ]'
[kɕ, gʑ][15] palatal (= between the [hard] palate and the [medio]dorsum) '[c͡ɕ, ɟ͡ʑ]'
[kɕ̂, gʑ̂][16] palatal rounded (with lip rounding) '[c͡ɕʷ, ɟ͡ʑʷ]'
[kɕ̝, gʑ̝][17] [[kɕ, gʑ]] uvularized palatal '[c͡ɕˠ, ɟ͡ʑˠ]'
[kɕ̟, gʑ̟][18] postpalatal (= retracted palatal or advanced prevelar) '[c͡ɕ̟, ɟ͡ʑ̟]'
[kɤ, gɣ][19] [kx, gɣ] prevelar (= between the prevelum and the [post]dorsum) '[k͡x̟, g͡ɣ̟]'
[kx, gɣ][20] velar (= between the velum and the [post]dorsum) '[k͡x, g͡ɣ]'
[kx̂, gɣ̂][21] velar rounded (with lip rounding) '[k͡xʷ, g͡ɣʷ]'
[kχ, gʁ][22] preuvular '[q̟͡χ, ɢ̟͡ʁ]'
[kχ̂, gʁ̂][23] preuvular rounded '[q̟͡χʷ, ɢ̟͡ʁʷ]'
[kχ, gʁ][24] uvular (= between the uvula and the [post]dorsum) '[q͡χ, ɢ͡ʁ]'
[kχ̂, gʁ̂][25] uvular rounded '[q͡χʷ, ɢ͡ʁʷ]'
[kʡ, gʕ][26] pharyngealized uvular '[q̺̆͡ʀ̆, ɢ̆͡ʀ̆]'
[kʡ̂, gʕ̂][27] pharyngealized uvular rounded '[q̺̆͡ʀ̆ʷ, ɢ̆͡ʀ̆ʷ]'.

10.4.2. *Grooved* stop-strictives /KS/ [KS] (39).

[tʂ, dʐ][28] labiodentalized dental (with a *lowered* tip of the tongue) '[t̪͡sᵛ, d̪͡zᵛ]'
[tʂ, dʐ][29] labiodentalized dental (with a *raised* tip of the tongue) '[t̪͡sᵛ, d̪͡zᵛ]'
[tʂ, dʐ][30] [[tʂ, dʐ]] uvulo-labiodentalized dental (with a *raised* tip) '[t̪͡sˠᵛ, d̪͡zˠᵛ]'
[ts, dz][31] dental (with a *lowered* tip) '[t̪͡s, d̪͡z]'
[tŝ, dẑ][32] dental rounded (with a *lowered* tip + lip rounding) '[t̪͡sʷ, d̪͡zʷ]'
[[ts, dz]][33] [ts, dz] denti-alveolar (with a *raised* tip) '[t̪͡s, d̪͡z]'
[[tŝ, dẑ]][34] [tŝ, dẑ] denti-alveolar rounded (with a *raised* tip + lip rounding) '[t̪͡sʷ, d̪͡zʷ]'
[tʂ, dʑ][35] alveolar (between the alveoli and the tip) '[t̪͡s, d̪͡z]'
[tʂ̂, dʑ̂][36] alveolar rounded '[t̪͡sʷ, d̪͡zʷ]'
[tʂ̂, dʑ̂][37] alveolar protruded '[t̪͡sʷ̟, d̪͡zʷ̟]'
[tʂ, dʑ][38] velarized alveolar '[t̪͡sˠ, d̪͡zˠ]'
[tʂ̂, dʑ̂][39] velarized alveolar rounded (with lip rounding) '[t̪͡sʷ, d̪͡zʷ]'
[tʂ, dʑ][40] postalveolar: (apico-)… (= not laminal) '[t̺̆͡s, d̺̆͡z]'
[tʂ̂, dʑ̂][41] postalveolar rounded: (apico-)… (= not laminal) '[t̺̆͡sʷ, d̺̆͡zʷ]'
[tʂ, dʑ][42] velarized postalveolar: (apico-)… (= not laminal) '[t̺̆͡sˠ, d̺̆͡zˠ]'
[tʂ̂, dʑ̂][43] postalveolar rounded: (apico-)… (= not laminal) '[t̺̆͡sˠʷ, d̺̆͡zˠʷ]'
[tʂ̻, dʑ̻][44] apicopalatal (= between the [hard] palate and the tip) '[t̻̆͡s̻, d̻̆͡z̻]'
[tʂ̻̂, dʑ̻̂][45] apicopalatal rounded (with lip rounding) '[t̻̆͡s̻ʷ, d̻̆͡z̻ʷ]'
[tʃ, dʒ][46] postalveo-palatal: (lamino-)… (between the postalveolar area and the lamina, with raising of the mediodorsum, and with a *lowered* tip) '[t̪͡ʃʲ, d̪͡ʒʲ]'
[[tʃ, dʒ]][47] postalveo-palatal half-protruded: (lamino-)… '[t̪͡ʃ⁽ʷ⁾, d̪͡ʒ⁽ʷ⁾]'
[tʃ, dʒ][48] postalveo-palatal protruded: (lamino-)… (with protr., not just round.) '[t̪͡ʃʷ, d̪͡ʒʷ]'
[tʃ̟, dʒ̟][49] postalveo-palatal over-rounded: (lamino-)… (with round. and protr.) '[t̪͡ʃʷ̟, d̪͡ʒʷ̟]'
[[tʃ, dʒ]][50] [tʃ, dʒ] postalveo-palatal: (lamino-)… (between the postalveolar area and the lamina, with raising of the mediodorsum, and with *raised* tip) '[t̪͡ʃʲ, d̪͡ʒʲ]'
[[tʃ, dʒ]][51] [tʃ, dʒ] postalveo-palatal half-protruded: (lamino-)… '[t̪͡ʃ⁽ʷ⁾, d̪͡ʒ⁽ʷ⁾]'
[[tʃ, dʒ]][52] [tʃ, dʒ] postalveo-palatal protruded: (lami.)… '[t̪͡ʃʷ, d̪͡ʒʷ]'
[[tʃ̟, dʒ̟]][53] [tʃ̟, dʒ̟] postalveo-palatal over-rounded: (lamino-)… '[t̪͡ʃʷ̟, d̪͡ʒʷ̟]'

[ʧ̠, ʤ̠][54] postalveo-prevelar: (lamino-)… (with raising of the dorsum towards the prevelum, not towards the palate) '[t͡ʃ̟˕˖ɣ, d͡ʒ̟˕˖ɣ]'
[[ʧ̠, ʤ̠]][55] postalveo-prevelar half-protruded: (lamino-)… '[t͡ʃ̟˕˖ɣ⁽ʷ⁾, d͡ʒ̟˕˖ɣ⁽ʷ⁾]'
[ʧ̠, ʤ̠][56] postalveo-prevelar protruded: (lamino-)… '[t͡ʃ̟˕˖ɣʷ, d͡ʒ̟˕˖ɣʷ]'
[ʧ̠, ʤ̠][57] postalveo-prevelar over-rounded: (lamino-)… '[t͡ʃ̟˕˖ɣʷ̹, d͡ʒ̟˕˖ɣʷ̹]'
[ʧ̟, ʤ̟][58] postalveo-velar: (lamino-)… (with raising of the dorsum towards vel.) '[t͡ʃ̟ɣ, d͡ʒ̟ɣ]'
[ʧ̟, ʤ̟][59] postalveo-velar half-protruded: (lamino-)…'[t͡ʃ̟ɣ⁽ʷ⁾, d͡ʒ̟ɣ⁽ʷ⁾]'
[ʧ̟, ʤ̟][60] postalveo-velar protruded: (lamino-)…'[t͡ʃ̟ɣʷ, d͡ʒ̟ɣʷ]'
[ʧ̟, ʤ̟][61] postalveo-velar over-rounded: (lamino-)… '[t͡ʃ̟ɣʷ̹, d͡ʒ̟ɣʷ̹]'
[ʧ̟, ʤ̟][62] labiodentalized postalveo-velar: (lamino-)… '[t͡ʃ̟ɣᵛ, d͡ʒ̟ɣᵛ]'
[ʦ̻, ʣ̻][63] pre-palatal: (lamino-)… (= between the prepalate and the lamina) '[t͡s̻ʲ, d͡z̻ʲ]'
[ʦ̻ˠ, ʣ̻ˠ][64] bilabialized pre-palatal: (lamino-)… (with vertical labialization) '[t͡s̻ʲβ, d͡z̻ʲβ]'
[ʦ̂, ʣ̂][65] pre-palatal rounded: (lamino-)… '[t͡s̻ʲʷ̹, d͡z̻ʲʷ̹]'.
[ʦ̺, ʣ̺][66] pro-palatal (= between prepalatal and palatal) '[t͡s̺ʲ, d͡z̺ʲ]' (≠)

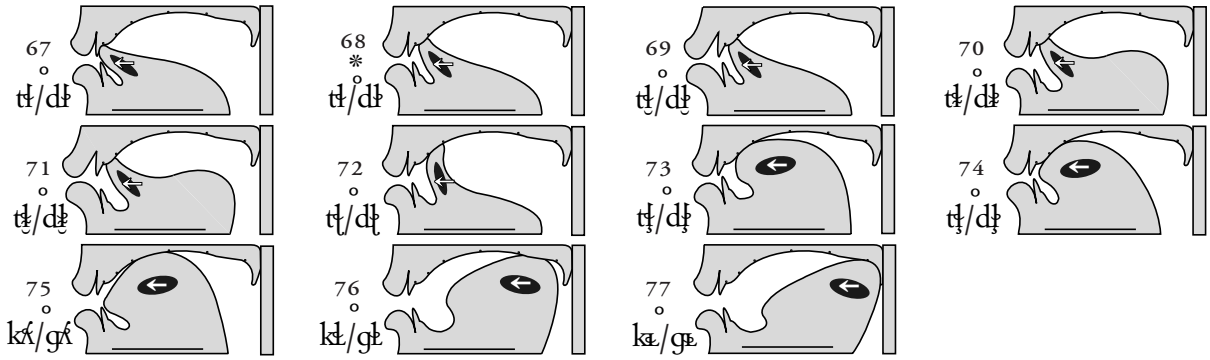
fig 10.4.2. Grooved stop-strictive orograms (39).



10.4.3. *Lateral* stop-strictives [KɬL] (11).

[[tɬ, dɬ]][67]	[tɬ, dɬ] dental (with lateral contraction of the tongue) '[t͡ɬ̪, d͡ɮ̪]'
[tɬ, dɬ][68]	alveolar (with lateral contraction) '[t͡sˡʲ, d͡zˡʲ]'
[tɬ̟, dɬ̟][69]	alveolar rounded (with lateral contraction) '[t͡sˡʲ, d͡zˡʲʷ]'
[tɬ̠, dɬ̠][70]	velarized alveolar (with lateral contraction) '[t͡ɬˠ, d͡ɮˠ]'
[tɬ̠̟, dɬ̠̟][71]	velarized alveolar rounded (with lateral contraction) '[t͡ɬˠʷ, d͡ɮˠʷ]'
[tɭ, dɭ][72]	postalveolar (with lateral contraction) '[t͡ɭ̟, d͡ɭ̟]'
[[tʎ̝, dʎ̝]][73]	[tʎ̝, dʎ̝] postalveo-palatal (with lateral contraction) '[t͡ʎ̝ˡʲ, d͡ʎ̝ˡʲ]'
[tʎ̝, dʎ̝][74]	prepalatal (with lateral contraction) '[t͡ʎ̝˖ˡʲ, d͡ʎ̝˖ˡʲ]'
[kʎ̠, gʎ̠][75]	palatal (with lateral contraction) '[c͡ʎ̠˖, ɟ͡ʎ̠˖]'
[kɬ, gɬ][76]	velar (with lateral contraction) '[k͡ʟ̠˖, g͡ʟ̠˖]'
[kʟ, gʟ][77]	uvular (with lateral contraction) '[k͡ʟ̠˖, g͡ʟ̠˖]'.

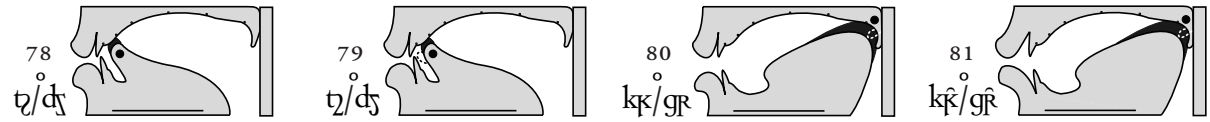
fig 10.4.3. Lateral stop-strictive orograms (11).



10.4.4. *Tapped* and *trilled* stop-strictives [KR] (4).

[ɽ, ɖɽ][78]	*tapped* alveolar '[t͡ɾ̟˖, d͡ɾ̟˖]'
[ɽ, ɖʃ][79]	*trilled* alveolar '[t͡r̟˖, d͡r̟˖]'
[kʁ, gʁ][80]	*trilled* uvular '[q͡ʀ̠˖ˤ, ɢ͡ʀ̠˖ˤ]'
[kχ̂, gʁ̂][81]	*trilled* uvular rounded '[q͡ʀ̠˖ˤʷ, ɢ͡ʀ̠˖ˤʷ]'.

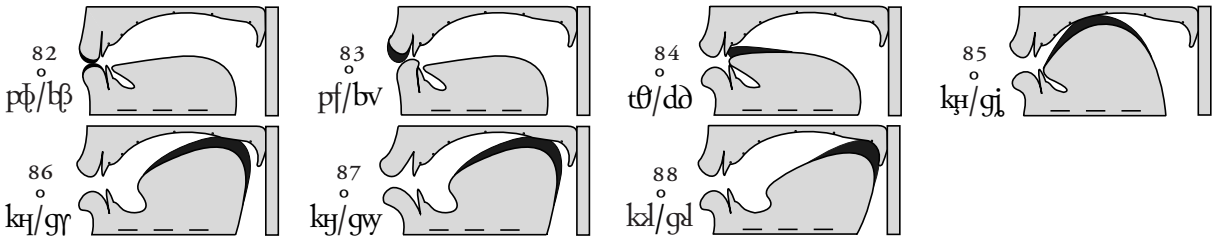
fig 10.4.4. Tap & trill stop-strictive orograms (4).



10.4.5. Stop-*semi*(con)strictives [K^{X}] (7, others are possible).

[[pɸ, bβ]][82]	[pɸ, bβ] bilabial (= with semi-constrictive second element) '[p͡ɸ̞, b͡β̞]'
[[pf, bv]][83]	[pf, bv] labiodental (= with semi-constrictive second element) '[p͡f̞, b͡v̞]'
[[tθ, dð]][84]	[tθ, dð] dental (= with semi-constrictive second element) '[t͡θ̞, d͡ð̞]'
[[kɻ, gɻ]][85]	[kɕ, gʝ] palatal (= with semi-constrictive second element) '[c͡ɕ̞, ɟ͡ʝ̞]'
[[kɻ, gɣ]][86]	[kx, gɣ] velar (= with semi-constrictive second element) '[k͡x̞, g͡ɣ̞]'
[[kɧ, gʍ]][87]	[kχ, gʁ] velar rounded (= with semi-constrictive second element) '[k͡x̞ʷ, g͡ɣ̞ʷ]'
[[kɹ, gʁ]][88]	[kχ, gʁ] uvular (= with semi-constrictive second element) '[k͡χ̞, g͡ʁ̞]'.

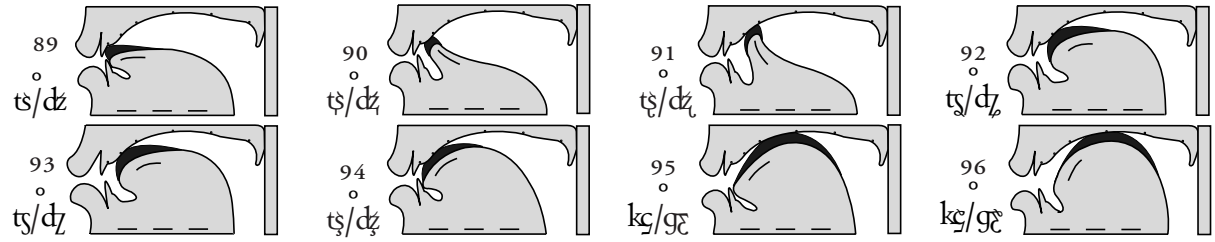
fig 10.4.5. Stop-semi-(con)strictive orograms (7).



10.4.6. *Grooved* stop-*semi*(con)strictives [K^{S}] (8, others are possible). Of course, their groove is less marked than for normal phones, and thus possible even for palatal and postpalatal phones.

[[ʦ, ʣ]][89]	[ʦ, ʣ] dental (= with semi-constrictive second element) '[t͡s̪̟, d͡z̪̟]'
[[ʂ, ʐ]][90]	[ʂ, ʐ] alveolar (= with semi-constrictive second element) '[t͡s̪, d͡z̪]'
[[ʂ̺, ʐ̺]][91]	[ʂ̺, ʐ̺] postalveolar (= with semi-constrictive second element) '[t͡ʂ̺, d͡ʐ̺]'
[[ʧ, ʤ]][92]	[ʧ, ʤ] postalveo-palatal (= with semi-constrictive second element) '[t͡ʃ̟ʲ, d͡ʒ̟ʲ]'
[[ʧ, ʤ]][93]	[ʧ, ʤ] postalveo-palatal protruded (= with semi-constr. second elem.) '[t͡ʃ̟ʷ, d͡ʒ̟ʷ]'
[[ʨ, ʥ]][94]	[ʨ, ʥ] prepalatal (= with semi-constrictive second element) '[t͡ɕʲ, d͡ʑʲ]'
[kɕ, gʑ][95]	palatal (almost [kç, gʝ] but with grooved & semi-constr. second el.) '[k͡ɕˢ, g͡ʑᶻ]'
[[kɕ, gʑ]][96]	postpalatal (almost [kɕ, gʝ] but with grooved & semi-constr. second el.) '[k͡ɕˢ, g͡ʑᶻ]'.

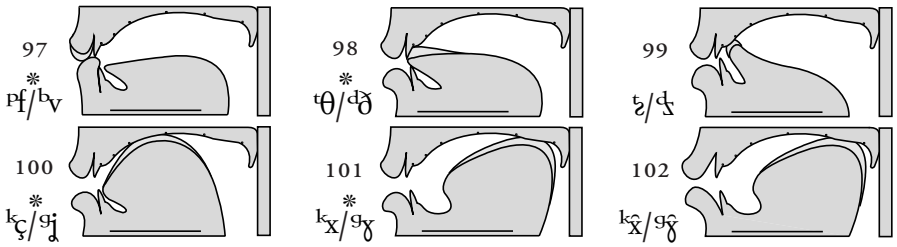
fig 10.4.6. Grooved stop-semi-(con)strictive orograms (8).



10.4.7. *Semi*stop-strictives by proportion [^{K}X] (6, others are possible).

[[ᵖf, ᵇv]][97]	[pf, bv] labiodental (= with reduced first element) '[p̆f, b̆v]'
[[ᵗθ, ᵈð]][98]	[tθ, dð] dental (= with reduced first element) '[t̪̆θ, d̪̆ð]'
[[ᵗɹ, ᵈɹ]][99]	[tɹ, dɹ] alveolar (= with reduced first element) '[t̆̈ɹ̈, d̆̈ɹ̈]'
[[ᵏç, ᵍʝ]][100]	[kç, gʝ] palatal (= with reduced first el.) '[c̆ç, ɟ̆ʝ]'
[[ᵏx, ᵍɣ]][101]	[kx, gɣ] velar (= with reduced first element) '[k̆x, ğɣ]'
[[ᵏχ, ᵍʁ]][102]	[kχ, gʁ] velar rounded (= with reduced first element) '[k̆xʷ, ğɣʷ]'.

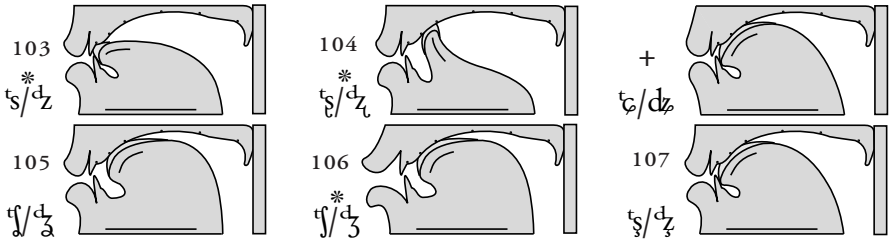
fig 10.4.7. *Semi*-stop-strictives *by proportion* (6).



10.4.8. *Grooved semi*-stop-strictives by proportion [KS] (5).

[[ᵗs, ᵈz]]¹⁰³ [ts, dz] dental (= with reduced first element) '[t͡s̪, d͡z̪]'
[[ᵗʂ, ᵈʐ]]¹⁰⁴ [tʂ, dʐ] postalveolar (= with reduced first element) '[t͡ʂ, d͡ʐ]'
[[ᵗʃ, ᵈʒ]]¹⁰⁵ [tʃ, dʒ] postalveo-palatal (= with reduced first element) '[t͡ʃ̪ʲ, d͡ʒ̪ʲ]'
[[ᵗʃ, ᵈʒ]]¹⁰⁶ [tʃ, dʒ] postalveo-palatal protruded (= with reduced first element) '[t͡ʃ̪ʷ, d͡ʒ̪ʷ]'
[[ᵗʂ, ᵈʐ]]¹⁰⁷ [tʂ, dʐ] prepalatal (= with reduced first element) '[t͡ʂ̪ʲ, d͡ʐ̪ʲ]'.

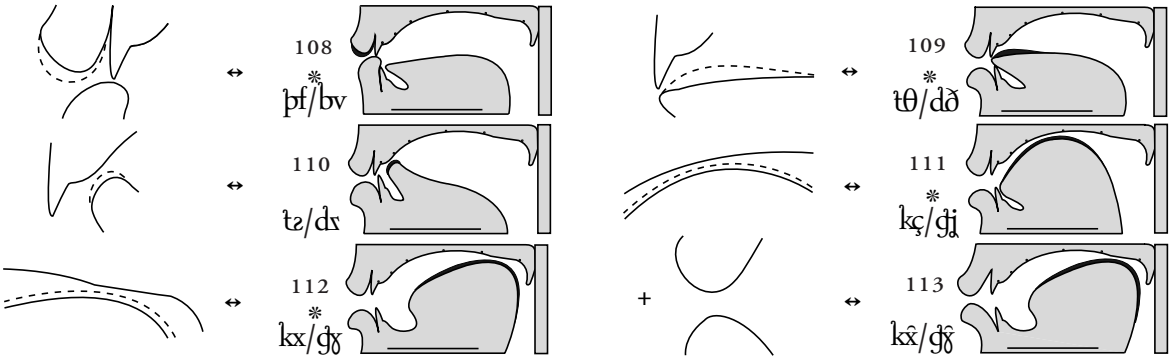
fig 10.4.8. *Grooved semi*-stop-constrictives *by proportion* (5).



10.4.9. *Semi*stop-strictives by detension [KX] (6, others are possible).

[[ƥf, ɓv]]¹⁰⁸ [pf, bv] labiodental (= with semistopped first element) '[p̪͡f, b̪͡v]'
[[ŧθ, ɗð]]¹⁰⁹ [tθ, dð] dental (= with semistopped first element) '[t̪͡θ, d̪͡ð]'
[[ƭɾ, ᶁɾ]]¹¹⁰ [tɾ, dɾ] alveolar (= with semistopped first element) '[t̪̆͡ɾ̆, d̪̆͡ɾ̆]'
[[ƙç, ɠʝ]]¹¹¹ [kç, gʝ] palatal (= with semistopped first el.) '[c̪͡ç, ɟ̪͡ʝ]'
[[ƙx, ɠɣ]]¹¹² [kx, gɣ] velar (= with semistopped first element) '[k̪͡x, g̪͡ɣ]'
[[ƙχ, ɠʁ]]¹¹³ [kχ, gʁ] velar rounded (= with semistopped first element) '[k̪͡xʷ, g̪͡ɣʷ]'.

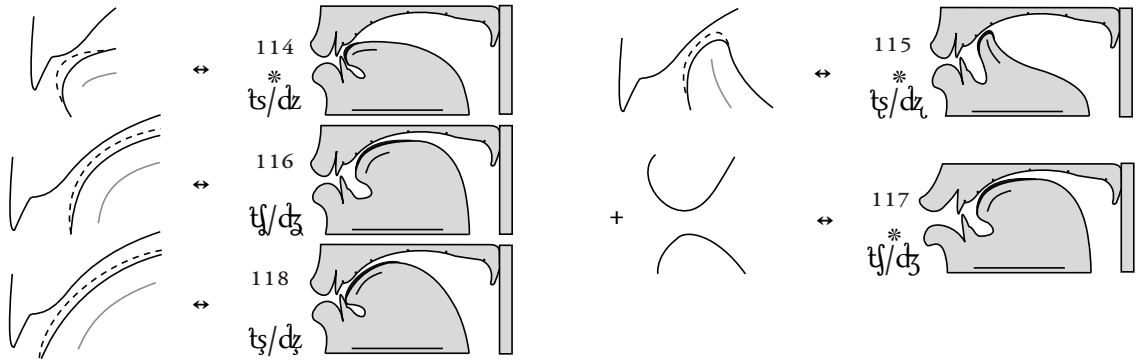
fig 10.4.9. *Semi*-stop-constrictives *by detension* (6).



10.4.10. *Grooved semi*stop-strictives by detension [KS] (5, others are possible).

[[ƭs, ᶁz]]¹¹⁴ [ts, dz] dental (= with semistopped first element) '[t̪͡s̪, d̪͡z̪]'
[[ʈʂ, ᶁʐ]]¹¹⁵ [tʂ, dʐ] postalveolar (= with semistopped first element) '[t̪͡ʂ, d̪͡ʐ]'
[[ƭʃ, ᶁʒ]]¹¹⁶ [tʃ, dʒ] postalveo-palatal (= with semistopped first element) '[t̪͡ʃ̪ʲ, d̪͡ʒ̪ʲ]'
[[ƭʃ, ᶁʒ]]¹¹⁷ [tʃ, dʒ] postalveo-palatal protruded (= with semistopped first element) '[t̪͡ʃ̪ʷ, d̪͡ʒ̪ʷ]'
[[ƭʂ, ᶁʐ]]¹¹⁸ [tʂ, dʐ] prepalatal (= with semistopped first element) '[t̪͡ʂ̪ʲ, d̪͡ʐ̪ʲ]'.

fig 10.4.10. *Grooved semi*-stop-strictives *by detension* (5).



Constrictives /Σ/ [X, Ⱨ, S, ˣ, ˢ] (still called 'fricatives' – 127)

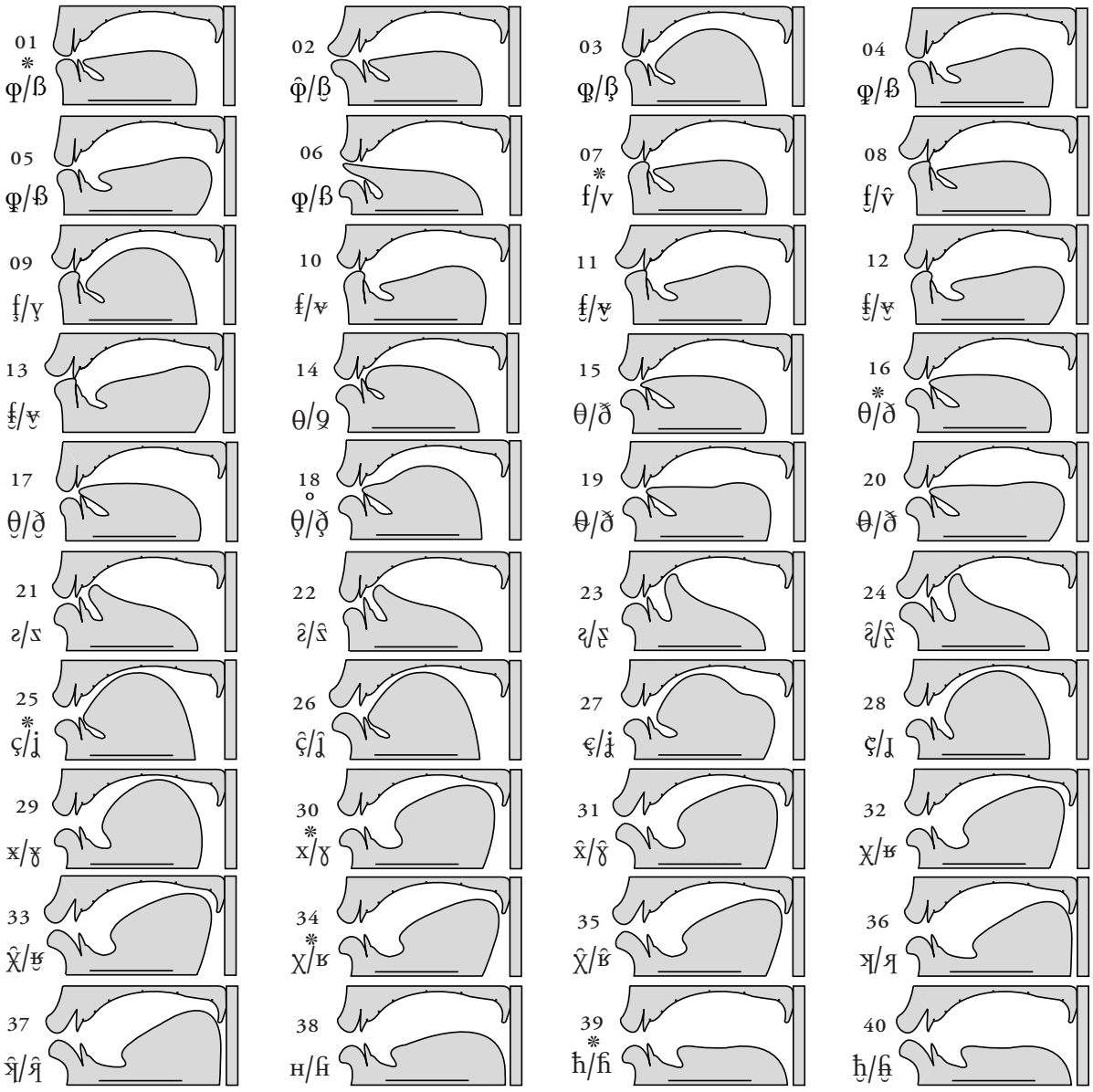
10.5. These comprise five synopses of plain (or 'slit', or un-grooved) and grooved phones. Again, *grooved* refers to the actual groove which can be formed on the tip and lamina of the tongue. The possible laryngeal constrictives are also shown; and semi-constrictives are given, as well (including grooved ones). Instead, the synopses of lateral and trilled constrictives are placed among the corresponding manners, since that is their prevailing aspect.

10.5.1. Constrictives [X] (40).

[ɸ, ß]01 bilabial (= between the lips) '[ɸ, β]' (≠)
[ɸ̂, β̂]02 bilabial rounded (= bilabial with lip rounding) '[ɸʷ, βʷ]'
[ɸ̟, β̟]03 palatalized bilabial '[ɸʲ, βʲ]'
[ɸ̠, β̠]04 velarized bilabial '[ɸˠ, βˠ]'
[[ɸ, ß]]05 [ɸ, ß] uvularized bilabial '[ɸ̠ˠ, β̠ˠ]'
[ɸ, ß]06 labial-apical (= between the upper lip and the tip of the tongue) '[s̪, z̪]'
[f, v]07 labiodental (= between the lower lip and the upper teeth) '[f, v]' (=)
[f̂, v̂]08 labiodental rounded '[fʷ, vʷ]'
[f̟, ʏ]09 palatalized labiodental '[fʲ, vʲ]'
[f̠, ⱱ]10 velarized labiodental '[fˠ, vˠ]'
[f̠̂, ⱱ̂]11 velarized labiodental rounded '[fˠʷ, vˠʷ]'
[[ɬ, ⱱ]]12 [ɬ, ⱱ] uvularized labiodental '[f̠ˠ, v̠ˠ]'
[[ɬ̂, ⱱ̂]]13 [ɬ̂, ⱱ̂] uvularized labiodental rounded '[f̠ˠʷ, v̠ˠʷ]'
[[θ, ɋ]]14 [θ, ð] dental or pre-dental (with a *lowered* tip), or predorsal-dental '[θ͡s, ð͡z]'
[[θ, ð]]15 [θ, ð] pro--dental (with a *raised* and protruding tip), or interdental '[θ̪, ð̪]'
[θ, ð]16 dental (with a *raised* tip) '[θ, ð]' (=)
[θ̬, ð̬]17 dental rounded (with a *raised* tip) '[θʷ, ðʷ]'
[[θ̟, ð̟]]18 ([θj, ðj]) palatalized dental (with a *lowered* or *raised* tip) '[θʲ, ðʲ]'
[θ̠, ð̠]19 velarized dental (with a *raised* tip) '[θˠ, ðˠ]'
[[θ̠, ð̠]]20 [θ̠, ð̠] uvularized dental (with a *raised* tip) '[θ̠ˠ, ð̠ˠ]'
[ɾ, ɹ]21 alveolar '[ɺ̪, ɻ̪]'
[ɾ̂, ɹ̂]22 alveolar rounded '[ɺ̪ʷ, ɻ̪ʷ]'
[ɾ̟, ɹ̟]23 postalveolar: (apico-)… (not lam.) '[ɺ̟, ɻ̟]'
[ɾ̟̂, ɹ̟̂]24 postalveolar rounded: (apico-)… (not lam.) '[ɺ̟ʷ, ɻ̟ʷ]'
[ç, ʝ]25 palatal '[ç, ʝ]' (=, ≠)
[ĉ, ʝ̂]26 palatal rounded '[çʷ, ʝʷ]'
[[ɕ, ʑ]]27 [ɕ, ʑ] uvularized palatal '[ç̠ˠ, ʝ̠ˠ]'
[[ç, ʝ]]28 [ç, ʝ] postpalatal (= retracted palatal or advanced prevelar) '[c̄, ɟ̄]'
[[x, ɣ]]29 [x, ɣ] prevelar '[x̟, ɣ̟]'
[x, ɣ]30 velar '[x, ɣ]' (=, ≡)
[x̂, ɣ̂]31 velar rounded (or [x̘, ɣ̘], ɕf § 9.14) '[xʷ, ɣʷ]'
[[χ, ʁ]]32 [χ, ʁ] preuvular '[χ̟, ʁ̟]'
[[χ̂, ʁ̂]]33 [χ, ʁ] preuvular rounded '[χ̟ʷ, ʁ̟ʷ]'
[χ, ʁ]34 uvular '[χ, ʁ]' (=)
[χ̂, ʁ̂]35 uvular rounded '[χʷ, ʁʷ]'
[ʞ, ʁ̞]36 pharyngealized uvular '[χˤ, ʁˤ]'

[χ̂ˤ, ʁ̂ˤ][37] pharyngealized uvular rounded '[χˤʷ, ʁˤʷ]'
[ʜ, ʢ][38] prepharyngeal (= between the *upper* pharynx and root of the tongue) '[ħ, ʕ]' (≠)
[ħ, ʕ][39] pharyngeal (= betw. the *lower* phar. and the root of the t., 'epiglottal') '[ʜ, ʢ]' (≠)
[ħ̪, ʕ̪][40] pharyngeal rounded ('epiglottal' rounded) '[ʜʷ, ʕʷ]'.

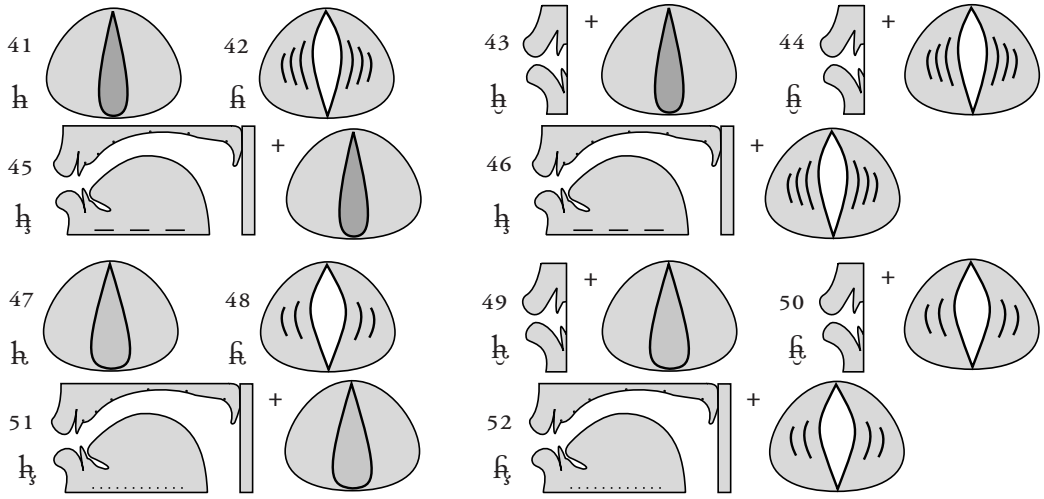
ʃig 10.5.1. Constrictive orograms (40).



10.5.2. *Laryngeal* constrictives [Ꞝ] & semi-constrictives [ʰ] (or 'glottal', (in International English pronunciation: [ləˈɹɪɲʤɬ, læ-, -ʤiɬ, ˌlæɹəɲˈʤiiɬ], or *laryngal* [ləˈɹɪŋgɬ, læ-], 12 – cf § 10.13, too).

[[h, ɦ]][41-42] [h, ɦ] laryngeal (= between vocal folds, including arytenoid cartilages) '[h, ɦ]'
[[ḥ, ɦ̥]][43-44] [h, ɦ] laryngeal rounded (with lip rounding) '[hʷ, ɦʷ]'
[[ḫ, ɦ̥ʲ]][45-46] [h, ɦ] palatalized laryngeal '[hʲ, ɦʲ]'
[[h̬, ɦ̬]][47-48] [h, ɦ] laryngeal (*semiconstrictive*, with less energy and expiratory air) '[h̬, ɦ̬]'
[[ḥ̬, ɦ̬ʷ]][49-50] [h, ɦ] laryngeal rounded (*semiconstrictive*) '[h̬ʷ, ɦ̬ʷ]'
[[ḫ̬, ɦ̬ʲ]][51-52] [h, ɦ] palatalized laryngeal (*semiconstrictive*) '[h̬ʲ, ɦ̬ʲ]'.

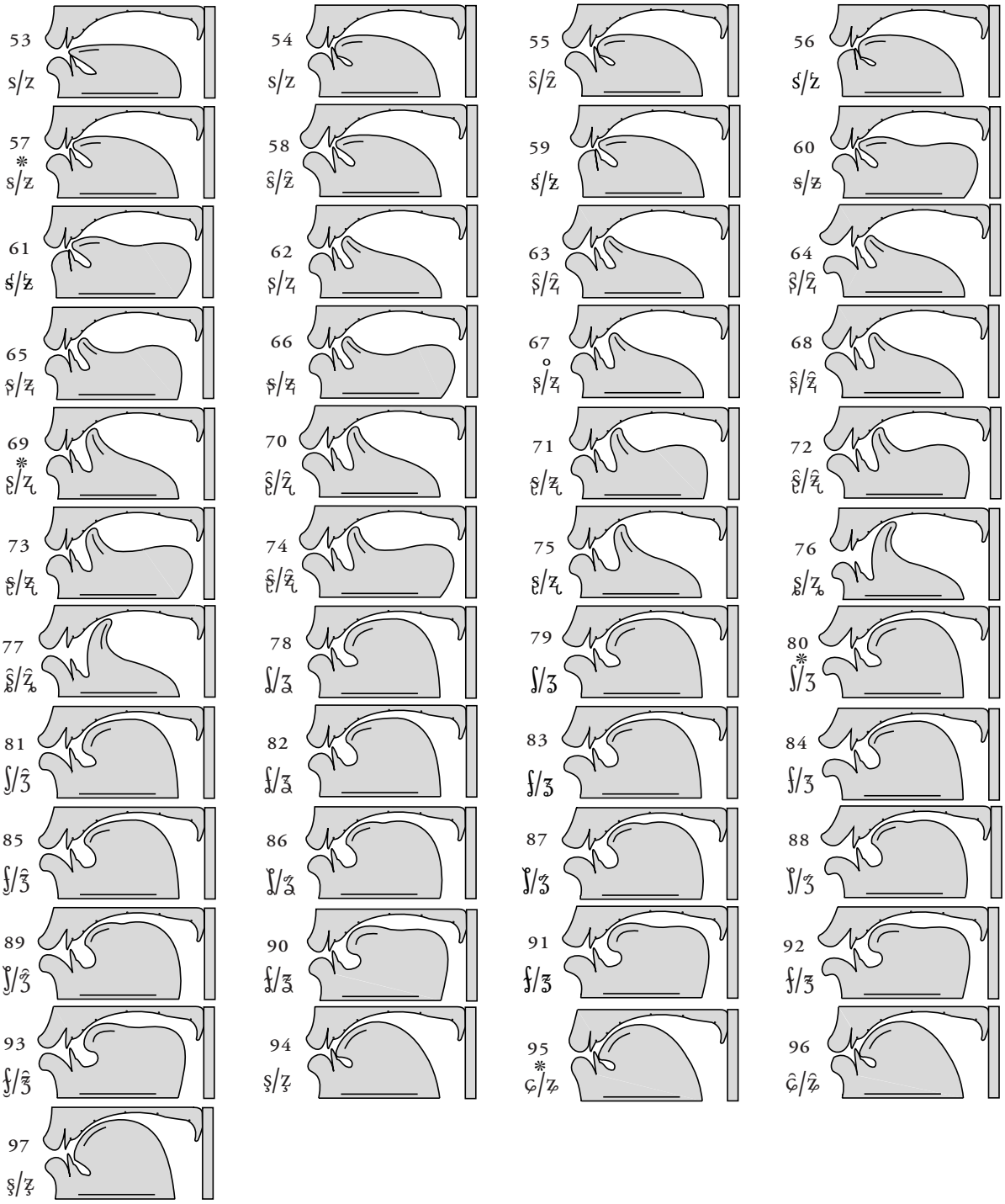
fig 10.5.2. Constrictive ([41-46]) and semi-constrictive ([47-52]) laryngograms (12).



10.5.3. *Grooved* constrictives [S] (45).

[s, z][53] prodental '[s̪, z̪]'
[s, z][54] dental (with a *lowered* tip) '[s̻, z̻]'
[ŝ, ẑ][55] dental rounded (with a *lowered* tip) '[s̻ʷ, z̻ʷ]'
[ʂ, ʐ][56] labiodentalized dental (with a *lowered* tip) '[sᵛ, zᵛ]'
[[s, z]][57] [s, z] denti-alveolar (with a *raised* tip) '[s̺, z̺]'
[[ŝ, ẑ]][58] [ŝ, ẑ] denti-alveolar rounded (with a *raised* tip) '[s̺ʷ, z̺ʷ]'
[[ʂ, ʐ]][59] [ʂ, ʐ] labiodentalized denti-alveolar (with a *raised* tip) '[s̺ᵛ, z̺ᵛ]'
[[s, z]][60] [s, z] uvular. dental, or denti-alv. (with a *raised* tip, or more rarely *lowered*) '[s̺ˠ, z̺ˠ]'
[[ʂ, ʐ]][61] [ʂ, ʐ] labiodento-uvularized dental (with a *raised* tip), or …denti-alveolar '[s̺ˠᵛ, z̺ˠᵛ]'
[ʂ, ʐ][62] alveolar: (apico-) '[s̺, z̺]'
[ŝ, ẑ][63] alveolar rounded: (apico-)… '[s̺ʷ, z̺ʷ]'
[[ŝ, ẑ]][64] [ŝ, ẑ] alveolar protruded: (apico-)… '[s̺₊, z̺ʷ₊]'
[ʂ, ʐ][65] velarized alveolar: (apico-)… '[s̺ˠ, z̺ˠ]'
[[ʂ, ʐ]][66] [ʂ, ʐ] uvularized alveolar: (apico-)… '[s̺ˠ, z̺ˠ]'
[[ʂ, ʐ]][67] back-alveolar (apico-)… '[s̻, z̻]' or '[s̪, z̪]'
[[ŝ, ẑ]][68] back-alveolar rounded (apico-)… '[s̻, z̻]' or '[s̪, z̪]'
[ʂ, ʐ][69] postalveolar: (apico-)… (not laminal) '[ʂ, ʐ]' (=)
[ŝ, ẑ][70] postalveolar rounded: (apico-)… '[ʂʷ, ʐʷ]'
[ʂ, ʐ][71] velarized postalveolar: (apico-)… '[ʂˠ, ʐˠ]'
[ŝ, ẑ][72] velarized postalveolar rounded: (apico-)… '[ʂˠʷ, ʐˠʷ]'
[[ʂ, ʐ]][73] [ʂ, ʐ] uvularized postalveolar : (apico-)… '[ʂˠʷ, ʐˠʷ]'
[[ŝ, ẑ]][74] [ŝ, ẑ] uvularized postalveolar rounded: (apico-)… '[ʂˠʷ, ʐˠʷ]'
[ʂ, ʐ][75] back-postalveolar: (apico-)… (not laminal) '[s̻, z̻]'
[ɕ, ʑ][76] apico-palatal (= between the palate and the tip) '[s̻̟, z̻̟]'
[ɕ̂, ʑ̂][77] apico-palatal rounded '[s̻̟ʷ, z̻̟ʷ]'
[ʃ, ʒ][78] postalveo-palatal: (lamino-)… (with a *lowered* tip) '[ʃ̻ʲ, ʒ̻ʲ]'
[[ʃ, ʒ]][79] postalveo-palatal half-protruded: (lamino-)… '[ʃ̻⁽ʷ⁾, ʒ̻⁽ʷ⁾]'
[ʃ, ʒ][80] postalveo-palatal protruded: (lamino-)… '[ʃ̻ʷ, ʒ̻ʷ]'
[ʃ̂, ʒ̂][81] postalveo-palatal over-rounded: (lamino-)… '[ʃ̻ʷ̹, ʒ̻ʷ̹]'
[[ʃ, ʒ]][82] [ʃ, ʒ] postalveo-palatal: (lamino-)… (with *raised* tip) '[ʃ̺ʲ, ʒ̺ʲ]'

fig 10.5.3. Grooved constrictive orograms (45).



