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; ʧ, ʤ].

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, [ ], 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: [x̱, β̞, β̟, ɹ̟, w̟, ɧ̟, ɥ̟], 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).

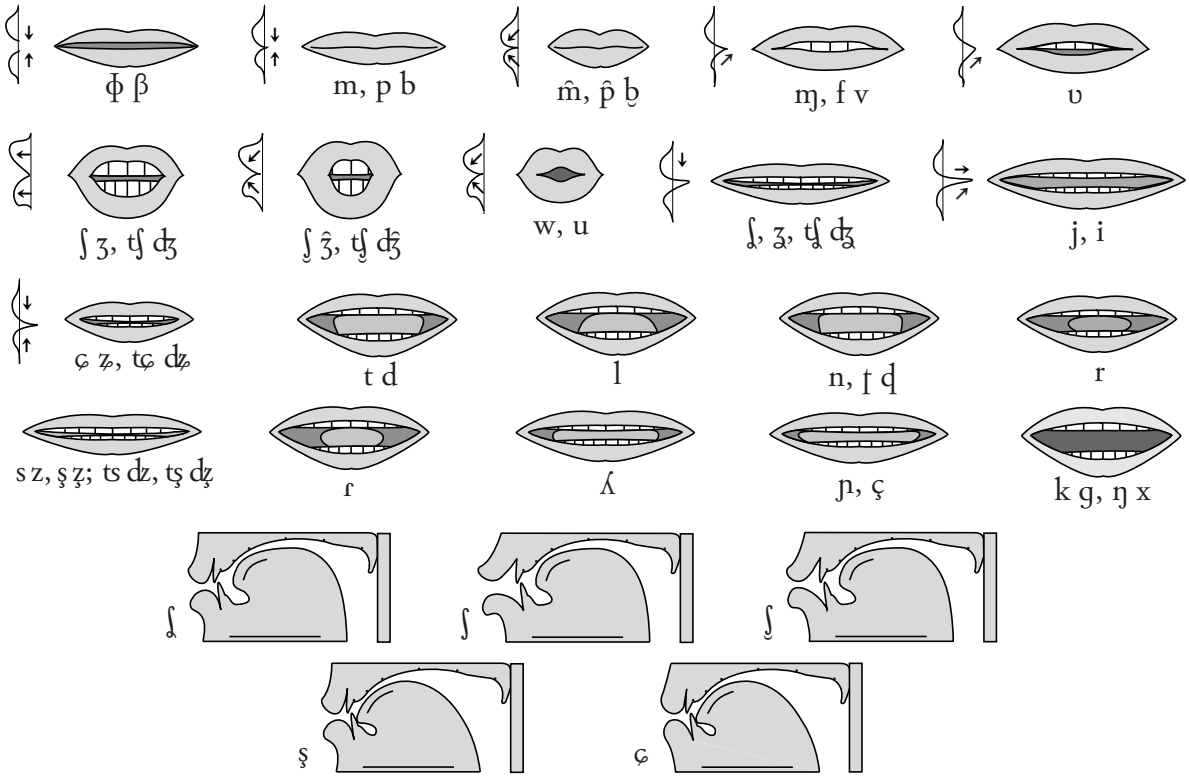


fig 9.2.1. Contoid linguograms.

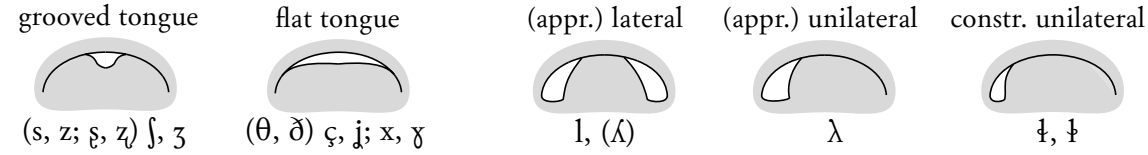


fig 9.2.2. Contoid palatograms.