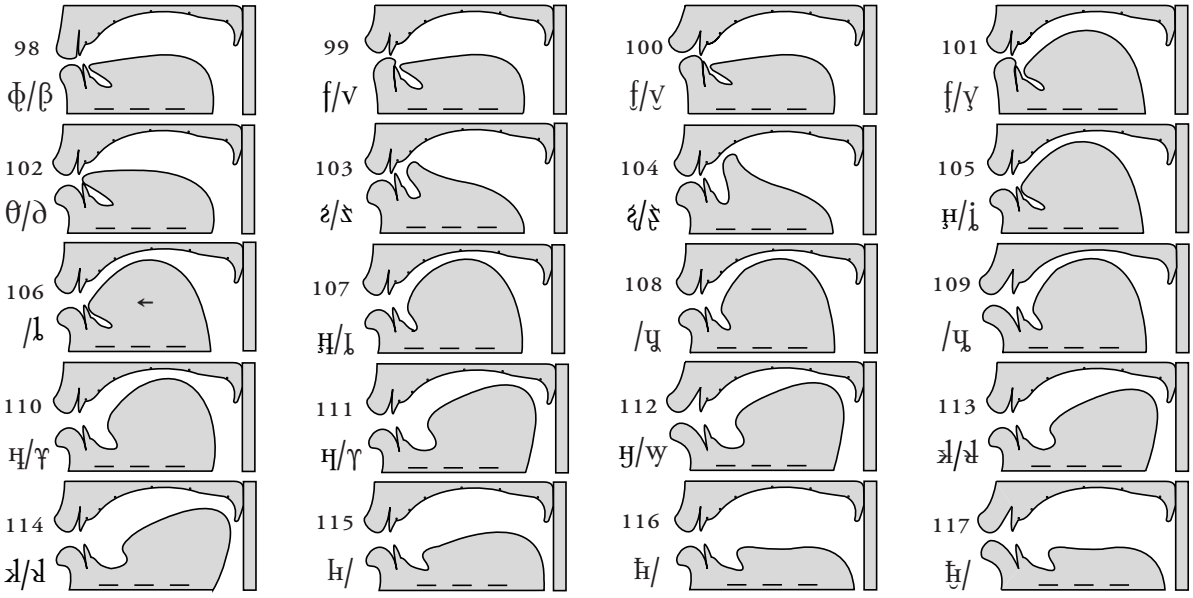
[[ʃ, ʒ]][83] [ʃ, ʒ] postalveo-palatal half-protruded: (lamino-)… '[ʃ̪ʷ, ʒ̪ʷ]'
[[ʃ, ʒ]][84] [ʃ, ʒ] postalveo-palatal protruded: (lamino-)… '[ʃ̪ʷ, ʒ̪ʷ]'
[[ʃ̂, ʒ̂]][85] [ʃ̂, ʒ̂] postalveo-palatal over-rounded: (lamino-)… '[ʃ̪ʷ̹, ʒ̪ʷ̹]'
[ʃ̺, ʒ̺][86] postalveo-prevelar: (lamino-)… '[ʃ̪˖ˠ, ʒ̪˖ˠ]'
[[ʃ̺, ʒ̺]][87] postalveo-prevelar half-protruded: (lamino-)… '[ʃ̪˖ˠʷ, ʒ̪˖ˠʷ]'
[ʃ̺, ʒ̺][88] postalveo-prevelar protruded: (lamino-)… '[ʃ̪˖ˠʷ, ʒ̪˖ˠʷ]'
[ʃ̺̂, ʒ̺̂][89] postalveo-prevelar over-rounded: (lamino-)… '[ʃ̪˖ˠʷ̹, ʒ̪˖ˠʷ̹]'
[ɧ, ʑ][90] postalveo-velar: (lamino-)… '[ʃ̪ˠ, ʒ̪ˠ]'

[[ʃ̻, ʒ̻]][91] postalveo-velar half-protruded: (lamino-)… '[[ʃ̻ˠ⁽ʷ⁾, ʒ̻ˠ⁽ʷ⁾]'
[ʃ̻, ʒ̻][92] postalveo-velar protruded: (lamino-)… '[[ʃ̻ˠʷ, ʒ̻ˠʷ]'
[ʃ̻̹, ʒ̻̹][93] postalveo-velar over-rounded '[[ʃ̻ˠʷ̹, ʒ̻ˠʷ̹]'
[ʂ, ʐ][94] pre-palatal: (lamino-)… '[ʂ̻ʲ, ʐ̻ʲ]'
[ɕ, ʑ][95] bilabialized pre-palatal: (lamino-… with *vertical* labialization)… '[ʂ̻ʲᵝ, ʐ̻ʲᵝ]'
[ɕ̹, ʑ̹][96] pre-palatal rounded: (lamino-)… '[ʂ̻ʲʷ, ʐ̻ʲʷ]'
[ʂ̺, ʐ̺][97] pro-palatal (= between prepalatal and palatal) '[ʂ̻ʲ, ʐ̻ʲ]' (≠).

10.5.4. Semi-constrictives [ˣ] (18).

[[ɸ̞, β̞]][98] [ɸ, ß] bilabial (= intermediate between constrictive and approximant) '[ɸ̞, β̞]'
[[f, v]][99] [f, v] labiodental (= intermediate between constrictive and approximant) '[f̞, v̞]'
[[f, v̞]][100] [v] labialized labiodental (= intermediate between constrictive and approx.) '[v̞ʷ]'
[[f, ʏ̞]][101] [f, v] palatalized labiodental (= intermediate between constr. and approx.) '[f̞ʲ, v̞ʲ]'
[[θ, ð]][102] [θ, ð] dental (= intermediate between constrictive and approximant) '[θ̞, ð̞]'
[[ɾ, ɹ̠]][103] alveolar (= intermediate between constrictive and approximant) '[ɹ̞, ɾ̞]'
[[ɻ̟, ɻ̠]][104] postalveolar (= intermediate between constrictive and approximant) '[ɻ̟̞, ɻ̠̞]'
[[ʜ, j̟]][105] [ç, j̟] palatal (= intermediate between constrictive and approximant) '[ç̞, j̟̞]'
[[ʎ̝, ʟ̝]][106] lateralized palatal (with slight friction noise) '[ʎ̝̞]'
[[ʜ, ɥ̟]][107] [ç, j̟] postpalatal (= intermediate between constrictive and approximant) '[ç̞, j̟̞]'
[[ʎ̝, ɥ̟]][108] palatal rounded (= intermediate between constrictive and approximant) '[j̟̞ʷ]'
[[ʎ̝, ɥ̟]][109] pospalatal rounded (= intermediate between constrictive and approximant) '[j̟̞ʷ]'
[[ʜ, ɣ̟]][110] [x, ɣ] prevelar (= intermediate between constrictive and approximant) '[x̟̞, ɣ̟̞]'
[[ʜ, ɣ]][111] [x, ɣ] velar (= intermediate between constrictive and approximant) '[x̞, ɣ̞]'
[[ʜ, ɰ]][112] velar rounded (= interm. between constrictive and approximant) '[x̞ʷ, ɣ̞ʷ]'
[[ʞ, ʁ̠]][113] [χ, ʁ] preuvular (= intermediate between constrictive and approximant) '[χ̟̞, ʁ̠̞]'
[[ʞ, ʁ]][114] [χ, ʁ] uvular (= intermediate between constrictive and approximant) '[χ̞, ʁ̞]'
[[ʜ, ʢ]][115] [ʜ] prepharyngeal (= intermediate between constrictive and approximant) '[ʜ̟̞]'
[[ħ, ʢ]][116] [ħ] pharyngeal (= intermediate between constrictive and approximant) '[ʜ̞]'
[[ħ̟, ʢ]][117] [ħ̟] pharyngeal rounded (= intermediate between constrictive and approx.) '[ʜ̞ʷ]'.

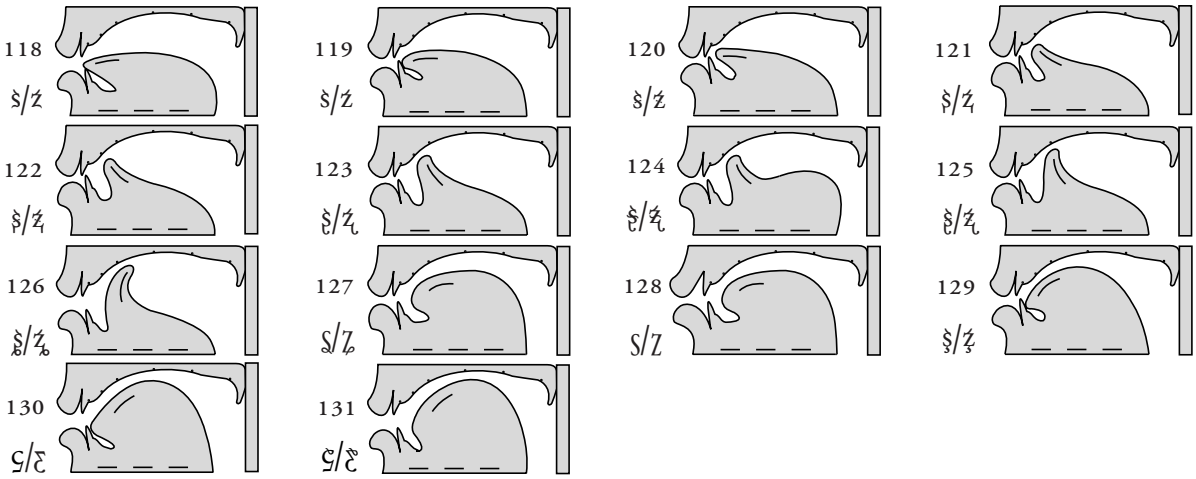
fig 10.5.4. Semi-constrictive orograms (number [101] is also lateralized – 20).



10.5.5. *Grooved* semi-constrictives [ˢ] (14).

⟦s̻, z̻⟧[118]	[s, z] prodental (= intermediate between constrictive and approximant) '[s̻̬, z̻̬]'
⟦s̺, z̺⟧[119]	[s, z] dental (= intermediate between constrictive and approximant) '[s̺̬, z̺̬]'
⟦s̼, z̼⟧[120]	[s, z] denti-alveolar (= interm. between constrictive and approximant) '[s̼̬, z̼̬]'
⟦ʂ, ʐ⟧[121]	[ʂ, ʐ] alveolar (= intermediate between constrictive and approximant) '[ʂ̬, ʐ̬]'
⟦ʂ̠, ʐ̠⟧[122]	[ʂ, ʐ] backalveolar (= intermediate between constrictive and approx.) '[ʂ̠̬, ʐ̠̬]'
⟦ʃ, ʒ⟧[123]	[ʃ, ʒ] postalveolar (= intermed. between constric. and approx.) '[ʃ̬, ʒ̬]'
⟦ʃʷ, ʒʷ⟧[124]	[ʃ, ʒ] uvularized postalveolar (= interm. between constric. and approx.) '[ʃ̬ʷ, ʒ̬ʷ]'
⟦ʃ̠, ʒ̠⟧[125]	[ʃ, ʒ] backpostalveolar (= intermediate between constric. and approx.) '[ʃ̠̬, ʒ̠̬]'
⟦ɕ, ʑ⟧[126]	[ɕ, ʑ] apicopalatal (= intermediate between constric. and approx.) '[ɕ̬, ʑ̬]'
⟦ʃ̻, ʒ̻⟧[127]	[ʃ̻, ʒ̻] postalveo-palatal: (lamino-)… (= interm. between constr. and appr.) '[ʃ̻̬ʲ, ʒ̻̬ʲ]'
⟦ʃ, ʒ⟧[128]	[ʃ, ʒ] postalveo-palatal protruded: (lamino-)… (= int. betw. con. & app.) '[ʃ̻̬ʷ, ʒ̻̬ʷ]'
⟦ʂʲ, ʐʲ⟧[129]	[ʂʲ, ʐʲ] prepalatal (= interm. between constrictive and approximant) '[ʂ̬ʲ, ʐ̬ʲ]'
⟦ɕ, ʑ⟧[130]	palatal (almost [ç, ʝ] but grooved & interm. betw. constric. and approx.) '[ç̬ˢ, ʝ̬ᶻ]'
⟦ɕ̠, ʑ̠⟧[131]	postpalatal (almost [ç, ʝ] but retracted, grooved & interm. betw. constr. and appr.) '[ç̠̬ˢ, ʝ̠̬ᶻ]'.

fig 10.5.5. Grooved semi-constrictive orograms (14).



Approximants /J/ [J, ᴶ, J̃, H, ɬ, ɬ*, ᴶ̩] (114)

10.6. These include six synopses –in addition to those of normal phones– also those of semi-approximants, some nasalized phones (among the various possibilities), laryngeals, and lateralized ones (with structuring differences, which we will see below, as for semi-approximants).

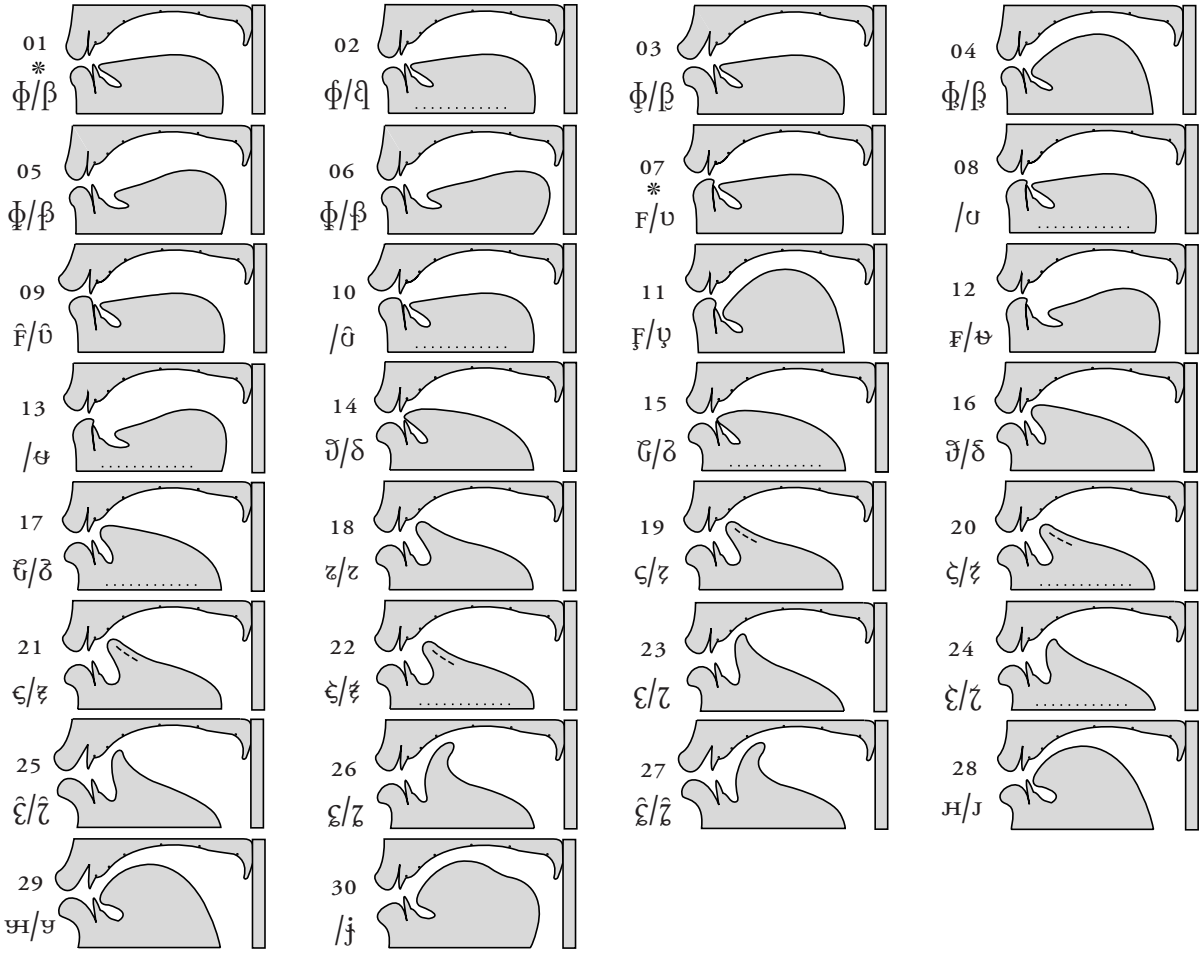
10.6.1. (Normal, rather 'static') approximants [J] (in addition to 'dynamic' ones, shown by a double arrow on their orograms, indicating a tiny, but clear, movement of the dorsum). We also indicate *semi*-approximant articulations, with greater space between the articulators than for approximants and with a definitely more elusive auditory impression [ᴶ]. We put them close to real approximants, for useful comparisons, in order to show their tiny differences better. In addition, to be of further help, the semi-approximant orograms bear a broken line on their bottom. In order to adequately show the difference between constrictives, semi--constrictives, approximants and semi-approximants, within the very poor possibilities of *offIPA* symbols and diacritics, we would be obliged to use combinations of even *four* same signs, as [ᵀ ᵀ ₜ ₜ] – for instance, in order to transcribe our semiapproximant [ɋ], it would be necessary to combine [β] with [ᵀ ₜ]. Therefore, we give up fully trying to indicate the difference between all of these four classes of contoids, especially seen that too often *offIPA* does not coherently distinguish yet even between constrictives and approximants. The same is true for other nuances (such as for places of articulation) that *canIPA*, instead, can adequately show.

As a matter of fact, we are showing these official monstruosities more to insist on their absurdity, rather than to try to guide readers to their more or less (im)probable interpretation (70).

[ɸ, β]01 bilabial (= vertically) '[ɸ̪, β̪]'
[[ɸ, ɋ]]02 [β] *semi*-bilabial (= bilabial, with very wide narrowing) '[β̞]'
[ɸ̫, β̫]03 bilabial rounded '[ɸ̪ʷ, β̪ʷ]'
[ɸ̞, β̞]04 palatalized bilabial '[ɸ̪ʲ, β̪ʲ]'
[ɸ̠, β̠]05 velarized bilabial '[ɸ̪ˠ, β̪ˠ]'
[[ɸ̠, β̠]]06 [ɸ, β] uvularized bilabial '[ɸ̪ˁ, β̪ˁ]'
[ꜰ, ʋ]07 labiodental '[f̪, ʋ]' (≠, =)
[/, ʋ]08 *semi*-labiodental '[ʋ̪]'
[f̂, ʋ̂]09 labiodental rounded '[f̪ʷ, ʋʷ]'
[/, ʋ̂]10 *semi*-labiodental rounded '[ʋ̪ʷ]'
[ꜰ̞, ʋ̞]11 palatalized labiodental '[f̪ʲ, ʋʲ]'
[[ꜰ, ʁ]]12 [ꜰ, ʁ] uvularized labiodental '[f̪ˁ, ʋˁ]'
[[/, ʁ]]13 [ʁ] *semi*-uvularized labiodental '[ʋ̪ˁ]'
[θ, ð]14 dental, or lamino-dental (with *raised* tip) '[θ̪, ð̪]'
[[ɕ, ʑ]]15 [θ, ð] *semi*-dental (= dental, with very wide narrowing) '[θ̪̞, ð̪̞]'
[[θ, ð]]16 [θ, ð] denti-alveolar '[θ̪̄, ð̪̄]'
[[ɕ, ʑ]]17 [θ, ð] *semi*-denti-alveolar (with very wide narrowing) '[θ̪̞̄, ð̪̞̄]'
[ʦ, ʣ]18 alveolar '[s̪, z̪]'
[ɕ, ʑ]19 alveolar semi-grooved '[s̪̞, z̪̞]'
[ɕ, ʑ]20 *semi*-alveolar semi-grooved '[s̪̞, z̪̞]'

[ɕ, ʑ][21] backalveolar semi-grooved '[s̠̻, z̠̻]'
[ɕ, ʑ][22] *semi*-backalveolar semi-grooved '[s̠̻, z̠̻]'
[ɕ, ʑ][23] postalveolar: (apico-)… (not laminal) '[s̠̻, z̠̻]'
[ɕ, ʑ][24] *semi*-postalveolar: (apico-)… (not laminal) '[s̠̻, z̠̻]'
[ɕ̂, ʑ̂][25] postalveolar rounded: (apico-)… '[s̠̻ʷ, z̠̻ʷ]'
[ɕ, ʑ][26] apico-palatal '[s̠̻, z̠̻]'
[ɕ̂, ʑ̂][27] apico-palatal rounded '[s̠̻ʷ, z̠̻ʷ]'
[ʜ, ʝ][28] prepalatal: (lamino-)… '[s̻ʲ, z̻ʲ]'
[ʬ, ʭ][29] prepalatal rounded: (lamino-)… '[s̻ʲʷ, z̻ʲʷ]'
[/, ɟ̬][30] ⟦ɟ̬⟧ uvularized palatal *dynamic* '[qˠ]'

fig 10.6.1. Front approximant & semi-approximant orograms (30).

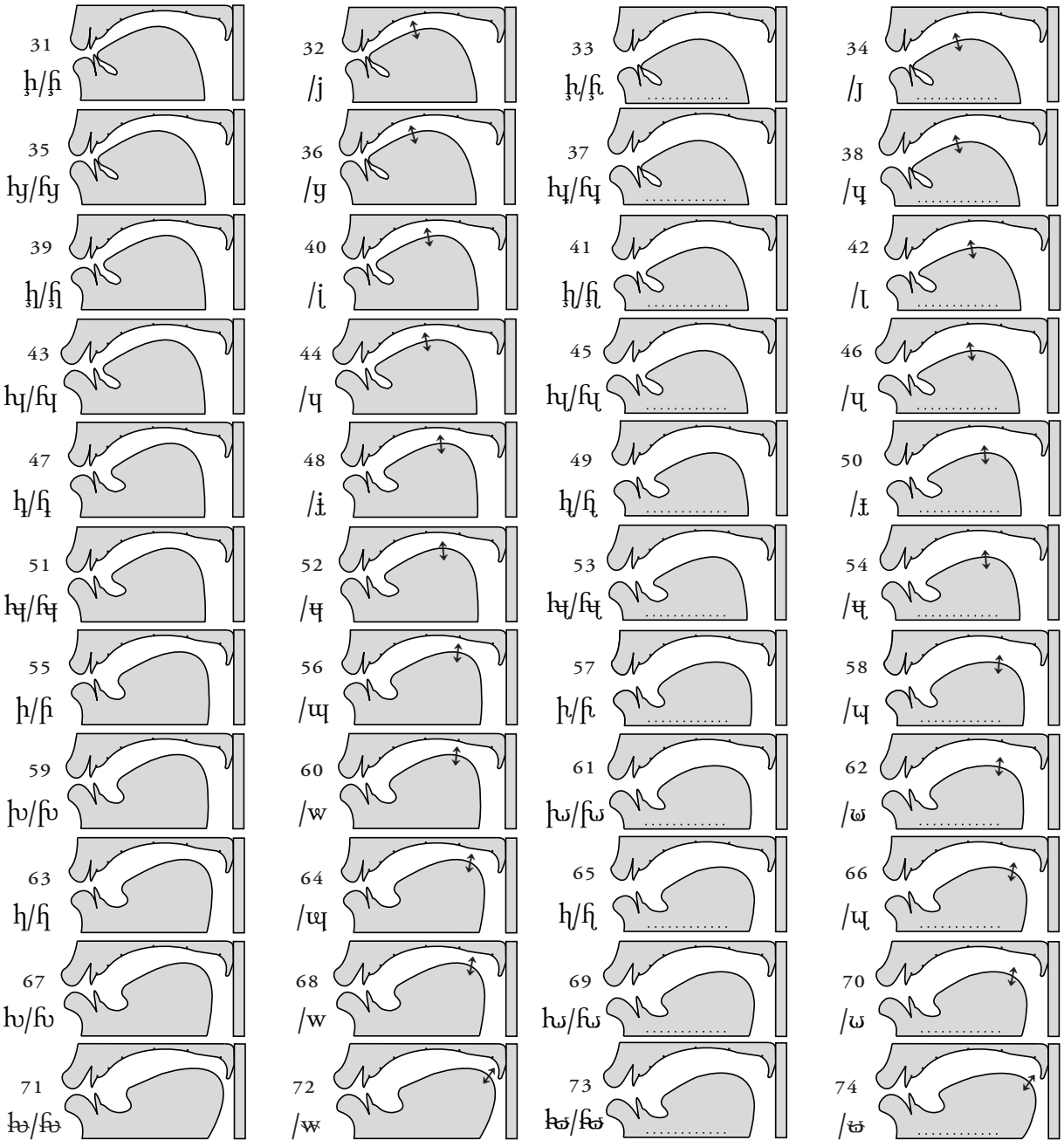


10.6.2. Dorsal approximants corresponding to some vocoids (43).

[ɧ, ʃ̬][31] palatal '[h͡j, ɦ͡j]' (≠)
[/, j][32] palatal *dynamic* '[j]' (=)
⟦ɧ, ʃ̬⟧[33] [j] *semi*-palatal (with very wide narrowing) '[h̬ʲ, ɦ̬ʲ]'
⟦/, ʝ⟧[34] [j] *semi*-palatal *dynamic* (with very wide narrowing) '[j̬]'
[ɧʏ ʃ̬ʏ][35] palatal rounded '[hʏ, ɦʏ]' (≠)
[/, ʏ][36] palatal rounded *dynamic* '[ɥ]'
[ɧɥ, ʃ̬ɥ][37] *semi*-palatal rounded '[hʏ, ɦʏ]' (≠)
[/, ɥ][38] *semi*-palatal rounded *dynamic* '[ɥ]'

[ʝ, ʄ][39]	postpalatal '[h͡j̄, ɦ͡j̄]'
[/, ʝ][40]	postpalatal *dynamic* '[j̄]'
[ʝ, ʄ][41]	*semi*-postpalatal '[h͡j̄, ɦ͡j̄]'
[/, ɟ][42]	*semi*-postpalatal *dynamic* '[j̄]'
[ʮ, ɧ][43]	postpalatal rounded '[h͡ɥ̄, ɦ͡ɥ̄]'
[/, ɥ][44]	postpalatal rounded *dynamic* '[ɥ̄]'
[ʮ, ɧ]][45]	[ɥ] *semi*-postpalatal rounded (with very wide narrowing) '[h͡ɥ̄, ɦ͡ɥ̄]'
[/, ɥ]][46]	[ɥ] *semi*-postpalatal rounded *dynamic* (with very wide narrowing) '[ɥ̈̄]'
[ɧ, ʄ][47]	prevelar '[h͡j̟, ɦ͡j̟] or [h͡ɥ̟, ɦ͡ɥ̟]'
[/, ɟ̟][48]	prevelar *dynamic* '[j̈̄] or [ɥ̟̈]'
[[ɧ, ʄ]][49]	[ɯ] *semi*-prevelar (with very wide narrowing) '[j̈̄] or [ɥ̟̈]'

fig 10.6.2. Dorsal approximant & semi-approximant orograms (including dynamic ones – 44).

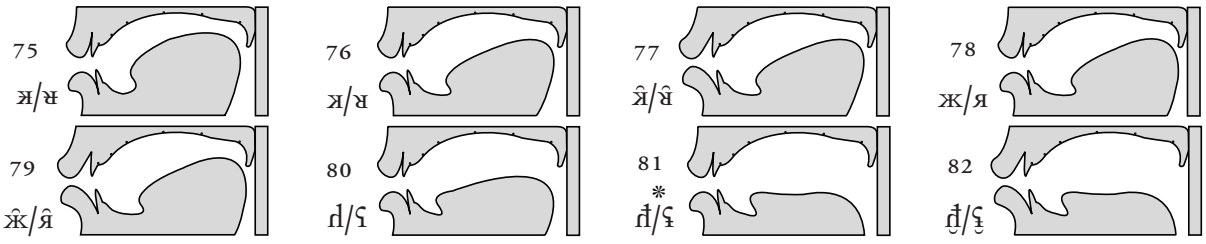


[⟦/, ɻ̟⟧][50] [ɰ̟] *semi*-prevelar *dynamic* (with very wide narrowing) '[j̟̄] or [ʟ̟̈]'
[ʜ̟, ɦ̟][51] prevelar rounded '[h͡ɥ̟̄, ɦ͡ɥ̟̄]'
[/, ʜ̟][52] prevelar rounded *dynamic* '[ɥ̟̄]'
⟦ʜ̟, ɦ̟⟧[53] [ɥ̟] *semi*-prevelar rounded (= prevel., with very wide narrowing) '[h͡w̟, ɦ͡w̟]'
[⟦/, ʜ̟⟧][54] [ɥ̟] *semi*-prevelar rounded *dynamic* (= prevel., with very wide narrowing) '[w̟]'
[ʰ, ʱ][55] *pro*velar (= between prevelar and velar) '[h͡ʟ̟̈, ɦ͡ʟ̟̈]'
[/, ɰ̟][56] *pro*velar *dynamic* (= between prevelar and velar) '[ʟ̟̈]'
⟦ʰ, ʱ⟧[57] [ɰ̟] *semi*-provelar (with very wide narrowing) '[h͡ʟ̟̈, ɦ͡ʟ̟̈]'
[⟦/, ɰ̟⟧][58] [ɰ̟] *semi*-provelar *dynamic* (with very wide narrowing) '[ʟ̟̈]'
[ʰ, ʱ][59] *pro*velar rounded '[h͡w̟, ɦ͡w̟]'
[/, w̟][60] *pro*velar rounded *dynamic* '[w̟]'
⟦ʰ, ʱ⟧[61] [ɰ̟] *semi*-provelar rounded (with very wide narrowing) '[h͡w̟, ɦ͡w̟]'
[⟦/, ɷ⟧][62] [ɰ̟] *semi*-provelar rounded *dynamic* (with very wide narrowing) '[ʟ̟̈]'
[ʰ, ʱ][63] velar '[h͡ɰ, ɦ͡ɰ]' (≠)
[/, ɰ][64] velar *dynamic* '[ɰ]' (≠)
[ʰ, ʱ][65] *semi*-velar '[h͡ɰ, ɦ͡ɰ]' (≠)
[/, ɰ][66] *semi*-velar *dynamic* '[ɰ]' (≠)
[ʰ, ʱ][67] velar rounded '[h͡ʍ, ɦ͡w]' (≠)
[/, w][68] velar rounded *dynamic* '[w]' (=)
⟦ʰ, ʱ⟧[69] [w] *semi*-velar rounded (with very wide narrowing for both points) '[h͡w̟, ɦ͡w̟]'
[/, ɷ][70] [w] *semi*-velar rounded *dynamic* (with very wide narrowing for both points) '[w̟]'
[ʱʷ, ʱʷ][71] ⟦ʱʷ, ʱʷ⟧ uvularized velar rounded '[h͡ʍˠ, ɦ͡wˠ]'
[/, ʷ][72] ⟦ʷ⟧ uvularized velar rounded *dynamic* '[wˠ]'
⟦ʱʷ, ʱʷ⟧[73] uvularized *semi*-velar rounded *dynamic* '[h͡ʍˠ, ɦ͡wˠ]'
[/, ʷ][74] ⟦ʷ⟧ uvularized *semi*-velar rounded *dynamic* '[wˠ]'.

10.6.3. Back approximants (8).

[ʁ̟, ʁ̟][75] preuvular '[χ̟, ʁ̟]'
[ʁ, ʁ][76] uvular '[χ̟, ʁ̟]'
[ʁ̂, ʁ̂][77] uvular rounded '[χ̟ʷ, ʁ̟ʷ]'
[ʁˤ, ʁˤ][78] pharyngealized uvular '[χ̟ˤ, ʁ̟ˤ]'
[ʁ̂ˤ, ʁ̂ˤ][79] pharyngealized uvular rounded '[χ̟ˤʷ, ʁ̟ˤʷ]'
[ɻ, ʕ][80] prepharyngeal (= between the *upper* pharynx and the root of the tongue) '[ħ̟, ʕ̟]'
[ɻ̊, ʕ̊][81] pharyngeal (= between the *lower* pharynx and root of tongue, 'epiglottal') '[ʜ̟, ʢ̟]'
[ɻ̊̂, ʕ̊̂][82] pharyngeal rounded '[ʜ̟ʷ, ʢ̟ʷ]'.

ʃig 10.6.3. Back approximant orograms (8).

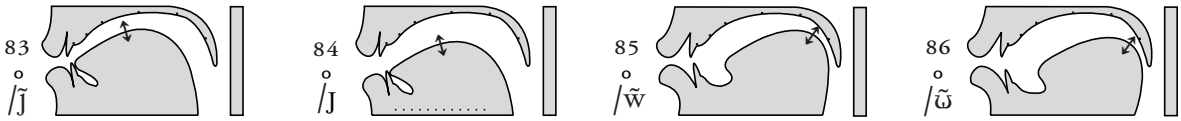


10.6.4. *Nasalized* approximants [J̃] (4). The difference between these and semi-nasals (in § 10.2.3) lies in the fact that these are normal contoids, with the addi-

tion of a lowered velum, whereas the others are nasals with an incomplete contact. In fact, in *fig* 10.6.1, we have indicated double arrows as well (as in *fig* 5.1), to show the exact combination of the two articulation manners – by insisting and slightly exaggerating. (The same happens to other contoids –as constrictives, taps, or laterals– with added nasalization.)

[/, j̃][83] palatal *dynamic* (with a *lowered* velum) '[j̃]'
[/, j̃][84] *semi*-palatal *dynamic* (with a *lowered* velum) '[j̞̃]'
[/, w̃][85] velar rounded *dynamic* (with a *lowered* velum) '[w̃]'
[/, ω̃][86] *semi*-velar rounded *dynamic* (with a *lowered* velum) '[w̞̃]'.

fig 10.6.4. Nasalized approximant & semiapproximant orograms (4).

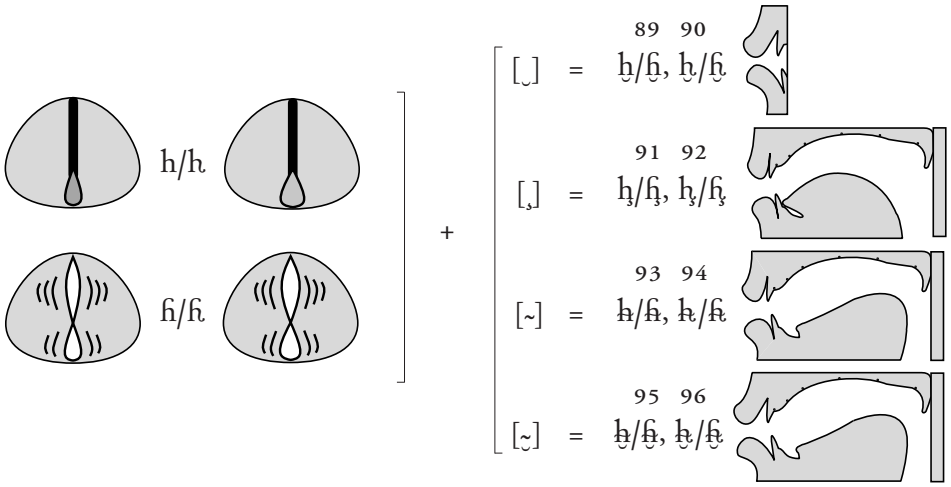


10.6.5.1. Lenited *laryngeal* approximants [H] (10, including semi-approximants, which are laxer, using less expiratory air. Others are possible).

[h, ɦ][87] laryngeal (= between the vocal folds, including the arytenoid cartilages) '[h̬, ɦ̬]'
[h, ɦ][88] *semi*-laryngeal (= between the vocal folds, including the arytenoid cartil.) '[h̬, ɦ̬]'
[h̬, ɦ̬][89] laryngeal rounded (= with lip rounding) '[h̬ʷ, ɦ̬ʷ]'
[h̬, ɦ̬][90] *semi*-laryngeal rounded (= with lip rounding) '[h̬ʷ, ɦ̬ʷ]'
[hʲ, ɦʲ][91] palatalized laryngeal (= betw. the vocal folds, including the aryten. cartil.) '[h̬ʲ, ɦ̬ʲ]'
[hʲ, ɦʲ][92] palatalized *semi*-laryngeal (= betw. the vocal folds, including aryten. cartil.) '[h̬ʲ, ɦ̬ʲ]'
[ɧ, ɦ̴][93] velarized laryngeal (with velarization) '[h̴ˠ]'
[ɧ, ɦ̴][94] velarized *semi*-laryngeal (with velarization) '[h̴ˠ]'

fig 10.6.5.1. Lenis voiced & voiceless approximant and semi-approximant laryngograms (4).

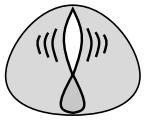
fig 10.6.5.2. Lenis voiced & voiceless approximant and semi-approximant laryngograms (with lip rounding, palatalization, velerization, and rounding & velarization – 8).



[ʜ̞, ɧ̞][95] velarized laryngeal rounded (with velarization & rounding) '[ʍ̞]'
[ʜ̞, ɧ̞][96] velarized *semi*-laryngeal rounded (with velarization & rounding) '[ʍ̞]'.

10.6.5.2. Laryngeal approximant with *intermediate* phonation and some coarticulations, as in § 10.6.3.1 (the difference lies in their laryngoid, shown on the right – 5).

⟦ɦ̞⟧ laryngeal (with intermediate phonation) '[ɦ̞]'
⟦ɧ̞⟧ laryngeal rounded (with intermediate phonation) '[ɦ̞ʷ]'
⟦ɦ̞ʲ⟧ palatalized laryngeal (with intermediate phonation) '[ɦ̞ʲ]'
⟦ɦ̞ˠ⟧ velarized laryngeal (with intermediate phonation) '[ɦ̞ˠ]'
⟦ɧ̞⟧ velarized laryngeal rounded (with intermediate phonation) '[ʍ̞]' .



10.6.6. *Lateralized* apico-laminal approximants, with other coarticulations [l̻] (some with lip-rounding, as well – 9). Let us make it clear that *lateralized* does not coincide with *lateral* (nor with *semi-lateral*). As the first four linguograms in *fig* 10.9.9 (that we reproduce here, as *fig* 10.6.6.1) show, the mechanism is partially different: for *(bi)lateral* (and *semi(bi)lateral*) articulations, the lower parts of the sides of the tongue are completely moved away from the side teeth. The difference between them is that (full) laterals have a contact with the upper part of the mouth roof, while semi-laterals do not have it.

Lateralized phones, on the other hand, lack such a consistent space on both sides of the tongue. They have just a smaller space, which normal approximants lack. In addition, to be of greater help, the orograms of (semi)lateral have an arrow (bigger for full laterals), while added lateralization is shown by a simple head of an arrow (which, of course, is not present on normal approximants).

fig 10.6.6.1. Linguograms of lateral, semi-lateral, and lateralized articulations in comparison with normal approximant ones.

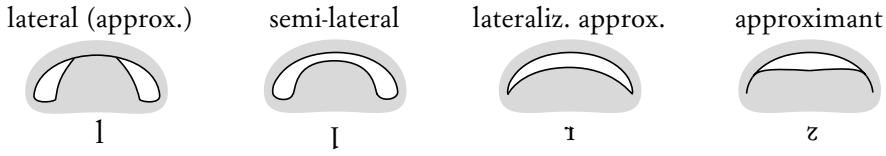
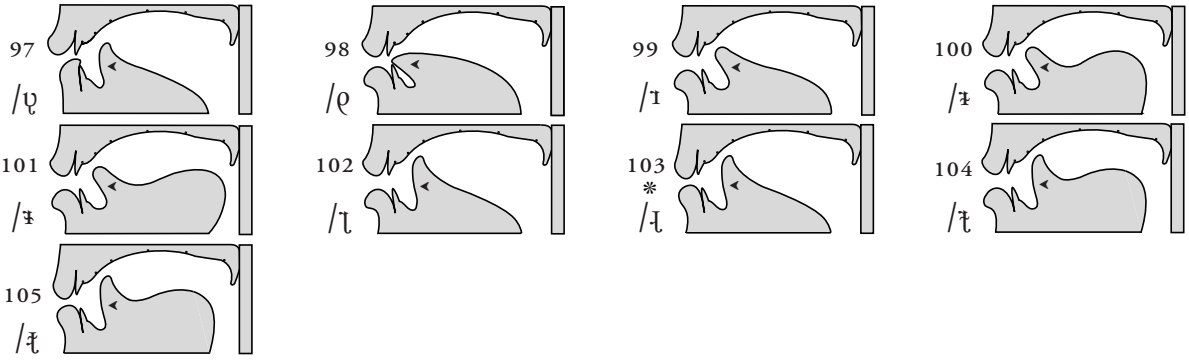


fig 10.6.6.2. Lamino-lateralized approximant orograms (9).



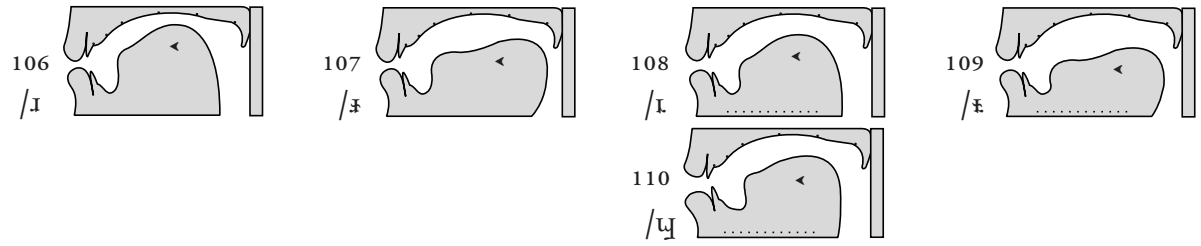
⟦/, ɻ̺⟧[97] labiodentalized postalveolar slightly rounded (with lateral contraction) '[ʊ͡ɹ̺ʷ]'
⟦/, ɻ̪⟧[98] dental, or lamino-dental (= with a *lowered* tip and with lateral contraction) '[ð̪̞]'

[[/, ɾ̠]][99] alveolar (with lateral contraction) '[ɾ̠]'
[[/, ɻ̠]][100] velarized alveolar (with lateral contraction) '[ɾ̠ˠ]'
[[/, ʁ̠]][101] [ʁ] uvularized alveolar (with lateral contraction) '[ʁ̞̠]'
[[/, ɽ̠]][102] postalveolar: (apico-)… (with lateral contraction) '[ɽ̠]'
[/, ɻ̠]][103] postalveolar slightly rounded: (apico-)… (with lateral contraction) '[ɽ̠ʷ]'
[[/, ʈ̠]][104] velarized postalveolar: (apico-)… (with lateral contraction) '[ɽ̠ˠ]'
[[/, ʂ̠]][105] velarized postalveolar slightly rounded: (apico-)… (with lateral contract.) '[ɽ̠ˠʷ]'.

10.6.7. *Lateralized* approximants and semi-approximants (with postaveolar and labial coarticulations; the last one without the latter) [[*, ɪ̠] (5).

[/, ɹ̠][106] postalveolarized prevelar slightly rounded (with lateral contraction) '[ɹ̠͡l̠ʷ]'
[/, ɪ̠][107] [ɪ] postalveolarized *semi*-prevelar slightly rounded (with lateral contraction – but with very wide narrowing) '[ɪ̞̠͡l̠ʷ]'
[[/, ʁ̠]][108] [ʁ] uvulo-postalveolarized velar slightly rounded (with lateral contraction) '[ʁ̞̠͡l̠ʷ]'
[[/, ʁ̠]][109] [ʁ] [ʁ] uvulo-postalveolarized *semi*-velar slightly rounded (with lateral contraction – but with very wide narrowing) '[ʁ̞̠͡l̠ʷ]'.
[/, ʮ][110] *semi*-provelar (with no labialization) '[ɯ̟]'

fig 10.6.6.3. Dorso-lateralized approximant and semi-approximant orograms (with slight post-alveolarization – 5).