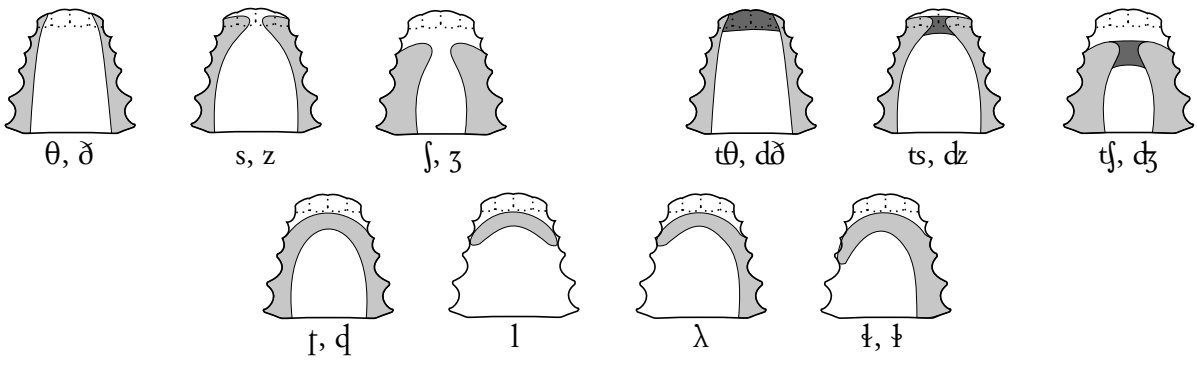
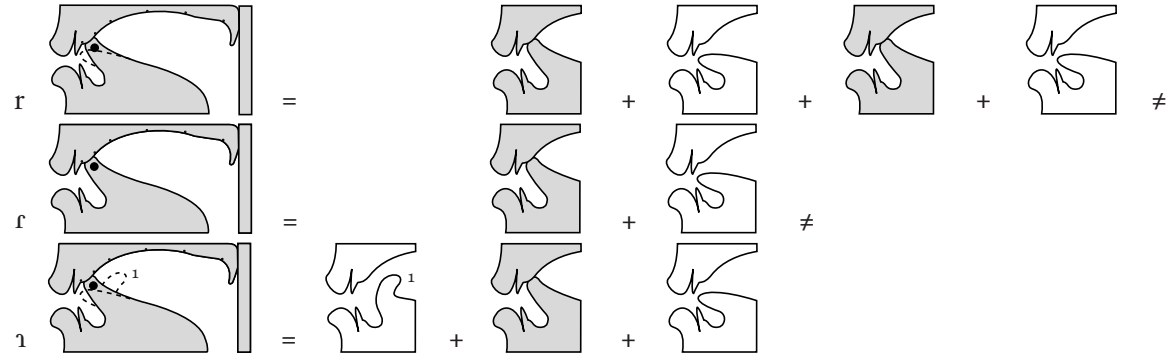


fig 9.2.2 also provides some revealing palatograms, which contribute to further clarifying the differences between some manners of articulation.

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, [ɺ], 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, [ɺ].



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 also be rounded, shown by [ˆ]), and even the *semi-velarized* or *semi-uvularized alveolar*, [n̠̽], 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, [ɱ̂], palatalization, [ɱ̟], or uvularization, [ɱ̠] (and possible further combinations, as the *alveolarized labiodental*, [ɱ̪], 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*, [[n̪̼]].

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], [[n̟̽]], and *postalveo-velar*, [n̟̠], [[n̟̠̽]].

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

the *prepalatal* nasal, [ɲ̟], and the *uvularized palatal*, [ɲʶ] (with uvular coarticulation). Also a *postpalatal* is possible, [[ɲ̠]], 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, ɴ̂ʕ].

In addition, there are nasals with labiodental coarticulations: *labiodentalized bilabial* [[mʱ]], *labiodentalized alveolar* [[nʱ]], *labiodentalized velar* [[ŋʱ]].

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*, [n̠̈]. It is very important in Japanese, for instance, where it is a phoneme too (ɕf § 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*, [ɲ̈], 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 [j̃ˠ, ɲ̟̃, ɲ̠̃, ɲ̈̃], as well.