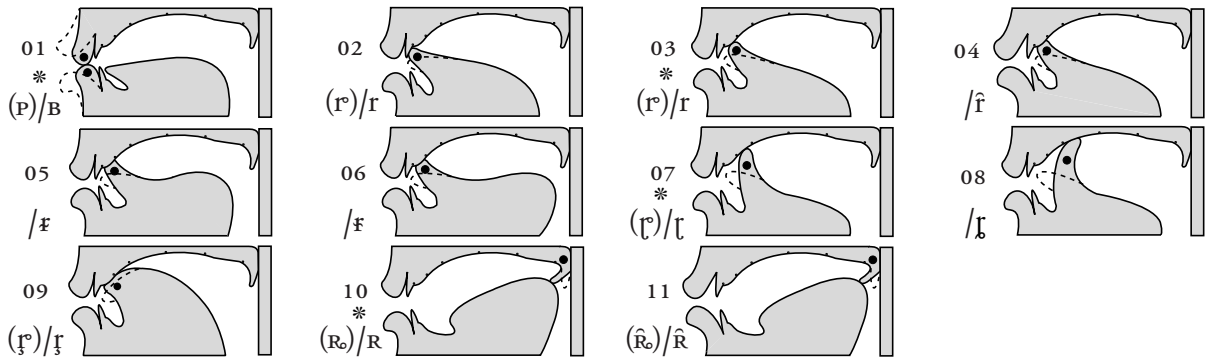
Trills, taps & flaps /R/ [R, ʀ, ɾ, ɽ, ɺ] (41)

10.7. These include three synopses for trills, taps, flaps; and two more, for *constrictive* trills and taps; finally, we find *lateralized* taps and flaps. The synopses of tapped laterals are with those of laterals. Our orograms clearly show that *taps* and *flaps* are two very different contoid categories.

10.7.1. *Trills* [R] (11).

[(ᴘ), ʙ]^{01}	bilabial '[ʙ̥, ʙ]' (≠, =)
([(ʳ̥), r])^{02}	dental (with *raised* tip) '[r̥̪, r̪]'
[(ʳ̥), r]^{03}	alveolar (apical) '[r̥, r̲]'
[/, r̂]^{04}	alveolar rounded '[r̲ʷ]'
[/, ɾ]^{05}	velarized alveolar '[r̲ˠ]'
⟦/, ɾ⟧^{06}	[ɾ] uvularized alveolar '[r̲ˠ]'
[(ɽ̥), ɽ]^{07}	postalveolar: (apico-)… (not laminal) '[ɽ̥, ɽ̲]' (≠)
[/, ɻ]^{08}	apico-palatal '[t͡ɽ]' (≠)
[(ʃ̥), ʃ]^{09}	prepalatal: (lamino-)… '[ʃ̥ʲ, ʃ̪ʲ]'
[(ʀ̥), ʀ]^{10}	uvular '[ʀ̥, ʀ]' (≠, =)
[(ʀ̥̂), ʀ̂]^{11}	uvular rounded '[ʀ̥ʷ, ʀʷ]'.

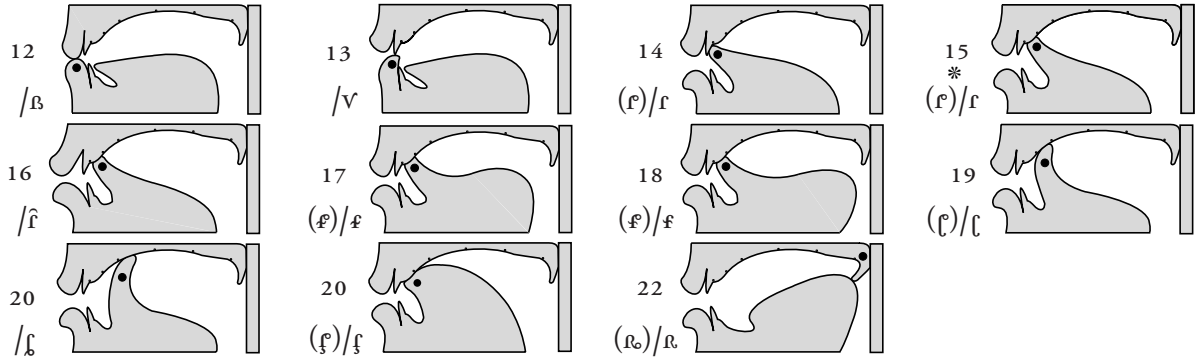
fig 10.7.1. Trill orograms (11).



10.7.2. *Taps* [ɾ] (11).

[/, ʁ]^{12}	bilabial '[ʁ̆/w̆]'
[/, ѵ]^{13}	labiodental '[ѵ]' (=)
([(ɾ̥), ɾ])^{14}	dental (with *raised* tip) '[ɾ̥̪, ɾ̪]'
[(ɾ̥), ɾ]^{15}	alveolar (with *raised* tip) '[ɾ̥, ɾ̲]'
[/, r̂]^{16}	alveolar rounded '[ɾ̲ʷ]'
[(ɾ̥), ɾ]^{17}	velarized alveolar '[ɾ̥ˠ, ɾ̲ˠ]'
[(ɾ̥), ɾ]^{18}	⟦ɾ, ɾ⟧ uvularized alveolar '[ɾ̥ˠ, ɾ̲ˠ]'
[(ɽ̥), ɽ]^{19}	postalveolar: (apico-)… (not laminal) '[ɽ̥, ɽ]'
[/, ɻ]^{20}	apico-palatal (palatal and apical, not laminal) '[ɻ̪]'
[(ʃ̥), ʃ]^{21}	prepalatal: (lamino-)… '[ʃ̥ʲ, ʃ̪ʲ]'
[(ʁ̥), ʁ]^{22}	uvular '[ʁ̆, ʁ̆]'.

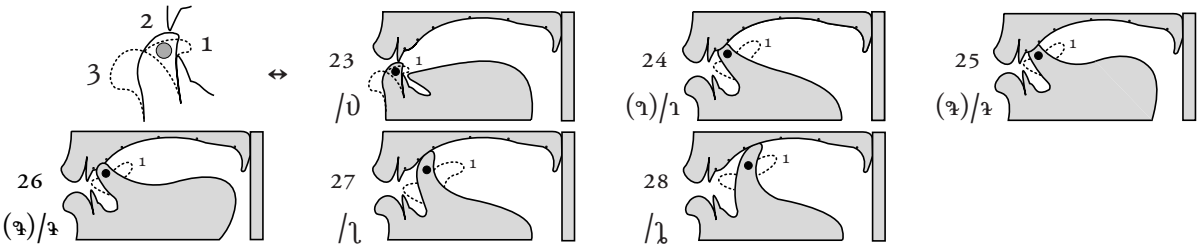
fig 10.7.2. Tap orograms (11).



10.7.3. *Flaps* [ɾ] (6).

[/, ʋ][23] labiodental (= between the lower lip and the upper teeth) '[ʋ̟/ʋ̆/ʌ]'
[(ɹ), ɹ][24] alveolar '[ɾ̞̟, ɾ̟]'
[(ɻ), ɻ][25] velarized alveolar '[ɾ̞̟ˠ, ɾ̟ˠ]'
[(ɻ), ɻ][26] [[ɻ, ɻ]] uvularized alveolar '[ɾ̞̟ˠ̲, ɾ̟ˠ̲]'
[/, ɺ][27] postalveolar: (apico-)… '[ɺ̟]'
[(ʟ̠), ʟ̠][28] apico-palatal (not laminal) '[ɺ̟̊, ɺ̟]'.

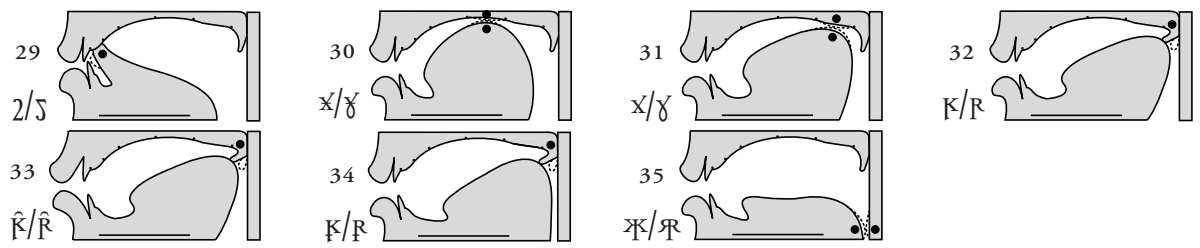
fig 10.7.3. Flap orograms (6).



10.7.4. *Constrictive* trills [Ʀ] (7).

[[ʔ, ʕ]][29] alveolar (with raised tip and narrowing which produces friction noise) '[ɹ̝̟̊, ɹ̝̟]'
[[x, ɣ]][30] [x, ɣ] prevelar (with friction noise) '[ʀ̝̟̊⁺, ʀ̝̟⁺]'
[[x, ɣ]][31] [x, ɣ] velar (with friction noise) '[ʀ̝̊, ʀ̝]'
[[ʁ, ʀ]][32] [χ, ʁ] uvular (with friction noise) '[ʀ̞̊, ʀ̞]'
[[ʀ̂, ʀ̂]][33] uvular rounded (with friction noise) '[ʀ̞̊ʷ, ʀ̞ʷ]'
[[ʁ, ʀ]][34] pharyngealized uvular (with friction noise) '[ʀ̞̊ˤ, ʀ̞ˤ]'
[[ʜ, ʢ]][35] pharyngeal (between the *lower* phar. & root of t.; with friction noise) '[ʜ̞̊, ʢ̞̊]'.

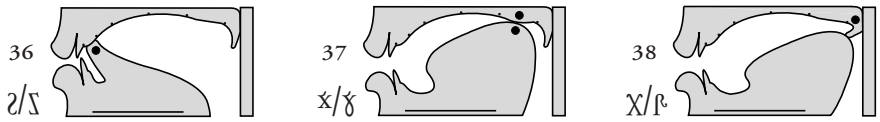
fig 10.7.4. Constrictive trill orograms (7).



10.7.5. *Constrictive* taps [ʀ*] (3).

[⟦ʔ, ɻ⟧][36] alveolar (with raised tip and narrowing which produces friction noise) '[ɹ̝̊, ɹ̝]'
[⟦x, ɣ⟧][37] velar (with friction noise) '[ɾ̞̆, ɾ̞]'
[⟦ʃ, ʁ̞⟧][38] uvular (with friction noise) '[ʀ̞̆]'.

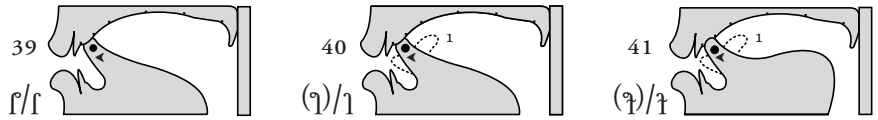
fig 10.7.5. Constrictive tap orograms (3).



10.7.6. *Lateralized* taps & flaps [ʎ] (3).

[(ɾ), ɾ][39] alveolar *tap* (with *raised* tip) '[ɾ̝̊, ɾ̝]'
[(ɳ), ɳ][40] alveolar *flap* (with *raised* tip) '[ɽ̝̊, ɽ̝]'
[(ɬ), ɮ][41] velarized alveolar *flap* (with *raised* tip) '[ɽ̝̊ˠ, ɽ̝ˠ]'.

fig 10.7.6. Lateralized orograms: tap and flap.



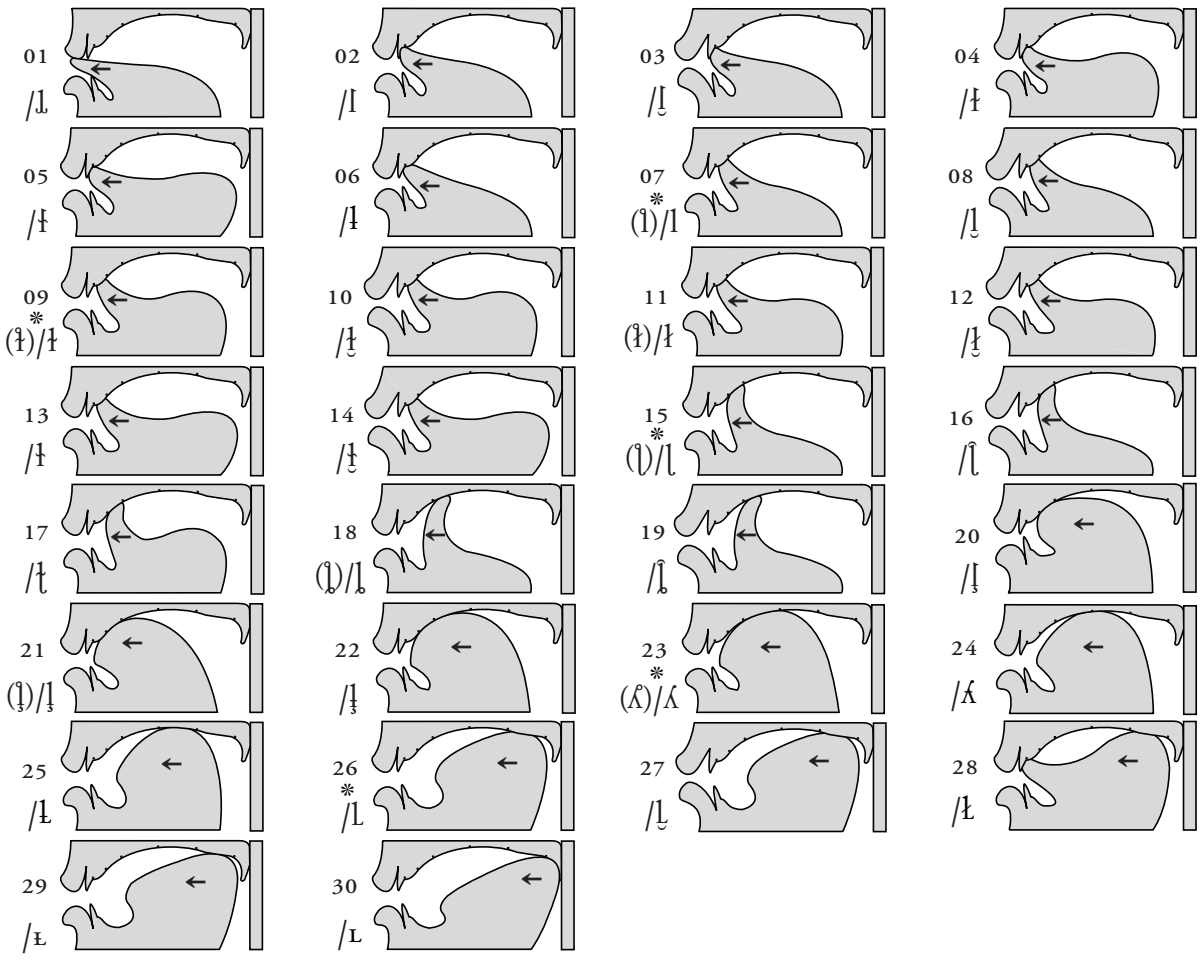
Laterals /L/ [L, ɭ, ɬ, ʟ, ˡ] (67)

10.8. These include five synopses for (bi)laterals, *uni*laterals, constrictive laterals, lateral taps; semi-laterals; finally, the symbol for a diaphone is added, [ɬ] (which can be called either 'lateralized tap' or 'tapped lateral', for oscillations between [ɾ, ɽ, ɺ, l]).

10.8.1. *Laterals* [L] (30).

[/, ɭ̪]01	labial-apical (= between the upper lip and the tip of the tongue) '[l̪]'
[[/, l̪]]02	[l] dental, or predental (with *raised* tip) '[l̪]'
[[/, l̪̆]]03	[l̪] dental rounded '[l̪ʷ]'
[[/, ɬ̪]]04	[ɬ] velarized dental '[l̪ˠ] or [ɬ̪]'
[[/, ɬ̪]]05	(or [ɬ̪]) [ɬ] uvularized dental '[l̪ˤ] or [ɬ̪]'
[[/, ɬ̪]]06	[l] denti-alveolar (= intermediate between the teeth and the alveoli) '[l̪]'
[(l), l]07	alveolar (= between the alveoli and the tip of the tongue) '[l̥, l]'
[/, l̆]08	alveolar rounded '[l̆ʷ]'
[(ɬ), ɬ]09	velarized alveolar '[l̥ˠ], [l̆ˠ] or [ɬ̆], [ɬ]'
[/, ɬ̆]10	velarized alveolar rounded '[l̥ˠʷ] or [ɬ̆ʷ]'
[(ɬ), ɬ]11	*semi*-velarized alveolar (with reduced velar narrowing than [ɬ]) '[l̥˕, l˕] or [ɬ̥, ɬ]'
[/, ɬ̆]12	*semi*-velarized alveolar rounded '[l̥˕ʷ] or [ɬ̆ʷ]'

fig 10.8.1. (Bi)lateral orograms (30).

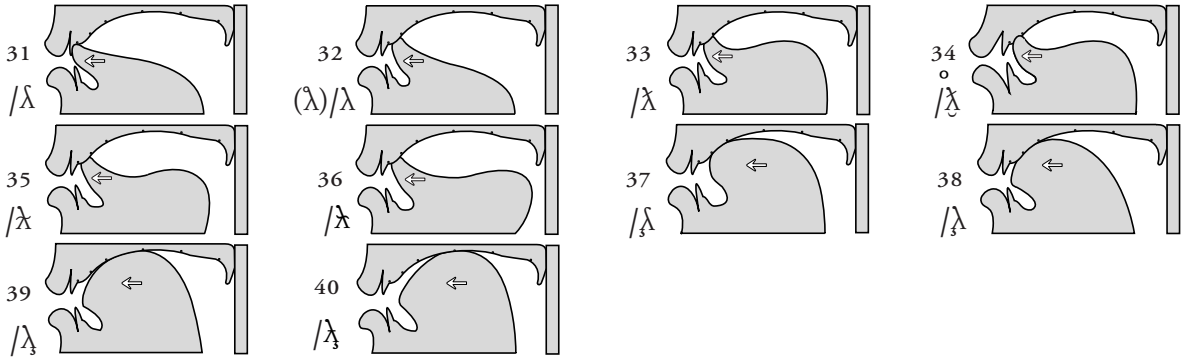


⟦/, ɬ⟧[13] (or [ɬ̪]) [ɬ] uvularized alveolar '[l̪ˠ] or [ɬ̪]'
⟦/, ɬ̪⟧[14] (or [ɬ̪]) [ɬ̪] uvularized alveolar rounded '[l̪ˠʷ] or [ɬ̪ʷ]'
[(l̥), l̥][15] postalveolar: (apico-)… (not laminal) '[l̥, l̥]' (≠, =)
[/, l̥ʷ][16] postalveolar rounded: (apico-)… '[l̥ʷ]'
[/, ɬ̠][17] velarized postalveolar '[l̠ˠ]'
[(l̺), l̺][18] apico-palatal (= between the palate and the tip) '[l̺, l̺]'
[/, l̺ʷ][19] apico-palatal rounded '[l̺ʷ]'
⟦[ɬ̟]⟧[20] [ɬ̟] postalveo-palatal: (lamino-)… '[l̪ʲ]'
[(l̟), ɬ̟][21] pre-palatal: (lamino-)… '[l̪ʲ, l̪ʲ]'
[/, ɬ̟][22] pro-palatal (= between prepalatal and palatal) '[ʎ̟]' (≠)
[(ʎ̊), ʎ][23] palatal '[ʎ̥, ʎ]' (≠, =)
[/, ʎ][24] postpalatal '[ʎ̠]'
[/, ɬ̠][25] prevelar '[ɬ̠]'
[/, L][26] velar (= betw. the velum and the back of tongue; not 'velarized [alveol.]') '[ʟ]' (≠)
[/, L̠][27] velar rounded '[ʟʷ]'
[/, ɬ͡L][28] velar–alveolar '[ɬ͡ʟ]'
[/, ʁ][29] preuvular '[ʟ]'
[/, ʟ][30] uvular '[ʟ̠]'.

10.8.2. *Unilaterals* [ℒ] (10).

⟦/, ʎ⟧[31] [l] dental: (lamino-)… (air passing only, or mostly, around one side of the tongue) '[l̪]'
⟦(l̥), l⟧[32] [l] alveolar '[l̥, l]'
⟦/, ɭ̠⟧[33] prevelarized alveolar '[l̪ˠ]'
⟦/, ɭ̠ʷ⟧[34] prevelarized alveolar rounded '[l̪ˠʷ]'
⟦/, ɭ̠⟧[35] [ɬ] velarized alveolar '[l̪ˠ]'
⟦/, ɭ̠⟧[36] (or [ɭ̠]) [ɬ] uvularized alveolar '[l̪ˠ]'
⟦/, ʎ̟⟧[37] [ɭ̟] postalveo-palatal: (lamino-)…'[l̪ʲ]'
⟦/, ʎ̟⟧[38] [ɭ̟] prepalatal: (lamino-)… '[l̪ʲ]'
⟦/, ʎ̟⟧[39] [ʎ] palatal: (lamino-)… '[ʎ̟]'.
⟦/, ʎ̟⟧[40] postpalatal '[ʎ̟]'.

fig 10.8.2. Unilateral orograms (10).

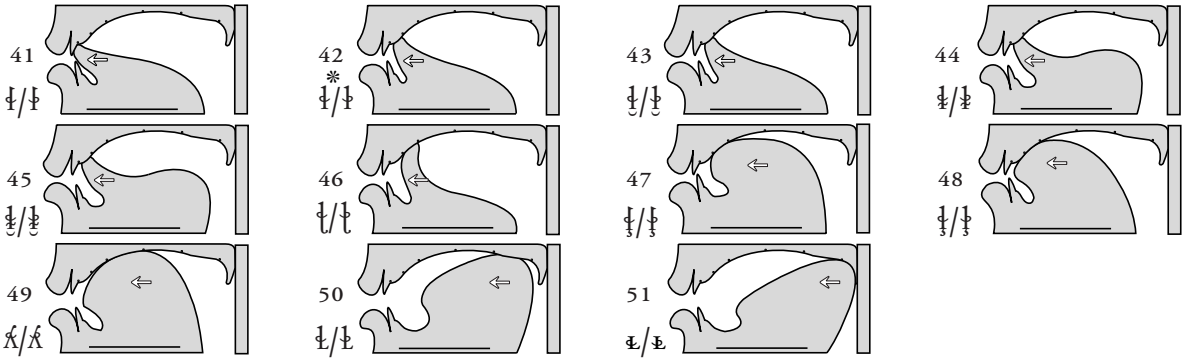


10.8.3. *Constrictive (uni)*laterals [Ɬ] (11).

⟦ɬ, ɮ⟧[41] [ɬ, ɮ] dental, or predental (with friction noise) '[ɬ̪, ɮ̪]'
[ɬ, ɮ][42] alveolar (with friction noise) '[ɬ, ɮ]'

[ɬ̪, ɮ̪][43] alveolar rounded (with friction noise) '[ɬ̪ʷ, ꞎʷ]'
[ɬ, ɮ][44] velarized alveolar (with friction noise) '[ɬˠ, ꞎˠ]'
[ɬ̪̽, ɮ̪̽][45] velarized alveolar rounded (with friction noise) '[ɬ̪ˠʷ, ꞎˠʷ]'
[ɭ̊˔, ɭ˔][46] postalveolar: (apico-)… (not laminal – with friction noise) '[ɭ̪̊˔, ꞎ̪˔]'
[[ʃ̺, ʒ̺]][47] [ʃ, ʒ] postalveo-palatal: (lamino-)… (with friction noise) '[ʃ̺ʲ, ʒ̺ʲ]'
[ʃ̻, ʒ̻][48] prepalatal: (lamino-)… (with friction noise) '[ʃ̻ʲ, ʒ̻ʲ]'
[ɧ, ʎ̝][49] palatal (with friction noise) '[ʎ̝̊, ʞ͡ɧ] or [ʎ̝̊˔, ʎ̝˔]'
[ɬ̠, ɮ̠][50] velar (not 'velarized [alveolar]' – with friction noise) '[ɬ̠̊˔, ꞎ̠˔] or [ʟ̠̊˔, ʟ̠˔]'
[ɬ̴, ɮ̴][51] uvular (with friction noise) '[ɬ̴̊˔, ꞎ̴˔] or [ʟ̴̊˔, ʟ̴˔]'.

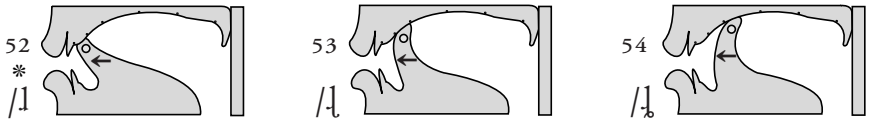
fig 10.8.3. Constrictive (uni)lateral orograms (11).



10.8.4. *Tapped* laterals [ɾ] (3).

[ɺ, ɾ][52] alveolar '[ɾ]' (≡)
[ɺ, ɭ̆][53] postalveolar: (apico-)… (not laminal) '[ɾ̪]'
[ɺ, ʎ̆][54] apico-palatal (= between the [hard] palate and the tip) '[ɾ̈]'.

fig 10.8.4. Tapped lateral orograms (3).

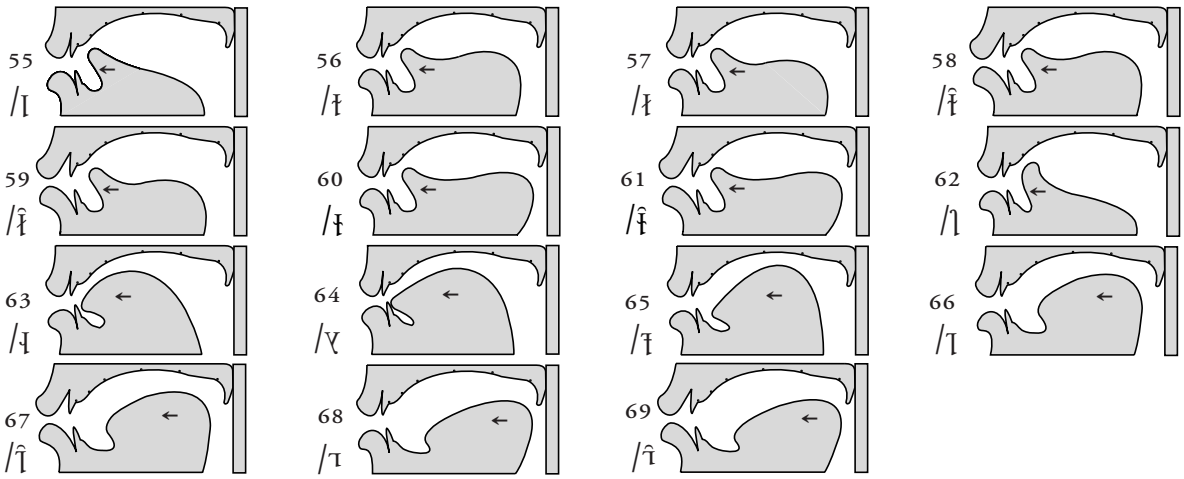


10.8.5. *Semilaterals* (or lateralized approximants) [ʟ] (15).

[[ɺ, ɭ]][55] [l] alveolar (with lateral contraction) '[l̺̊]'
[[ɺ, ɬ]][56] [ɬ] velarized alveolar (with lateral contraction) '[ɬˠ̺̊]'
[[ɺ, ɬ̴]][57] [ɬ] semivelarized alveolar (with lateral contraction) '[ɬ̴̺̊]'
[[ɺ, ɬ̪̽]][58] [ɬ] velarized alveolar rounded (with lateral contraction) '[ɬ̪ˠʷ̺̊]'
[[ɺ, ɬ̴̪̽]][59] [ɬ] semivelarized alveolar rounded (with lateral contraction) '[ɬ̴̪ˠʷ̺̊]'
[[ɺ, ɬ̴]][60] [ɬ] uvularized alveolar (with lateral contraction) '[ɬ̴̺̊]'
[[ɺ, ɬ̴̪̽]][61] [ɬ] uvularized alveolar rounded (with lateral contraction) '[ɬ̴ˠʷ̺̊]'
[[ɺ, ɻ]][62] [ɻ] postalveolar (with lateral contraction) '[ɻ̺̊]'
[[ɺ, ɪ̟]][63] [ɪ̟] pre-palatal (with lateral contraction) '[ʏ̟̺̊]'
[[ɺ, ʏ]][64] [ʏ] palatal (with lateral contraction) '[ʏ̺̊]'
[[ɺ, ɬ̠]][65] [ʟ] prevelar (with lateral contraction) '[ɬ̠̺̊]'
[[ɺ, ʟ̠]][66] [ʟ] velar (with lateral contraction) '[ʟ̠̺̊]'

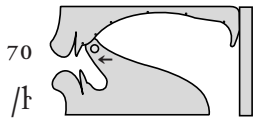
⟦/, ɬ̂⟧[67] [ɭ] velar rounded (with lateral contraction) '[ɮ̊ˠʷ]'
⟦/, ɪ⟧[68] [ɪ] uvular (with lateral contraction) '[ɮ̊]'
⟦/, ɪ̂⟧[69] [ɪ] uvular rounded (with lateral contraction) '[ɮ̊ˠʷ]'.

fig 10.8.5. Semi-laterals, or lateralized approximants (15).



10.8.6. As already pre-empted in § 10.8, we also give the 'diaphone' [ɬ] (*ie* either a 'lateralized tap' or a 'tapped lateral' (or something else), for possible oscillations between [ɾ, ɽ] and [l, ɭ]). Of course, our symbol is the combination of [ɾ] and [l]. As a matter of fact, it is no easy task to try to show it with a suitable orogram, given its particular nature. We leave the task of devising possible *offIPA* 'transcriptions' to the imagination of careful readers.

fig 10.8.6. Orogram of the alveolar lateralized tap, or tapped lateral, diaphone.

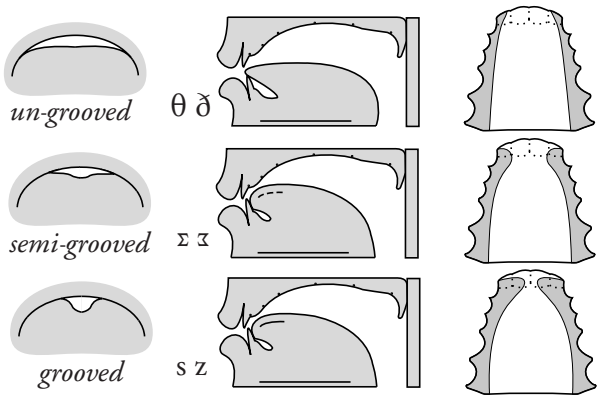


Appendix

Intermediate contoids: semi-grooved

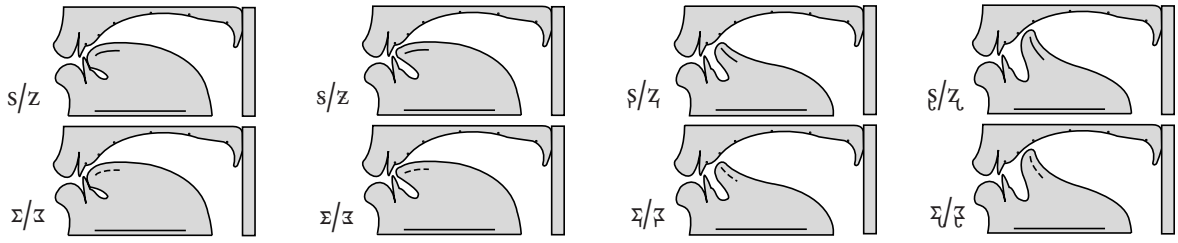
10.9.1. *Semi-grooved* constrictives & stop-strictives can also occur. There follows an illustration showing the difference between *un-grooved*, *semi-grooved* and *grooved* dental constrictive contoids, as a necessary exemplification.

fig 10.9.1. Comparison between plain (un-grooved, or 'slit'), semi-grooved, and grooved dental contoids.



Now, for comparison, we show the orograms of grooved and semi-grooved dental, denti-alveolar, alveolar and postalveolar constrictives. As can beseen, it is no easy job to draw them by hand or in print at reduced dimensions, especially for voiceless ones. However, we can rely on them, if needed.

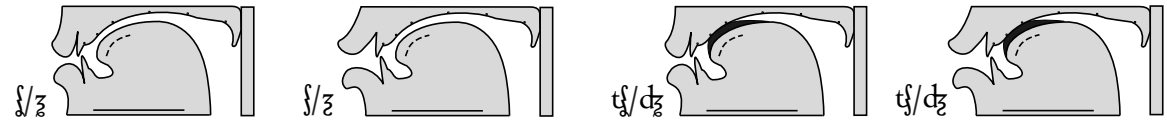
fig 10.9.2. Some grooved and semi-grooved constrictive orograms.



Here, we just show the two most frequent semi-grooved stop-strictives and their correspondent constrictives (but, of course, others are possible).

In certain societies, semigrooved contoids are often (though not always) associated with gay-male lisp.

fig 10.9.3. Some semi-grooved constrictive and stop-strictive orograms.

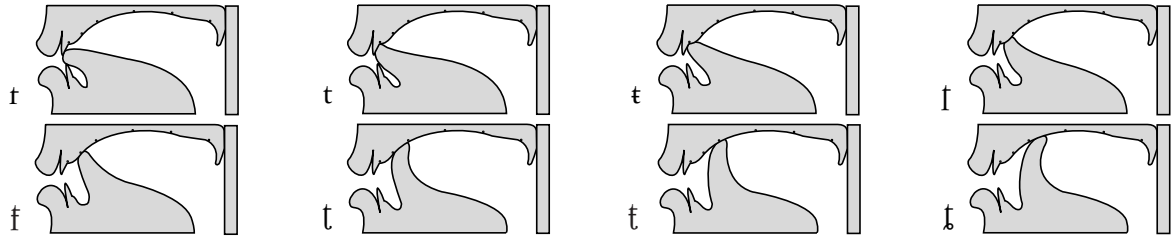


Comparisons between similar contoids

10.9.2. For *nasals*, to closely examine their many articulatory possibilities, we can consider the position of German, as it emerges mainly from § 5.2.1-7 of *HPr*. We have indicated many coarticulatory combinations, by using both (more) 'normal' and (more) 'special' symbols. Certainly, this has been done not for the sake of useless pedantry, but rather to fully describe native speakers' 'spontaneous and automatic' phonetic reality, in order to allow even non-native speakers to use what natives actually do. In fact, for the 3 nasal phonemes of German, /m, n, ŋ/, we have 6 taxophones, [m, ɱ, n, n̪, ŋ, ɴ], and some special ones, ⟦m̟, nˠ, n̺⟧ (if necessary, ⟦n̺⟧, too). For the 2 intense ('syllabic') nasals, /m̩, n̩/, we have 6 more normal taxophones, [m̩, ɱ̩, n̩, n̪̩, ŋ̩, ɴ̩], and 9 special ones ⟦m̩ˠ, m̟̩, ɱ̟̩, n̺̩, n̻̩, nˠ̩, n̪̩, ɳ̩, ŋ̩⟧ (if necessary, ⟦n̺̩⟧, too). They are all given in *fig* 10.2.1-2 (with others).

10.9.3. For *stops*, let us carefully observe the characteristics of some (voiceless) phones, belonging to the apical group (predental, dental, denti-alveolar, alveolar, postalveolar, apico-palatal), [(t), t, t̪, ɹ̪, ɻ, c̻]. We find the last five respectively in: Spanish *tú* [ˈtu], German *Tod* [ˈt̪hoːt̪], English *tat* [ˈɹ̪hæɹ̪], Hindi *ṭaaṭ* [ˈɻaaɻ], and Tamil *ṭii* [ˈc̻ii]. The first orogram in *fig* 10.9.4 adds the predental articulation which in Malayalam opposes /ɻ/ [c̻] (and, in traditional pronunciation, also /ɹ̪/ [ɹ̪], which in modern pronunciation merges into /t/ [ɾ]; thus, they can both become [t]): *muṯṯu* [ˈmʊɾːʊ], *muttu* [ˈmʊɹ̪ːʊ], *muṭṭu* [ˈmʊc̻ːʊ]. Others are possible (*fig* 10.9.4).

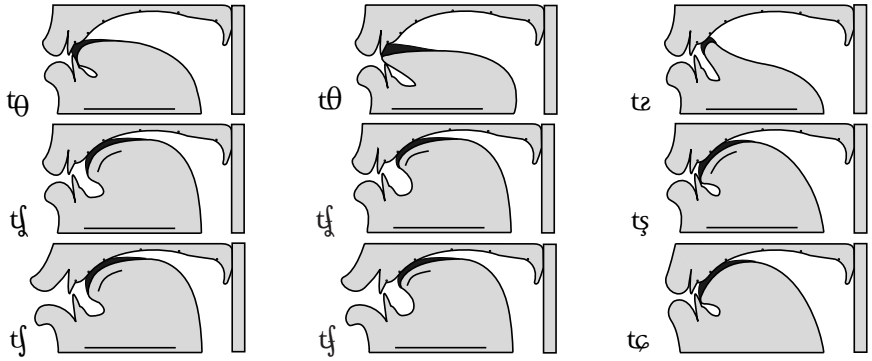
fig 10.9.4. Comparisons between some (voiceless) stops: prodental, dental, denti-alveolar, alveolar, back-alveolar, postalveolar, back-postalveolar, apico-palatal.



10.9.4. For *stop-strictives*, let us expressly consider some groups, in order to see their nuances well, since too often they are described badly. For simplicity, we will see voiceless phones only. The first three we consider are (prodental, dental, and alveolar) un-grooved contoids, [t̪θ, tθ; tɹ]. We find the first two in regional Italian pronunciations from Trentino (in north-eastern Italy), for /ts/: *marzo* [ˈmɑɾɾt̪θo, -tθo] (for neutral Italian [ˈmaɾːtso]), and [tɹ], in Sicily, for /tr/: *tre* [ˈtɹɛ, ˈtɹɛə] (this is the 'legendary' –and 'phonetic-fiction'– 'cacuminal' sequence *'ṭṛ'*, for [ˈtre]).

It is useful to also consider the grooved triple set, with no lip-rounding nor lip-protrusion – postalveo-palatal with a lowered or raised tip, and prepalatal: [tʃ̠], ⟦tʃ̠⟧, [tʂ], as in typical pronunciations in northern Italy, for /tʃ/: *cera* [ˈtʃ̠eːɾa, tʃ̠-, tʂ-], /ˈtʃera/. Let us also consider the pair with lip-protrusion: [tʃ], as in neutral Italian [ˈtʃeːɾa]; ⟦tʃ⟧, as in English *chain* [ˈtʃhɛᵻn] /ˈtʃɛɪn/ and German *deutsch* [ˈd̥ɔʏtʃ] /ˈdɔʏtʃ/. Finally, let us observe [tɕ], as well, with vertical labialization (not rounding or protrusion), as in Chinese *jī* [¯tɕi] /¯tɕi/.

fig 10.9.5. Comparisons between some (voiceless) stop-strictives.



10.9.5. In addition, it is worthwhile considering the set of eight *grooved constrictives*. For instance, [s, ʂ, ʃ, ɬ], can occur respectively in neutral Italian, regional Italian (of upper-southern and northern parts), and regional Italian (of other northern parts), as in *sí* ['si, ˈsi, ˈʃi, ˈɬi] /ˈsi/ (or of variants of Spanish; while neutral Castilian Spanish uses [θ], neutral American Spanish [s]). English speakers can actually use any of these four contoids, but the neutral one is ⟦s⟧, although generally transcribed with [s]: *sixty* ⟦ˈsɪksʧi⟧ [ˈsɪksʧi] /ˈsɪksti/. Look at *fig* 10.9.6.2-3, too.

fig 10.9.6.1. Comparisons between some (voiceless) grooved constrictives: prodental, dental, denti-alveolar, alveolar, back-alveolar, postalveolar, back-postalveolar, apico-palatal.

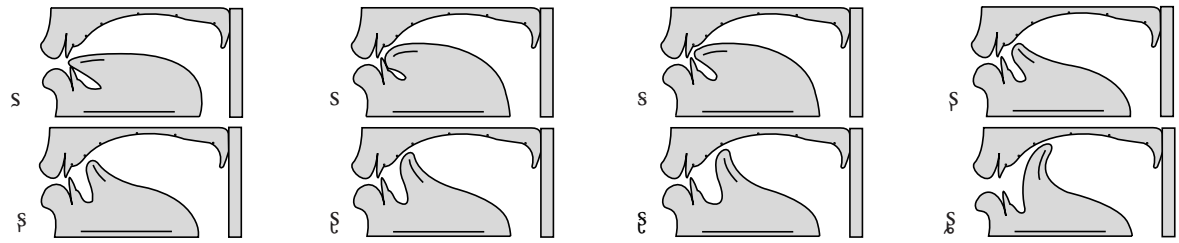


fig 10.9.6.2. Comparisons between some (voiceless) grooved semi-constrictives: prodental, dental, denti-alveolar, alveolar, back-alveolar, postalveolar, back-postalveolar, apico-palatal.

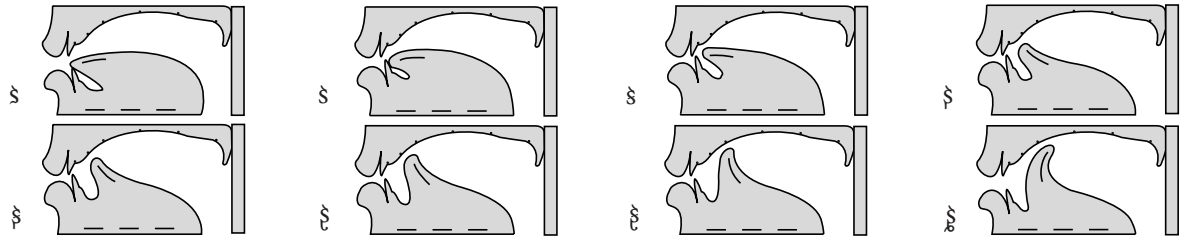
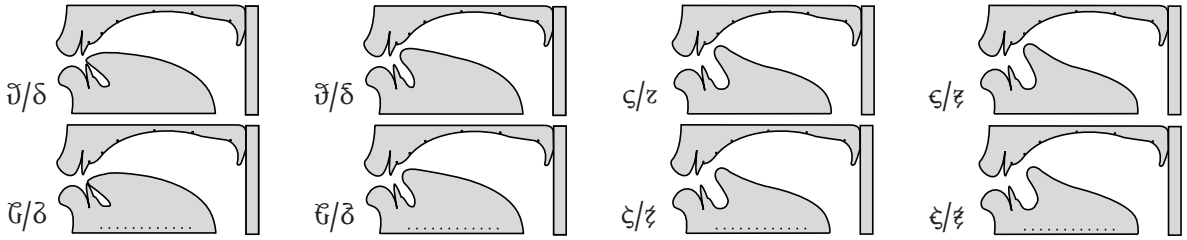


fig 10.9.6.3. Comparisons between some (voiceless and voiced) approximants and semi-approximants: dental, denti-alveolar, alveolar, back-alveolar.



10.9.6. As far as *median approximants* are concerned, that is those produced within the phonetic space of vocoids (cf *fig* 8.1), it is very important to also observe some realizations with greater or lesser space between the dorsum and the palate, up to constrictive phones, by considering the following areas: (*prepalatal*,) *palatal*, *postpalatal*, *prevelar*, *provelar*, *velar* (and *uvularized velar*, too). We will present the voiced contoids in a synoptic way (whereas their articulations can be found in previous sections). It is to be noted that the median approximants (and semi--approximants) in this table are dynamic contoids (rather than static ones – cf *fig* 10.9.14-15). Besides, the high *vocoids*, that we show below the table, are there to help to connect them with the contoids.

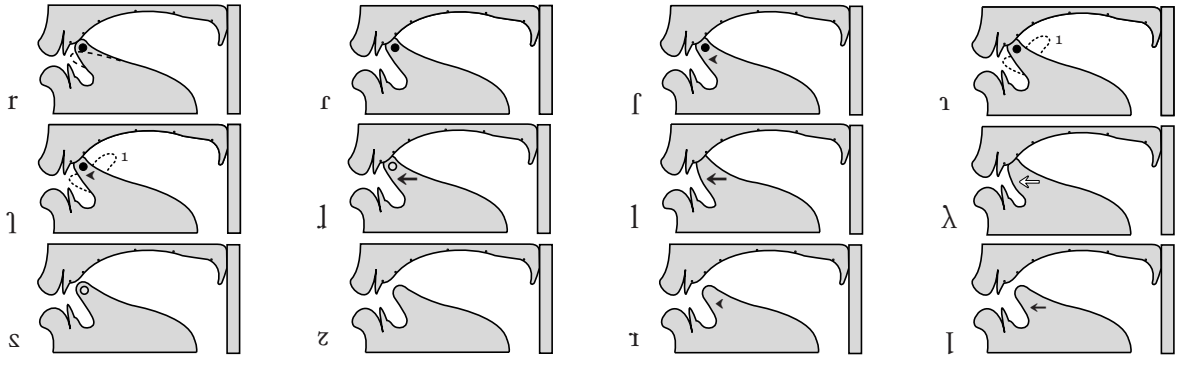
fig 10.9.7.

Comparisons between voiced median approximants (& similar nearby contoids).

	pre-palatal	palatal	postpalatal	pre-velar	pro-velar	velar	velarized alveolar	pre-palatal rounded	palatal rounded	postpalatal rounded	pre-velar rounded	pro-velar rounded	velar rounded	velarized alveolar r.	uvularized velar r.
constrictive		ʝ	ɹ̠	ɣ		ɣ			ʝ̂		ɧ		ɣ̂		
semi-constrictive		j̞	ɹ̞	ʏ		ʏ			ɥ̞	ɰ̞	ɧ̞	ʍ̞	ʍ̞		
approximant	ɹ	j	ɹ̠	ɻ	ɯ̟	ɯ		ɐ	ɥ	ɰ	ɧ	w	w		ʬ
semi-approxim.		ɻ	ɹ̠	ɻ	ɯ̟	ɯ			ɥ	ɰ	ɧ	ʍ	ʍ		ʭ
semi-lateral	ɬ	ʎ		ɬ		ʟ	ɬ						ʟ̂	ɬ̂	
high vocoids		i	ɪ	ɨ	ɯ	(ɯ)			ʏ	y	ʉ	ɯ	u		

10.9.7. It is important to also consider some alveolar contoids, which can be difficult to distinguish. For the speakers of certain languages (mostly spoken in the Far East, as the various Chinese languages, and Japanese and Korean) they are a severe difficulty, since these differences are not present in the phonemic systems of those languages (cf *fig* 10.13 & § 9.33). Those Spanish accents which (really or presumably) neutralize the patterns /ɾC, lC/ can have [ɾ, ɽ, l̠, l] (with apical contact, cf § 10.8.6, as well), or [s̠, z̠, ɹ̠, ɭ̠] (with no such contact). The difference between the last three phones (and orograms) is fairly small: [z̠] lacks any lateral contraction,

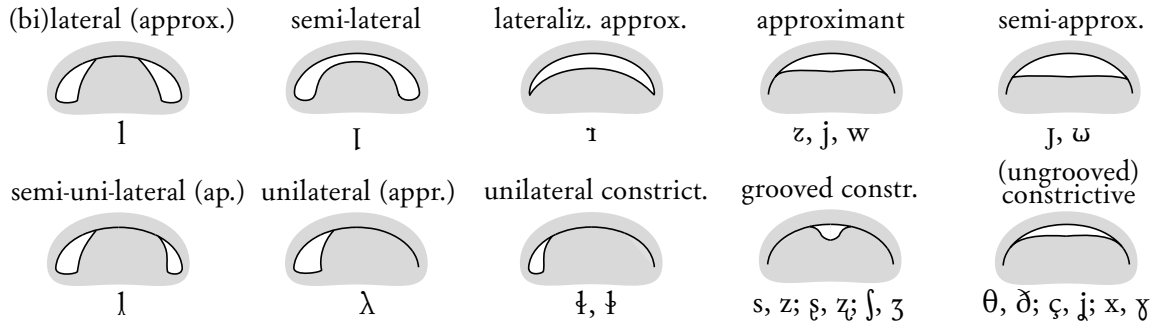
fig 10.9.8. Comparisons between trills, taps, flaps, laterals, approximants (& combinations).



which is present in [ɪ] (as an added feature), and in [ɻ] (as a fundamental feature coupled with the lack of any apical contact). It is important to pay careful attention to the size of the arrows, too. The possible alveolar *semi-tap*, [ɾ] is intermediate between [ɾ] and [z], with which it can actually alternate (and might –indeed– work as a diaphone, as well, *cf* § 10.8.6).

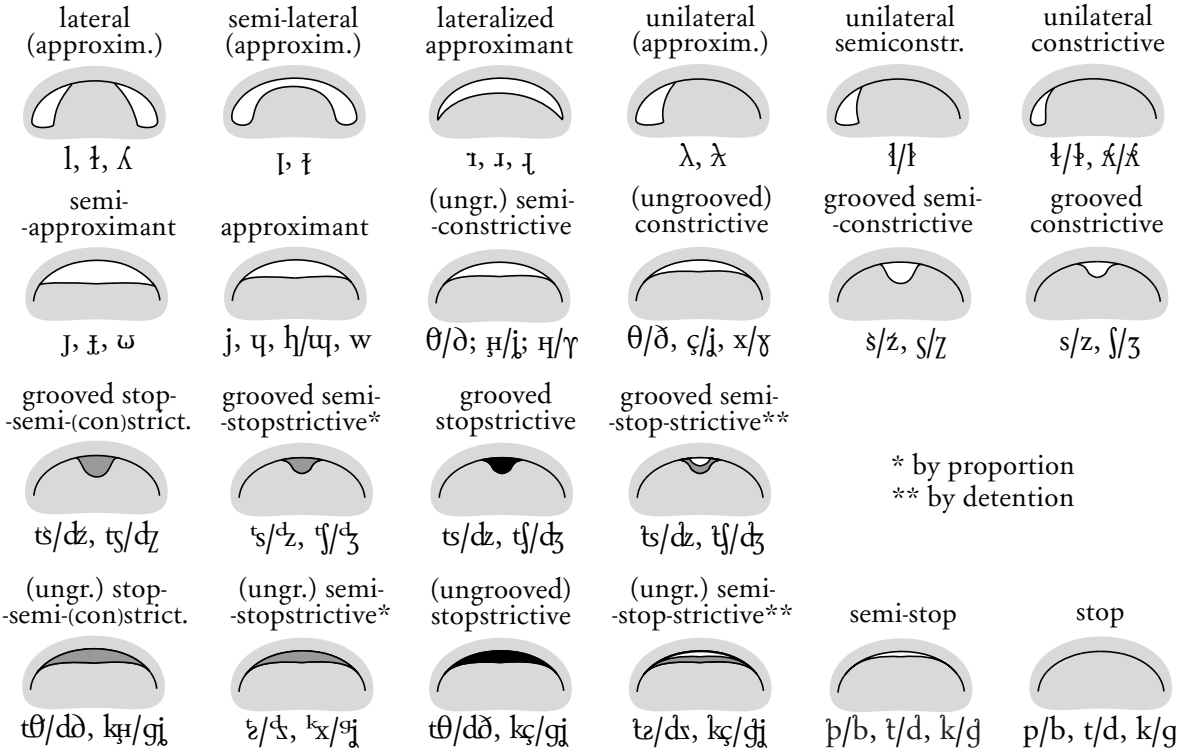
10.9.8. *fig* 10.9.9 shows some diagrams of frontal orograms, or *linguograms*, in order to help to visualize the slight mechanism which contributes to differentiate similar phones. Those in the middle concern the last three phones we have seen; the two on the sides highlight other interesting relations.

fig 10.9.9. Linguograms (or frontal orograms) showing a different perspective.



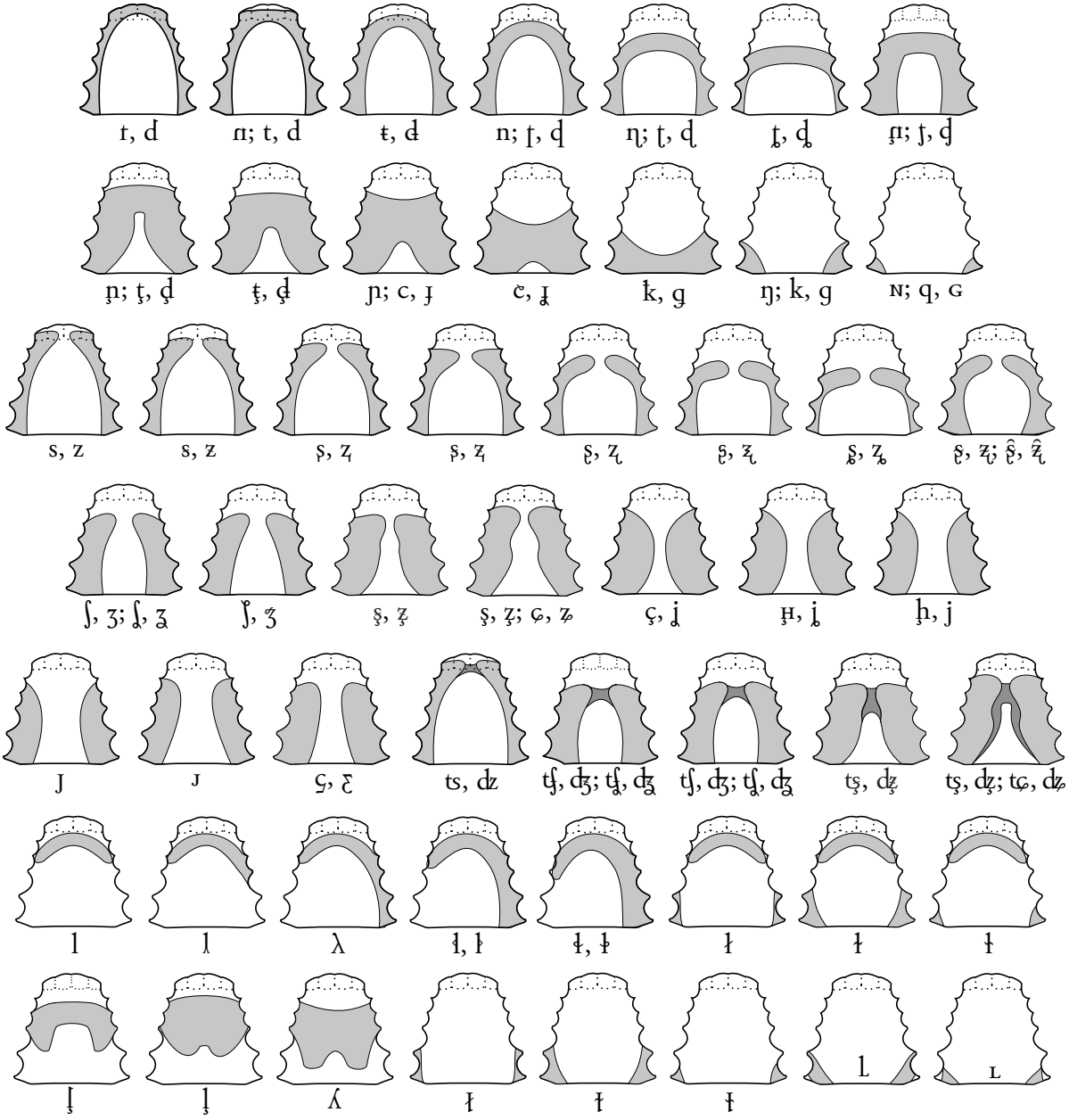
10.9.9. Here we add some more linguograms to better show the difference between certain (categories of) contoids already dealt with in this chapter. It is very important to accurately connect every linguogram to its articulatory chartacteristics.

fig 10.9.10. Further linguograms showing a different perspective for given contoid classes.



10.9.10. Palatograms are also very important to help to recognize some articulatory peculiarities which can make a real difference between similar phones. Thus, it is fundamental to accurately inspect all palatograms we are presenting here.

fig 10.9.11. Further different palatograms to be compared very attentively.



10.9.11. We also show the palatograms of all principal vocoids, because even comparisons between these two categories of phones can be very illuminating. But, first, let us show them in their vocograms (as in ℘ 8)

fig 10.9.12. Vocograms with *canIPA* vocoids.

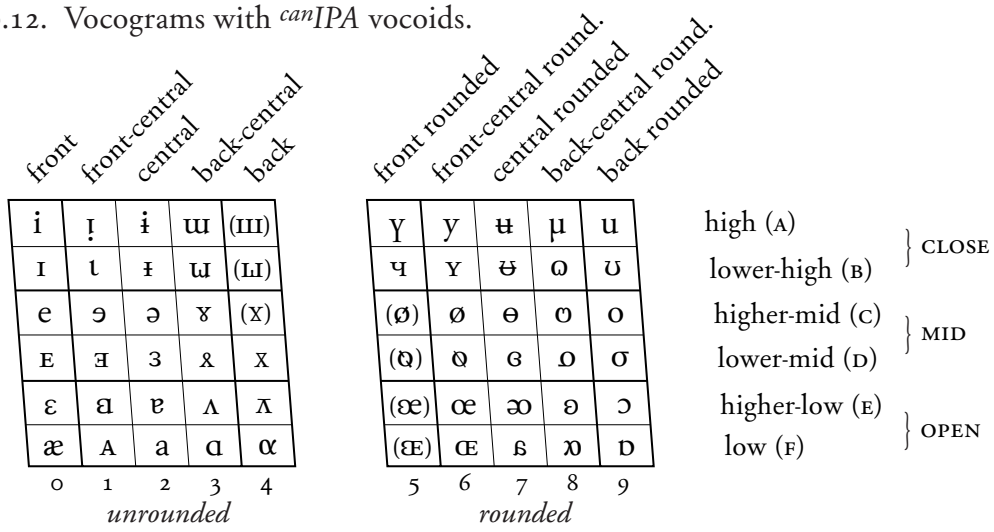
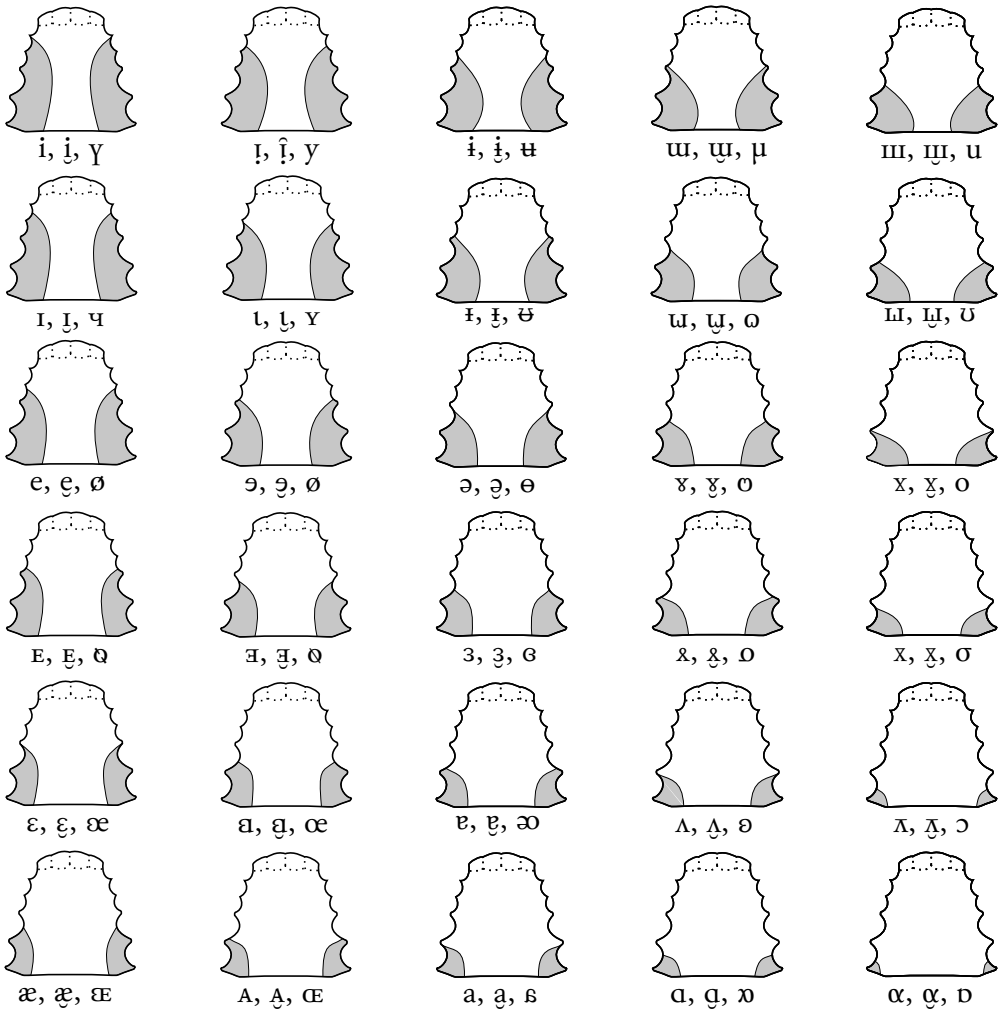
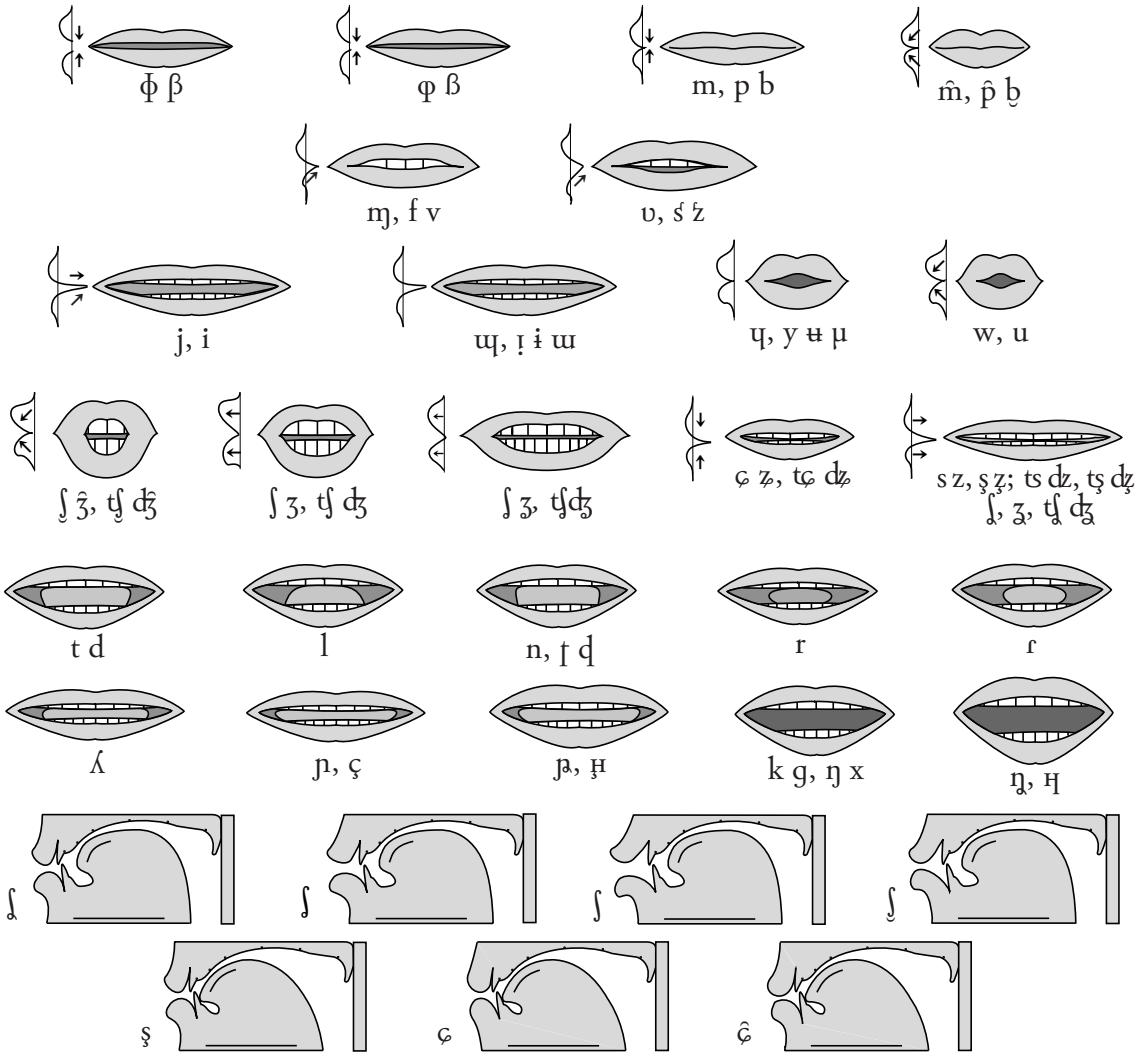


fig 10.9.13. Palatograms of *canIPA* vocoids.



10.9.12. Here is an expanded version of *fig* 9.1, which can complete this overview, to continue making useful comparisons between phones and some of their nuances.

fig 10.9.14. Contoid labiograms (and seven orograms for the lips again).



'Aspiration' & coarticulation

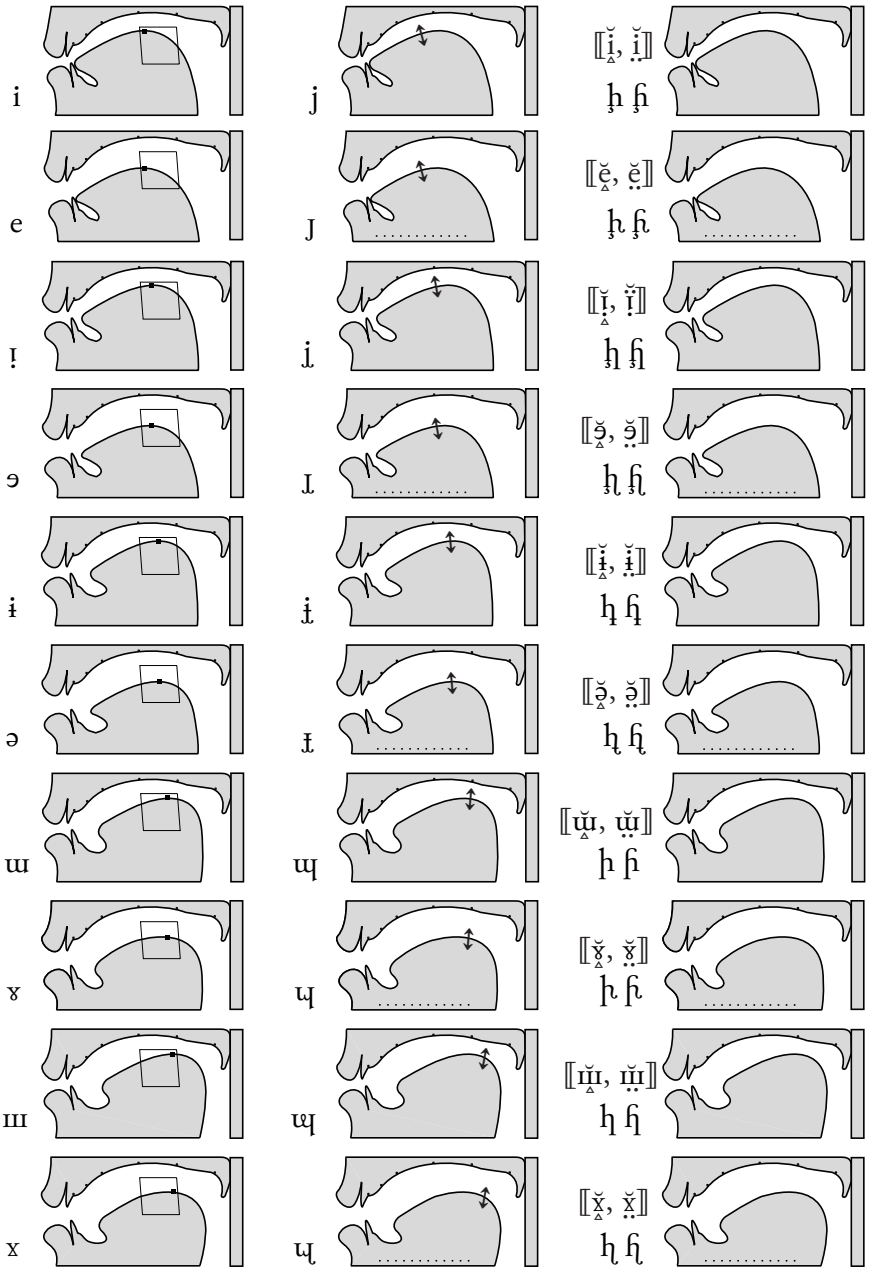
10.9.13. Certainly, it will not be in vain to also reflect upon different possible degrees of '[h]' in various languages, either as a phoneme, /h/, or as an element of 'aspiration', either phonetic, for /C/, or phonemic, for /Ch/. As a matter of fact, it could be very important to be able to adequately distinguish, not only between (voiced or voiceless) laryngeal approximants, [h, ɦ], but also between laryngeal constrictives, [ẖ, ɦ̞] (*cf* § 10.6.4 & 10.5.2). And, in addition to a possible intermediate phonation type, [ɦ̤] (*cf* § 10.6.4.2), we can also find the corresponding semi-constrictive, [[ẖ, ɦ̞]] (formerly [[ɬ, ʱ]]), and semi-approximant, [[h̞, ɦ̤]] (formerly [[ʜ, ɐ]]), contoids – which are produced by using a lesser amount of air than the respective constrictive or approximant phones. However, the special symbols are not yet in great use.

This reflection can show that the VOT theory (= voice onset time – *ie* the time that elapses between some articulatory events, mostly the release of a stop and the

point at which the vocal folds begin to vibrate) is a very weak one, since not only time, but also tension is important in the transitions from a phone to another.

Unfortunately, as we know quite well, *offIPA* is nothing more than a phonemic alphabet (in spite of its official name: 'International Phon*etic* Alphabet', with some vague and curious definitions, too. It only has two voiceless and voiced 'fricative' (meaning *approximant*) sounds, /h, ɦ/ (beside oldfashioned, or provincial, '/ʍ/' –*ie* [hʊw, hw]– mostly for English *wh-*). In addition, let us notice that generally *offIPA* indicates any kind of 'aspiration' as /Cʰ/ – and also [Cʰ], even for voiced 'aspiration'.

ƒig 10.9.15. Orograms of some unrounded vocoids and their corresponding dynamic & (more) static approximants & semi-approximants.

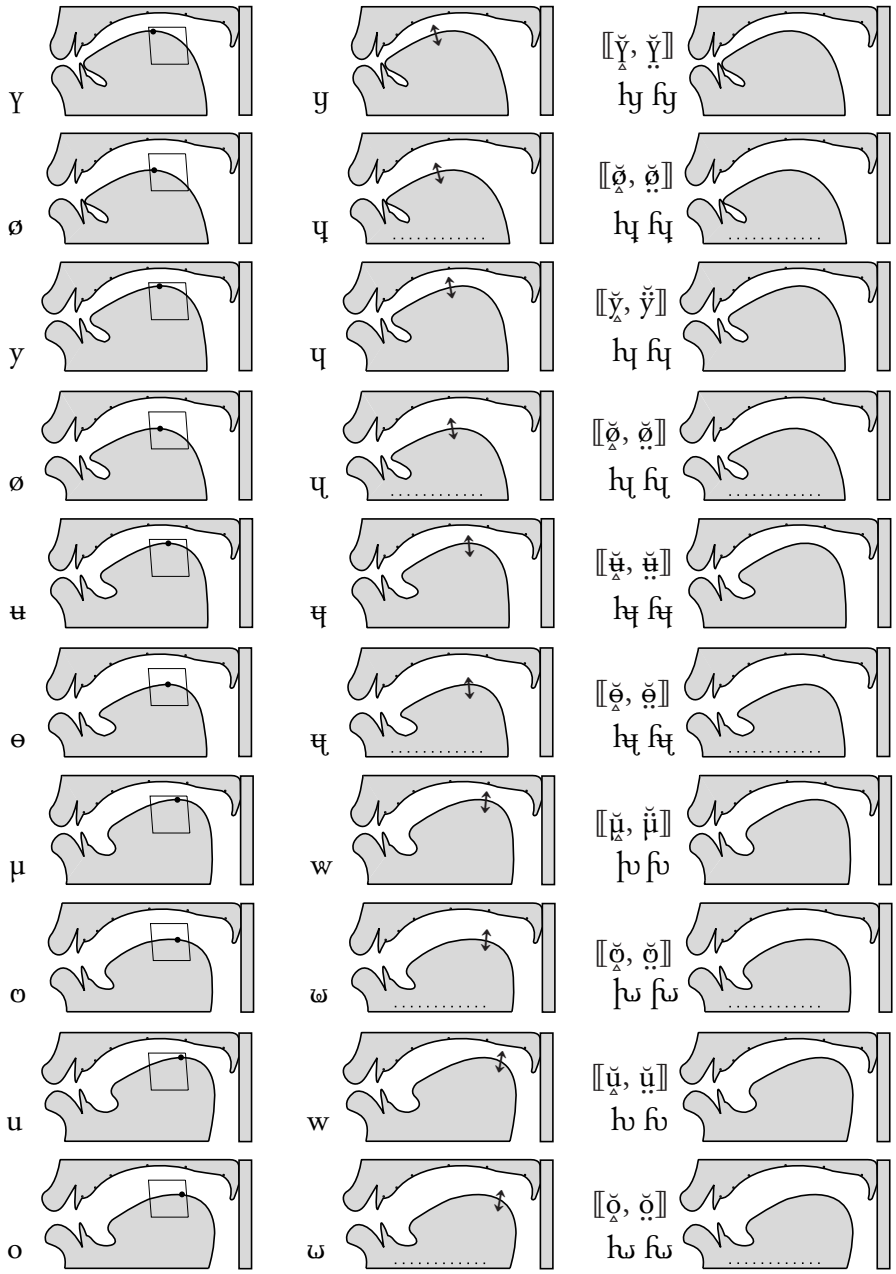


10.9.14. What corresponds to /h/ [h] & /Ch/ [Ch]? Is it correct to represent the 'aspirate' /h/ as [h]? In fact, the *offIPA* current representation –/h/ [h]– is quite phonemic, but generally a satisfactory one, indeed.

The same is true for a general *canIPA* representation. As a matter of fact, even within *canIPA*, this is more than sufficient, due to normal automatic coarticulation. Of course, when the effect of coarticulation is stronger, *canIPA* shows it adequately (taking particular aims into consideration, as well), as we will see below, for more or less important nuances.

It would not be convenient to continuously notate expressly that we have (prevelar) [k̟] /k/ before front vowels. But –if we want to be realistic– we have to in-

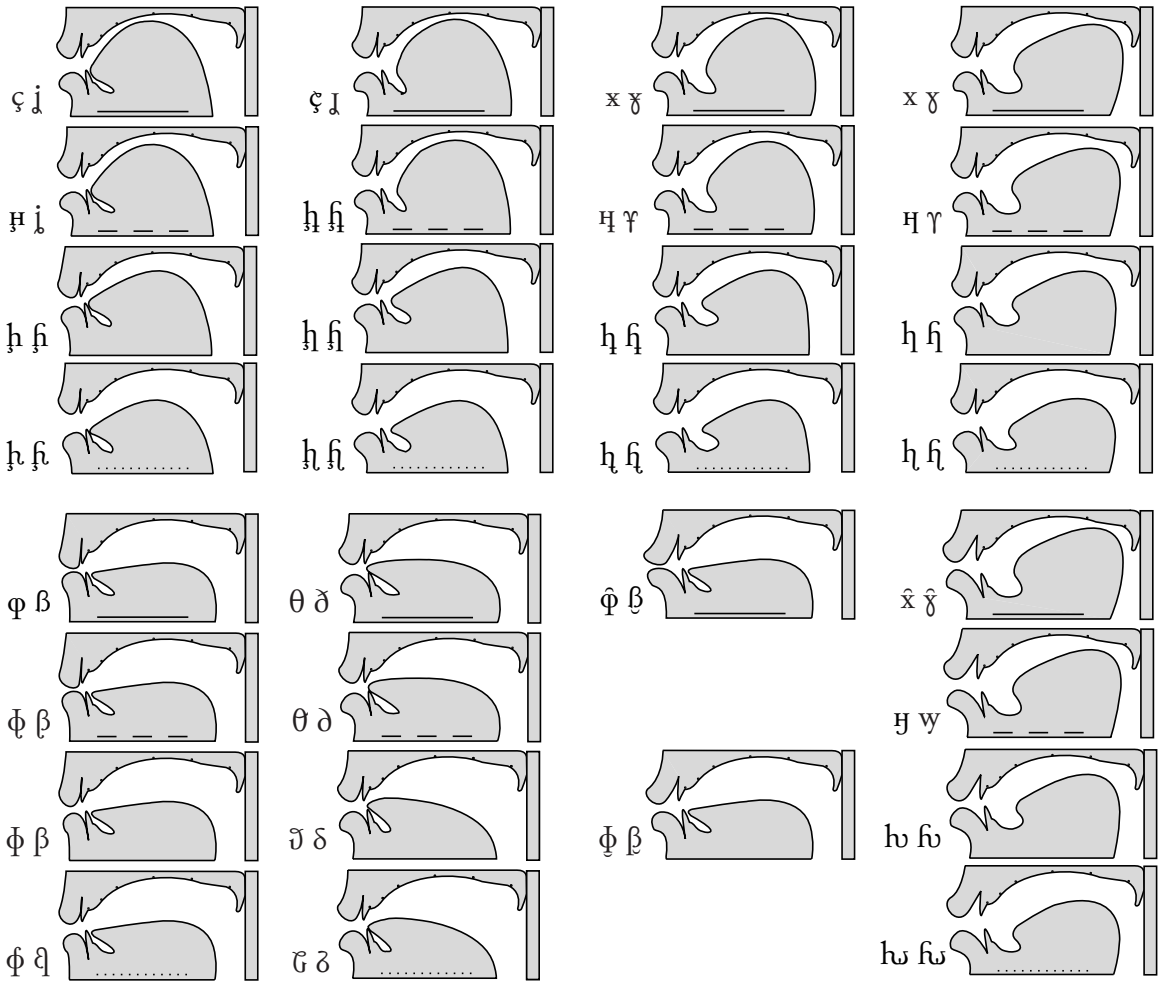
fig 10.9.16. Orograms of some rounded vocoids and their corresponding dynamic & (more) static approximants & semi-approximants.



dicate a palatal [c] (or a pospalatal [ɕ]) realization, when it realizes the (velar) /k/ phoneme, either before front vowels, or at the end of a word, as it happens in neutral French pronunciation: [ˈci, ˈmɛc] *qui*, *mec*. Of course, strictly speaking, a transcription like ⟦ki⟧ would not represent a natural /ki/ sequence in any real language. That is, a true *velar* stop, ⟦k⟧, would not be possible in any human language, in front of a true *palatal* vocoid like ⟦i⟧, because –by assimilation– the actual articulation of /k/ necessarily becomes prevelar, [k̟]. In fact, if we actually find something like ⟦ki⟧, the only possible natural phonemic sequence is /qi/, as in Arabic [qɪˈʃɑːni] *qīšānī*, which would rather be ⟦kɪˈʃɑːni⟧. But, again, even in *canIPA Natural Phonetics*, it is better to simply transcribe [qɪ], because assimilation does the rest properly.

10.9.15. Going back to /hV/ sequences, we have (using examples for international-English pronunciation): [ˈhiiɪ̯] *heat*, [ˈhɪ̯] *hit*, [ˈhæ̯] *hat*, [ˈhɐ̯] *hut*, [ˈhɒ̯] *hot*, [ˈhuuɪ̯] *hoot*, [ˈhəːɹɪ̯] *hurt*. These transcriptions are quite sufficient for any human being. However, they would not be enough for a talking machine, unless a suitable adaptation is used, simply to take account of (natural) assimilation. In fact, to be

fig 10.9.17. Palatal, postpalatal, prevelar, velar & laryngeal possible taxophones (with bilabial rounding, too). They can belong to the constrictive, semi-constrictive, approximant or semi-approximant classes (according to our Natural Phonetics conventions).



true, in any /hV/ sequence, /h/ is realized as a voiceless (non-intense, or 'non-syllabic', [[C̥]]) contoid, perfectly corresponding to the vocoid that follows /h/, [[V̥̆]]. These are all *canIPA* conventions that go far beyond poor *offIPA*.

This distinction between contoids and vocoids is fundamental, so the 'proper' *canIPA* transcription of the above examples would, then, be: [[ˈĭ̯̥iiɪ, ˈɪ̥̆ɪɪ, ˈæ̥̆æɪ, ˈɐ̥̆ɐɪ, ˈɒ̥̆ɒɪ, ˈʊ̥̆uuɪ, ˈə̥̆ˑɹɪ]] (or perhaps, by convention, [[V̥]]: [[ˈi̥iiɪ, ˈɪ̥ɪ, ˈæ̥æɪ, ˈɐ̥ɐɪ, ˈɒ̥ɒɪ, ˈʊ̥uuɪ, ˈə̥ˑɹɪ]]). And so on, for any further vocoids (and in any other languages). But it is perfectly clear that a notation like [h] is not only sufficient, but also remarkably simpler. In fact, otherwise, we should have further systematic symbols even for /hC/ sequences, like Burmese /hm, hn, hɲ, hŋ, hw, hl/ [hm, hn, hɲ, hŋ, hw, hl], *ie* [[m̥m, n̥n, ɲ̥ɲ, ŋ̥ŋ, ɥ̥w, l̥l]].

10.9.16. Furthermore, many languages have phonemic sequences like /Ch/, or at least phonetic ones, [Ch]. Let us see a few (international-English) examples: [ˈphliˑiz̥] *please*, [ˈkhɹuˑu] *crue*, [ˈʈhwaɛs] *twice*, which should be rendered as: [[ˈpl̥̥̆liˑiz̥, ˈkɹ̥̆ɹuˑu, ˈʈ̥̆waɛs]] (and other more cumbersome combinations). Thus, it is very clear that the notation with [h] is the more convenient (and even *natural*) one: [hV, hC, Ch]. This is a serious problem only for talking machines, not for human speakers (and hearers).

In German, 'aspiration' is generally stronger than in English, cf: [ˈphl̥̊ats] ([[ˈpl̥̥̆l̥̊ats]]) *Platz*, as compared with [ˈphlæn] [[ˈpl̥̥̆læˑn]] *plan*. This can be indicated –and even more clearly, indeed– while keeping the [h]-notation, as we have just seen. In Danish, an even stronger 'aspiration' occurs for /ˈʈh/, which shows its strength changing a stop into a stop-strictive: [ˈʈ̟ʂh].

10.9.17. In Mandarine Chinese, 'aspiration' is distinctive and still somehow stronger. In fact, according to stress, we find, for instance: /ph/ [ˈpʱ, ˌph, ˌ̥p]; while the 'un-aspirated' counterpart is: /p/ [ˈp̬, ˌb̥, ˌ̥b], and so on. As can be seen, we have /ˈph/ [pʱ] (a sequence of a stop and a true constrictive laryngeal contoid), while, in completely unstressed syllables, we find /ˌ̥ph/ [p], *ie* a non-aspirated taxophone for an 'aspirated' phoneme.

Other languages, mostly Indian ones, such as Hindi, can oppose voiceless /Ch/ sequences to voiced ones: /C̥h, C̬ɦ/. On the other hand, in Mandarin Chinese, the 'aspirate' /h/ has three different 'normal' voiceless taxophones: [ˈɬ, ˌʁ, ˌ̥ɧ] (respectively: uvular semiconstrictive, uvular approximant, and velar approximant). In Korean, both /h/ and /Ch/ have [ʱ] + /i, j/, [ʰʊ] + /u, w/, [ʱ] + /ɯ/. Guarani has tautosyllabic /Vh/ sequences as [iʱ, ɯʱ, uʰʊ].

10.9.18. Even without having to invent all possible ('un-diacritical') symbols for the assimilatory taxophones seen above (and their possible extensions), *canIPA* has a number of phones and symbols to adequately account both for coarticulation *assimilation* and for gradation *tension*.

In fact, not only the 'aspirate' /h/, but also 'aspirated' consonants (such as /kh, ʧh, sh/) can vary, first of all, because of differences in their tension. Thus, any /h/ (alone or in combinations) can range from true *constrictives* [ʱ, ɦ] (and semi-

-contrictives [ɦ, ɧ], formerly shown as [ɬ, ʜ]) to true *approximants* [h, ɦ] (and semi-approximants [h̯, ɦ̯]) – including voicing lenition, with voiced phones (and half-voiced ones, too).

Besides, in addition to plain laryngeal phones /h, ɦ/, a number of assimilatory coarticulations can be added to them, especially in correspondence to vocoidal phones. As a matter of fact, such coarticulations are quite peculiar, so that they are easily noticed (sometimes even by laymen). In particular, *fig* 10.9.15-16 show 20 (and 20 further voiced) approximants (and semi-approximants), corresponding to as many high and higher-mid vocoids (and to their matching dynamic contoids, too). Their points of articulation are: *palatal*, *postpalatal*, *prevelar*, *provelar* and *velar* (including bilabial rounding, too).

The 'color' of /h/, then, depends mostly on the phone that follows it. In the case of /VhV/, of course, the 'color' can be determined also by the vocoid that precedes /h/, according to languages and accents. The influence of two vocoids alike, or similar, is necessarily stronger than that caused by very different, or opposit, vocoids. Thus, just showing very general, and extreme sequences, we might consider: [ihi, aha, uhu] or else [iha, ihu, uhi, uha, ahi, ahu].

10.9.19. Frequently, however, this assimilatory strength derives not only from a *following* vocoid (or a sonant contoid). In fact, also a *preceding* vocoid can determine their (places of) articulation. *fig* 10.9.17 shows further contoidal orograms (including some approximants and semi-approximants already seen in *fig* 10.9.15-16). They belong to the four classes of (semi-)constrictives and (semi-)approximants, and can be used by several languages, both for /hV/ and /Ch/ sequences.

They can also represent the taxophonic realizations of other phonemes, such as Spanish /s/, mostly in /sC/ and /s$^{\#}$/ sequences (but also, in /s$^{\#}$V/ sequences; more rarely so for /VsV/). For instance, some accents of Spanish can have /s/ [ʂ, h, ɧ, ʂ̧, hɔ], respectively, in sequences of /i, e, a, o, u/ + /sC/, depending on the preceding vowel; or they can have [ɸp, ʊt, ɧk], depending on the following consonant, and so on. Sometimes, they are even (unprecisely) represented as '/hC/' (and defined as 'aspiration', too).

10.9.20. In *fig* 10.9.15-16 (and related sections) we saw that various [h]-type contoids could be shown as certain unsyllabic (or loose) vocoids: generically ⟦V̆⟧. Now, to help to connect phonic things more completely, we will briefly show how given vocoids (using some of the same) could be rendered as intense (or 'syllabic') types of voiced [h]: generically ⟦ɦ̩⟧, thus gaining a full-voice status, just as normal vocoids (although starting from a lenis-voice situation). For instance: [i] ≡ ⟦ɦ̩ⁱ⟧, [y] ≡ ⟦ɦ̩ʲ⟧, [ɯ] ≡ ⟦ɦ̩ᵘ⟧, [u] ≡ ⟦ɦ̩ʷ⟧; [e] ≡ ⟦ɦ̩ᵉ⟧, [ø] ≡ ⟦ɦ̩ᵠ⟧, [ə] ≡ ⟦ɦ̩ᵊ⟧, [ɤ] ≡ ⟦ɦ̩ᵞ⟧, [o] ≡ ⟦ɦ̩ʷ⟧.

Of course, this is just a mere reflection, to deepen the subject, as a useful articulatory and auditory introspection. In fact, nobody would ever suggest using such loose vocoids, or intense contoids, in transcribing current texts.

An intermediate lip position for some grooved contoids: half-protrusion

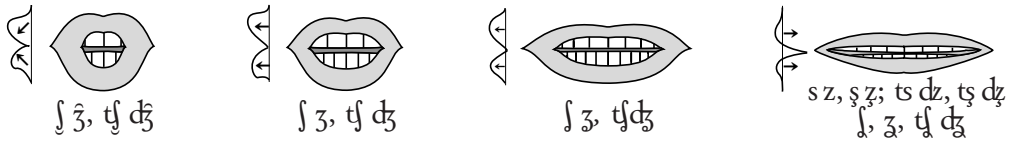
10.9.21. Sometimes, it might be important, or even necessary, to distinguish not only between protruded and non-protuded (or spread) lip positions for some grooved stop-strictives or constrictives. In fact, in addition to the over-rounded lip position, also a half-protruded position is possible (and recognizable, too, in spite of complex coarticulation adjustments, due to rounded or spread vocoids that may occur in contact with these contoids).

They can be seen in *fig* 10.4.2 and *fig* 10.5.3, by a lucky chance lined up, set by set, for a more useful comparison: 47-51-55-59, 46-50-54-58, 45-49-53-57, 44-48-52-56, and: 81-85-89-93, 80-84-88-92, 79-83-87-91, 78-82-86-90.

Thus, *fig* 10.9.18 shows these four lip positions, which are the only articulatory difference between the diphonic pairs that we show, here, through their appropriate symbols: [ʧ, ʤ; ʧ, ʤ; ʧ, ʤ; ʧ, ʤ], [ʧ, ʤ; ʧ, ʤ; ʧ, ʤ; ʧ, ʤ], [ʧ, ʤ; ʧ, ʤ; ʧ, ʤ; ʧ, ʤ], [ʧ, ʤ; ʧ, ʤ; ʧ, ʤ; ʧ, ʤ] & [ʃ, ʒ; ʃ, ʒ; ʃ, ʒ; ʃ, ʒ], [ʃ, ʒ; ʃ, ʒ; ʃ, ʒ; ʃ, ʒ], [ʃ, ʒ; ʃ, ʒ; ʃ, ʒ; ʃ, ʒ], [ʃ, ʒ; ʃ, ʒ; ʃ, ʒ; ʃ, ʒ].

Of course, the same is true –at least for three positions– of the stop-semi-strictive and semi-constrictive contoids (not shown in *fig* 10.4.6 and *fig* 10.5.5): [ʦ, ʣ; ʦ, ʣ; ʦ, ʣ], [ʂ, ʐ; ʂ, ʐ; ʂ, ʐ]. Let us also note that only some among the most frequent symbols are indicated below the labiograms in *fig* 10.9.18. Arguably, further contoids are possible, as well.

fig 10.9.18. Comparison between four important lip positions.