Equally, the prevelar oscillates from the *prevelum* (along the *provelum*), to the *velum* – with nasalized approximant versions [ŋ̟̃, ɰ̃ˠ, ɰ̠̃, ɰ̃̈]. 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!* [khɯmɐˈʊˑn, -ˈɑˑn], *how many times* [ˈhaɒməɲi ˈɬhaˑəmz̥]. 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, [ɹ̠̞̃] ([ʒ̞̃, ɻ̃])– are necessary for accurate transcriptions of Hindi, for /n/ followed by continuous *C* (ɕf § 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, ɲ̊, ɲ̠̊, ŋ̊, ɴ̊, ɴ̠̊]; 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, ɕf § 5.2.1-7 of *HPr*): [m̬, n̬, ɲ̬, ŋ̬]…

Stops (ɕf § 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*, [t̪p, d̪b]; *alveolar–bilabial*, [t̺p, d̺b] (please note the difference in comparison with the symbol [ʘ]); *bilabial–postalveolar*, [p̪ɻ, b̪ɻ]; and *labio-apical*, [p̼, b̼], with a single contact.

Following are the two very important pairs: *dental*, [t, d] and *alveolar*, [t̺, d̺], 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, [t̺, d̺] (unfortunately still rendered as ‹[t, d]›).

The possible variations of [t, d] are: *labiodentalized dental*, [t̪ʲ, d̪ʲ]; *predorsal dental* (or *predental*) [t̪, d̪]; *denti-alveolar*, [t̪̺, d̪̺]; *dental rounded*, [t̪ʷ, d̪ʷ]; *uvularized dental*, [t̪ˁ, d̪ˁ]; and the variations of [t̺, d̺] are: *alveolar rounded*, [t̺ʷ, d̺ʷ]; *velarized alveolar*, [t̺ˠ, d̺ˠ].

Next comes the *(apico)postalveolar* place of articulation, with [ɻ, ɖ], and its variants: *(apico)postalveolar rounded*, [ɻʷ, ɖʷ]; *velarized apico-postalveolar*, [ɻˠ, ɖˠ] and *velarized apico-postalveolar rounded*, [ɻˠʷ, ɖˠʷ]; *apico-palatal*, [ʂ̺, ʐ̺] and *apico-palatal rounded*, [ʂ̺ʷ, ʐ̺ʷ].

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*, [cʷ, ɟʷ] and *uvularized palatal*, [cˁ, ɟˁ] (besides the *postpalatal* one, [c̟, ɟ̟], [[c̟ˁ, ɟ̟ˁ]], which is slightly more retracted, but not yet prevelar); before these, we have the *prepalatal*, [c̠, ɟ̠], and *prepalatal rounded*, [[c̠ʷ, ɟ̠ʷ]], pairs.

At the velum, of course, there is the very important *velar* pair, [k, g], with its variants: *prevelar*, [[k̟, g̟]] (generally transcribed [k, g]) and *velar rounded*, [kʷ, gʷ] (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*, [qʷ, ɢʷ] and *pharyngealized uvular rounded*, [qˤʷ, ɢˤʷ].

In addition, we find the *pharyngeal* pair, [ʔˤ, ʕ]; 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, [ʔʷ], 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*, [f̠, v̠]; *uvularized labiodental*, [f̴, v̴], and *uvularized labiodental rounded*, [f̴̂, v̴̂]; *predorsal-dental,* [θ̺, ð̺]; *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*, [θ̺̂, ð̺̂]; *uvularized dental*, [θ̴, ð̴]; *alveolar*, [ɹ, ɻ]; *alveolar rounded*, [ɹ̂, ɻ̂]; *(apico)postalveolar*, [ɹ̠, ɻ̠]; *(apico)postalveolar rounded*, [ɹ̠̂, ɻ̠̂].