A couple of semiconstrictive laterals (& an alveolar semi-uni-lateral)

10.9.22. As we know, constrictive laterals, like [ɬ, ɮ], can be used even as phonemes, for instance in Zulu and (only the voiceless one) in Welsh. They are also frequently used as a well-known speech defect, for /s, z/ (and, sometimes, for /ʃ, ʒ/, and possible connected stop-strictives). They are generally realized as alveolar and palatal, [ɬ, ɮ], [ʎ̝, ʎ̝]. Sometimes, the defect is milder, perhaps, in an attempt to solve the problem and avoid the broader realizations, by trying to form the necessary groove on the lamina. In fact, we can hear semiconstrictive contoids: [ɬ̠, ɮ̠], [ʎ̠, ʎ̠] (*cf fig* 10.9.10-12). For instance, *Miss* [ˈmɪɬ̠], *cash* [ˈkhæʎ̠]; Italian *passo* [ˈpaˑɬ̠ːo], *pesce* [ˈpeʎ̠ːʎ̠e]. An alveolar voiced semi-uni-lateral can also be found, [l̠].

11. Phonic peculiarities

Intense (or 'syllabic') contoids

11.1. Particularly nasal, lateral, and trill contoids (but others, too) can often become *intense* (which does not mean 'double, long'). They are articulated with relatively greater muscular tension, articulatory energy, and expiratory pressure. This kind of intensity is denoted by placing a short vertical stroke below the symbol (or above, if there is little space below).

Such intense contoids can become nuclei for syllables in appropriate contexts – namely close to, or between, less perceptible contoids (according to the scale of syllabicity). After vocoids, instead, they do not form another syllable in any way (unless there is an increase in their stress prominence, as can happen with vocoids).

Traditionally, though, these (more) intense contoids –for want of a better term– are defined as 'syllabic' (even when they are not syllabic nuclei), just to emphasize that they are different from normal –or 'non-syllabic'– contoids.

We will now consider several examples. In (British & American) neutral English: *suddenly* [ˈsɐɖn̩li, ˈsʌ-], *dictionary* [ˈɖɪkʃn̩ɻi, -əˌnɛɹi, -n̩ˌɛɹi]), *from there* [fɻm̩ˈðɛˑɜ, fɹm̩ˈðɛˑɻ], *compel* [khɯmˈphɛɬː, khm̩-], *I can go* [aəkɲ̍ˈgɜˑɷ, -σˑɷ], *rifle* [ˈɻaəfɬ̩, ˈɻ-], *till then* [ʃhɪɬˈðɛnː, ʃhɬ̩-], *temporary* [ˈʃhɛmpɻəɻi, -pɻɻi, ˈʃhɛmpəˌɹɛɹi, -pɻˌɹɛɹi], *literal* [ˈlɪʈəɻɬ̩, ˈlɪʈɻɬ̩, ˈlɪɪəɹɬ̩, ˈlɪʈɹɬ̩].

And: *that was me* [ˈðæp wz̩ˈmɾi], *a cup of tea* [ɯˈkhɐp ɣ̩ˈʃhɾi, -ʌp]; German: *kommen* [ˈkhɔmm̩], *reisen* [ˈʁaezn̩], *fliegen* [ˈfliːgŋ̍], *Esel* [ˈʔeːzl̩], *Mutter* [ˈmʊtʁ̩]; Czech: *osm* [ˈʔɔsm̩, -sum], *vlk* [ˈvɬ̩k], *prst* [ˈpr̩st]; Dutch: *zonder* [ˈz̩ondɐ̯, -dɘ̯]; Mandarin Chinese: *shí*/*shǐ* [ˈˌʂʐ̩] (less frequent a variant than [ˈˌʂɯ̩]); Japanese: *gen'an* [ˌgɛŋ̍ˑɐŋ̍].

It is possible, and more advisable, to use intense consonants in phonemic transcriptions as well. Among other reasons, they are more clear, and less ambiguous, than transcriptions such as '/ˈsʌdn, ˈlɪtl/', to indicate /ˈsɐɖn̩, ˈlɪʈ̩ɬ̩, -ɬ̩/ *sudden*, *little*.

Coarticulation

11.2. The 'speech chain', or in other words, actual speech, *ie* spoken language, is not constituted by disconnected single phones, as might be deduced from seeing the individual symbols making up a sentence or a rhythm group. To be true, there is no interruption or pause even between words, although they are separated by spaces in writing (and in old-style phonemic/phonetic transcriptions).

While speaking, the articulatory organs are continually in movement, and they pass from one position to another. As it happens, there are never *positions*, or *moments* when the articulators are entirely static – this can be seen in *x*-ray films as well. Even during the articulation of long phones, there are differences in the posi-

tioning of the articulators, in muscular tension, and in direction, so that movement is present here, as well.

The movement from one sound to another is by the shortest path, dulling a bit the characteristics of the two sounds which are most in contrast with each other. Moreover, in part for reasons of inertia and elasticity, the characteristics of the preceding phone are preserved. At the same time, for reasons of adaptation, the characteristics of the following phone are anticipated. This important cohesion between the different elements, in fact, constantly delays and anticipates information regarding the structure of the phones surrounding each other phone in the speech chain. This phenomenon, which (at the beginning) is not immediately obvious, is called COARTICULATION.

The articulatory movements necessary to produce a particular phone in isolation can be considered a *target* to be reached. In the speech chain, the different targets follow one another. The targets exert influences on each other, according to the speed and length of the utterance, as well as the characteristics of each single target. In fact, the more the targets are different and independent from each other, the more the articulators are, on the one hand, free to move on their own, and on the other, required to take up positions not unduly distant from each other.

Modifications

11.3. In order to articulate *p*, *b*, *m*, for example, the tongue has no precise role. It is therefore free to move into position for any phone which follows, such as for example [pr, pɾ, pɹ, pɻ, pʀ, pʁ, pʁ, pl, pj, pw, pi, pa, pu]. In fact, each one of these [p]'s, strictly speaking, could be shown (although –definitely– not in transcriptions for descriptive and teaching purposes) with a *subscript*: ⟦p_{r}r, $p_{ɾ}$ɾ, $p_{ɹ}$ɹ, $p_{ɻ}$ɻ, $p_{ʀ}$ʀ, $p_{ʁ}$ʁ, $p_{ʁ}$ʁ, p_{l}l, p_{j}j, p_{w}w, p_{i}i, p_{a}a, p_{u}u⟧ (*fig* 11.1 gives several frequent coarticulations).

In the same way, the lips have no specific role in most contoids. Therefore, they can freely move into the position for the lip shape of the following vocoids, such as *rounded* or *spread*: [bu, ba, bi; su, sa, si; nu, na, ni; lu, la, li; ku, ka, ki]. Here, as well, we show the labial coarticulation anticipating the following phones through subscripts, in order to focus attention on the phenomenon: ⟦b_{u}u, b_{a}a, b_{i}i; s_{u}u, s_{a}a, s_{i}i; n_{u}u, n_{a}a, n_{i}i; l_{u}u, l_{a}a, l_{i}i; k_{u}u, k_{a}a, k_{i}i⟧.

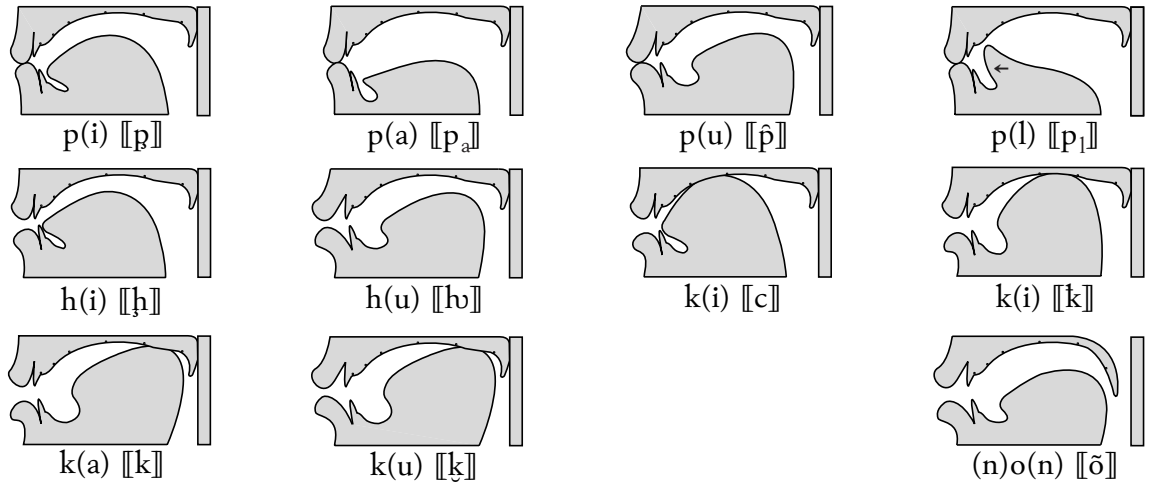
Clearly, the subscript ⟦$_{u}$⟧ refers, by anticipation, both to lip rounding and to lifting the back of the tongue towards the velum (or soft palate), to a greater or lesser degree according to the level of independence of the articulators involved. By the same token, ⟦$_{i}$⟧ refers to spreading of the lips and the corners of the mouth, and to lifting the back of the tongue towards the (hard) palate. The subscript ⟦$_{a}$⟧ has a coarticulatory component as well, which consists in a neutral lip position (neither rounded, nor spread) and in a much greater opening of the jaw than what takes place in ⟦$_{i}$⟧ or in ⟦$_{u}$⟧. It has neither the front or back tongue movement of these last two, given that it is low central.

In the case of [h], which is laryngeal, the coarticulatory possibilities are even more abundant and common, because the tongue and the lips are both completely independent of the articulation. In fact, in sequences of the form [hV], we ac-

tually have [[ⱽV]], where the first symbol placed in *superscript* stands for a plain 'non-syllabic' and voiceless vocoid, corresponding in position to the (voiced) vocoid which follows. Thus, the tongue and the lips have the same position, while the articulation is that of a contoid, since it is less static than that of a vocoid. This is the same relationship we encounter between [i, u] and [j, w] (approximants) or better yet, [ɹ, ɯ] (semiapproximants) seen in *fig* 5.1.

Therefore, we have: [hi, he, hɛ, ha, hɔ, ho, hu] [[hᵢi, hₑe, hɛɛ, hₐa, hɔɔ, hₒo, hᵤu]], and similarly: [hæ, hɒ, hə; hm, hɹ, hɾ, hl] [[hₐæ, hɒɒ, hₔə; hₘm, hɹɹ, hɾɾ, hₗl]]. The same goes, often, for [Vh] – it corresponds to [[Vⱽ]]: [ih, eh, ɛh, ah, ɔh, oh, uh] [[ihᵢ, ehₑ, ɛhɛ, ahₐ, ɔhɔ, ohₒ, uhᵤ]]…

fig 11.1. Automatic coarticulations, which are more or less marked according to languages.



In conclusion, the lips are always subject to coarticulation, within a syllable. Therefore, in words like the following we will actually have almost (with ^{a} = *American*, and ^{b} = *British* neutral accents) *whole/hole* [[ˈh̪ʊ·ʊ̟ɬ̪^{b}, ˈh̪ʊ·ʊ̟ɬ̪^{a}]], *holy* [[ˈhɜʊ-li^{b}, ˈh̪ʊʊ-li^{a}]], *wholly* [[ˈh̪ʊʊɬ̪-li^{b}, ˈh̪ʊʊɬ̪-li^{a}]], *follow* [[ˈf̪ɒl̪-ɜʊ^{b}, ˈfɑl-ʊʊ^{a}]], *fall* [[ˈf̪ɔːɬ̪^{b}, ˈf̪ɔːɬ̪^{a}]], *law* [[ˈl̪ɔː^{b}, ˈl̪ɔː^{a}]].

[ʃ], which has intrinsic lip protrusion (being *protruded*), naturally has less protrusion before [ɪi, ɪ, ɛ, æ, ɐ/ʌ, ɜʊ, ɛɪ, aə, aɒ, ə, ɜː]. Instead, when preceding [μu/ʊu, ʊ, ɔː/ɔː, ɒ, ɔʊ, ɔə], there is a bit more protrusion, even though it does not reach the point of [ʃ̫]; just as before non-rounded *V* it does not become [ʃ̰].

In the case of consonant articulations which are simply *bilabialized*, with bilabialization (not rounding, nor protrusion), there is a similar, but less obvious mechanism. In fact, in the case of Japanese, /s/ followed by /i, jV/ is pronounced as [ɕ], [ɕi, ɕjV], not [şi, şjV], since the lips are not spread, with the corners of the mouth pulled back (as happens with Slavonic languages), but are rather neutral, for reasons of coarticulatory compensation and adjustment.

In any case, if these coarticulations are automatic, they should normally not be marked except in points where they are explained while describing systematically the phonic structure of a language. Therefore, coarticulation is not marked in front of rounded *V*, unless it is of a stronger or additional level. A case of this sort oc-

curs in Mandarin Chinese, in the case of *mǒ* [ˌm̂ o̯o̯], but not in *mǔ* [ˌmu̯u̯] (cf English *more* [ˈmoː/ˈmoːɹ], *moo* [ˈmʉ̟ːu/ˈmʊ̟ːu]).

11.4. Given that, as we have indicated, these phenomena are automatic, once they have been fully understood, it is better not to mark them in any way – neither with superscripts, nor with diacritics. It would rather be important to mark the contrary, that is when the coarticulation does *not* occur, even when the elements which normally cause it are present; or instead, if the coarticulation should reach *excessive* levels.

When [k] is followed by [j, i, ɪi, ɪ], it is not articulated as a velar, but rather as a *prevelar*, as in *queue*, *sticky*, *key*, *kit* [ˈkhjʉ̟ːu/ʊ̟ːu, ˈsʃɪki, ˈkhɾːi, ˈkhɪʃ]. This is also true in the case of checked (especially final) syllables, when preceded by [ɪi, ɪ]: *antique*, *tick* [ænˈʧhɪik, ˈʧhɪk]. However, given that this fact is predictable and automatic, there is no real need to use a special symbol (which would be ⟦k̡⟧).

On the other hand, if one should actually hear (or produce) a sequence of a true velar stop and a high front vocoid, ⟦ki⟧, it is quite likely that we have a realization of [q], fronted due to coarticulation. In such cases, the sequence can therefore be transcribed without problems as [qi]. This is a practical solution, because there are a great number of nuances involved in the fronting of [q, k] followed by phones which are progressively fronter and higher. Three symbols ([q, k, k̡]) would be insufficient to be fully accurate regarding phenomena which, in any case, do not require undue attention (once their frequency and normality have been understood adequately). It is only appropriate to be particularly rigorous on this point in the preliminary phase of analyzing a new (oral) text, in an unknown language. On the other hand, if the stop is articulated in a fronter (palatal or postpalatal) place in front of [i], then this fact should be indicated in the transcription: [ci, c̟i], even if there is no phonemic relevance or importance.

Along the same lines, if the stop is (post)palatal in final position: [c, c̟], instead of velar: [k], then this fact should be marked. This is in fact less 'normal' and less predictable, respect to most languages, as a realization of the velar stop (even though in French, Swedish, and Persian –for instance– we do have palatals (or postpalatals) in this context: French *flic* [ˈflic], *mec* [ˈmɛc], *qui* [ˈci], *quai* [ˈce; ˈcɛ]; Swedish *bruk* [ˈbrʉyc]; Persian *yak* [ˈjɐ̟ːc]).

Variations

11.5. A good transcription will not note explicitly anything which is normal (and inevitable), just as it does not, in fact, mark the normal levels of stress (*ie* weak), of tone (*ie* middle), and of length (*ie* short). Instead, it will show all of the other, less universal characteristics, even if a large number of languages is an agreement on particular matters. Phonetic transcriptions, in order to be useful, should represent the differences of sound belonging to different phones, even if these are similar and near, and not actually distinctive, phonemic.

From a phonetic point of view, even small nuances which are perceptible, per-

haps mostly unconsciously, are important for good descriptions and for teaching and learning good pronunciation. These nuances include many of those elements which determine the nature of a regional or foreign accent. Therefore, all taxophonic (*ie* combinatory allophonic) differences, which occur in practice, and are not automatic and predictable for *non-native* speakers, should be transcribed.

Let us consider some examples: English: *dried* [ˈd̪ɻaˑəd̪] (British), *width* [ˈwɪd̪θ], *has to* [ˈhæsʈu], *has she* [ˈhæʑ̊ʃi, -ʃʃi]; Italian: *banco* [ˈbaŋːko], *lancio* [ˈlaɲːʧo], *un pane* [umˈpaːne], *gonfio* [ˈgomːfjo].

Contoids with particular offsets

11.6. The production of phones occurs in three concatenated phases: the onset, the hold, and the offset (these concepts could even be indicated by more complex terminology as well, although this would be decidedly less useful). The *onset* is naturally the start of the phone. It forms the prelude to the *hold*, the central and usually most characteristic phase. From here, we have the *offset*, which moves into the production of another phone, with its own three phases.

The OFFSET of a contoid can occur without being audible. In fact, if phonation ends after the HOLD, the offset ends up coinciding with the silence of a pause. By the same token, if during the hold of a contoid, the organs move into position directly for the next contoid, the articulation passes from one hold to another, while leaving out the interruption due to the offset of the first contoid and the onset of the second. This phenomenon is particularly evident when the contoids are stops – in fact, the first of the two stops then has an incomplete (and silent) offset. To consider the point, *fig* 11.2 could be useful; there the phenomenon is shown applied to the English sequences [pʲʈ, kʲʈ], where there is an intermediate phase with an articulation with two occlusions.

Geminate articulations ('doubled' consonant) are of this type, and are also homorganic – they have the same place and manner of articulation, and the same phonation type, as well. Therefore, geminate consonants are realized as geminate contoids without an offset (whether articulatory or auditory). To be rigorous, these articulations could be shown with the diacritic [ˀ], as in: *bookcase* [[ˈbʊkˀ-ˌkheɪs]], *big girl* [[ˈbɪgˀ ˈgɜːɬ, ˈgɻːɬ, ˈgɻˀɬ]]; and in taxophonic geminates as well: *good girl* [[ˈgʊˑgˀ ˈgɜːɬ, ˈgɻːɬ, ˈgɻˀɬ]]). In Italian we have: *ecco* 'here/there' [[ˈɛkːˀko]], *fatto* 'done/made' [[ˈfatːˀto]], *carro* 'cart' [[ˈkarːˀro]], which are different from *eco* 'echo' [ˈɛːko], *fato* 'fate' [ˈfaːto], *caro* 'dear/expensive' [ˈkaːro].

In any case, in English (and in other languages) we have *unexploded* stops (*ie* with *inaudible release*) even when followed by a stop of another place of articulation: *walked* [[ˈwɔˑkʲʈ, ˈwɔˑkʲʈ]], *robbed* [[ˈɻɒˑbʲd̪ ˈɹɑˑbʲd̪]]. In English, normally, stops are unexploded in final position as well (except in cases of precision or emphasis): *rob* [[ˈɻɒˑbˀ, ˈɹɑˑbˀ]], *Bob Dylan* [[ˈbɒˑbˀ ˈd̪ɪl-ən, [ˈbɑˑbˀ]].

The same is true of stopstrictives in Italian, as well: *faccia* [[ˈfaʧːˀʧa]], *mezzo* [[ˈmɛʣːˀʣo]] (*cf* § 9.15). However, in English things are different. In fact, there stopstrictives are always exploded (also because they are in combinations and always

belong to different lexemes): *Dutch cheese* ⟦ˈɖɐtʃ⁎ ˈʧhrˑiˌz, ˈɖʌtʃ⁎⟧, *judge Jones* ⟦ˈʤɐˑʤ⁎ ˈʤɜˑʊnˌz, ˈʤʌˑʤ⁎ ˈʤɔˑʊnˌz⟧, *a large channel* ⟦əˈlɑːˌʤ⁎ ˈʧhænɬ, əˈlɑːɹʤ⁎⟧; finally, *switched* ⟦ˈswɪtʃ⁎ʈ⟧, *judged* ⟦ˈʤɐˑʤ⁎ˌɖ, ˈʤʌˑ-⟧.

With other geminate contoids, even continuous ones, the situation remains the same, too. In fact, in completely rigorous transcriptions all of the Italian geminates would be marked with the diacritic showing lack of explosion: *sanno* ⟦ˈsanːˀno⟧, *ballo* ⟦ˈbalːˀlo⟧, *passo* ⟦ˈpasːˀso⟧; including cases like the borrowing from English *status symbol* ⟦sˈtaˑtusˀ ˈsimːbʊl⟧, which would sound quite strange if pronounced '⟦sˈtaˑtus⁎ ˈsimːbʊl⟧' (with offset between the two [s]'s).

In Korean, the final contoids of words have inaudible offsets, since phonation ends before releasing the hold phase, and expiratory air is blocked during the articulation: *nat* [ˈnatˀ] (which is also the pronunciation of *nath, nas, nac, nach*, words of different meaning, and distinguished in the morphonological orthography, in spite of their actual phonemic neutralization). Instead, in Vietnamese and other oriental languages, final [pˀ, tˀ, kˀ, ʧˀ] &c are maintained different, although they are unexploded.

fig 11.2. Unexploded stops in sequences, with juxtaposition of the articulations.

11.7. An interesting case occurs when a stop is followed by a nasal or lateral contoid, especially when the combination is homorganic. In fact, without releasing the contact between the articulators, a *nasal* or *lateral explosion*, respectively, is produced (*cf fig* 11.3).

In a NASAL EXPLOSION, the velum is simply lowered while maintaining the occlusion in the mouth. The result is a nasal contoid, whether a normal one or an intense one, as in: *cotton* ⟦ˈkhɒʈˀn̩, ˈkhɑʈˀn̩, ˈkhɑʔn̩⟧, *beatnik* ⟦ˈbɪiʈˀnɪk⟧; in German: *sieben* ⟦ˈziːbˈm̩⟧, *bitten* ⟦ˈbˌɪtˈn̩⟧, *sagen* ⟦ˈzaːgˈŋ̍⟧; in Italian: *etnico* ⟦ˈɛtːˀniko⟧. There should be no break in the contact between the tongue and the palatal vault (or between the lips).

In a LATERAL EXPLOSION, the tongue passes from the position of the stop to that of the lateral contoid by simply contracting the tongue body. In this way, expiratory air is allowed to pass along the sides of the tongue, producing a lateral, all without breaking the contact with the middle part of the tongue (in our examples, the tip of the tongue is against the alveolar ridge or the upper teeth): *little* ⟦ˈlɪʈˀɬ, ˈlɪɪɬ⟧, *lately* ⟦ˈlɛɪʈˀli⟧, *medal* ⟦ˈmɛɖˀɬ⟧; German: *Mantel* ⟦ˈmantˀl̩⟧; Italian: *atlante* ⟦aˈtˀlanːte⟧.

It is not indispensable to mark *nasal* or *lateral* explosion with the diacritic shown. It is enough to know exactly how and when it happens, and to learn and be able to teach the correct pronunciation. It would be more useful to mark cases where the transition might not be so (immediate) and direct, thus creating a true separation between the elements. In this case, the phenomenon will be denoted

generically by [C⁎] (*ie open transition*), or with more details, according to the possibilities, with ⟦Cə, Cᵊ, C̥ə, Ch, Cɧ, Cɸ⟧…

For example, in *non-neutral* Italian pronunciation, instead of [ˌlopsiˈkɔːlogo, ˈsubːdolσ, opˈʦjoːne, ˈtɛkːniko, segˈmenːto], *lo psicologo*, *subdolo*, *opzione, tecnico*, *segmento*, we can find sequences with heterosyllabic stops with audible explosions: [ˌlop⁎siˈkɔːlogo, ˈsub⁎dolσ, op⁎ˈʦjoːne, ˈtɛkː⁎niko, seg⁎ˈmenːto], with ⟦Cᵊ⟧.

While in *regional* pronunciations, there can be full actual vocoids: [ˌlopəssiˈkɔːlogo, ˈsubːbədoˌlσ, ˌoppətsˈʦjoˑʊnᴇ, ˈtɛkːkəniˌko, ˌseggəˈmenːd̥σ] (Upper South), [lσˌpɪssɪˈkσːlσgσ, ˈsʊbːbɪdσˌlσ, ˌσppɪtsˈʦjσːnᴇ, ˈtᴇkːkɪnɪˌkσ, ˌsᴇgːgɪˈmᴇnːtσ] (Lower South), [ˌlopᵖᵖi̥ˢˢiᵏˈkɔˑˡloᵍᵍo, ˈsubᵇu̥ᵈᵈoˡˡo, ˌoᵖᵖp̥ᵗᵗsiˈɔˑnⁿe, ˈtekᵏi̥ⁿⁿiᵏᵏo, ˌsᴇᵍᵍE̥ᵐˈmɛnto] (Sardinia).

Or they can be assimilated: [ˌlossiˈkɔːlogo, ˈsudːdolσ, otsˈʦjoːne, ˈtɛnːniko, semˈmenːtσ] (Center). The same happens, in a typical Italian pronunciation of English, to forms such as: *cab*, *good*, *look*, *rubbed*, *offset*, *with me* [ˈkɛbː⁎, ˈgudː⁎, ˈlukː⁎, ˈrabː⁎d⁎, ˈɔfː⁎sᴇt⁎, wid⁎ˈmi], instead of [ˈkhæˑb̚ˀ; ˈgʊˑd̚ˀ; ˈlʊkˀ; ˈɻɐbˀd̚; ˈɹʌbˀd̚; ˈɒfˌsᴇɟ, ˈɔˑfˌsᴇɟ; ˈwɪðmi, wɪðˈˈmɪˑi].

fig 11.3. Lateral and nasal explosions (respectively on the left/right).

Prenasalization

11.8. Certain languages, particularly in Africa, use contoids (and consonant phonemes) whose manner of articulation is modified by a particular type (of articulation): [~b, ~d, ~g, ~ʤ, ~z, ~j, ~r, ~ɾ]. We have here single segments, which, even when occurring between two syllabic nuclei, belong entirely to a single one of the two syllables (usually beginning the second). Their length is comparable to that of other common segments (or only slightly longer).

Their articulation (*cf fig* 11.14) is characterized by the lowering of the velum during the onset, and possibly even during the first part of the hold (the different possibilities give impressions of more or less nasality). During the second part of the hold and the offset, instead, the velum is raised, thus excluding resonance from the nasal cavity. The second phase has therefore the articulation and timbre of the basic contoid in question.

Generally, prenasalized contoids are voiced, and –most commonly– stops; but also stopstrictives, constrictives, and approximants (without excluding other man-

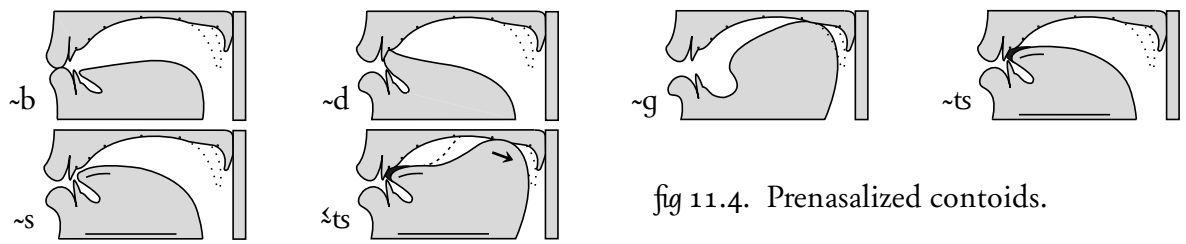


fig 11.4. Prenasalized contoids.

ners, such as trills and taps). Examples from Swahili: *nenda* [ˈnɛˑɾa], *mwenzi* [ˈmɯɛˑɾzi], *mbuzi* [ˈɾbuˑzi], *mvinyo* [ˈɾviˑɲɔ], *njia* [ˈɾɖʒia], *ngoma* [ˈɾgɔˑma].

'Aspiration' (ɕf § 10.13, as well)

11.9. Many languages use 'aspirated' contoids in ways which are, to a greater or lesser extent, distinctive. In other words, sometimes the aspiration is the only feature (and is therefore essential, *ie* phonemic), at other times it works together with others (then it is redundant, *ie* phonetic); ɕf ɟig 11.5. More commonly stops, but also stopstrictives and constrictives, can involve various levels of 'aspiration'. The aspiration can, in fact, be sometimes more audible, and sometimes less. The normal level consists of a voiceless phone followed by the voiceless lenis laryngeal approximant: [ph, kh, ʧh, sh] (this last, naturally, has nothing to do with the English digraph *sh*, which represents /ʃ/ [ʃ]; just as the first sequence, [ph], is not related to *ph* /f/ [f]; the same is true of *th* /θ, ð/ [θ, ð]).

If 'aspiration' is more strongly audible, it typically involves sequences with a voiceless laryngeal *constrictive* as a second element, [pɦ], or possibly a *non-laryngeal approximant*, such as [pɧ, pɸ]... (all of the possibilities should be analyzed, listening carefully). If followed by front vocoids (or velar rounded ones), this stronger 'aspiration' can consist in the voiceless palatal or velar rounded approximants, respectively: [pɧ, phʊ]. With a voiced (or intermediate) phone, 'aspiration' generally involves the voiced (lenis) laryngeal approximant: [bɦ, b̥ɦ].

'Aspiration' can be phonetic, as in English: *pin* /ˈpɪn/ [ˈphɪnː], and German: *zehn* /ˈtseːn/ [ˈtsheːn]; or it can be phonological, as in (Mandarin) Chinese: *cā* /ˉtsha/ [ˉtsɦa] 'to rub' (ɕf *zā* /ˉtsa/ [ˉtsa] 'to tie'), Hindi: *paṅkh* /ˈpɐnkh/ [ˈpɐŋkh] 'wing' (ɕf *paṅk* /ˈpɐnk/ [ˈpɐŋk] 'mud'), *ghaal* /ˈghaal/ [ˈgɦaal] 'confusion' (ɕf *gaal* /ˈgaal/ [ˈgaal] 'cheek').

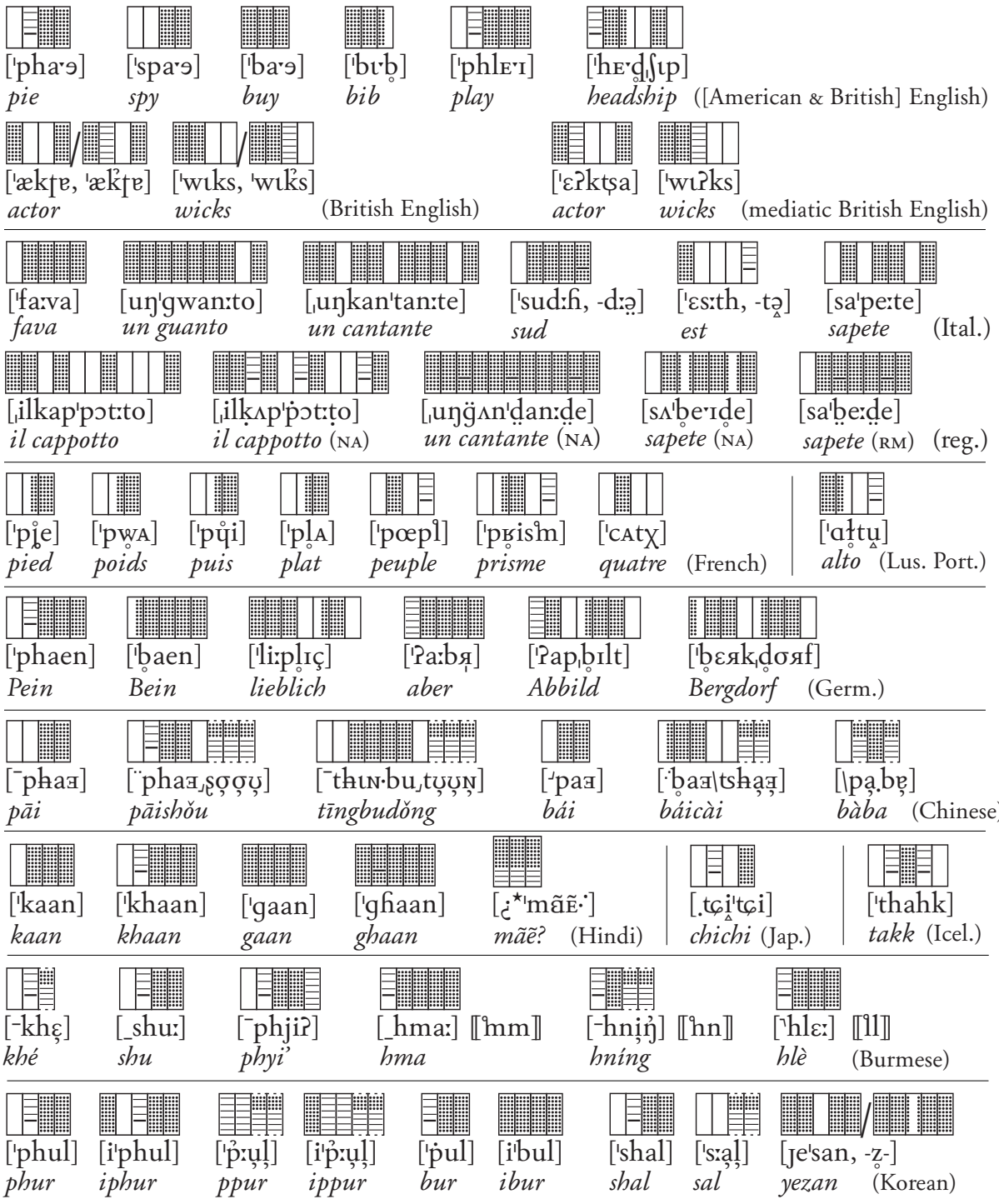
As can be seen from the transcriptions above, it is appropriate to treat the two types of 'aspiration' as sequences, either exclusively phonetic ones, or phonetic and phonemic as well, respectively, composed of [C] + [h] and /C/ + /h/. This is the reason why we have put the term 'aspiration' in quotation marks, since, logically, it is not different in any way from other consonant sequences such as: [C] + [j, w, l] or /C/ + /j, w, l/...

We have already eliminated the useless formalistic complication of VOT. Similarly, 'preaspiration' is simply the preceding sequence, taken in backwards order. It occurs in some languages, including Icelandic: *þetta* [ˈθɛhta], *takk* [ˈthahk] (in the last example we have both types of 'aspiration' together).

In regional variants of Spanish, we have the improperly so-called 'aspiration' of /sC, s#/, which we represent here generically as [hC, h#] (but for variations, see the part on Spanish in *HPr*, Ch 6): *estas casas* /estasˈkasas/ [ˌehtahˈkaˑsah] (ɕf the neutral pronunciation of Spain [ˌeʂtaʂˈkaˑʂaʂ], or American Spanish [ˌestasˈkaˑsas]).

In § 4.1.7-12, and in ɟig 4.4, we have seen the positions of the glottis for the different phonation types, including the paraphonic ones. Let us consider now the examples of ɟig 11.5, using the same icons already shown in ɟig 4.4. The differences

fig 11.5. Different phonation types exemplified by some languages: American & British *English* (with mediatic British variants); *Italian* (with two regional variants: Naples & Rome); *French*; (Lusitanian) *Portuguese*; *German*; (Mandarin) *Chinese*; *Hindi*; *Japanese*; *Icelandic*; *Burmese*; *Korean*.



between voiceless ([f, s, ɬ]) and voiced ([v, z, ɮ, m, a]), phones are fairly evident, even in the case of the voiceless lenis type ([f̬, s̬, h, ʰn, a̬]), or the voiced lenis ([v̬, z̬, ɦ, a̤]). We also have the mixed (or ‘intermediate’, [v̥, z̥, ɦ̥, m̥, ḁ]) phonation, which contains a voiceless part at the beginning ([ˈv̥a]), or in the middle ([aˈv̥a]), or at the end ([ˈav̥]).

There is, moreover, the glottal stop, by itself ([ʔ] ▤), or simultaneously pronounced with a voiceless stop or stopstrictive ([p̥, t̝ʃ̊]). Additionally, we have the creaky type of phonation, frequently used for voiced phones in various Eastern languages, such as Chinese ([m̰, a̰] ▤), and falsetto, used at least on entire syllables, as in Hindi ([*ma] ▤) – *cf* the relative chapters in *HPr*.

Non-pulmonic consonants

11.10. All of the consonant (and vowel) articulations encountered so far are 'normal', in the sense that it is expiratory air (originating in the lungs, and passing through the trachea) which makes them possible. For this reason, they can be called PULMONIC articulations. We will now, instead, see three consonant groups which are produced through the aid of a NON-PULMONIC source of air (even if possibly more limited).

Ejective consonants

11.11. EJECTIVE (sometimes also called 'egressive', or 'explosive') consonants are the combination of normal consonant articulations with raising of the closed larynx (*cf fig* 11.16). The existence of this movement can be verified by observing the upward movement of the 'Adam's apple'. Besides raising the larynx with the glottis closed, the degree of jaw opening is diminished too, as the lower jaw is raised.

All of these actions compress the air contained between the closed larynx and the point of the mouth where the occlusion or constriction occurs. For this reason, the offset of the contoid is accompanied and characterized by a fairly brusque and perceptible explosion. The glottis is then immediately opened, and the articulation moves on the next phone or to a pause.

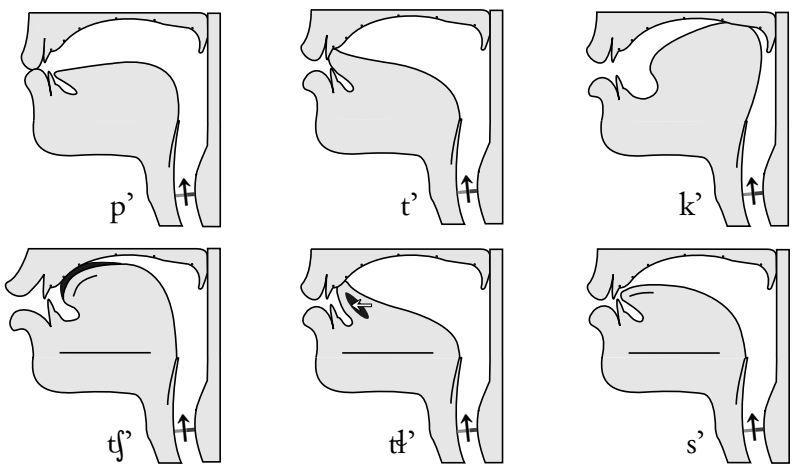


fig 11.6. Ejective contoids.

The more extensive and energetic the movements of the larynx, the lower jaw, and the tongue are, the more perceptible will be the characteristic explosion (and vice versa). Generally, ejective contoids are voiceless, and more often they are stops or stopstrictives, although they can be ordinary constrictives, as well. (If they are 'voiced', they are almost always devoiced stops.) They are especially used distinctively, as phonemes, in African, Asian, and American languages. They are denoted by an apostrophe placed after the symbol in question: [pʼ, tʼ; tsʼ, tʃʼ; sʼ].

Here are some examples – Hausa: *ƙasà* /kʼa.sa/ [ˈkʼɐ.sa], *tsahì* /sʼa.hi/ [ˈsʼɐ.ɦi, ˈtsʼɐ-] (stress is marked only in phonetic transcriptions, since this is a language with to-n[em]es, in which the phonetic stress is generally on syllables with non-low to-nemes); Quechua: *k'asa* /ˈkʼasa/ [ˈkʼaˑsa]; Georgian: *q'op* /ˈqʼop/ [ˈqʼɔp].

Injective consonants

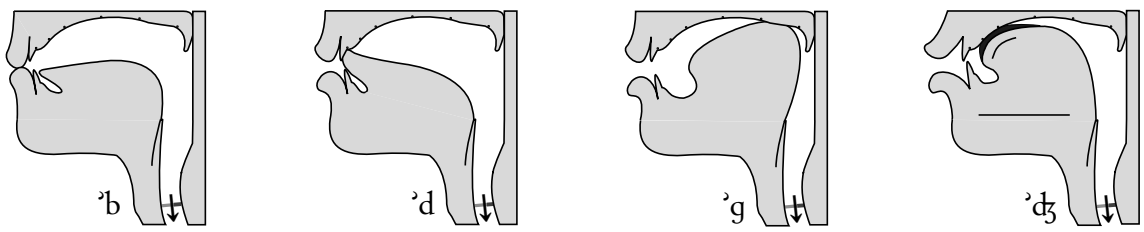
11.12. INJECTIVE (also called 'ingressive', or 'implosive') consonants are the combination of normal consonant articulations with the lowering of the larynx. The larynx is closed, but less tightly than in the case of ejective consonants (cf *fig* 11.7). With respect to the ejectives, there is also a corresponding difference in the direction of the movement of the 'Adam's apple', since the larynx is lowered, as is the lower jaw. Due to these actions, the air contained in the oral cavity becomes rarefied.

Consequently, during the offset of the contoid, a certain amount of external air enters, for an instant, into the mouth. The result is an implosion, and thereby an attenuation of energy, compared with normal phones. The auditory effect is opposite to that of ejective contoids. Injectives are mainly stops and stopstrictives.

In the various languages which use them distinctively (*ie* African, Asian, Oceanic, and American) the voiced ones are more common. In voiced injectives, voicing is produced because while the larynx is lowered, the glottis (the space between the vocal folds) is not tightly closed, and so the vocal folds can vibrate. We denote injectives by preceding the symbols by a (vertically) *flipped* apostrophe: [ˀb, ˀd, ˀg; ˀʤ]. In fact, we have here (as with the ejectives) an additional mechanism which occurs in combination with normal articulations. If the vocal folds vibrate only during the offset of the phone, the voicing is not complete, but rather only partial: [ˀb̥, ˀd̥, ˀg̊; ˀʤ̥].

The official *IPA* notation uses, instead, rather special symbols: '[ɓ, ɗ, ɠ; ʄ]', derived from a phonetically-based alphabet which was devised intentionally to write

fig 11.7. Injective contoids.



African languages which lacked a preceding writing tradition. However, this alphabet was never fully used, and in any case was restricted to certain particular languages. For these reasons, people have often thought it more 'practical' to return to the normal letters of the traditional Latin alphabet, with diacritics and digrams added when necessary.

Some examples – Swahili (the variants given are international and traditional, respectively): *bwana* [ˈbɯaˑna, ˈbɯɑˑnɐ], *dege* [ˈdɛˑˀgɛ, ˈɖɛˑˀge], *jiko* [ˈʤiˑkɔ, ˈɟiˑko]; Hausa: *ɓaràà* [ˈbɐˌɾaː], *ɗafà* [ˈdɐˌfa]; Vietnamese: *bà* [_ˀbaa], *đục* [_ˀdu̯k˧˨].

Dejective consonants (or 'clicks')

11.13. DEJECTIVES (or *clicks*) are the 'strangest' new type, and they are produced with non-pulmonic air which has been drawn into the oral cavity from outside. These contoids contain, first of all, a *characterizing* occlusion, formed in some place between the lips or the palate (with contact of the tongue tip or blade). At the same time, there is another occlusion, the *activating* one (which is so called because it activates the *dejective mechanism*, cf §§ 11.8), produced between the back of the tongue and the prevelum. Dejectives are appropriately indicated by placing the symbol [ˀ] in front of the relevant articulatory symbol, as will be seen in the following sections.

The back of the tongue moves rapidly backwards, while staying in contact with the palatal vault (this fact is shown by using broken lines in the orograms), and it is lowered further in the center (in the case of articulations formed with the front part of the tongue). Consequentially, there comes to be greater space between the two occlusions, and the intervening air becomes therefore rarefied.

In the meantime, the tongue slides back farther still, until reaching the velar place, and the mediumdorsum is lowered farther, too. At this point, we have the offset of the front articulation (the *characterizing* one), and external air comes into the mouth, producing a sharp snap. Finally, the postdorsal occlusion (the *activating* one) is released. In the case of a bilabial characterizing articulation, the expanded oral space extends from the lips to the (pre)velum.

We will give some examples from Zulu, after introducing all the characteristics of dejectives. Among these characteristics, the most complicated ones are the accompaniments (which will be treated at the end of § 11.16).

11.14. In many languages, certain dejective contoids are used phonostylistically. For example, when children throw a *kiss*, or when an actress does the same to the audience, this is nothing other than a bilabial dejective (*ie* voiceless bilabial rounded stopstrictive), [ˀp̂p̂]. The same movement is produced when we drink a liquid through a straw. When we wish to express *disappointment*, or *impatience*, we may produce a dental dejective (*ie* voiceless [slit] stopstrictive), [ˀt̪θ̪]. We may communicate *disapproval* if we repeat the sound twice (perhaps shaking our heads, as well): [ˀt̪θ̪ˀt̪θ̪] or [ˀt̪̪θ̪ˀt̪̪θ̪].

The peoples of southwestern Europe (and Africa) often express *negation* by us-

ing this dental dejective contoid as a phonosymbol, accompanied by raising one's head (or with horizontal shaking, singly or repeatedly; or without any shaking, as one moves northwards). The postalveolar dejective (*ie* voiceless stop), [ˈʈ], is often used to express *appreciation* for a beverage, such as a good wine. The noise of a *horse's hooves* is usually imitated by repeating continually the apicopalatal dejective (*ie* voiceless stop), [ˈʇ].

To *get a horse moving*, wagoners and horsemen often use an alveolar dejective (*ie* voiceless lateral stopstrictive) [ˈtɬ], which children associate with the image of a horse, even when they are very young. In order to *call a cat*, we often repeat sequences of two dejectives [ˈpp̂ˈpp̂, ˈtθˈtθ] (already mentioned), or the prepalatal (*ie* voiceless stop), [ˈʈˈʈ].

On the other hand, in order to get someone's attention, without causing too much notice (among many people, or in places where there is silence), we do not produce a dejective. Here the normal sound is a voiceless bilabial stop, possibly either normal (pulmonic) or ejective, completed as follows: [ˈpˌs, ˈpˌsˈ, ˈpʾˌs, ˈpʾˌss].

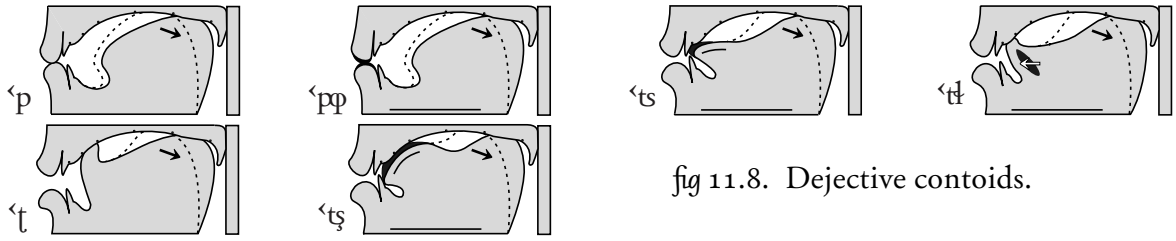


fig 11.8. Dejective contoids.

11.15. Only languages of southern Africa (such as Nama/Hottentot, Zulu, Xhosa, and southern Sotho, which can be seen in the phonosyntheses of ℭ 18 in *NPT*) use dejective contoids distinctively (*ie* as true consonant phonemes). In these languages, they are generally at the beginning of syllables, and they occur combined fluently with other phones which are produced with pulmonic air.

The basic *phonation* type is voiceless; however *voicing* can also occur (through vocal fold vibration; the voicing can be complete or partial), ‰ *nasalization* (through lowering the velum).

The *manners* of articulation used are *stops* and *stopstrictives* (including *lateral stopstrictives* as well), naturally together with the dejective mechanism, which is shown by simply adding the diacritic [ˈ] in front of the current symbol. If the contoid is nasalized, we use [ˢ], thus avoiding the necessity of introducing new nasal symbols for stopstrictives as well, which would be used only for dejectives. In fact, the diacritic [ˢ] implies both the dejective mechanism ([ˈ]) –activated by the back of the tongue against the (pre)velum– together with lowering of the velum itself, which characterizes nasalized ([Ṽ]) and prenasalized articulations ([ⁿC]).

There are four *areas* of articulation which can be used phonemically for dejectives: *labial* and (referring here to the lower articulation) *coronal*, *apical*, and *predorsal*. The number of actual *places* of articulation is definitely much greater: sixteen (16), including labialization in many cases, which combined with the manners mentioned, give twenty-six different basic types (26). With voicing and nasal-

ization taken into account, we have about a hundred (±100), still without counting the accompaniments and other combinations, which produce others with different functionality (as will be seen shortly).

We have, therefore, the following – *bilabial*: [ˈp, ˢp, ˈb, ˢb], [ˈpp, ˢpp, ˈbꞵ, ˢbꞵ] (and *bilabial rounded*: [ˈp̂, ˢp̂, ˈb̂, ˢb̂], [ˈpp̂, ˢpp̂, ˈbꞵ̂, ˢbꞵ̂]), *labiodental*: [ˈpf, ˢpf, ˈbv, ˢbv]; *dental* (with lowered or raised tip, respectively: [ˈt̪θ, ˢt̪θ, ˈd̪ɻ, ˢd̪ɻ] or [ˈtθ, ˢtθ, ˈdð, ˢdð]), grooved *dental*:[ˈts, ˢts, ˈdz, ˢdz] (and grooved *dental rounded*: [ˈt̂s̻, ˢt̂s̻, ˈd̂z̻, ˢd̂z̻]), grooved *labiodentalized dental*:[ˈtʂ, ˢtʂ, ˈdʐ, ˢdʐ] (also *dental–bilabial*: [ˈtp, ˢtp, ˈdb, ˢdb]).

Moreover – *alveolar*: [ˈʈ, ˢʈ, ˈɖ, ˢɖ], [ˈtɬ, ˢtɬ, ˈdɮ, ˢdɮ], *postalveolar*: [ˈʧ, ˢʧ, ˈʤ, ˢʤ], [ˈtʂ, ˢtʂ, ˈdʐ, ˢdʐ], [ˈtɬ, ˢtɬ, ˈdɮ, ˢdɮ]; *apico-palatal*: [ˈʧ, ˢʧ, ˈʤ, ˢʤ] (with five rounded variants: [ˈʧ̂, ˢʧ̂, ˈʤ̂, ˢʤ̂], [ˈtɬ̟, ˢtɬ̟, ˈdɮ̟, ˢdɮ̟], [ˈʧ̟, ˢʧ̟, ˈʤ̟, ˢʤ̟], [ˈt̠ʂ̠, ˢt̠ʂ̠, ˈd̠ʐ̠, ˢd̠ʐ̠], [ˈʧ̠̂, ˢʧ̠̂, ˈʤ̠̂, ˢʤ̠̂]; *cf* the following section, on additional characteristics); *prepalatal*:[ˈʨ, ˢʨ, ˈʥ, ˢʥ], [ˈʨ, ˢʨ, ˈʥ, ˢʥ], [ˈtɬ, ˢtɬ, ˈdɮ, ˢdɮ] (and *prepalatal rounded*: [ˈtɕ, ˢtɕ, ˈdʑ, ˢdʑ]).

11.16. After the release (or offset) of the front occlusion, instead of passing directly to the following vocoid, there can be a segmental 'back' accompaniment (in the actual languages which use dejectives phonologically). This segment can be velar, uvular, or laryngeal, and can be furthermore combined with labialization.

The *accompaniments* can be constituted by stop, stopstrictive, constrictive, approximant, or nasal manners of articulations (while their phonation can range from voiceless to voiced, with intermediate degrees possible: lenis or mixed). The voiceless stops, stopstrictives, and constrictives can also be ejective ([C']); while the voiced ones can be prenasalized ([ⁿC]), and the voiced approximants can be labialized.

The possible accompaniments for dejective phon(em)es are the following: *velar* [ˈʰ, ŋ; k, k', g, ⁿg; kx, kx', gɣ, ⁿgɣ; x, x', ɣ; ɬ, ɯɭ]; *uvular* [ʀ, ˈʰʀ; q, q', ɢ, ⁿɢ; kχ, kχ', gʁ, ⁿgʁ; kʁ, kʁ', gʀ, ⁿgʀ; χ, χ', ʁ, ⁿʁ; ʁ, ʁ', ⁿʀ, ʀ; ʁ, ʁ]; *laryngeal* [ʔ; ħ, ɦ; h, ɦ]. All of these can also have *rounded* variants, shown by adding [◌̫]; while for the velar approximants, the symbols [ʰʊ, w] are used. For example, in the case of /ˈtθw, ˈʧw/, the primary articulation is [t̪θ, ʧ], because here there is not only lip rounding, but also velarization, which is perceptible in the moment of the velar offset, because the back of the tongue remains raised, as happens during velarization.

The official IPA symbols generically indicate four areas with '[ʘ]' (bilabial), '[ǀ]' (dental), '[ǃ]' ([post]alveolar), '[ǂ]' ('palatoalveolar', for *prepalatal*), and the lateral manner with '[ǁ]'. These symbols are then preceded by '[k, g, ŋ]' (to indicate voicelessness, voicing, and nasality, respectively), but also by other symbols for sequences with uvulars or laryngeals, and followed by –still other– symbols for the accompaniments.

Leaving aside the disharmony and insufficiency of these five symbols ('[ʘ, ǀ, ǃ, ǂ, ǁ]' – much more appropriately used, if ever, for prosodic values than for articulatory ones), we find it more logical to use the diacritic ([ˈ]) to represent the *mechanism* (with [ˢ] for supplementary nasality), but to maintain the regular symbols (distinguishing voiceless and voiced, too) for the twenty-six types of articulations found. These conventions make for a more realistic description, to which the accompaniments mentioned above can be added when necessary.

In this way, we avoid masking phonic reality and losing the relationships with the pulmonic articulations. In fact, notwithstanding the particular mechanism (involving the postdorsum of the tongue), the characterizing articulations remain fundamental throughout. For this reason, using 'special' symbols is completely out of place, especially considering that these symbols have nothing in common with the others.

Let us now see some examples from Zulu: *icicì* /iᵏtiˌᵏti/ [ɪᵏʇθiːɪˌᵏʇθɪ], *qinà* /ᵏʈiˌna/ [ᵏʄiːɪˌna], *uxâmù* /uᵏʇɬaˌmu/ [ʊᵏʇɬaːaˌmʊ], *chàchà* /ˌᵏthaˌᵏtha/ [ˌᵏʇθhaːaˌᵏʇθha], *qhàqhà* /ˌᵏʈhaˌᵏʈha/ [ˌᵏʄhaːaˌᵏʄha], *xhûmà* /ˌᵏʇɬhuˌma/ [ˌᵏʇɬhuːʊˌma], *gcìnà* /ˌᵏdiˌna/ [ˌᵏdðiːɪˌna], *gqùmà* /ˌᵏɖuˌma/ [ˌᵏɖuːʊˌma], *gxìlà* /ˌᵏdɬiˌla/ [ˌᵏdɬiːɪˌla], *kancanè* /kaˈᵏdaˌne/ [kaˈᵏdðaːaˌnɑ], *nqênà* /ˌᵏɖeˌna/ [ˌᵏɖɑːɑˌna].

Nasalization of vocoids

11.17.1. Most vocoids are produced orally. By this we mean that the air comes out through the mouth (after passing through the articulatory channel, formed by the tongue, the palatal vault, and the pharynx), since the velum is raised. Instead, in order to produce nasal(ized) vocoids, air has to come out through the nasal cavity as well. Phones like [a, b] are oral, while [ã, m] are nasal(ized). When producing [m], air comes out through the nose *only*; for [ã], the air comes out of the mouth *as well* (cf *fig* 11.9, which contrasts [i, a, u] and [ĩ, ã, ũ]). Therefore [m] is a *nasal* phone, but, rigorously, [ã] is merely *nasalized*. Should it become important to denote semi-nasalized vowels, this would be possible by writing [a̰]; on the other hand, however, a transcription like [n̰, β̰] would only indicate a nasalized *C* (for *C*'s, nasalization is without a doubt less important and not phonemic, unless we are dealing with actual nasal contoids). In these examples, the diacritic was placed below the symbol exclusively because there is no room to put it on top of the symbol. Let us note, however, that in official *IPA* practice [◌̰] is –unfortunately– used to indicate creaky voice, while [˜] –of course– indicates nasalization.

11.17.2. Here we take a look at the four French phonemes /ɛ̃, œ̃, ɔ̃, õ/, and we will also consider the taxophones which are stress-dependent (for details, even in cases where a single symbol is used, cf Ch 4 of *HPr*): *bien* /ˈbjɛ̃/ [ˈbjɐ̃], *bientôt* /bjɛ̃ˈto/ [bjɐ̃ˈtɒ], *brun* /ˈbʁœ̃/ [ˈbʁœ̃], *lundi* /lœ̃ˈdi/ [lœ̃ˈɖi], *bonbon* /bõˈbõ/ [bõˈbõ], *pendant* /pɔ̃ˈdɔ̃/ [pɔ̃ˈdɔ̃]; in Parisian and mediatic pronunciation, we have: [ˈbjɐ̃, bjɐ̃ˈtɒ, ˈbʁɐ̃, lɑ̃ˈɖi, bõˈbõ, pɔ̃ˈdɔ̃].

In the Parisian pronunciation of the *banlieues*, the 'suburbs' (outlying areas): [ˈbjɑ̃, bjɑ̃ˈtɒ, ˈbʁɑ̃, lɑ̃ˈɖi, bõˈbõ, põˈdõ]; in 'refined' Parisian pronunciation: [ˈbjæ̃, bjæ̃ˈto, ˈbʁæ̃, læ̃ˈɖi, bõˈbõ, põˈdõ]; in Canadian neutral pronunciation (*fig* 4.15-15 of *HPr* give further more or less marked variants, which are not shown here): [ˈbjɛ̃ɛ̃, bjɛ̃ɛ̃ˈto, ˈbɾɶ̃ø̃, lɶ̃ø̃ˈʤi, bɔ̃ʊ̃ˈbɔ̃ʊ̃, pãɐ̃ˈdãɐ̃].

There is a practical and effective way to check whether the reader has succeeded in producing true nasalized vowels, instead of sequences of vocoids followed by nasal contoids.

First, pronounce a very long [m::]; while continuing to pronounce the [m::], block the passage of air through the nose by lightly squeezing the nostrils shut with the thumb and index finger. Immediately the production of sound is interrupted, since in nasal contoids, the only place where air escapes is through the nose. Try with [n::] as well – the result is the same.

Now, pronounce the French word *on* /õ/ [õ], drawing it out more than normal: [õ::], and repeating it as well. Squeeze on the nostrils, and if the sound continues without any interruption, that means the reader is actually producing [õ] (at least, in terms of the mechanism; as for the exact quality of the vocoid, it will be necessary to check with the vocogram and by listening carefully).

However, if while squeezing the nostrils, the same thing happens that happened with [m::, n::] – namely, if (at a certain point) the sound and flow of air become blocked, then this means that, instead of [õ], the reader is actually producing [on], or [oŋ], or at most, [õn], or [õŋ].

Therefore, it is necessary to learn to pronounce the sound so that it does not become interrupted, and so that it remains at all times with the same timbre. The reader could possibly begin by closing the nose and trying to produce any vocoid, not to mention [õ]! But it is important to make sure that the result is not simply [o]. The first thing to remember is that the timbre of nasalized vocoids is always darker (than corresponding non-nasalized vocoids), because –in cases like [õ]– the resonator of the nasal cavity comes into play, modifying the sound wave. Moreover, while pronouncing voiced nasal phones, such as [m, n], or voiced nasalized ones, such as [õ, ã], the outer walls of the nostrils vibrate, as can be felt by touching the nostrils with the fingers (naturally, without blocking the passage of air through them, as in the preceding exercise).

This vibration is considerably reduced in the case of non-nasal phones, since then the velum is raised, thereby cutting off the nasal cavity from being an active resonator. If we compare [õ::] (or also [n::]) with [o::], the fingers manage to perceive a noticeable difference.

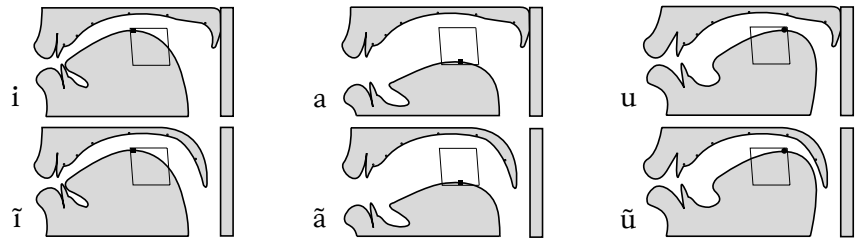


fig 11.9. Vocoid nasalization.

11.17.3. Moreover, there are still other possible tests. If, while producing [o, a], we close our lips (by bringing them together, or by putting a hand over our mouth), the resulting sound is [bˈ] – or else possibly something paraphonic, representable by ⟨[p̚ˈ]⟩. Instead, if we are truly producing [õ, ã], then when we intentionally close our lips, we produce [m̂] (or [m̶̂], for [õ]; and [m] for [ã]; or else, if we put a hand over our mouth, [m̩]). Therefore, the sound continues in this case, passing out through the nose (even though the timbre is modified by the operation of the lips or the hand).

Devoicing vocoids

11.18. In certain languages, some vocoids can be partially devoiced, phonetically, [i̥, ḁ, u̥], or totally devoiced, [i̥, ḁ, u̥], as will be seen in several chapters of *HPr* (especially [cf *fig* 11.5] in Japanese, but also in Lusitanian Portuguese, French, and Russian). Very few languages have been described with voiceless vowel *phonemes*, among which Comanche (USA, Oklahoma), and Ik (Western Africa). In these cases, it is always possible to analyze the voiceless vowels phonologically as sequences of the form /hV, Vh/. Here is an example from Comanche (Shoshone): *noribaki-ki'u'* [ˈnɔɾiˌβakiˌkiʔuʔ] 'he came to pack his bags' and *noribakîki'u'* [ˈnɔɾiˌβakiˌ̥kiʔuʔ] 'he packed his bags and came'. This example could be interpreted as /-kiki-/ vs /-khiki-/ or /-kihki-/.

Vocoids in unstressed syllables

11.19. In unstressed syllables, it is natural that the phonetic space of the vocoids is somewhat reduced in size, given that there is less (general and, particularly, articulatory) tension present. Therefore even languages such as Spanish or Italian, which do not reduce their unstressed *V*, have an inevitable tendency towards 'reduction'. On the vocogram, this reduction corresponds, more or less, to what is seen in *fig* 11.10, namely /i, e, ɛ, a, ɔ, o, u/ [i, e, ɐ, a, ʊ, o, u] 'tend to move towards' [ɪ, ə, ɜ, ɐ, ɒ, ʊ, µ], without however reaching them. In fact, this 'movement' is rather fictitious, in the sense that what actually happens is that in unstressed syllables, there is reduction mainly in the degree of jaw opening (and somewhat in the movement of the back of the tongue in a front–back direction, too). However, the relationship between the elements remains exactly the same as what it was before (just as if one spoke with a mouth of smaller dimensions, even without reaching the difference between the mouth of a child and one of an adult).

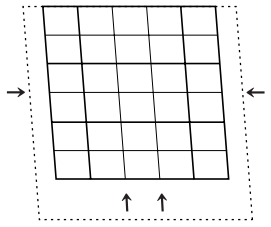
The ear automatically compensates for these small and inevitable differences, without letting itself be fooled. In this respect, it is different from machines, which 'obtusely' (in a manner characteristic only of machines) computes physical differences. These physical measurements are given as simple numbers, out of context, without any means for calibrating and reinterpreting the data. Thus the machine tends to fail in reassigning the new realizations to the appropriate phonemes and phones. We see clearly here the difference between *natural phonetics* (ie auditory/articulatory and functional), and *artificial phonetics* (ie acoustic).

Naturally, other languages, among which even English and certain regional pronunciations of Italian (and dialects of Italy), can have true reductions and even neutralizations of vocoids in unstressed syllables. These reductions can actually reach the points [ɪ, ə, ɜ, ɐ, ɒ, ʊ, µ], and even arrive at [ə, ɜ, ɐ]. However, these realizations are noted immediately as being different, and, as was mentioned above, they make up an element of certain regional accents and dialects, as well as certain languages. In such cases, but only in such cases, these realizations should be marked appropriately in transcriptions, as of course happens in English with /ə/: *about* [əˈbaʊt], *again* [ɯˈgɛnː] (near velars), *sofa* [ˈsɜɷfɐ/ˈsʊɷfʌ] (prepausal).

The supremacy of the ear (a well-trained one, or one of a native speaker which responds to relevant phonological oppositions) is still more obvious when comparing *different voices*, belonging to people with phonoarticulatory apparatuses of different dimensions and shapes. Even using the *bark* acoustic measurements it is (still) not possible to rival the incredible work of the human ear, which is capable of normalizing (phonetically and phonologically) the utterances of different people, and also of a single person, in *different types* of speech, with respect to variables such as speed, precision, and spontaneity.

The possibility of making seriously useful acoustic comparisons is complicated further by the fact that acoustic analyses depend dramatically on the skill of the analyst, on the quality of the apparatuses and computer programs employed, and also on the specific way the research is organized. Measurements, unfortunately, are subject to the evident limits of certain programs and the ways these are used, as well as the choice of questions considered, without mentioning differences in aims and hypotheses. For these reasons, any comparison with the acoustic data of someone else (with different informants) is a very risky undertaking, which can lead to surprising and misleading conclusions. The important thing is not to take as gospel truth everything which 'science' offers us (given all the limits and weaknesses to which we have briefly but incompletely referred).

fig 11.10.
Reduction in the size of the articulatory space for vocoids in unstressed syllables.



Vocoids in singing

11.20. First of all, it is necessary to point out that 'normal' language, from a phonetic point of view, is *spoken language*, such as what can be heard on the radio or television. Instead, while singing –and particularly in opera singing– the physical structuring of the phonoarticulatory apparatus becomes modified. The change is particularly important for vowels, which are central to the syllables in words (within phrases and sentences).

In fact, the oral cavity is usually more open during singing than in normal speech. This occurs for fairly evident reasons of professional technique: in order to obtain more impressive results, and in a way which is physio-pathologically less risky (above all, to avoid serious damage to the vocal folds).

In fact, the *operatic position* involves a deformation of the vocogram in the following ways (whether advisably or not): (1) the mouth is generally more open, given that the jaw is lower; (2) the lips are consequently never spread for [i, ɪ, e, ɛ, ɛ, æ], even though they are still at least somewhat rounded for the back vocoids [u, ʊ, o, ʊ, ɔ, ɒ]; (3) the tongue is correspondingly raised, in order to compensate for the lowering of the jaw (thus bringing the dimensions almost back to those of

speech, but with a slight lowering, thus moving down and back by one box in the vocogram), as can be seen in comparison with the original vocogram; (4) the vocogram is therefore not so much 'deformed' as lowered and drawn back, with regard to the original.

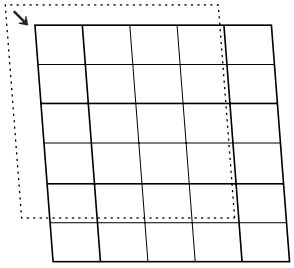
fig 11.11 gives the 'opera' vocogram, together with its boxes, placed in relationship with the normal vocogram of speech. There, it is easy to see how the 'opera' vocogram is slid downwards and backwards, and slightly enlarged.

Considering the figure attentively, we see that the column of front *vocoids* such as [i, ɪ, e, ɛ, ɛ, æ], coincides in practice with the next column, whose phones would be represented, rigorously by the symbols [ɪ̟, ɪ̠, ɘ, ɜ̟, ɐ, ä], Actually, they are those vocoids, but in a square which is relatively lower and farther back, within the mouth.

The important thing is to remember that the lips can never be spread – it is in fact physiologically impossible, given the four differences mentioned above. Therefore, a more realistic representation would show this absence of spreading, by at least using a dot placed underneath the 'normal' symbols (as a mnemonic diacritic): [i̤, ɪ̤, e̤, ɛ̤, ɛ̤, æ̤].

As it happens, it is a fact that this position is typically surpassed, while singing, moving past the spread position (of speaking) [i, ɪ, e, ɛ, ɛ, æ], and the neutral one (now seen) [i̤, ɪ̤, e̤, ɛ̤, ɛ̤, æ̤], to reach a half-rounded position [i̞, ɪ̞, e̞, ɛ̞, ɛ̞, æ̞] (which could be considered halfway between [i, ɪ, e, ɛ, ɛ, æ] and [y, ʏ, ø, ɞ, œ, ɶ], of French and German, &c). The reasons are, as before, technical ones having to do with the necessities of maintaining an appropriate sound for a greater length of time. This characteristic is undoubtedly paraphonic (*cf* § 14.1-2), and it is denoted by ⟨ˌ⟩, added to the normal symbols: ⟨ˌ [i, ɪ, e, ɛ, ɛ, æ]⟩; or (although not necessarily) it can be added to symbols with the diacritic: ⟨ˌ [i̞, ɪ̞, e̞, ɛ̞, ɛ̞, æ̞]⟩ (since ⟨ˌ⟩ is enough by itself to imply the particular articulatory differences seen here).

fig 11.11.
Difference in production of vocoids between speaking and singing.



Abolition of the term (and concept of) 'retroflection'

11.21. Natural Phonetics excludes any so-called 'retroflex(ed)' contoids; while, contoids such as [ɳ; ʈ, ɖ; ʂ, ʐ; ʐ] are postalveolar by nature (and [ɻ] is slightly rounded as well); in addition, [ɳ̟; ʈ̟, ɖ̟; ʂ̟, ʐ̟; ʐ̟] are (sub)apico-palatal (*cf fig* 10.2.1 & 10.3.1 & 10.5.3 & 10.6.1 & 10.6.5).

The concept and term of 'retroflection' are highly misleading, since they can neither explain anything, nor can they describe any phonic reality.

Furthermore, if they are applied to vocoids, they are even more misleading. As a matter of fact, the device which is used for what is incorrectly defined as 'retroflex(ed) vocoids' is not real *postalveolarization* (as it is called in more correct terms). Instead, it is lateral contraction of the body of the tongue, with a simultaneous –and unavoidable– retraction of the lamina (of the tongue), near the postalveolar zone, but with no actual (nor intentional) approaching. On the contrary, the lateral contraction (of the body of the tongue) with no retraction of the lamina, produces semi-lateralized approximants, such as [ɪ̟, ɬ̟] (*cf fig* 10.8.5).

The space in the mouth where the supposed 'retroflex vocoids' (that is *laterally contracted* ones) can be produced is very limited. Actually, it corresponds to the space of the following intense ('syllabic') contoids [ɻ̟, ɻ̟] (prevelar), [ʁ̟, ʁ̟] (uvularized velar, *cf fig* 10.6.6 for both pairs, respectively approximant and semi-approximant in each pair), with more or less marked lip-rounding. Less often, that space corresponds to the intense postalveolar contoids, [ɻ̟,ɻ̟], or to the velarized postalveolar ones, [ɻ̟,ɬ̟] (with or without rounding, *cf fig* 10.6.5 – the second element of each pair is unrounded), or even to [ʔ̟] (*cf fig* 10.6.1) as in Mandarin Chinese: *shī/shǐ* /ˉʂɻ̟/ [ˉʂʔ̟].

In addition to these intense contoids, which can form syllabic nuclei, we also find sequences of *V* + some of these contoids (either intense or not). We will only give the following examples *fur*, *fear*, *far*, from neutral American English, [ˈfɻ̟ː, ˈfrːɻ̟, ˈfɑːɹ], mediatic American English, [ˈfʁ̟ː, ˈfʊʁ̟, ˈfɑːʁ], and International English, [ˈfɻ̟ː, ˈfʊɻ̟, ˈfɑːɹ]; all of them are diaphonemically /ˈfəːɻ̟, ˈfɪəɻ̟, ˈfɑːɻ̟/.

Generic symbols (for phonic categories)

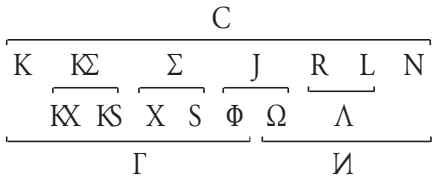
11.22. It might prove useful, sooner or later, to have symbols available which do not directly represent particular segments, but rather whole phonic categories. For this task, phonetic and phonemic formulae can be used, and the resulting symbols can be employed, for example, on the edges of vocograms or tables. We therefore provide a list of appropriate symbols of this type.

fig 11.12 gives a schematic presentation of the *seven* fundamental manners of articulation, for contoids. Also given are useful groupings and subdivisions, including the distinction between *obstruents* and *sonants* (however, the *mixed* manners of articulation, typical of approximants, and even more of trills and laterals, are not included).

The category of *obstruent* contoids includes *stops* (but not nasals, even though these could technically be considered stops with added nasalization), *stopstrictives*, *constrictives* (including constrictive trills and constrictive laterals), and *approximants* (only the peripheral ones). The *sonants* (or *sonorants*) comprise, on the other hand, central and lateralized *approximants*, besides *nasals* and *trills* (together with *taps* and *flaps*), and *laterals* (including *uni*laterals and lateral taps).

In various languages, for any manner of articulation (rarely trills, taps and flaps), phonetically *semi-*… articulations are possible (*ie* less tense – with no full contact, for nasals, stops, stopstrictives and laterals, as well).

fig 11.12.
Groupings of the fundamental manners of articulation.



V vocoid/vowel
V̽ reduced *V* (in duration: ≡ V̆)
V̆ shortened *V*
Ṽ nasalized *V*
V̥ devoiced *V*
V̬ voiced lenis *V*
V̤ voiceless lenis *V*
V̰ half-nasalized *V*
V̹ rounded *V*
V̜ unrounded *V*
V̟ advanced *V*
V̠ retracted *V*
V̝ lowered *V*
V̞ raised *V*
V̇ normal *V* – or under other conventions
V̰ creaky *V* (or laryngealized)
C contoid/consonant
C̽ reduced *C* (in duration: ≡ C̆)
C̆ shortened *C*
C̰ glottalized voiceless *C*, with simultaneous [ʔ]
Ç intense ('syllabic') *C*
C̥ devoiced *C*
C̬ voiceless lenis *C* – or under other conventions, especially diaphonemic
C̤ voiced lenis *C*
C̰ voiceless *C*
C̹ voiced *C*
C̜ rounded *C*
C̟ unrounded *C*
C̠ palatalized *C*
C̴ velarized/uvularized *C*
C̟ advanced *C*
C̠ retracted *C*
C̝ tenser/closer *C*
C̞ less tense/close *C*
C̰ creaky/laryngealized voiced *C*
L lateral *C*
Ɬ constrictive lateral *C*
L̥ voiceless lateral *C*
Ʇ lateral tap *C*
ɭ unilateral *C*
ʟ semilateral *C*

Λ lateral ‰r trill/tap *C*
Λ intense ('syllabic') lateral ‰r trill/tap *C*
Λ̥ voiceless lateral ‰r trill/tap *C*
N nasal *C*
N intense ('syllabic') nasal *C*
N̥ voiceless nasal *C*
И sonant (or sonorant) *C*
И intense ('syllabic') sonant *C*
И̥ voiceless sonant *C*
R trill (or trill & tap) *C*
R̥ voiceless trill (or trill & tap) *C*
Ꞧ constrictive trill *C*
Я tap *C*
ɮ lateralized tap *C*
ɾ flap *C*
ɺ lateralized flap *C*
Ω median approximant *C*
J approximant *C*
ʲ semi-approximant *C*
l lateralized approximant *C*
ɹ lateralized semiapproximant *C*
Φ peripheral approximant *C*
Γ obstruent (K, KΣ, Σ) *C*, in diphonic pairs
H laryngeal approximant *C*
Ꞩ laryngeal constrictive *C*
K stop *C*
ᴷ semi-stop *C*
X (slit) constrictive *C*
ˣ (slit) semi-constrictive *C*
S grooved constrictive *C*
ˢ grooved semi-constrictive *C*
Σ (generic) constrictive *C*
ᵡ (generic) semi-constrictive *C*
KX (slit) stop-strictive *C*
KX (slit) stop-semi-strictive *C*
ᴷX (slit) semi-stop-strictive *C*
KS grooved stop-strictive *C*
KS grooved stop-semi-strictive *C*
ᴷS grooved semi-stop-strictive *C*
KΣ (generic) stop-strictive *C*
KΣ (generic) stop-semi-strictive *C*
ᴷΣ (generic) semi-stop-strictive *C*
KɬL lateral stop-strictive *C*

KR trill(ed)/tap(ped) stop-strictive *C*
Π lexeme
π grammeme
Ψ rhythm group
ψ reduced rhythm group
$ phono-syllable
$ reduced phono-syllable
$̀ 'light' syllable
$́ 'heavy' syllable
Ø 'zero' phone/phoneme
^{v} indicates proximity to V – ^{v}C, ^{v}C^{v}, C^{v}
^{c} indicates proximity to C – ^{c}V, ^{c}V^{c}, V^{c}
C$_{*}$ *C* with audible explosion
C$^{\urcorner}$ *C* with inaudible explosion
C^{h} = /C̗/ ≠ /C̗h/
C^{ɦ} = /C̬/ ≠ /C̬h/
C' ejective *C*
ʾC injective *C*
ʿC dejective/click *C*
ᵑ̇C prenasalized dejective *C*
ⁿ̃C prenasalized *C*
ˈV stressed *V* (with strong/primary stress)
ˌV half-stressed *V* (with mid/medium/secondary/half-strong stress)
˳V unstressed *V* (with weak stress)
˚V destressed *V* (with reduced stress, up to weak; starting from ˈV)
ˈˈV over-stressed *V* (with extrastrong stress)
V: long *V*
V· half-long *V*
V꞉ less than long *V*
V. less than half-long *V*
V| utterance-final *V*
|V after a pause or silence *V*
V# word-final *V*
#V word-initial *V*
V# syllable-final *V*
-V- *V* within a word, word-internal *V*
| pause
¦ potential pause
‖ longer pause
⸤ ⸣ (low) parenthesis
⸢ ⸣ (mid) parenthesis
⌜ ⌝ quotation
. *emic* conclusive intoneme
? *emic* interrogative intoneme
; *emic* suspensive intoneme
, *emic* continuative intoneme
normal preintoneme (*no sign*)
¿ interrogative preintoneme
¡ imperative preintoneme
ᵃ̀ emphatic preintoneme
ɔ supplementary interrogative preintoneme (in French)
¯ (˗ ˈ ‗ _) tone with strong stress, cf § 12.17
¨ (˧ ‥) tone with mid stress, cf § 12.17
· (· ˳) tone with weak stress, cf § 12.17
= (= ˮ = ‗) tone with extrastrong stress, cf § 12.17
ˊˋ (˥˩ ˊˋ ˩˥) falling tone, cf § 12.18
ˋˊ (˩˥ ˋˊ ˥˩) rising tone, cf § 12.18
ꜜ Japanese *akusento* (distinctive pitch lowering, cf § 12.3.2.1-4 of *HPr*)
ꜛ (ꜜ ꜛ ↓ ↑ ↘ ↗ ↘ ↗) shift diacritic, cf § 8.11, 9.5
⟨ ⟩ paraphonic element (cf § 14.3-5) – or grapheme
[ ] phonetic transcription
/ / phonemic transcription
⟦ ⟧ *hyper*phonetic transcription
// // *hyper*phonemic transcription
( ) symbol/phon(em)e which can fall (or be lacking)
(( )) potential symbol/phon(em)e, which can be used, as in *fig* 8.8-9.

7. The official *IPA* & other notations

Official *IPA*

7.0. We will present –for informative purposes– the official *IPA* chart (*fig* 7.1, which we indicate as *offIPA*), as the result of the latest reform (brought about in 1989-1993, with corrections in 1996), which –almost playfully, but not without very good reason– can be considered a reform of the past century – indeed, of the past… millennium! Again, as we have done for the preceding, introductory, part we will be using the –generic and phonological– terms VOWEL and CONSONANT, since these are still beginning, general, levels.

Of course, when we deal with phonetics in specialistic terms (from the next chapter onwards), for enthusiasts, for ‹experts›, we will accurately distinguish, by using VOWEL and CONSONANT, at the phonemic (or graphemic) level, but VOCOID and CONTOID, at the proper phonetic level, which can satisfy real scientific and human curiosities, in order to enjoy the wonderful world of linguistic sounds, with all its variegations (which remind one of the rest of the natural world very much: zoology, botany, mineralogy, astronomy, &c).

Consonants

7.1. If we observe the official chart, we find consonants given first, although it might have been better to start from vowels. However, in the consonant table (at the beginning of *fig* 7.1), we immediately notice that the manners of articulation are slightly different from those presented in our early simplification (*fig* 6.2, and the specialist chapters: Ch 9-10). In fact, their order is: *stops*, *nasals*, *trills*, *taps & flaps*, *fricatives*, *lateral fricatives*, *approximants*, *lateral approximants*. Instead of providing a global view, it moves along by slight internal differences, as between *stops* vs *nasals* (≡ stops with lowered velum).

The chart goes on by comparing *trills* with *taps* (including *flaps*). In our mini--table in *fig* 6.2, which shows the fundamental types of manners and places of articulation, flaps are not given, as seems to be more suitable for a first, high-impact, approach. Our rigorous treatment will start from Ch 8 to Ch 14, although symbols like [ɾ] have already been used right from the start. However, attentive and keen readers of a book such as this should first go through the content and index pages and the various figures, in order to understand their way around the book, which will make future reference to specific topics easier.

ƒ 7.1. Tabella ufficiale IPA (2005).

ALFABETO FONETICO INTERNAZIONALE

(ufficiale, del 1993, corretto nel 1996 e aggiornato nel 2005)

CONSONANTI (PNEUMONICHE) (Traduz. & realizzaz. *Lu@*)

	Bilabiali	Labiodent.	Dentali	Alveolari	Postalveol.	Retroflessi	Palatali	Velari	Uvulari	Faringali	Glottali
Occlusive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasali	m	ɱ		n		ɳ	ɲ	ŋ	ɴ		
Polivibranti	ʙ			r					ʀ		
Monovibr.		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Fric. later.				ɬ ɮ							
Approssim.		ʋ		ɹ		ɻ	j	ɰ			
Appr. later.				l		ɭ	ʎ	ʟ			

Nelle coppie, la consonante sulla destra è sonora. Le zone in grigio indicano articolazioni considerate impossibili.

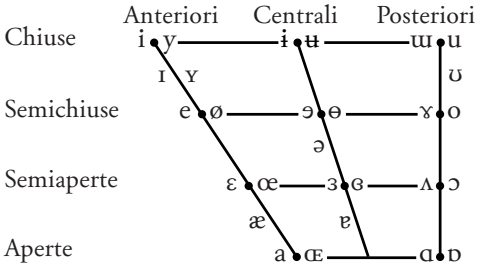
CONSONANTI (NON-PNEUMONICHE)

Avulsive/Clicks	Implosive sonore	Eiettive
ʘ Bilabiale	ɓ Bilabiale	’ come in:
ǀ Dentale	ɗ Dentale/alveol.	pʼ Bilabiale
ǃ (Post)alveolare	ʄ Palatale	tʼ Dentale/alveol.
ǂ Palatoalveolare	ɠ Velare	kʼ Velare
ǁ Laterale alveol.	ʛ Uvulare	sʼ Fricativa alveol.

ALTRI SIMBOLI

ʍ	Fric. labiovelare sorda	ɕ	Fric. alveopalatale sorda
w	Appr. labiovelare sonora	ʑ	Fric. alveopalatale sonora
ɥ	Appr. labiopalat. sonora	ʖ	Monovibr. laterale alveol.
ʜ	Fric. epiglottale sorda	ʩ	= ʃ e x simultaneamente
ʢ	Fric. epiglottale sonora	t͡s	Le affricate e le articolazioni
ʡ	Occlusiva epiglottale	k͡p	doppie si possono indicare con legature, se necessario

VOCALI



Nelle coppie, la vocale sulla destra (e ʊ) è arrotondata.

TONI E ACCENTI DI PAROLA

COSTANTI			MODULATI		
ő o ˥	Extra-alto		ǒ o ˩˥	Ascendente	
ó ˦	Alto		ô ˥˩	Discendente	
ō ˧	Medio		ǒ ˨˦	Alto ascend.	
ò ˨	Basso		ǒ ˩˨	Basso ascend.	
ȍ ˩	Extra-basso		ő ˦˥	Ascend.-discend.	

↑ Sollevamento (relativo) ↗ Sollevamento globale
↓ Abbassamento (relativo) ↘ Abbassamento globale

DIACRITICI (possono esser posti sopra i simboli che scendano sotto il rigo, per es. n̪)

◌̥	Desonorizzato	d̥ u̥	◌̤	Mormorato	b̤ a̤	◌̪	Dentale	t̪ d̪
◌̬	Sonorizzato	t̬ s̬	◌̰	Cricchiato	b̰ a̰	◌̺	Apicale	t̺ d̺
◌ʰ	Aspirato	tʰ dʰ	◌̼	Linguolabiale	t̼ d̼	◌̻	Laminale	t̻ d̻
◌̹	Piú arrotondato	ɔ̹ o̹	◌ʷ	Labializzato	tʷ dʷ	◌̃	Nasalizzato	ẽ õ
◌̜	Meno arrotond.	ɔ̜ o̜	◌ʲ	Palatalizzato	tʲ dʲ	◌ⁿ	Rilascio nasale	dⁿ
◌̟	Avanzato	u̟ o̟	◌ˠ	Velarizzato	tˠ dˠ	◌ˡ	Rilascio laterale	dˡ
◌̠	Arretrato	e̠ i̠	◌ˤ	Faringalizzato	tˤ dˤ	◌ˀ	Ril. non udibile	dˀ
◌̈	Centralizzato	ë ö	◌̴	Velarizzato o faringalizzato		ɫ ɬ		
◌̽	Centripeto	e̽ o̽	◌̝	Innalzato	e̝ (w̝ = fricativa labiovelare sonora)			
◌̩	Sillabico	n̩ ɪ̩	◌̞	Abbassato	e̞ (x̞ = approssimante velare sorda)			
◌̯	Non-sillabico	e̯ o̯	◌̘	Radice della lingua avanzata	e̘ o̘			
◌˞	Rotacizzato	ɚ ɑ˞	◌̙	Radice della lingua arretrata	e̙ o̙			

SOPRASEGMENTALI

ˈ	Accento primario
ˌ	Accento secondario: ˌfoneˈtista
ː	Lunga aː
ˑ	Semilunga aˑ
˘	Brevissima ă
.	Divisione sillabica: ʃi.are
|	Gruppo minore (gruppo ritmico)
‖	Gruppo maggiore (gruppo intonativo)
‿	Legato (mancanza d’interruzione)

The official table also shows the ‹fricatives› (an auditory term instead of our articulatory one, CONSTRICTIVES) ʊs ‹lateral fricatives› (for our CONSTRICTIVE LATERALS); also *approximants* (*ie* central approximants) ʊs *lateral approximants* (or simply *laterals* – since even *nasals*, strictly speaking, are *nasal approximants,* rather than ‹nasal stops›, seeing that air is not completely blocked and, above all, that they are not ‹noisy›).

7.2. One may immediately observe that the table gives no ‹affricate› manner (an auditory term instead of our articulatory one, STOP-STRICTIVE). Only at the end of the ‹other symbols› addition, do we find that name, accompanied by the indication: ‹affricates and double articulations can be represented by two symbols joined by a tie bar if necessary›. And here some of the absurd notational complications arise, since symbols like [ʦ, ʧ] –which, before the ‹reform›, were highly-recommended ‹expert› variants (although never clearly withdrawn by the reform)– are no longer indicated. Instead, one can infer that their ‹normal› notation is meant to be ‹[ts, tʃ]›, exactly like [ts, tʃ] sequences, which actually occur in languages of the world. The ‹sophisticated› official alternative consists in making use of the clown-like notation ‹[t͡s, t͡ʃ]› ʊs ‹[ts, tʃ]› (or ‹[ts, tʃ]› ʊs ‹[t-s, t-ʃ]›, respectively, or even ‹[t.s, t.ʃ]› for the latter, in case it coincides with syllabification). Officially, the ‹boat› ([‿]) or the ‹umbrella› ([͡]) are also possible for double articulations, *ie* with two (simultaneous) coarticulations, as for the velar and labial ones, ‹[k͡p, g͡b]›, corresponding to our unitary symbols [kp, ɡb].

7.3. We will now examine a serious problem in the official consonant table, in relation to places of articulation. First of all, it is absurd to maintain the ambiguous term ‹retroflex› (instead of POSTALVEOLAR), which more than a place of articulation could be a possible COARTICULATION with many fallacies. But the worst thing is the presentation of the section from DENTAL to ALVEOLAR, up to ‹postalveolar› (which has deceived quite a few people who try to do phonetics with no good grounding).

This inaccuracy is directly responsible for published pages ‹telling› that in most languages (including neutral Italian) [t, d; s, z] would be ‹alveolar› (instead of dental); and even English [ɹ] would be ‹alveolar› too! A brief moment of quiet meditation would be sufficient to realize that this (serious) mistake is brought about by that absurd presentation, with those pseudo-science subdivisions. In addition, it is seriously misleading to define [ʃ, ʒ] as ‹postalveolar›; again, by actually observing the real articulation of [ʃ, ʒ], and of [ʧ, ʤ] as well (*cf fig* 6.6), one should easily realize once and for all that we are dealing with three coarticulated places, not only one; in fact, [ʃ, ʒ; ʧ, ʤ] are POSTALVEO-PALATAL PROTRUDED contoids.

The true POSTALVEOLAR articulations are, for example, [ʈ, ɖ; ʂ, ʐ; ɻ] (*ie* ‹presumed› retroflex sounds). The reform has misplaced, or ignored (?), the ‹palato-alveolar› place, which used to indicate [ʃ, ʒ; ʧ, ʤ] slightly better, although ambiguity with ‹alveopalatal› was very frequent. Furthermore, up to the 1951 reform, ‹retroflex› rightly stood for *postalveolar*; whereas the 1979 reform added ‹postalveolar›, while maintaining ‹retroflex›. In addition, there were ‹palatalized palatoalveolar› sounds (*ie* our POSTALVEO-PALATAL, with no lip rounding), [ʃʲ, ʒʲ], which have now disappeared and officially must be rendered as ‹[ʃʲ, ʒʲ]›!