Moving on to GROOVED constrictives, we find the pairs: *dental* (with a lowered tip) [s, z], *denti-alveolar* (with a raised tip) [[s̪, z̪]], but normally written [s, z]; with the variants: *labiodentalized dental*, [ʃ, ʒ]; *dental rounded*, [ŝ, ẑ]; *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, [θ̪, ɸ̪; θ, ð; θ̴, ð̴; ɕ, ʑ]; GROOVED, [s̪, z̪; s, z; s̴, z̴; ʃ, ʒ]. We have to add a constrictive pair which is both (slit) *alveolar* and a *tap* as well, [ɾ, ɽ]; 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, [s̬, ź] (which is not the only one [ɕf § 9.14, half-way through it]).

Continuing with GROOVED contoids, we find the following pairs: *(apico)postalveolar*, [ʂ, ʐ], and *(apico)postalveolar rounded*, [ʂ̂, ʐ̂]; *velarized (apico)postalveolar*, [ʂ̴, ʐ̴], and *velarized (apico)postalveolar rounded*, [ʂ̂, ʐ̂]; *apico-palatal*, [ʂ̡, ʐ̡], and *apico-palatal rounded*, [ʂ̂, ʐ̡̂]; *velarized apico-palatal*, [ʂ̴̡, ʐ̴̡], and *velarized apico-palatal rounded*, [ʂ̡̂, ʐ̡̂].

To complete the survey of grooved constrictives, we have the pairs: *postalveo-palatal*, [ʃ̡, ʒ̡], and *postalveo-palatal protruded*, [ʃ̡, ʒ̡] (also with a *postalveo-palatal hyperrounded* version, [ʃ̡̫, ʒ̡̫]); *postalveo-prevelar*, [ʃ̠, ʒ̠], and *postalveo-prevelar protruded*, [ʃ̠, ʒ̠] (also *hyperrounded* [ʃ̠̫, ʒ̠̫]); *postalveo-velar*, [ʃ̟, ʒ̟], and *postalveo-velar protruded*, [ʃ̟, ʒ̟] (also *hyperrounded* [ʃ̟̫, ʒ̟̫]); *prepalatal*, [ʂ̟, ʐ̟], and *bilabialized prepalatal*, [ɕ, ʑ] (or *prepalatal rounded* [ɕ̂, ʑ̂]). Lastly, we also have a pair of grooved *postalveo-palatal semi-constrictives*, [ʂ̡̽, ʐ̡̽] (also with the *protruded* version, [ʂ̡̽, ʐ̡̽] as well, although with a greater degree of labial and oral opening), but this is not the only one (ɕf § 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, ⟦x̠, ɣ̠⟧ (normally rendered with [x, ɣ]). Then, *uvular*, [χ, ʁ], and *uvular rounded*, [χ̫, ʁ̫]; *pharyngealized uvular*, [ɤ̴, ʁ̴], and *pharyngealized uvular rounded*, [ɤ̴̫, ʁ̴̫]; in addition: *prepharyngeal*, [ʜ, ʢ]; *pharyngeal*, [ħ, ʕ], and *pharyngeal rounded*, [ħ̫, ʕ̫]. Lastly: *laryngeal*, [ɦ̞, ɦ], and *laryngeal rounded*, [ɦ̞̫, ɦ̫] (there are also *laryngeal semi-constrictives*, ⟦ɧ, ʱ⟧).

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, ⱱ̪]; *dental*, [θ̪, ð̪]; *palatal*, [ɻ̟, j̠]; *velar*, [ʁ̠, ɣ̠]; *velar rounded*, [ʁ̞̠, w̞̠]; and grooved: *dental*, [s̪, z̪]; *postalveolar*, [s̠, z̠]; *postalveo-palatal*, [ʃ̠, ʒ̠]; *postalveo-palatal protruded*, [ʃ̞̠, ʒ̞̠]; *prepalatal*, [ʂ̟, ʐ̟] (in addition to two voiced phones: *postpalatal rounded*, [[ɻ̞̠]], 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, [ʡ, ʢ]), 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*, [ʞ̞, ʀ̞]; *pharyngealized uvular*, [ʞˤ, ʀˤ]; *pharyngeal*, [ʞˤ̞, ʀˤ̞] (they are all ‹stronger› than: [χ, ʁ; χ̞, ʁ̞; ʜ, ʢ; 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, ʎ̞]; *velar*, [ʟ̝, ʟ̞]; *uvular*, [ʟ̝̠, ʟ̞̠].

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*, [t̠ʃ, d̠ʒ]; besides, *postalveo-velar protruded*, [ʧ, ʤ], and *postalveo-velar*, [ʧ̠, ʤ̠]. 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; t̠ʃ, d̠ʒ]], 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*, [tʷʃ, dʷʒ] (if necessary, [[tʷʃ, dʷʒ]], 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, ɟʤ; ʄʨ, ʄʥ]], &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’atːʃe, r’ɛdːʒe/›, also by changing ‹prevocalic› stress and ‹chronemes›, /ː/, 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; ʦ, ʣ; ɕç, ʑʝ; qχ, ɢʁ],

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), [tθ, dð]; *dental*, [tθ, dð], *alveolar*, [tɹ, dɹ], and *alveolar rounded*, [tɹ̂, dɹ̂]; besides, *(apico)postalveolar*, [tɹ̠, dɹ̠], and *(apico)postalveolar rounded*, [tɹ̠̂, dɹ̠̂]. 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*, [ʦ̸, ʣ̸]. 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*, [ʦ, ʣ], and *velarized alveolar rounded*, [ʦ̂, ʣ̂]; *(apico)postalveolar*, [ʧ, ʤ]; *(apico)postalveolar rounded*, [ʧ̂, ʤ̂]; *velarized apico-postalveolar*, [ʧ, ʤ]; *apico-palatal*, [ʨ, ʥ]; *apico-palatal rounded*, [ʨ̂, ʥ̂].

Completing the aforementioned pairs with a lamino-postalveolar component (*cf* § 9.15), we have: *postalveo-palatal*, [tʃ, dʒ], and *postalveo-palatal protruded*, [tʃ, dʒ] (also with the *postalveo-palatal hyperrounded* variant, [tʃ, dʒ]); *postalveo-prevelar*, [tʃ, dʒ], and *postalveo-prevelar protruded*, [tʃ, dʒ] (also *hyperrounded* [tʃ, dʒ]); *postalveo-velar*, [tʃ, dʒ], and *postalveo-velar protruded*, [tʃ, dʒ] (also *hyperrounded* [tʃ, dʒ]); and *prepalatal*, [ʧ, ʤ], and *bilabialized prepalatal*, [ʧᵝ, ʤᵝ] (or *prepalatal rounded* [ʧ̂, ʤ̂]). Lastly, we have to mention a *grooved postalveo-palatal stop-semi-constrictive* pair, [ʧ,

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

Going back to slit pairs, we find: *palatal*, [kɕ, gʝ̊]; *palatal rounded*, [kɕ̂, gʝ̊̂]; *uvularized palatal*, [kɕ̴, gʝ̴̊]; *prevelar*, [[kx, gɣ]] (normally rendered as [kx, gɣ]). Then we have: *velar*, [kx, gɣ], and *velar rounded*, [kx̂, 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)*, [tɽ, dʏ], and *trill(ed)*, [tɽ, dʖ], 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, ɕf § 9.14: [pɬ, bʋ; tθ, dð; kɻ, gʝ̊; kʯ, gʏ; kɧ, gw] and [ts, dz; tʂ, dʐ̊; tʂ, dʐ̊; tʂ, dʐ; tʂ, dʐ̊].

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, ᵍʝ̊; ᵏx, ᵍɣ; ᵏx̂, ᵍɣ̂] and [ᵗs, ᵈz; ᵗʂ, ᵈʐ̊; 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 (ɕf § 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*, [ɸ̞, β̞] (with the addition of rounding); *palatalized bilabial*, [ɸ̡, β̡]; and *uvularized bilabial*, [ɸ̴, β̴]; besides: *labiodental*, [ʏ, ʋ], and *labiodental rounded*, [ʏ̞, ʋ̞]; *palatalized labiodental*, [ʏ̡, ʋ̡]; *uvularized labiodental*, [ʏ̴, ʋ̴].