7.4. Let us now consider the additional symbols (and of course the articulations and, consequently, the sounds) we find in the official table by comparing them with what was used as a first impression to be developed gradually (cf fig 6.2). Nonetheless, from our own point of view, the official table is too limited to be sufficient or useful. In fact, to produce more realistic transcriptions –within the *off*IPA– one must resort to compromises, by using complicated diacritics. This is the reason why, although *off IPA* is better than any other ‹phonetic alphabet›, its limitations spontaneously call to mind the negative feelings connected to *off* in various phrases, as for instance *an off day* – quite different, of course, from *a day off*!

However, by following the official order (which is different from what we consider more logical and convenient from an articulatory point of view), for STOPS we have PALATAL ‹[c, ɟ]› [c, ɟ] (as in Greek *kýrios*, *anánkē* (κῡ̔ριος, ανᾱ̔γκη) [ˈciˑɾjɔʂ, aˈnaɲɟi]) and UVULAR [q, ɢ] (Arabic *qadiim*, *suuq* [qɑˈdiːm, ˈsʊːq], Persian *enqeraaz* [ˌɘnɢɘˈɾɒːz̥]), and LARYNGEAL (or GLOTTAL, [ʔ], which is placed here among voiceless sounds, being correct for two thirds, since the vocal folds are not vibrating, although they are not open either, as for true voiced sounds, but rather tightly closed…).

In the table of the ‹reformed› *IPA*, which is mainly phonemic (although it is still called phonetic), among the NASALS, we also find (amazingly enough) the LABIODENTAL, [ɱ] (*envy* [ˈɛɱvi] /ˈɛnvi/), which is not phonemic in any language! As a matter of fact, also in Teke (spoken in Congo), what has been described as ‹/ɱ/› is actually the short homorganic element of prenasalization in /ⁿbv/ [ⁿbv]). Besides, we find POSTALVEOLAR (‹retroflex›) [ɳ] (Hindi *kaaraṇ* [kaˈɾɐɳ], Norwegian *korn* [ˌkhuːɳ]), and UVULAR [ɴ] (German *Zeitung* [ˈtshaetʊɴ] /-ʊŋ/; also seen in the Persian example given above, as a taxophone of /n/).

Among trills, a bilabial [ʙ] is added (as in Asua, spoken in [the D. R. of] the Congo, *ɓo'e* [_ʙɔˀɛ]). Then we find an alveolar tap [ɾ] (as in Italian *rifare* [ɾiˈfaːɾe] /riˈfare/, or Spanish *cara* [ˈkaˑɾa]), but also a postalveolar (*ie* ‹retroflex›) flap ‹[ɽ]›, which has a different nature (as we will see). This must be one of the reasons why too often, the terms *tap* and *flap* are dangerously mistaken or misused.

7.5. Among the CONSTRICTIVES (‹fricatives›) we find BILABIAL ‹[ɸ, β]› (for our [φ, ß], whereas we prefer to use [ɸ, β] for the approximants, which occur more ‹normally› in the world's languages), as in Ewe: *èvè* [ˌe_ße] ‹Ewe (language)›, different from *èvè* [ˌe_ve] ‹two› and *fú* [ˉɸu] ‹bone›, different from *fú* [ˉfu] ‹feather›. Let us briefly note the graphemes *Ƒ/ƒ* and *F/f*, or *Ʋ/ʋ* and *V/v*, by comparison with *F/f* and *V/v* – let us look at their shapes and *serifs*, since the lower cases are *all* different: three types of *f* and three of *v*. The ‹normal› or ‹unmarked› ones have intermediate shapes between the two extreme ones, which are used distinctively (although just two forms would suffice, as happens with upper cases).

Then we have (slit) DENTAL [θ, ð]: *this thing* [ðɪsˈθɪŋː], in addition to various (grooved) dental [s, z], *seizing* [ˈsɪizɪŋ], Latin-American Spanish *seis*, *desde* [ˈsɛis, ˈdɛsðe, -zðe], which are to be distinguished from the ALVEOLAR ones which we transcribe as [ʂ, ʐ] – Iberian Spanish: *seis*, *desde* [ˈʂɛiʂ, ˈdɛʐðe]; Greek: *zéstē* (ζῶστη) [ˈʐɛʂ-

ti]. After ‹postalveolar› [ʃ, ʒ] (*ie* our POSTALVEO-PALATAL PROTRUDED), we find ‹retroflex› [ʂ, ʐ] (*ie* just true POSTALVEOLAR), as in Swedish: *Lars* [ˈlaʂ], Mandarin Chinese: *shū* [ˉʂu], Vietnamese: *số* [ˊʂoo], *ru* [ˈʐuu]); PALATAL ‹[ç, ʝ]› [ç, ʝ], in Greek: *chióni*, *giágia* (χιόνι, γιαγια) [ˈçoˑni, ˈʝaˑʝa], German: *ich* [ˈʔɪç]; VELAR ‹[x, ɣ]› [x, ɣ], in Greek: *láchano*, *gála* (λάχανο, γάλα) [ˈlaˑxanɔ, ˈɣaˑla], in American Spanish: *jefe* [ˈxeˑfe], general Spanish: *luego* [ˈlweˑɣo]; UVULAR [χ, ʁ], in Iberian Spanish: *jefe* [ˈχeˑfe], French: *roi* [ˈʁwa], German: *rot* [ˈʁoːt]; and voiceless PHARYNGEAL [ħ], in Arabic: *ħubbi*, *faħħaaš* [ˈħʊbbi, faħˈħaːʃ].

Unfortunately, in this row (of ‹fricatives›) we also find some articulations which are evidently approximant. The first is the voiced pharyngeal ‹[ʕ]› (Arabic: *baʿda*, *salʿ* [ˈbaʕda, ˈsalʕ]). But we prefer to subdivide more clearly and exchange symbols: PREPHARYNGEAL (‹pharyngeal›) [ʕ] and PHARYNGEAL (‹epiglottal›) [ʢ] (in any case, always approximant!).

The other two pseudo-constrictives –‹fricatives›– are (voiceless and voiced) LARYNGEAL [h, ɦ] (*hat*, *behave* [ˈhæʈ, bɪˈɦeˑɪˬ, bə-, -ˈh-]; Hindi: *bahut* [bɐˈɦʊt]), which are decidedly approximant! Thus they are a diphonic pair, although both of them are lenis (or lenited) since the aretynoids are drawn away (*cf fig* 4.4).

The CONSTRICTIVES (‹fricatives›) seen up to now are all normal, or CENTRAL, *ie* produced with no deviations from the most common articulations along the central part of the ARTICULATORY CHANNEL. The table then introduces a ‹lateral constrictive› articulation, *ie* CONSTRICTIVE LATERAL, ‹[ɬ, ɮ]› (a diphonic pair; although we prefer the symbols [ɬ, ɬ], which are more harmonious and coherent, for whole series, as we will see), with friction noise produced at one side of the tongue, where air is forced; otherwise the result would be a normal lateral approximant, as in: *lily* [ˈlɪli].

7.6. Moving to APPROXIMANTS, we see that in the official table they are all voiced (although, of course, many of them are voiceless, as we can ascertain below, § 9.19-20 & § 10.6 & *fig* 10.5). This fact of (diphonic) pairs is undoubtedly responsible for the mistaken placing of ‹[ʕ, h, ɦ]› –*ie* our own [ʢ, h, ɦ]– among the constrictives. However, we find a LABIODENTAL [ʋ] (as in a typical variant of /ɹ/ in mediatic British English, often colorfully called ‹Estuary English›: *very* [ˈvɛʊɜɪ] /ˈvɛɹi/, corresponding to normal [ˈvɛɻi], or to American English [ˈvɛɹi]).

This last example also introduces the ‹dental/alveolar/postalveolar› general factotum, ‹[ɹ]›, in actual fact, in our classification, in a more objective and normal way, apart from the dental one, we have three primary types: alveolar [ɹ], PREVELO-POSTALVEOLAR ROUNDED [ɹ] (for neutral American pronunciation /ɹ/), and ‹retroflex›, actually POSTALVEOLAR ROUNDED [ɻ] (for neutral British pronunciation). They represent three different articulatory types, for different places of articulation.

We shall return to [ɻ, ɹ], illustrated above in contrast with [ʋ], in order to explain quite a fair few things. For now, however, we limit ourselves to relate the official situation, with ‹official transcriptions›, but adding our own transcriptions, to avoid further distortions and misbeliefs: for instance, for *rat* –according to the official version– we would have ‹[ɹæt]› in British English, and ‹[ɻæt]› in American En-

glish. However, if one does phonetics –and transcribes– seriously, by relying on actual articulations, the two symbols must be exchanged, writing [ˈɻæɾ, ˈɹæɾ], respectively. This means that (besides the important addition of stress, since a word has to be inserted in a sentence, where even among monosyllables there may be stressed or unstressed syllables) the neutral British sound is postalveolar (‹retroflex›) [ɻ], better still POSTALVEOLAR ROUNDED, since the lips are involved too, whereas the neutral American sound is POSTALVEOLARIZED PREVELAR ROUNDED [ɹ].

Among LATERALS, we find POSTALVEOLAR (‹retroflex›) [ɭ], in addition to velar ‹[ʟ]› (for us, [l], as already said).

7.7. Obviously, since the official symbols are too few indeed, it is necessary to add the ‹other symbols› appendix, with: a voiceless ‹labial-velar fricative› –or velar-labial– ‹[ʍ]› (better defined as VELAR ROUNDED APPROXIMANT and represented by [hʊ], both to make handwriting easier and –above all– for its link with other similar sounds – which will be revealed in the more scientific part, ☪ 9-10), and the corresponding voiced sound [w] (Scottish English: *which* [ˈhʊɪʧ], New Zealand English: *which* [ˈhʊəʧ, ˈw-], British and American English: *which* and *witch* [ˈwɪʧ]). There is also a ‹labial-palatal› approximant (more precisely POSTPALATAL ROUNDED) [ɥ] (French: *lui* [ˈl̪ɥi]).

Next, we find ‹fictional› phonetics, too, with three ‹epiglottal› sounds, *ie* indicated with the name of the supposed ‹lower› articulator; in fact, instead of referring to the –legitimate– ‹upper› part, constituted by the roof of the mouth and its extensions (in the labial, pharyngeal, and laryngeal cavities), reference is made to an area of the gregarious part. It would be like calling [c, ɟ; k, g; q, ɢ], or [ɲ, ŋ, ɴ], or [ç, ʝ; x, ɣ; χ, ʁ] simply ‹dorsal› articulations; in fact, ‹epiglottal› sounds correspond to our own PHARYNGEAL, whereas official ‹pharyngeal› ones correspond to our PREPHARYNGEAL.

Again, under ‹other symbols› we find the ‹alveopalatal fricative› pair [ɕ, ʑ] (BILABIALIZED PREPALATAL), which turn up like… a bad penny, in that –given the severe deficiency of official symbols– several authors use these two symbols as if they were a jack of all trades; namely when a sound is neither [s, z] nor [ʃ, ʒ], it is ‹magically› transcribed as ‹[ɕ, ʑ]›, to render an all-embracing otherness, to the detriment of accuracy… And to think that, sometimes, our own symbols (which will be seen later on, ☪ 10) may seem to be insufficient for any decently reliable rendering!

Then comes an alveolar lateral ‹flap› ‹[ɺ]› (actually a lateralized tap: [ɺ̆]) probably drawn in a hasty way, by simply overturning an old symbol, as when it was impossible to redraw symbols using a computer. The ‹free gifts› end with another monstruosity: ‹[ɧ] for simultaneous [x, ʃ]› (wrongly drawn from laryngeal [ɦ]!), instead of a pre-reformed ‹[ʢ]›, corresponding to our [ʩ] (VELARIZED POSTALVEOLAR PROTRUDED, which can be seen among the orograms in *fig* 10.5.3, obviously in its second part, since it has a back component).

7.8. Thus far all consonants have been PULMONIC, *ie* produced using only expiratory air. There is a box for NON-PULMONIC consonants – ‹clicks, voiced implo-

sives, and ejectives›. The *clicks* (or DEJECTIVES, ☞ § 11.13-16) appear in five places: bilabial, dental, (post)alveolar, ‹palatoalveolar› (inadvertently maintaining the name of a place abolished by the ‹reform›), and alveolar lateral. Here we limit ourselves to report the ‹symbols› judged to be ‹fundamental› (in fact we reserve their scientific treatment, with our symbols, for some later sections, ☞ § 11.15-16): ‹[ʘ, ǀ, ǃ, ǂ, ǁ]› (which from the cross-eyed point of view of the reform, are accompanied by another [velar or uvular] symbol, instead of using a normal consonantal symbol preceded by a special diacritic to indicate the dejective mechanism).

For *implosives* (or INJECTIVES) the five following places appear: bilabial, dental/alveolar, palatal, velar, uvular: ‹[ɓ, ɗ, ʄ, ɠ, ʛ]›; for EJECTIVES we find four examples: [p', t', k', s']. This treatment is also reserved for the specialistic part (from ☪ 8 onwards), since –apart from the neophytes' curiosities– their natural place (with a ‹European› slant) is there.

Vowels

7.9. In the official chart (☞ *fig* 7.1), there are 28 vowels, placed in a trapezium, or trapezoid, resulting from a partially wrong initial approach, although within the brilliant idea of analyzing the positions of the tongue dorsum through *x*-rays, as we will see (☪ 8). Here we also accept the trapezium-shaped diagram as a precious device, since as regards the usual chaos, it is decidedly at a fundamental stage. However, we have already seen *fig* 6.1, which meets phonetic requirements better.

The vowel space is slightly subdivided, but without the advantage of real boundaries, into four heights (of the dorsum, placed in three superimposed bands): *close*, *close-mid*, *open-mid*, *open*; but, of course, they are not sufficient, so other intermediate positions have to be added. As far as forward and backward movements of the dorsum are concerned, three classifications are given, in two irregularly shaped areas (which should have been more realistic, according to physiology): *front*, *central*, *back*. Unfortunately, official markers –used to indicate the placement of vowels– are always big black dots; therefore the opportunity of showing lip positions too is lost (whereas our markers have two basic shapes: round and square).

Consequently, looking at the trapezium from top to bottom and from left to right (keeping in mind that when symbols appear in pairs, the one to the right represents a rounded vowel, including isolated [ʊ]), we find: [i, y; ɨ, ʉ; ɯ, u], [ɪ, ʏ; ʊ], [e, ø; ɘ, ɵ; ɤ, o], [ə], [ɛ, œ; ɜ, ɞ; ʌ, ɔ], [æ; ɐ], [a, œ; ɑ, ɒ]. Note the ‹reformed› shape of ‹[ɤ]› (for our own –and pre-reform– [ɣ]), which was meant to be useful to avoid authors, editors, and publishers confusing [ɤ] with [ɣ] (officially, ‹[ɣ]›); but nothing has improved…

7.10. Let us maintain that the official trapezium is mainly theoretical, since it tries not to neglect any possibilities. But the actual result is a forced reality, due to lack of practice and direct experience with at least dozens of structurally very different languages. In default of this, people may labor under the illusion that they know the real value of vowels, but will inevitably be bound to the vowels of

their own personal pronunciation of their mother tongue. What is even worse is that they will be limited by what they think their realizations are and by what they presume the ‹cardinal› values of the official vowels are… Actually too many English-speaking phoneticians, instead of cardinal [u], instead produce (almost) [ʉ].

On the basis of the degrees of proximity to cardinal (and additional) vowels, phoneticians are supposed to place markers, to which the articulations of a given language ought to correspond. Too often, though (and unfortunately even in publications!), it is possible to find trapeziums with markers that seem placed at random and hastily. At other times, the markers roughly coincide with the points placed on the official trapezium (as if they really might correspond to the theoretical positions). This mainly happens according to the particular symbol in question (be it right or wrong!), used mechanically, without realizing the importance of the vocogram. Instead, lengthy work ought to be done, by attentively and patiently listening to many recordings, in order to compile an average of samples, excluding inadequate and occasional performances, but showing even two or more placements, provided they represent actual contextual, geographical, social, generational, or individual variations… It is absurd to place the /ɔ/ phon(em)es of different languages such as French, German, Portuguese, Italian, and many more, exactly on the official point. However, those who do so, inevitably lose the incredible and useful resources of the trapezium.

7.11. Let us now see the approximate values of the 28 official vowels, whereas exact values (with our 52 vocoids) will be given in the vocograms used in the phonosyntheses of 350 languages (including variants, ☞ 16-23, and also in *HPr*, which is dedicated to 12 languages dealt with systematically and with variants). Only by doing this, is it possible to prepare complete transcriptions and descriptions, which actually show the structure of languages, for *descriptive* and *teaching purposes*.

The observations made about the eleven vowels introduced in § 6.1.1-2 must be kept in mind; here we will give only some examples, as can be found in texts and dictionaries, making only few comments. Again a scientific treatment is postponed to the specialistic part of this handbook, although it should not be so, since it would better to start well, and to go on even better… However, we thought that some help might be useful, to avoid discouraging people, especially those who are beginning phonetics reluctantly and more as somebody else's ‹wish› than to meet their own needs. Even those who might fall within this last category could find this part anything but useless…

7.12. Therefore, omitting the vowels already seen in ƒig 6.1, we have – Russian: *ty* (*мы*) [ˈtɻɨˑ], Norwegian: *null* [ˌnʉl], Mandarin Chinese: *zì* [\tsɯ], German: *litt* [ˈlɪt], *Stück* [ˈʃtʏk], *rund* [ˈʁʊnt], English: *light* [ˈlaəʃ], Dutch: *bus* [ˈbəs̪], Mandarin Chinese: *gé* [ˊkɤ] (‹[ɤ]›), British English: *bird* [ˈbɜːd̥], New Zealand English *bird* [ˈbɐːd̥], Swedish: *höra* [ˉhɞɔ̤˕ɾa], English: *hat* [ˈhæʃ], British English: *hut* [ˈhɐʃ], American English: *hut* [ˈhʌʃ], American English: *hot* [ˈhɑʃ], British English: *hot*

[ˈhɒʃ], non-neutral Canadian French: *preuve* [ˈprœːv].

Let us only observe that the official chart continues to consider ‹[ə]› as something undefined, to oppose more precise timbres; something with a kind of intrinsic theoretical statute, more with a phonemic value than as an actual sound. In fact, unfortunately it is used as a jack of all trades (*cf* § 8.16 – with a range of possibilities which is even bigger than those assigned to the ‹jack-of-all-trades consonants› [ɕ, ʑ], seen above, § 7.7).

Also for [a], completely without foundation, the chart continues to make people believe that it is actually articulated in a full front position, that is as if it corresponded to what, objectively (even according to acoustic analyses) is [æ]; whereas the chart continues to ‹insert› ‹[æ]› (in the trapezium), putting it *above* ‹[a]›.

In addition, as will appear obvious due to the scarceness of official symbols, each one of them must assume very broad and different values (from language to language), which may not correspond to an actual phonetic value to be used positively. At a phonemic level, things can be (almost) satisfactory; mainly if we limit it to one or few languages, *ie* for INTERPHONEMIC indications. However, as soon as we try to do something INTRALINGUISTIC, according to the criteria of INTERPHONEMICS (*cf* § 1.9-10, and ☞ 16-21), we immediately feel severe limitations, which prevent actual and useful comparisons between different languages. Indeed, we do not want to render the pronunciation of some languages poorly, as they would be inevitably flattened into something barely decent (when someone uselessly tries to indicate many different phones, by using only few symbols [as the official ones]). On the contrary, we prefer to be able to choose among many phonemic and phonetic symbols, in order to manage to –accurately– potentially render all languages, and dialects (including variants not yet described). On the other hand, even the few official symbols are a problem to people who are no good at phonemics and phonetics, and practice them reluctantly, by using symbols in a ridiculous and unsatisfactory way (considering them to be real… enemies).

Prosodic indications & diacritics

7.13. The official chart has a tiny section on TONES (which meant to be illustrative, but many have taken as the complete ‹revealed truth›), and another one on suprasegmentals: primary and secondary STRESS, indications on LENGTH, and structural boundaries; but it is better to look directly at the whole chart. The same holds true of the DIACRITICS which from the ‹reform› point of view ought to be used to indicate modifications of ‹cardinal› values, in the hope of achieving a certain descriptive accuracy. On the other hand, INTONATION is completely missing, so much so that whoever tries to transcribe it within *offIPA*, according to the chart, is obliged to use the ‹difficultly delivered› notation for tones. Before the ‹reform›, there was an official notation system for ton(em)es which was more nimble and flexible and (almost) seemed appropriate to mark intonation too. From the pre-reform system, with adjustments and necessary expansions, we have derived the system we use in the true scientific parts of this *NPT/HPh* (☞ 8-23, and in *HPr*, as

well as in *M^{a}PI* and *D^{i}PI*, and in the various books in progress too).

Before preparing these sections, we had thought of leaving the readers with the task of evaluate what the official chart may offer. As the saying goes: *enough is as good as a feast* – but science is quite another thing... In addition, at many readers of *M^{a}PI*'s insistence, we re-propose for reflection ℂ 19 of the second edition of *M^{a}PI –¿to IPA or not to IPA?–* which shows the problems and limitations of *^{off}IPA* and other widely used phonetic alphabets, with respect to *^{can}IPA*. Some observations might sound repetitive –but are certainly not useless. As the ancient Romans wisely said: *repetita iuvant*...

How come the *IPA* is not used by everyone?

7.14. The International Phonetic Alphabet, officially born in 1888, is the most widely used system of transcription all over the world. Indeed, it has high inherent qualities of clarity, rigor, and non-provincialism, in spite of varied and colored resistance, in almost every Country, where anachronistically people continue to use heterogeneously several different notation systems, which are often contradictory and strangely mixed. All this happens more out of laziness and unwillingness to accept ‹innovations› than for respect of ‹traditions›.

However, the *IPA* is based on phonological principles, rather than phonetic ones, especially after the latest reform, of 1989 (‹de-worsened› in 1993 & 1996) – thus it would be more appropriate to call it the ‹International Phonemic Alphabet›, as we will see below. Nevertheless, besides providing a certain number of symbols and diacritics, it allows everybody the necessary freedom of expanding the number of diacritics and symbols, to satisfy various needs, as we have done in *NPT/HPh* (and in *HPr*), with the *^{can}IPA* symbols.

7.15. The first perfectly evident weakness of most phonetic alphabets resides in being devised by considering pronunciation as a by-product of writing, instead of vice versa, as it is obvious and evident: pronunciation precedes writing, all the more so that the latter, for many languages and mainly for most traditional dialects, does not exist yet or is not coherently standardized. ¿How many people in the whole world then can not read or write, although they speak their tongue as ‹perfect natives›?

All other phonetic alphabets are ‹provincial› since they stem from a very limited number of *letters*, which are generally those of an official orthography, with some additions or modifications. In order to increase, as is necessary and unavoidable, the number of ‹sounds› to be represented, several diacritics are introduced, which are often used in various orthographies, as well: accents, strokes, dots, dashes, &c, often in combinations of two, three, and even more. This inevitably makes writing, and especially printing, heavier; it also complicates reading, which sometimes becomes real deciphering, and not always with successful results. As a matter of fact, several authors, and also several editors and publishers, mix and confuse not only diacritics, but also basic symbols.

A further obvious weakness of these alphabets resides in their limited phonetic &/or phonemic reality, although they are often not based on functional criteria, but only on graphemic or, even worse, typographic principles for each language. Therefore, *a* may represent [ᴇ] in Denmark, [ɛ] in Australia, [æ] in England, [ᴀ] in France, [a] in Italy, [ɑ] in Finland, [α] in Norway, [ɑ] in the Arab countries, [ɐ] in India, [ɔ] in Bangladesh, [ɒ] in Hungary, &c. Equally, *r* generally has to represent not only [ɾ], but also [r], and even… [ʀ, ʁ, ʁ̞, я, ʀ̆; ɹ, ɻ, ɻ̟, ɹ̶; ɹ̶, ɻ̶; ɿ, ʑ, ʐ; ʓ, ɀ, ʔ, ʕ; ɺ, ɭ̢] in addition to [ɐ, ʌ, ʁ, ʌ̄]! &c, according to languages (which we will not state here, being so many, although readers can certainly guess).

As can be seen, it is no bright idea at all to use common graphemes for the realizations of one's own language. It would inevitably lead the various phonetic alphabets to become more and more diverse, up to the point of using identical symbols with different –even opposite– values.

On the contrary, a real scientific criterion obliges one to leave out of consideration any particular orthographic tradition, preferring not what may be *familiar* (and often localized too) but what is *widespread* (and so more general and practicable, intuitively enough). The only phonetic alphabet which is founded on this rigorous method is the *IPA*, and –not by chance– is *the* ‹International Phonetic Alphabet›. As a matter of fact, the choice of its symbols is based on a wider range of sounds and on the values most often assigned to them in the best-known and most widely spoken languages in the world.

Furthermore, another basic criterion is that *every* symbol represents *one* of these sounds, without needing to use diacritics, in order both not to have second-class symbols (and sounds!), and to make them readable –and writable– without problems or complex calculations to achieve the awaited values of symbols with one or more diacritics.

7.16. The *IPA* used to resort to diacritics only when they show some additional articulations or systematic modifications of basic articulations, but mainly when such characteristics can not be expressed with slight modifications in the shape of basic symbols, which are more economical and convenient for reading too. It goes without saying, however, that the *IPA* is thus more a ‹phonEMIC› than a ‹phonETic› alphabet. Indeed, using the present-day *offIPA* version, when it is needed to be more specific and precise, it becomes *necessary* to resort to some diacritics, which of course have their own rigorous and scientific value; but they make writing and reading less easy. Nonetheless, this is still better than other alphabets, which moreover use various and conflicting diacritics just to indicate articulatory timbres, or some of their nuances, as for instance: *ẹ/é* = [e], *ę/è* = [ɛ], *ọ/ó* = [o], *ǫ/ò* = [ɔ].

The (official) *IPA* then has [e, ɛ; o, ɔ], which can be shown as nasalized, for instance, without problems, indeed with definite advantages: [ẽ, ɛ̃; õ, ɔ̃]. On the other hand, when a vocoid is to be indicated which is neither [e] nor [ɛ] (or neither [o] nor [ɔ]), but intermediate between the two of them, the *offIPA* has two possibilities: either to ignore the difference (which is what other so-called phonetic alphabets, more often, do), but arbitrarily choosing between [e, ɛ], [o, ɔ]; or to resort to a diacritic such as [˕] for lowering, or [˔] for raising, with respect to (the position

of) the tongue dorsum. These (small-sized) diacritics can be put *under* or *over* a symbol (however, complicating writing, and especially printing), or *after* it (further complicating reading, though). The latter possibility is mainly practicable when one wants to precise a timbre in isolation [eᵀ, ɛᵢ, oᵀ, ɔᵢ], avoiding computer acrobatics.

7.17. However, it is much better to have unitary symbols as [ᴇ, σ], without having to renounce precision. These symbols belong to the expanded version of the *IPA* known as *canIPA*, which is rich of ‹necessary› symbols, both for precision and not to belittle a part of them, so as to make them ‹secondary›, or restricted, *ie* ‹diacriticalized›.

On the other hand, resorting to [eᵀ, ɛᵢ, oᵀ, ɔᵢ] for [ᴇ, σ] further reduces the potential and precision of diacritics, which may be necessary indeed for meticulous and competent phoneticians. In fact, it is often important to show, in addition to a mean value of [ᴇ] or [σ] (*ie* the ‹normal› or ‹central› value), also a closer ([ᴇᵢ, σᵢ]) or opener ([ᴇᵀ, σᵀ]) articulation, or a fronter ([ᴇˌ, σˌ]) or backer ([ᴇˍ, σˍ]) one; or even both closer and fronter ([ᴇ›, σ›]) or backer ([ᴇ‹, σ‹]) ones, or both opener and fronter ([ᴇ›, σ›]) or backer ([ᴇ‹, σ‹]). Incidentally, those who know the strange official use of [ˌ, ˍ] (for advanced/retracted ‹tongue root›, instead of a more logical [+, –]) will surely note their greater coherence and completeness.

Thus nine (9) –non-negligible– nuances are available for each vowel phone; besides, on quadrilaterals (*ie* vocograms) precision can be even greater. As a matter of fact, a *canIPA* vocogram contains 30 boxes (less four extreme peripheral ones, which are not usable, as will be seen below, § 7.18-9 & *fig* 7.2) which are doubled in number by possible additional lip rounding, for the amount of 52 vocoids, organized in 6 degrees of mouth opening (*ie* *high*, *lower-high*, *higher-mid*, *lower-mid*, *higher-low*, *low*) and 5 places of articulation (*front*, *front-central*, *central*, *back--central*, *back*) or 10 places if we separate rounded vocoids.

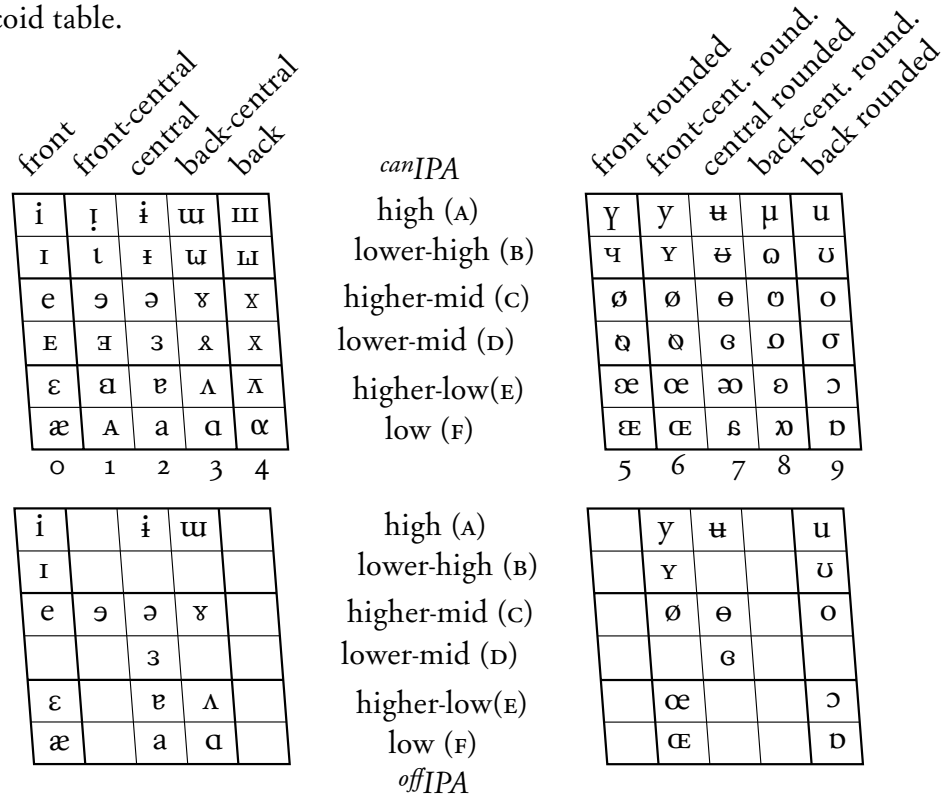
Instead, for the same articulatory space, the *offIPA* has only 28 vocoids, with 4 opening degrees (‹close, close-mid, open-mid, open›) and 3 places (‹front, central, back›); a kind of remedy for this deficiency has been the insertion of [ʏ], and quite messily also ‹[ɪ]› = [ɪ] and ‹[ʊ]› = [ʊ] (in addition to ‹[æ]›) and the *jack-of-all-trades* ‹[ə]›, which is being used –with considerable practical disadvantages– for (both primary and contextual) phones such as [ɨ, ə, ɜ, ɐ; ɯ, ɤ, ɤ̞, ʌ; ɘ, ɜ̞], and even [ɵ, ɷ, ɞ], up to [ɑ, ᴀ, a, ɐ̟] as well!

Obviously, also for consonantal phones, the *canIPA* version –in comparison to the *offIPA*– has many symbols more. But this, of course, is just a *possibility*, not an *obligation* at all. However, when people realize that it is possible and easy to be more precise, they are induced to precision, as a categorical imperative. The *IPA* has three ways of transcribing stopstrictives (*ie* ‹affricates›): a ‹monograph› ([ʦ], the best and smartest, the most respectful of the articulatory reality, and *canIPA*), a ‹digraph› ([ts], ambiguous and risky), and the use of a ‹bow› (together with a digraph: [t͡s, t͡s], oppressive and complicated). But, strangely enough, the monograph has been… ‹left out› from the *offIPA* chart.

Quick comparison between *offIPA* & *canIPA*

7.18. By taking the most official symbols and adapting them in a special table (fairly impoverished though, compared to the general one of the *canIPA* version), we will indicate in *italics* both the official symbols that would receive further values and the symbols and terms which are hardly recommendable (and which are worthwhile changing with some more rigorous and satisfying ones, given in the corresponding *canIPA* table, *cf fig* 7.3). However, at the beginning of this chapter we have already seen the *offIPA* table (*fig* 7.1), with the original terms and symbols, which are criticized in § 7.22-9, as is the missed reform of the *IPA*.

fig 7.2. Vocoid table.



7.19. As for the vowel quadrilateral ‹corresponding› to the *offIPA* position (*fig* 7.2), there are some empty boxes in the cases where one of two near official symbols ought perforce to be chosen (at considerable personal discretion to ‹decide› between one or the other).

The grey boxes indicate unused articulations in the different languages and dialects, since they would be ergonomically useless: in fact, they would produce a hardly evident auditory impression, in spite of an unnatural articulatory effort to combine on the one hand lip rounding with the highest degree of non-high advancement of the tongue, and on the other hand unrounding with the highest degree of non-low tongue retraction.

For the vocoid in 5-C the result would be a value which could be placed at the junction between [ʏ~ø~ɵ~ʉ], for 5-D [ø~ɷ~ɞ~ɵ], for 5-E [ɷ~œ~ɔ̈~ɞ], for 5-F [œ~ɶ~ɐ~ɔ̈]; for 4-A [ɯ~ɯ̽~ɨ~i̽], for 4-B [ɯ~ɤ~ə~ɨ], for 4-C [ɤ~ɤ̞~ɜ~ə], for 4-D [ɤ̞~ʌ~ɜ~ɐ]. Despite this, the *offIPA* continues to make people think that [ɯ ɤ ʌ ɑ]

correspond to column 4, and [y, ø, œ, œ] to column 5, and also that [æ] is closer than 0-F (‹zero›-F), where it persists in placing ‹[a]› = [A].

Obviously [a], which is the most widespread and frequent vocoid in the world's languages and dialects (irrespective of specific orthographies), is 2-F, and with good

fig 7.3. Partial table of *IPA* contoids for comparison.

*can*IPA	Bila-bial	Labio-dental	Den-tal	Alveo-lar	Postal-veolar	Postal-veo-dorsal	Pala-tal	Velar	Uvu-lar	Pharyn-geal	Laryn-geal
Nasal	m	ɱ	(n)	n	ɳ	ɲ̟	ɲ	ŋ	ɴ		
Stop	p b		t d	ʈ ɖ	ʈ̟ ɖ̟		c ɟ	k g	q ɢ		ʔ
Stop-strictive		pf					kx̟ gɣ̟				
Grooved st-st.			ʦ ʣ			ʧ ʤ					
Constrictive		f v	θ ð				ç ʝ	x ɣ	χ ʁ	ħ	
Grooved cons.			s z	ʂ ʐ	ʂ̟ ʐ̟	ʃ ʒ					
Approximant	ɸ β	ʋ	ð̞ ð̠	ɹ			ɧ j	ɻ ɰ	ʁ̞	ʕ̞	h ɦ
Rounded app.					ɻ̟	(ɹ̟)	ɥ ɥ̟	ʰʷ w			
Trill	ʙ			r					ʀ		
Tap & flap				ɾ	ɽ						
Lateral			(l)	l	l̠	l̠̟	ʎ	ʟ			
Constr. later.				ɬ ɮ							

*off*IPA	Bila-bial	Labio-dental	Den-tal	Alveo-lar	*Retro-flex*	*Postal-veolar*	Pala-tal	Velar	Uvu-lar	Pharyn-geal	*Glot-tal*
Nasal	m	ɱ	(n)	n	ɳ	*n̠/ɲ̟*	ɲ	ŋ	ɴ		
Stop	p b		t d	*t d*	ʈ ɖ		c ɟ	k g	q ɢ		ʔ
Affricate		*p͡f*					*c ɟ*				
Grooved *aff.*			*t͡s d͡z*			*t͡ʃ d͡ʒ*					
Fricative	*ɸ* ʬ	f v	θ ð				ç ʝ	x ɣ	χ ʁ	ħ ʕ	*h ɦ*
Grooved *fric.*			s z	*s z*	ʂ ʐ	ʃ ʒ					
Approximant	… …	ʋ	θ̞ ð̞	ɹ			*h* j	*h* ɰ	*ʁ̞*	…	… …
Labialized app.					ɻ̟	(ɹ̟)	*h* ɥ	*ʁ̞* w			
Trill	ʙ			r					ʀ		
Tap & flap				ɾ	*ɾ*						
Lateral			(l)	l	l̠	*l/ʎ*	ʎ	ʟ			
Fricative later.				ɬ *ɮ*							

reason indeed! It may be interesting to note that the rounded version of [a], that is [ɞ] (7-F), is instead the least used vocoid of all, together with [œ] (6-F); they both mainly remain as almost theoretical elements, since they are hardly distinguishable from [ɐ, a], especially if we consider the significant influence of coarticulation.

7.20. As for the tables of consonants (*fig* 7.3), it can be noticed that in the *IPA* one, again, terms and symbols in italics are less recommendable and often they must forcibly be used for different phones, for want of more precise symbols (to compare with those given in the *canIPA* table). But most of all we have to consider that in spite of the analyses (acoustic ones too) of many languages and the recognition of the difference between constrictives (‹fricatives›) and approximants, the *offIPA* continues to (let one) believe that [ɸ, β, ʕ, h, ɦ], which are real approximants indeed, are instead constrictives (as [ħ] actually is, though)!

Owing to the preservation of the inappropriate term ‹retroflex›, teamed with a good deal of hasty superficiality (which makes people still accept old descriptions based on outdated articulatory concepts with no objective verification or validity), the symbol [ɻ], at last officially accepted, is however assigned to the articulation of American English *r*, instead of more correctly to the British one. On the contrary, the latter is linked to the traditional symbol [ɹ], used for the alveolar place of articulation too (*ie* [ɪ]), whereas it would seem to be clearly evident and useful to use it for the most widespread and frequent articulation of American English *r*, which is a lateralized prevelar rounded approximant, although in the reduced and limited *canIPA* table we had to resort to a terminological device for the ‹postalveodorsal› column, which in this way also includes the most widespread (rounded or unrounded) postalveopalatal places of articulation.

7.21. Outside the official table there are some of the rarest consonantal symbols; although the voiced bilabial trill [ʙ] is certainly not frequent either! On the other hand, even [q, ɢ, ɴ] do not enjoy widespread use, except –relatively– [q]… But, again, the boxes were available. It is true, though, that in the official table there is no room for [w], even if this sound is really one of the most widely used in the world's languages. In the reduced *canIPA* version given in *fig* 7.3, in a convenient way, we have indicated both [w] and [ɥ] (and even [ʰɔ]). This last symbol is older and officially withdrawn, but we have retrieved it because it is much more suitable and in harmony with the series of approximants (as can be seen in the integrated table) than the official [ʍ] which also poses big problems of confusion with handwritten [m, ɯ], &c.

Again, outside the official table a pair of jack-of-all-trades consonants has been introduced –officially– which brings to minds the rough use of [ə] (*cf* § 7.17) from a phonetic point of view (not from a phonemic one). In fact, given the excessive scarceness of symbols for lingual constrictives, all those who must indicate some articulations, which do not fall within [s, z; ʃ, ʒ], believe they are ‹solving› the problem by resorting to [ɕ, ʑ], which are actually bilabialized grooved prepalatal articulations (although they have something in common, of course). In this way, according to different languages, variants, and dialects described, various authors

make [ɕ, ʑ] ‹correspond› to [ŝ, ṣ, ŝ, ʃ, ʂ; ẑ, ʐ, ẑ, ʒ, ʐ] (sometimes even to [ʂ, ʐ]!), in addition to sequences such as [ʃj, ʃj, ʂj, ʂj, ɕj; ʒj, ʒj, ʐj, ʐj, ʑj] &c. The same holds true of the corresponding stopstrictives (‹affricates›). After, a *canIPA* table is given (*fig* 7.4), although limited to the phones considered here. By careful observation, it will be apparent that its arrangement is more logical and rigorous (although the tables previously seen, *fig* 7.3, may look more familiar, since they have been around longer), in particular as far as the indication of voicing, or ‹voice›, is concerned; and with [ʔ] which can not be voiced nor voiceless indeed, as (since the vocal folds are in contact) no air passes through the glottis.

fig 7.4. Reduced table of *canIPA* contoids.

Bilabial	Labiodental	(n) Dental	n Alveolar	ɳ (Apico)Postalveolar	ɲ ‹Postalveo-dorsal›	ɲ Palatal	ŋ Velar	ɴ Uvular	ħ Pharyngeal	ʔ Glottal/laryngeal	Voice	
m	ɱ	(n)	n	ɳ	ɲ	ɲ	ŋ	ɴ			+	Nasal
p b		t d	ʈ ɖ	ʈ ɖ		c ɟ	k g	q ɢ		ʔ	− +	Stop
	pf					kç gʝ					− +	slit Stop-strictive
		ʦ ʣ			ʧ ʤ						− +	grooved
	f v	θ ð				ç ʝ	x ɣ	χ ʁ	ħ		− +	slit Constrictive
		s z	ʂ ʐ	ʂ ʐ	ʃ ʒ						− +	grooved
ɸ β	ʋ	ʊ ð	ɹ			ɧ j	ɧ ɯ	ʁ ʁ	ʕ	h ɦ	− +	Approximant
				ɻ	ɹ	ɧ ɥ	ɧ w				− +	rounded
ʙ			r					ʀ			+	Trill
			ɾ	ɽ							+	Tap/flap
		(l)	l	ɭ	ʎ	ʎ	ʟ				+	Lateral
			ɬ ɮ								− +	constrictive

The official revision of the *IPA* (1989-96): A missed reform

7.22. In these sections we will try to explain, with as much objectiveness as is humanly possible (since there is a limit to everything), the present situation of the International Phonetic Alphabet. Firstly, we can not help recalling once again that the most fitting formulation which, strictly speaking, correspond to reality should (and it is hoped will continue to) be the ‹International Phonemic Alphabet›. In fact, as it is now, it does not manage to objectively render the necessary phones

even for just one given language. Should knowledge really be only theoretical, that is abstract, this alphabet would be more than enough! But, seeing that many people can appreciate and use the advantages of practical articulatory phonetics (obviously not separated from theory, provided it is realistic, without frills or glottosophisms), it is clear right from the start that it is necessary to resort to something more systematic and rigorous (and not just vaguely ‹sufficient›). As a matter of fact, we are talking about the most ‹natural› *artistic science*, or about the most ‹general› *scientific art*.

7.23. Enough has been said in the previous sections about the evident vocalic deficiencies of the *offIPA*. Let us merely report one curiosity: during the spread of the reform, in 1989 and 1993, the vocoid [ɞ] always appeared as [ɔ]; only in the additions of 1996 the much awaited and required correction was finally made! As far as consonants are concerned, we have already managed to insert a few more with respect to the original setting. Again, we add some further ones in a slightly recast table presented in *fig* 7.3 (that are those put in a sort of ‹other-symbol› appendix there). In the overall treatment we will use our own more rigorous terminology: so we have the pair of bilabialized grooved prepalatal constrictives [ɕ, ʑ], the grooved velarized postalveolar constrictive [ʃ̴] (which, less intuitively, the *IPA* used to symbolize with [ʃ], or with the highly ambiguous present-day [ʃ], which is clearly hastily drawn by some designer who knew nothing about phonetics), the voiced alveolar lateral flap [ɺ], but represented with ‹[ɾ]›, by awkwardly overturning [ɽ], which used to indicate the voiced alveolar slit constrictive [ɹ] (found for Czech *ř*, or for Sicilian *r*-).

However, with an incredibly lively imagination, now some ‹epiglottal› consonants appear: ‹[ʜ, ʢ; ʡ]›, respectively: voiced and voiceless constrictives, and voiceless stop, which are actually just the ‹old› pharyngeal [ħ, ʕ] (in *canIPA*, more coherently they are rendered as [ħ, ʢ]: the former is a voiceless constrictive, whereas the latter is a voiced approximant, although in the official table it is still placed and defined as a constrictive). The corresponding stop is added too, [ʡ] (but, in point of fact, five further ones could be added: a voiced stop [ʗ], the *true* voiced constrictive [ɦ], a voiceless approximant [ɦ̞], and the corresponding trills [ʛ, ʠ]!). While, without bothering the epiglottis (which is there for different bio-physiological purposes), it is possible to add some rarer ‹prepharyngeal› constrictives and approximants, respectively –and more usefully– represented by [ʜ, ɦ] and [ɻ, ʕ] (by paying attention to the true value of *canIPA* [ʜ, ʕ], although this is definitely a kind of secondary articulatory area).

As an addition to the official table, we find the funny and awkward way of showing complex articulations by putting bows above (or even under, in the extra reform of 1996): [‿, ‿]: thus a voiceless dental stopstrictive [ʦ] more ‹officially› would be [t͡s], which goes canoeing, &c, and a velar-bilabial (or bilabial-velar) stop [k͡p] officially would be the heliophobous (or pluviophobous) [k͡p], &c.

7.24. In an added inset we find ejective contoids, marked (this time, by mutual consent) with an apostrophe, [ʼ], after the appropriate symbols of (voiceless)

stops, stopstrictives, and constrictives: [p', t', k', ʦ', s']. Surprisingly, voiced injectives (‹implosives›, or ‹preglottalized› contoids) have undergone the unwelcome influence of the (more or less official) orthographies of some African languages, which have in turn derived from old and inconvenient symbols. Thus [ɓ, ɗ, ʄ, ɠ, ƈ] would represent [ʾb, ʾd, ʾɟ/ʾʤ, ʾg, ʾɢ] (more often, [ʄ] would stand for a postalveopalatal rounded stopstrictive [ʾʤ], instead of a palatal stop [ʾɟ]).

It must be noted that, in our system, while ejectives are *followed* by an apostrophe: [C'], injectives are *preceded* by a (vertically) flipped apostrophe: [ʾC]; these are two ways not to confuse the two diacritics and their functions (which do not indicate articulations, but phono-articulatory *types*; thus it is legitimate indeed, in this case, to use actual diacritics): iconically [ʾ] also helps to remind one that with injectives the larynx lowers, whereas it raises, ['], with ejectives.

In 1989, the burning enthusiasm for exotic novelties on the one hand overlooked some surely more useful and necessary things, on the other hand it showed off –not in an appendix, but within the table– a whole absurd series of voiceless injective (‹implosive›) consonants, even with special symbols: [ɸ, ɬ, ƈ, ƙ, ɋ], which luckily had been definitely concealed as early as in 1993!

The same inset ‹presents› us with the colorful symbols for dejective contoids (or ‹clicks›) which are typical of some South African languages: [ʘ, ǀ, ǃ, ǂ, ǁ]; again, these are drawn from makeshift devices to typewrite some of those languages, but completely losing the articulatory link of phonetic reality, which is respected instead by the *canIPA* symbols: [ʿp, ʿt͡θ, ʿʈ, ʿʂ, ʿt͡ɬ], since their value can be easily inferred, even without technically defining them.

Official diacritics

7.25. Now we will give an exemplified account of the *offIPA* diacritics. As can be seen, a number of them are decidedly needless, since they are better represented by using symbols of the same rank, instead of ‹conditioned symbols› (by absolutely impracticable small marks above ◌̟ or underneath, which are very complicated to combine and print). We have already seen that English itself, the most transcribed language (mainly due to the considerable separation of its present-day orthography from actual pronunciation), arbitrarily has to resort either to [e] or [ɛ], to indicate [ɛ̝] which is an intermediate vocoid between the values of the two given symbols.

Thus, as we have generously said in previous sections of this chapter too, it seems quite obvious that it is more practical (and more effective for teaching purposes, and more appropriate for descriptions) to have a satisfactorily greater number of ‹basic symbols›, which may be on a par with the others, so that no one of them may be regarded as secondary or inferior because of the diacritics.

We will quickly present them, with indicative comments, for less experienced people. We will also consider (with better general adjustments) the *offIPA* table, already given in fig 7.1, to clearly show its inadequacy and various limitations and serious drawbacks.

Segmental diacritics

7.26. *Voiceless* (or rather *devoiced*) [◌̥], [n̥, d̥] (which is necessary); *voiced* (or rather with added *voicing*): [◌̬], [s̬, t̬] (more advisably substituted with more realistic notations such as [z̥, d̥] or, if necessary, [z, d], &c); *breathy voiced*: [◌̤], [b̤, a̤]; *creaky voiced*: [◌̰], [b̰, a̰] ([ḅ, ạ] are much better, since [,] brings [ʔ] to mind and thus the participation of the glottis, with irregular vibrations); *aspirated*: [ʰ], [tʰ, dʰ] (in case [tʰ, dʱ], but better still [th, dɦ] and other more precise possibilities for different degrees of ‹aspiration› strength).

Besides, *more rounded*: [◌̹], [e̹] (various *canIPA* vocoids settle the question better); *less rounded*: [◌̜], [e̜] (various *canIPA* vocoids settle this question better as well); *advanced tongue root*: [◌̟], [e̘] and *retracted tongue root*: [◌̠], [e̙] (again, various *canIPA* vocoids settle the question better, and also restoring to these two diacritics the values they very often had earlier [and still have for many non-dominated authors], that is those of the two following signs, in perfect parallel with the further two given soon after), *advanced*: [◌̟], [u̟] (rather [◌̟], [e̟]); *retracted*: [◌̠], [i̠] (which seems to be underlined, so [◌̠], [e̠] is much better); *raised*: [◌̝], [e̝, ɪ̝]; *lowered*: [◌̞], [e̞, β̞]; *centralized*: [◌̈], [ë]; *mid-centralized*: [◌̽], [ĕ] (that is diagonally centralized in the quadrilateral). As we have already said a few times, the richer number of the *canIPA* vowels seems to be more appropriate than the use of these last diacritics.

Furthermore: *syllabic* (or, better, *intense*): [◌̩], [n̩] (very important); *non-syllabic*: [◌̯], [e̯] (which is of very little account once we accept a truly phonic conception of syllables, *ie* phono-syllables, and not morphological-etymological, with grapho-syllables). Then, *linguolabial*: [◌̼], [t̼, d̼] (but [ɸ, ɓ] seem decidedly less odd and less bat-like); *rotacized*: [◌˞], [ɚ, ɑ˞] (but the *canIPA* system has no such vowels, which are better treated as intense laterally contracted approximants, or as sequences of vowels plus such [intense or normal] approximants which are about ten); *labialized*: [ʷ], [tʷ, dʷ] ([◌͡◌], [t͡, d͡] are much better); *palatalized*: [ʲ], [tʲ, dʲ] (again, [◌͡◌], [t͡ʃ, d͡ʒ] are much better, even compared to the old [◌ʲ], which was still better than the new official ‹solution›); *velarized*: [ˠ], [tˠ, dˠ] (if anything, [ᵚ], [tᵚ, dᵚ] for homogeneity and coherence, but [~], [ŧ, đ] are decidedly much better still); *pharyngealized*: [ˤ], [tˤ, dˤ] (but more often, instead, they are *uvularized*, so generally [~], [ŧ, đ] are sufficient); a velarized *l* is then [ɫ] (but for a uvularized *l*, which is darker to the ear, it is convenient to use [ɬ̠]); *nasalized*: [˜], [ẽ] (very important).

Furthermore, *dental*: [◌̪], [t̪, d̪] (but, [t, d] are realistically and statistically much more appropriate; *apical*: [◌̺], [t̺, d̺] (much better [ʈ, ɖ], &c); *laminal*: [◌̻], [t̻, d̻] (according to cases, [t, d; ʦ, ʣ; ʧ, ʤ; ʨ, ʥ], or something else); among the various *canIPA* symbols there are more satisfying answers (even if we are not considering here all possible cases). Lastly, *nasally released*: [ⁿ], [dⁿ] (which is better not to use, but to explain clearly); *inaudibly released*: [◌̚], [d̚] (which could conveniently be used for the previous two cases, to insist on the important difference with *canIPA* [◌*], [t*, d*] = *audibly released*).

Suprasegmental diacritics

7.27. *Primary stress*: [ˈ], [ˈe] and *secondary stress*: [ˌ], [ˌe]; *long*: [ː], [eː, nː], *half-long*: [ˑ], [eˑ, nˑ], and *extra-short*: [˘], [ĕ] (but, when necessary, a small superscript symbol is better: [ᵉ]); *syllabic break*: [.], ‹[ɹi.ækt]› (but instead dots at different heights [as before the ‹reform›] are ideal for indicating pitch without stress, or the *full stop* for tonemic conclusive intonemes; thus for marking syllabic division a hyphen is more appropriate, ‹[ɹi-ækt]›, and it is used at the end of a line too, but sometimes, as here, a stress symbol is sufficient ‹[ɹiˈækt]›; *minor* (*foot*) *group*: [|]; *major* (*intonation*) *group*: [‖]; *linking* (*absence of a break*): [‿].

Again, also for intonation, the *canIPA* signs are decidedly more complete and satisfying, and less ambiguous too. Before the ‹reform› a similar system was official, although not so complete.

Official tones & word accents

7.28. LEVEL (or CONSTANT) – *extra-high*: [̋], [ő], [˥] (rather [˙]); *high*: [́], [ó], [˦] (rather [¯]); *mid*: [̄], [ō], [˧] (rather [ˈ]); *low*: [̀], [ò], [˨] (rather [_]); *extra-low*: [̏], [ȍ], [˩] (rather [̩]). Among the *canIPA* signs we also have [¯] *semi-high* and [ˍ] *semi-low*. CONTOUR (or COMPOUND) – *rising*: [̌], [ǒ], [˩˥] (rather [/], or at least [ˏ]); *falling*: [̂], [ô], [˥˩] (rather [\], or at least [ˎ]); *high rising*: [᷄], [o᷄], [˧˥] (rather[ˊ]); *low rising*: [᷅], [o᷅], [˩˧] (rather [ˏ]); *rising-falling*: [᷈], [o᷈], [˧˥˧] (rather [^], or at least [ˊ·]). Utterance pitch diacritics – *downstep*: [ꜜ] and *upstep*: [ꜛ], *global rise*: [↗] and *global fall*: [↘]. (As many other intonation characteristics, even these can be shown better using the *canIPA* system.)

Furthermore, we have to recall that, also for level or contour tones, there are several other possibilities and combinations (which can adequately be expressed using *canIPA* symbols, without any problems) in addition to those indicated by the official source. However, too many people have considered them to be thorough and complete; on the contrary –alas!– even further things such as [ő, ō, ō, ô, ô, ǒ, ȍ, ő, ȍ, ő, ȍ, ő, ő] would be official… Equally, many people have thought they had to use the so-called ‹tone-letters› even within uninterrupted transcriptions, producing then such masterpieces as [ja˥pɔŋ˧ɤɯ˨˩˦wɐn˥˧sou˧˥˧] (even with spaces between syllables it would not be correct: [ja˥ pɔŋ˧ ɤɯ˨˩˦ wɐn˥˧ sou˧˥˧]). Tone-letters may have a certain practical functionality to show ton(em)es in isolation, since the vertical bar is a constant point of reference, especially in handwritten samples; but generally (square) brackets are sufficient and even better for this function.

As far as *intonation* is concerned, the official reform has practically ignored it, by supplying only phonemic and tonemic signs, and only for tonemes; but nothing more.

7.29. In conclusion, this is the story of a reform carried out very badly. But, given that it is something official, very many misinformed people have accepted it as complete and even satisfactory, by going so far as to adapt the reality of languages

to the ‹official› chart. Too many books and articles have been published where Italian (and many other languages) would have ‹alveolar› [t, d; ʦ, ʣ; s, z] (*ie* [ʈ, ɖ; ʦ, ʣ; ʂ, ʐ]) and ‹postalveolar› [ʧ, ʤ; ʃ, ʒ] (*ie* [ʦ, ʣ; ʂ, ʐ]!), since the unfortunate official table of consonants under *dental* seems to locate only [θ, ð]. Even [æ, a] are misleadingly placed, as we have already said, but many people continue to believe that statements such as those are true (while they are clearly not so), although it would be quite easy to settle the matter once and for all, by simply doing some actual articulatory and auditory phonetics, which cannot be substituted by acoustic phonetics, since all the most sofisticated instruments of this world cannot do anything at all, especially if the only possible references are based on ‹deskwork phonetics›! However, even acoustic analyses have demonstrated that [æ] is really low front.

To finish, after well-pondered reflection, we decided to provide an almost complete table of the *canIPA* contoids, fig 10.1 (while vocoids are also given in fig 7.2). This has been done both in order to encourage (perhaps even to reward – ¿why not?) the most interested people, and to discourage (and to caution in time) the *less* interested –and above all the *non*-interested– people. In fact, nobody obliges us to study these things in depth, except for a real personal, social, professional, and cultural interest (and more still).

Although these symbols are undoubtedly many, they have the clear advantage that, once one has entered the spirit of *natural phonetics* (*ie* articulatory, auditory and functional), the value of each symbol is easy to ascertain, according to its position in the table and to the values of nearby symbols, although they do not include the whole of our articulatory figures (*ie* orograms) for every symbol (but in Ch 10 they are all shown). It is obvious, however, that a keen interest is necessary, together with sheer perseverance and systematic personal, articulatory and auditory training, also using a (good) taperecorder with earphones.

About non-*IPA* alphabets

7.30. Moving back to provincial alphabets, which as we have said ‹disseminate› many diacritics to indicate timbres, which would be more logically expressed with unitary and ‹primary› symbols: none of them would be a second-class symbol. Let us make an extreme case to show their limitations: *IPA* [œ] is generally rendered as ø̈, and [œ̃] = ø̃̈, often [ˈœ] = ø̋, and consequently [ˈœ̃] = ø̃̋, and [ˈœ̃ː] = ø̃̋̃! The *IPA* convention of putting [ˈ] before a whole stressed syllable has the obvious advantage of not making notations heavier while simplifying reading; it also shows (phono)syllabic boundaries, which is often of fundamental importance both for pronunciation and actual understanding of transcriptions.

Let us pass over the various traditional terminologies, which are often pure fantasy or based on unscientific misbeliefs (cf the observation at § 1.7). Certainly, they do not make comparisons between different alphabets easy. Indeed, in the case of these alphabets it would not be useful to present vocalic and consonantal tables, like those we have seen for the *IPA*, since they are even poorer and more arbitrary.

Therefore, we will just give some lists of correspondences, to help the readers; but we must make it clear at once that often symbols and diacritics are used with little skill and even less attention (not only by typesetters).

In order to do this, and just this once, we will adapt ourselves to misleading graphemic criteria; as a matter of fact, those who consider phonetic symbols like alphabetic letters are doomed to failure, since they remain bound to the values each letter has in their own language. For all these, phonetic (and even phonemic) transcriptions are an awful nuisance they would be glad to avoid. Indeed, sometimes this is preferable, since when they find they have to make a transcription, the results are, to say the least, picturesque. In this way, monumental errors are spread, and incredible phonic beliefs arise which are often groundless but spread as widely as epidemics, and afterwards are difficult to fight and correct.

Let us give a notorious example: Mandarin Chinese phonology has been undermined for practically a century by a very strange belief about two alleged ‹apical vowels› which Karlgren in 1915 represented as ɿ and ʅ, referring to our [ɯ, ɻ̩]; the former is a high back-central (unrounded) vocoid, whereas the latter is an intense postalveolar approximant. Even *Pinyin* (the official romanized spelling for Mandarin) has been misled, and in fact uses *i* for [i, ɯ, ɻ̩], because they are all interpreted as belonging to one phoneme /i/, so that [ɯ] occurs after /ʦ, ʦh, s/, [ɻ̩] after /ʈʂ, ʈʂh, ʂ, ɻ/, and [i] after any other consonant, including ‹/ʨ, ʨh, ɕ/›. In our analysis (cf ℭ 11 of *HPr*) we have /ʦ, ʦh, s/+/ɯ/ [ɯ], /ʈʂ, ʈʂh, ʂ, ɻ/+/ɻ̩/ [ɻ̩], and (for any other C) /C/+/i/ [i] (including /ʦ, ʦh, s/ → [ʨ, ʨh, ɕ], by assimilation). Regardless of the particular phonological interpretations chosen, the actual phonetic facts are that we have [i, ɯ, ɻ̩], as acoustic analyses also show. Instead, most descriptions are still based on Karlgren beliefs and have to force the facts to match the position according to which *i* /i/ would have the variants ɿ and ʅ (even placed on actual trapeziums near /i, y/, as if they really were ‹apicalized› and ‹retroflexed› [i]!). In an article unfortunately published in the *Journal of the International Phonetic Association* (2003), they are both transcribed as ‹[ɻ̩]› and described as ‹(apico-)laminal denti-alveolar› (where no groove is mentioned, of course) and ‹apical post-alveolar› approximants respectively. The latter is correctly described (*ie* ^{can}[ɻ̩]), while the former is still not (*ie* ^{can}[ð̩]); there is a great (articulatory, auditory, and acoustic) difference between [ð̩] and [ɯ].

7.31. Scholars and students of linguistic subjects, such as language history, philology, dialectology, glottology and linguistics (and further subdivisions) ought to be able to skillfully use different phonetic alphabets, managing to pass from one to another without big problems, except for the ambiguities inevitably caused by the lack of scientific bases of many of these alphabets. Even mental idleness, which make people stick to questionable definitions and representations, does not seem to be justifiable at all. Actually, even those who are mainly interested in linguistic evolution, lexicology or lexicography (perhaps of dialects), or morphosyntax, or other linguistic aspects, should not ignore phonetic notation and its careful uses.

It might seem logical and necessary to think that ‹intellectuals› in general, and especially those who devote themselves to linguistic subjects, first of all should care

–with loving conviction– for the phonic aspect of their own language (and even of others). Unfortunately, reality is gloomier: the implacable enemies of language are often exactly those people who unashamedly (or even unawarely) misrepresent it. And what to say about transcriptions using capital letters at the beginning of sentences or for names?! Still such mistakes are found even in linguistics books and grammars written by university ‹experts› –not by novices!– and not only in the first printing of the first edition…

While even children, whether they are exposed to phonetics or not, know that ‹sounds can not be upper-case, so much so that there is no difference between *frank* and *Frank*, or *smith* and *Smith*, which are /ˈfɹæŋk/ and /ˈsmɪθ/ in any case› (leaving aside… *randy* and *Randy*), certain books ‹present› things such as */ˈHuː ɪz ˈKeɪt/, instead of /ˈhʊuz ˈkɛɪt/ (or at least /ˈhuː ɪz ˈkeɪt/) *Who is Kate?*

Comparison with the main non-*IPA* symbols used in Romance studies

7.32. Since there are so many different symbols, in different publications, often

a	[a]	*h̵*, *χ*	[ç]	*r*	[ɪ/ɾ]
ä	[æ/ʌ]	*i*	[i/ɪ/ι/ɪ̣]	*ṛ*	[ɤ, ɾ] **
å	[ɑ/ɐ/ʌ]	*i̇*	[i/ɪ̣]	*r̂*	[ʁ/ʁ/ʁ]
â, *ã*	[ã]…	*i̯*	[ɪ/ι]	*s*	[s/ʂ]
ā, *a*/	[aː]…	*i̯̇*	[j(V), (V)i]	*ś*	[ʂ/ʂ, z/ʐ]
b	[b]	*i̊*	[ɯ/ɯ]	*š*	[ʃ/ʃ̰, ʄ]
ƀ, *ƀ*, *β*	[β]	*j*	[j/j̰/ɡj̰]	*ſ*, *ṡ*	[z]
č, *ć*, *ĉ*	[ʧ/ʧ̰]	*k*	[k]	*ſ́*	[ʐ/ʐ̰]
c̋	[kç/c]	*l*	[l]	*ſ̌*	[ʒ/ʒ̰]
ɛ̀	[V∫V] *	*l̥*	[l̰]	*t*	[t/ŧ/ƭ]
d	[d/ɗ/ɖ]	*l̓*, *ɬ*	[ʎ/l̰]	*ṭ*	[ʈ/ƭ]
đ, *ɗ*, *δ*	[ð/ð]	*ɬ*	[ɬ, ʎ]	*ŧ*, *ϑ*	[ð/θ]
d̥	[ɖ/ɖ]	*m*	[m]	*t̓*	[ʦ/c]
e	[e/ɛ]	*m̛*	[ɱ]	*u*	[u/ʊ/ɷ/µ]
ẹ	[e]	*n*	[n]	*u̥*	[u/µ]
ę	[ɛ/ɛ]	*n̓*, *ñ*	[ɲ/ɲ̰]	*u̥̇*	[ʊ/ɷ]
e̯	[ɪ/ɪ]	*ṅ*, *ṇ*	[ŋ]	*u̯̇*	[w(V), (V)u]
e̲	[æ/ɑ/ɛ]	*o*	[o/σ]	*ü*	[y/ʏ]
e̊	[ɤ/ɤ/ʌ]	*o̥*	[o]	*ü̥*	[y/ɣ]
ë, *ə*	[ə/ɜ/ɨ]	*ȯ̥*	[ɔ/σ]	*ü̥̇*	[ʏ/ʉ]
f	[f]	*ȯ̯*	[ɷ/ʊ]	*v*	[v]
g, *ġ*, *ĝ*	[g]	*o̲*	[ɒ/ɐ/ɔ]	*z*	[ʦ/ʦ]
ǧ, *ǵ*, *ẑ*	[ʤ/ʤ]	*ö*	[ø/ɷ/œ]	*ƶ*	[θ/ʧ]
g̋, *ŷ*	[gj̰/ɟ]	*ö̥*	[ø]	*ž*	[ʒ]
ǥ, *ɡ*, *γ*	[ɣ/ɦ]	*ö̥̇*	[œ/ɷ]	*ʒ*, *ź*, *ż*	[ʣ/ʤ]
ġ	[VʒV] *	*p*	[p]	*ʒ*	[ð/ðð]
h, *ɦ*	[x/h]	*ƥ*, *ᵽ*, *φ*	[ɸ]		

* Often used for Tuscan, as if they were different from short *š*, *ž*! ** Traditionally used for Sicilian ‹*ɾ*›, instead of [ɤ]! (and *ṭṛ*, *ḍṛ*, [tɤ, dɤ] as well, as if they really were [ʈɻ, ɖɻ], ‹*ʈɾ*, *ɖɾ*›)!

even by one and the same author, it will not be useless to show (*in italics*) the main variants, at least for the most important and frequent sounds. Several variants are clumsy and ambiguous, others have very different values from the *IPA* ones (as: [z, ʒ, ʃ, c, y, χ, ɬ]). At first, it might seem that things are uselessly more complicated.

The most important thing, however, is to consider every symbol as an attempt to overcome the ambiguities implied by traditional orthographies. In addition, as we have already said, even symbols severely suffer from typographical and imaginative limitations, which often ‹force› one to make inappropriate choices or not to choose. The first list (*ie* from italics to *IPA*) is intentionally more limited. Roman

[i]	*i̱ í ī*
[ɪ]	*i ɪ ɪ̱ í̱ ì ĭ e̱*
[e]	*e̱ é e̱*
[ɛ]	*e̱ ê ë*
[æ]	*ɛ e̱ ë ä a a*
[ɪ̟]	*i ɪ ɪ̈ ï̱ í̱ ì ï e̱*
[ɪ]	*i ɪ ɪ i̱ í̱ ì ï e̱ ə*
[ə]	*i ɪ ɪ ɪ̱ i̱ í̱ ì ï e̱ e̱ e ə*
[ɜ]	*e ɛ ə ë e̱ e̱ e̱ e̱*
[ɑ]	*ɛ ə e̱ e̱ ë è e̱ e ä*
[ʌ]	*æ a ą a̱ à a ä e̱*
[ɨ]	*ï ÿ i ɪ ɪ̱ i̱*
[ɨ]	*ï ÿ i ɪ ɪ̱ i̱ ë ė e̱ ə*
[ə]	*ë ė e̱ ă &*
[ɜ]	*ë ė e̱ ă ɐ ə &*
[ɐ]	*ʌ a̱ ɑ ë ə*
[a]	*ą a̱ à a*
[ɯ]	*ɨ ï u̱ u̇ ů u*
[ɯ]	*ɯ ɨ ï u̱ ʊ ə*
[ɤ]	*ə ɯ ʊ ɨ ï ë*
[ɤ]	*ɤ ə ɜ ɐ ʌ ë*
[ʌ]	*ɐ ə ɜ ɑ ë*
[ɑ]	*a ɑ ɑ a̱ å â á*
[ʌ]	*ʌ ɐ ə ɜ a ɑ å â ɑ ɒ ɔ*
[ɑ]	*a̱ å â á a ɑ ɑ ɒ ɔ*
[ɣ]	*y ɥ ʏ*
[ɥ]	*y ʏ ɥ*
[y]	*ü ʉ*
[ʏ]	*ü u̱ ʉ*
[ø]	*ö ö̱ œ*
[ɷ]	*œ ö ö̱ ǫ̈ ǫ̈*
[œ]	*ö ǫ̈ ǫ̈*
[ɶ]	*œ ǫ̈ ǫ̈ ö*
[ʉ]	*ü y ʏ*
[ʉ]	*ʉ ü ʏ ɵ ü̱*
[ɵ]	*ø œ ö ə*
[ɷ]	*œ ø ö ə ɜ*
[ɐɔ]	*œ ö ɜ ɐ ʌ ɔ*
[ɞ]	*œ ö ɐ ɔ ɒ*
[ɯ]	*u ü ʉ ʊ*
[ɷ]	*u ʊ ɯ*
[ʊ]	*o ö ɵ*
[ɒ]	*o ɔ ö*
[ɐ]	*ɔ ö ʌ*
[ɷ]	*ɔ ö ʌ ɒ o̱ ǫ̈ ɑ ɑ å â*
[u]	*u̱ ú û ū ʊ*
[ʊ]	*u u̱ u̱ u̇ ů ù ŭ o̱*
[o]	*o̱ ó o̱*
[ʊ]	*o ɔ ó ò ô o̱*
[ɔ]	*ǫ o̱ ǫ̈ ò ë ɒ o*
[ɒ]	*ɒ o̱ ǫ̈ å ɔ ɒ o*
[ɸ]	*φ ᵽ ᵱ pɦ*
[β]	*ƀ ɓ bɦ*
[pf]	*pf p̂f p̌*
[ɓv]	*bv v̂ b̌*
[θ]	*þ ϑ ŧ tɦ ʒ̧ ʂ ţ*
[ð]	*đ ɗ ɗ dɦ ʒ ẓ*
[ʊ̈]	*θ ŧ ŝ*
[δ]	*ð đ ɗ ẑ*
[ʦ]	*ts ŝ tz z c ź ʒ*
[ʣ]	*dz ẑ ds dʃ dʒ ʒ ʒ́ ź ż*
	ż ẓ ʒ
[s]	*s*
[ʂ]	*s ʂ ś ś*
[z]	*ʃ ś ż ṡ ʂ ʃ*
[ʐ]	*z ẓ ź ź ʃ́ ʃ*
[ʧ]	*tʃ s ǎ c ĉ ć ċ tš ťš ťś*
	ê ŝ
[ʤ]	*dʒ z ǧ ǰ ž ɟ ĵ ġ ǵ dž*
	dʃ̌ dʃ̌ dʃ̀ ĵ ŷ ẑ
[ʃ]	*š ś é ė ɛ*
[ʒ]	*ǰ ʃ̌ ʃ̀ ž ġ j ʃ̀ ǰ*
[ç]	*ẖ ẖ́ ẖ̀ ẖ̂ ̈ẋ ŷ χ*
[j̊]	*ɻ ɻ j y*
[c/kç]	*k̨ ť ť ť̀ ţ ťẖ ţẖ č čẖ*
	k ć
[ɟ/gj̊]	*g̨ ɟ d̀ ĵ ď ḍ ďj ǧ ǧj*
	ŷ ĝ ǵ
[k]	*k̀ k̂*
[g]	*g ġ ĝ*
[x]	*h ẖ ẖ̀ ̈ẋ χ ẋ c kɦ ŧ k*
[ɣ]	*g̈ g̈ j̈ ɻ gɦ*
[h]	*ḥ ʿ*
[ɦ]	*h ʾ ḥ*
[ŋ]	*n m m̥ ɱ*
[ɲ]	*n ŋ ɳ ɴ n, ń ń ṅ n̓*
	ñ
[ɲ]	*ñ n ń ṅ n̓ ń n̂ ɲ*
[ŋ]	*n ᵑA ṅ ɲ*
[l̥]	*l l̨ ɬ ɭ l, l̓ l̥ ŧ*
[ʎ]	*l̨ l̓ l̥ l̓́ ľ ĺ ɬ ɬ l̨*
[ɬ]	*ɬ l*
[r]	*r̨ r̄ ʀ*
[ɾ]	*r̨ r ʼʏ*
[ʀ]	*r r̂ ʼʏ*
[ʁ]	*r r̂ ṙ ǫ̂ ʼʏ*
[j]	*y i̱ ĭ i*
[w]	*u̱ ŭ u*
[ɥ]	*ü ẅ ü y*
[ˈa]	*ʾa ʿa á à a' a᾽*
[ˌa]	*ˌa ˌa à a a' a''*
[õ]	*ô oⁿ*
[oː]	*oː o˛ oo ō oǫ*
[n̩]	*ᵊn n̥*
[n]	*n̩*
[ˈɶ̃ː]	*ǫ̈̃ ö̃˛ⁿ*

symbols are ^{off}*IPA* (and also ^{can}*IPA*) symbols, those in italics (in the second list, *ɪe* from *IPA* to the others, § 7.33) also include some of their previous versions and several taken from non-*IPA* alphabets (as they are often mixed).

Let us then carry on this pathetic operation (square brackets contain ^{off}*IPA* or ^{can}*IPA* symbols. Symbols are ‹rigorously given in alphabetical order›, mixing vowels and consonants, and with no distinction among manners of articulation. Of course, here we are doing this to demonstrate how a graphic-mnemonic approach to phonetic symbols is difficult and unfruitful. In fact, the most profitable way obviously is *from sounds to symbols* (using the more appropriate ones).

From a couple of *IPA*'s to many different non-*IPA*'s

7.33. We will provide here (on the next page) the variants of some phonetic symbols, starting from the (^{can})*IPA* values to reach several different alphabets, among the most widely used ones. It is important to note that there is no necessary correspondence with those just seen. As a further ‹sadistic› contrast, we will continue according to scientific categories, within the basic subdivision between vowels and consonants. Thus, we will first give the (^{can})*IPA* symbols – roman and in brackets, a byword for a scientific method, in contrast with those who go as far as to put graphemes between slashes, as if they were phonemes, in a false attempt to be scientific!

The phonetic alphabet of the *Atlante Linguistico Italiano* (‹Italian Linguistic Atlas›): Another example not to follow!

7.34. With the publication of the second volume of the *Atlante Linguistico Italiano* (1996), the list of the symbols used is provided, at last. In the first volume (1995) nothing of the kind was given, although a certain number of symbols had changed in comparison with bulletins previously issued. Such a list is very concise: a 38 × 50 *cm* wall sheet (plus margins) with medium-to-small-sized typefaces. But most disappointingly, they are not explained; they are just listed in a kind of alphabetical order. Sometimes we find indications corresponding to *Tuscan*, *Italian*, *Spanish*…; at other times some explanations are attempted, but often they are confused and very approximate, so that they give rise to more doubts than answers (to trained phoneticians as well).

In short, it is a ‹phonetic› alphabet which does not consider phonetic types, but rather graphic types to be artificially distinguished by unlawfully using disorganic and scrappy diacritics and graphemes, which have not been expressly devised. Even vowels are severely ‹writing addicted›, which is the major drawback of these phonetic pseudo-alphabets and shows the absurdity and incongruity of representations (and equalizations) such as (where slashes separate unstressed from stressed ones): *o̤*/*ọ́*, *ọ*/*ó*, *o*/*o*ˈ, *o̲*/*ò*, *o̲*/*ò*!

But is this algebra or phonetics? It would have been more logical to have *o̤*/*ọ́*, *ọ*/*ọ́*, *o*/*ó*, *o̲*/*ó̲*, *o̲*/*ó̲*; or, better still, even simplifying both composition and the sign in-

ventory: o̤/ˈo̤, o̜/ˈo̜, o/ˈo, o̲/ˈo̲, o̬/ˈo̬. So why do we not remove all those troublesome diacritics (which certainly do not facilitate either reading or composition)? These five blocks ought to be distinguished according to closing/opening degrees. On the other hand, how open can *a*-sounds be? According to certain false interpretations, they could indeed be well over the actual vowel space in the vocogram!

7.35. Unfortunately, these possibilities are not generally applied according to phonetic criteria (relating to the articulatory space in the vocogram), but rather by progressively drifting away from what subjectively is thought to be more common, more normal, more familiar. When some difference is perceived, a diacritic is searched with the aim of indicating it, while remaining linked to graphemes, on affinity grounds, or even because dominated by etymology! So it could happen to find u̬ when there is a ‹wish› for a given *u* to be very open, but o̤ when the ‹wish› is to have a very closed *o* sound; but in all likelihood there may be just one phone (or the two are very similar) to be represented with the same symbol. As a matter of fact, this phonetic alphabet ‹would provide for› even 85 vowel *phones* (against the 52 of *canIPA*, that some think are too many!). But that is not enough: in fact, the *symbols* are 85 × 2 = 170 (!), counting the awkward and troublesome accents *over* the vowels too. Of these 170 symbols, only 10 are free from diacritics, whereas 14 other ‹symbols› have three diacritics (3!); all the other have one or two! Is this not ‹diacritico-cracy›...?

Seven vowels, which were probably considered to be primary, are not explained at all: *i*, *e*, *ä*, *ȧ*, *a*, *o*, *u*. According to phonetics' logic and articulatory possibilities, they have the indicative value of [i, ɛ, æ, a, ɑ, ʊ, u]. Seven further vowels, *y*, *ə*, *ë*, *ü*, *ö*, *u̇*, *o̊*, are absurdly and uselessly ‹explained›. Their values ought to be: [ɨ, ə, ɤ, y, ɵ, ʉ, ɞ]. Furthermore, we find three ‹velarized› vowels, ɛ, ɑ, ω, which could correspond to [ɜ, ɐ, ʌ]. Each one of these 17 vowels, as we have seen, can be modified by diacritics five times, plus five more, due to the possible addition of accents!

7.36. As far as the consonants of the ALI are concerned, the situation is even worse. There is a limited number of graphemes, mostly from the Latin alphabet, with some stylistic variations, and a few Greek ones; they are often exemplified, whereas in other cases the readers are lost, faced with fictitious definitions, which are more confusing than indicative. Besides, not rarely there are symbols or, more often, combinations of symbols, sometimes as superscript characters, or with various diacritics which are not specific but ‹recycled›, for about 90 phonetic values.

However, a number of these combinations also indicate (true or presumed) fluctuations between other articulations, which are then generally wild and indecipherable.

Finally, let us draw a veil over all this by exemplifying an emblematic case: [s, ʃ] are represented by ‹*s*, *š* (Italian *sale*, *scena*)›; then several combinations with diacritics are presented, and *ṡ*, *ṡ* are among these. The funny thing is that one is ‹explained› through the other which, obviously, is as cryptically ‹explained› by referring to the previous one! In fact, we are told that *ṡ* is ‹between *s* and *ṡ*› and that *ṡ* is ‹between *ṡ* and *š*›; it is likely that they are [ʂ, ʂ] respectively. But why not say that

in a clear and firm way? On the other hand, several further cases are even more ambiguous. After some more diacritics, we also find some sounds used to spur or call animals. We have isolated the clicks (or dejectives): ‹>*p*'<, >*t*'<, >*tl*'<, >*k*'<› = [ʿp, ʿtθ, ʿtɬ, ʿʈ].

Furthermore, in the volumes containing the survey proceedings there are dozens and dozens (and dozens) of further symbol combinations (even reduced and superimposed) and further diacritics, which are generally not explained at all!

7.37. By now, it should be a known fact that the only clear and valid way to make the values of sounds understood is to show their articulations, by means of appropriate *figures* (orograms, rigorously drawn, but without useless frills), connected with *symbols* (not graphemes made up with some disturbing diacritics). Whenever it is possible, it is useful to add some references to well-known languages, but with no fear to introduce less-known ones too. As a matter of fact, when a correct *example* has been given, comparisons and verifications are always possible. Instead, with no example, there is little left to do…

Without all this everything is vague and unclear. This situation is congenial only to those who content themselves with superficiality.

Observations on the (non) ‹respect› of symbols

7.38. Too many printers, editors and publishers (even important ones) seem happy with symbolic approximation, either because they do not know, or cannot appreciate, what rigor and internal harmony there is in the symbol inventory. Even authors are often not sufficiently informed ‰r refined; or else they are subjected to typesetting limitations. Even without moving away from *offIPA*, and even in Great Britain where the *IPA* is more used than ever, we too often find cases such as those which follow.

The most serious, and too frequent, is the confusion and exchange of symbols with completely different values, even vocoids vs contoids, as (the problem is within pairs – the first symbol is the correct one): [ɣ, ɤ], [θ, ɵ], [ə, ɘ], [ʊ, ʊ], [ɬ, ɬ], [x, χ], [ɲ, ŋ], [ŋ, ɳ].

7.39. Then we find undue substitutions with ‹normal› letters (or ‹special› ones for computers): [ʃ, ʃ], [ʃ, ſ], [ʒ, ʒ], [ʒ, ʒ], [g, g], [ɪ, ɪ], [ɪ, ɪ], [ɲ, ñ], [β, ß], [ʀ, R], [ɪ, I], [ʊ, U], [ʏ, Y], [ɢ, G], [χ, X], [ʔ, ʔ], [ː, :], [ˈ, ’] (or [ˈ, ‘]) and [ˌ] rendered as [,]. And it is a hard task indeed to try to make typesetters notice the (obvious) difference, especially when lower-case signs are concerned! Try it and see… Some even put a space after [:] and [,] (which they use for [ː] and [ˌ]); others on the contrary (especially in the English-speaking countries) do not take the trouble to put the legitimate space after commas separating symbols, so they are able to produce strings like ‹/ɪ,ɛ,æ,ʌ,ɑː,ɒ,ɔː,ʊ,ɜː,ə/› (for the most readable and legitimate sequence /ɪ, ɛ, æ, ʌ, ɑː, ɒ, ɔː, ʊ, ɜː, ə/) even for *all* the phonemes of a given language (30 or 40 elements, and even more!).

We also find the absurdity of ligatures used with phonetic symbols: [fi, fi], [fl, fl], [ff, ff], [ffi, ffi], [ffl, ffl], and the opposite absurdity is found too (*ie* ‹false ligatures› for phonetic ligatures or *monographs*): [ʦ, ʦ], [ʣ, ʣ], [ʧ, ʧ], [ʤ, ʤ] (and even [t͡ʃ, t͡ʃ], [d͡ʒ]).

7.40. Then come substitutions with Greek letters: [ʎ, l], [ɸ, f], [ɸ, F], [β, b], [ɣ, g], [θ, y], [ð, d], [ŋ, h], [ɳ, m], [ɲ, m], [ɑ, a], [ɪ, i], or Cyrillic ones: [ɸ, ф], [k, к], [ʁ, я], [ɳ, ч], [ɛ, є], [ʒ, з] (there is an actual difference even between the last two signs). In addition, we find that the ‹phonic zero› – /∅/, [∅]– can be represented with the symbol of the vocoid [ø], instead –at least– of ‹diameter›, ‹⌀›, which at times is used for /ø/, [ø] instead.

Lastly, we also find symbols not drawn by phoneticians, but by some inaccurate persons (of no scruples or principles), which are purchased by linguists and phoneticians too! It is sad to see that even the *Journal of the International Phonetic Association* uses them (although years ago it used to use some absolutely despicable ones!): [ɟ, ɟ], [ɟ, ɟ], [ʝ, ʝ], [ʩ, ʩ], [ɻ, ɻ], [ɬ, ɬ], [ɣ, ɣ]. A rather weird idea was the substitution of [ɤ] with [ɤ], to –pointlessly– try to avoid it being confused with [ɣ] (which, as is apparent in the official version, *ie* [ɣ], dangerously has too small a loop). In fact, again, even in the *Journal of the International Phonetic Association* [ɤ] has been used in place of [ɣ] (2003, 33/2, p. 262)!

7.41. Not to mention then the undue and undesired substitutions that, too frequently, are to be found even in serious texts… The use of mixed symbols is particularly insulting: ‹/ˈbɛl/ or ‹/ˈbɛl/ (obviously for /ˈbɛl/); or ‹[ˈbʺÄl]; or else ‹/ˈbɛl/, ‹/ˈbɛl/. Besides, today, it is a mark of great and guilty slovenliness to publish transcriptions such as those just indicated. There are computer programs (although it is true that not all of them are really good), which enable phoneticians to produce all the symbols they need, by really making them as they should be done (so to say… ‹as Phone commands›).

7.42. Since the *offIPA* has told the world about its (sham) reform, the authors of linguistics books feel obliged to insert an appendix with the chart of the *IPA*. However, this ‹fashion› is (almost) always *old*, since the version of the inserted chart is (almost) never the latest one, even for books appearing many years after the latest revision. This does not happen only in the ‹colonies›, but also in Great Britain and North America, where novelties arrive first, since they are generally produced there. There are new books that still appear with the chart revised in 1993, instead of 1996 (or partially so, in 1989), or even in 1979, or in 1951 too!

Above all, many people are not even able to make the necessary corrections of misprinted symbols, on the contrary they often add some new (even serious and embarrassing) ones. For instance, in 2002 in Italy a book bearing the title of *Linguistica elementare* (‹Elementary Linguistics›) appeared; it is a second edition (although it is defined as the *ninth* one… – the first one was dated 1998!) and it reproduces the chart of 1989! Among the mistakes it contains, and excluding here foreign languages, we cannot help pointing out the highly misleading ones referring to the Italian lan-

guage and some dialects: according to this book, Italian has only [r] (whereas most often it has [ɾ]), and palatal stops *[c, ɟ] before front vowels (whereas they are normal prevelar ones, [k, g], [[k, g]]); besides ‹[tʃ, dʒ; ʃ]› are variously defined as ‹palatoalveolar›, ‹prepalatal›, or ‹palatal› (*ie* [tʃ, dʒ; ʃ], which are postalveopalatal protruded). But, the most surprising fanta-phonetic inventions regard dialects: in Rome, according to this source, they have a uvular *[ʀ] (for [ɱ] of the example given), in Naples, again, uvular *[q, ɢ] (for normal [k, g]). And, again according to this source, in Sicily they have a retroflex sequence *[ʈʈ] (for the alveolar slit stopstrictive, [ʦ]), but someone else has had a finger in this pie for more than a century. Thus we can balance this by adding a further ‹authentic› invention: ‹[ɺ]› (*ie* [ɺ]) would be the impossible ‹flapped lateral *click*›… It goes without saying that such errors are very misleading. And the author of that book had been… Minister of Education (although for a very short while); but for many people Phonetics is not ‹education›.

7.43. Our conclusion is quite obvious: ¿why should people want to deal with what they do not know? Regrettably, this way of thinking is still widely prevailing in the academia, in particular for linguistic and glottological studies. Fantastic stories are told about the fact that one should deal with all linguistic aspects, just to demonstrate how to ‹fully master› the whole subject. What *is* demonstrated, instead, is only (blind and uncritical) superficiality and presumption, which still undermine true qualification and competency. Inevitably, qualification and competency must be specialistic (as far as books to be written), but not limited (as far as books to be read).

Hypostatization & ‹IPAstatization›

7.44. Writing –we will never tire of repeating it– is nothing but a (very deficient and defective [even hysterical]) means of representing the absolute reality of the signifier of a given language or dialect (obviously in order to convey the signified).

It is necessary to consider writing simply in this way, although it is true that it is often based on a phonemic criterion, sometimes even without the inventor's full awareness. This mostly happens to new orthographies, if they are prepared calmly and after long reflection, by operating ‹from inside the language›, through a symbiotic relationship produced by a deep interest in the language and the need/necessity to represent it.

Instead, when people try to adapt the orthography of another language (even if it is a cognate language they known well), real problems arise owing to the interference from the native tongue, which inevitably prevails and leads to bad ‹choices›. In addition, if people try to do this with no phonological or phonetic bases, although with the best intentions, they are likely to fail.

However, also those who approach the different orthographies as if they were something absolute, almost divine, are likely to do worse things. Let us give some practical examples: to consider *j* as if it actually were /j/ [j] clearly means to hypostatize (or ‹IPAstatize›) the few and poor orthographic signs available to ordinary

mortals. The same is true of *n* = /n/ [n], whereas it is natural that, before consonants, it usually assimilates by place of articulation. Thus, although orthographies may give *aj*, *nk*, there is no good reason to consider those written sequences as corresponding to [aj, nk]; it is more likely that they stand for [ai, ŋk], even if in phonemic transcriptions we can actually find /aj, nk/.

7.45. Another connected problem, but even more serious, regards the stopstrictive (‹affricate›) articulation as too often wrongly described in so many books (even good ones). The use of more appropriate symbols, such as /ʦ, ʣ; ʧ, ʤ/, would make people realize that we are not at all dealing with /t+s, d+z; t+ʃ, d+ʒ/, as the most widely used *IPA* way of transcribing –*ie* /ts, dz; tʃ, dʒ/– would allow one to think at first. Nevertheless, even in influential books, we too often happen to read that such ‹affricates are formed by apical [t, d] followed by [s, z; ʃ, ʒ]›. Three mistakes are quite evident here: the articulations are not presented (as they actually are) as homorganic, unitary (although not simple), and lasting as any other consonant (not as two).