For prelingual (or coronal) contoids, we have the pairs: *dental*, [θ̻, ð̻] (with a raised tip); *alveolar*, [ɕ, ʑ]; *(apico)postalveolar*, [ɕ̺, ʑ̺], and *(apico)postalveolar rounded*, [ɕ̺̂, ʑ̺̂]; *apico-palatal*, [ɕ̻, ʑ̻], and *apico-palatal rounded*, [ɕ̻̂, ʑ̻̂]. As for the dorsum (or back of the tongue), we find the diphonic pairs: *prepalatal*, [ʜ, ʝ], and *prepalatal rounded*, [ʜ̞, ʝ̞]; *palatal*, [ɧ, j], and *palatal rounded*, [ɧ̞, ɥ]; *uvularized pala-*

tal, [ɻ, ʝ]; besides, *prevelar*, [ɳ, ɟ], and *prevelar rounded*, [ɳ̟, ɥ̟]; *velar*, [ŋ, ɰ], and *velar rounded*, [ʊ, w].

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

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, ʁ̠̂]; *pharyngealized uvular*, [ʁ̠ˤ, ʁˤ], and *pharyngealized uvular rounded*, [ʁ̠̂ˤ, ʁ̂ˤ]; *prepharyngeal*, [ɖ, ʕ̟]; *pharyngeal*, [ɖ̠, ʕ], and *pharyngeal rounded*, [ɖ̠̂, ʕ̂]. Finally, we have the pairs: *laryngeal*, [h, ɦ], and *laryngeal rounded*, [h̪, ɦ̪]. 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]: [ɦ̟, ɦ̠, ɦ̈, ɦ̪, ɦ̪̠]. 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*, [ɻ]; *semi-prevelar*, [ɻ̟]; *semi-provelar*, [ɥ̟]. We must also add: *semi-postpalatal rounded*, [[ɥ̠]], *semi-prevelar rounded*, [[ɥ̟]], *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 [ɰ̟]).

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, [ɭ̪ʷ].

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, [ɹ, ʁ]): *postalveolarized semi-prevelar*, [ɹ̞], and *uvulo-postalveolarized semi-velar*, [ʁ̞], practically with no rounding (ɕf § 10.6.6).

Some of these are also used as *intense* contoids: [ɺ̈, ɻ̈, ɹ̈, ʁ̈]...

Trills, taps & flaps (ɕf § 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 (*i.e.* 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, ʁ; ɻ̂, ʁ̂; ɻ̞, ʁ̞; ɻ̞̂, ʁ̞̂]. 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, ɽ̊; ʀ̆, ʀ̥̆; ɹ, ɹ̥; ɻ, ɻ̊; ɭ̆, ɭ̥̆].

Some trills or taps can be *intense*, as: [r̥̩, ɾ̥̩, ʀ̥̆] (which are more energetic, not longer; thus, [r̥̩] 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*, [[l̺]]). 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*, [ɻ̟]. Rounded articulations are also possible, as: [l̂, ɫ̂, 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, ʟ̠̈]: *palatal*, [ʎ̠̈], *prevelar*, [ɫ̠̈], and *velar*, [ɫ̴]; with possible rounded versions, as *velar rounded*, [ɫ̂]. Obviously, [ɫ̴] –*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, t̪; ɬ, t͡ɬ].

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* [ˈɛɳt̪ɹ̪i]; 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* [tenˈdɛr]; 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* [ˈfaˑəʏ̯]; slit dentals (or ‹interdental›, [θ, ð], in *the thing* [ðəˈθɪŋː]; grooved dental, [s, z], in *size* [ˈsaˑəz̬]; 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], [ʣ]; 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* [ˊʐɜn] (which in Mandarin is [ˊʐɜn], *ie* a real approximant, even if traditionally represented with ‹/ʐ/›, for lack of appropriate symbols). Then palatal, [ç, ʝ], as in Greek: *chéri* (χέρι) [ˈçɛˑri], *géiso* (γείσο) [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* [ˈhɪt], 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, ˈwɔːɫ] 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 /r/ 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.