A CRITIQUE OF THE IPA CHART
(REVISED TO 1951, 1979 AND 1989)

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En este trabajo se someten a una crítica detallada las tres versiones del A.F.I. (Alfabeto Fónico Internacional) (de 1951, 1979 y 1989) con el fin de evaluar los aciertos o desaciertos en el tratamiento de los sonidos de las lenguas. Se comienza con las dos primeras versiones para, a continuación, examinar la última versión. El cotejo muestra que los progresos entre las dos primeras versiones y la última son más bien escasas.

Palabras clave: aproximante, sistema de vocales cardinales, doble articulación, doble uso de símbolos, punto de articulación.

1.1 In a recent paper of mine (Akamatsu, 1992), I gave a brief critical assessment of the IPA chart revised to 1989 with only a limited reference to certain consonant symbols. My intention in the present paper is to submit to a substantially extensive, if not exhaustive, critique, three successive versions of the IPA chart, revised to 1951, 1979 and 1989. (The last version is the latest as at present.) The reason for my looking at the three successive versions rather than just the latest is that this may well

help us the better assess critically the evolution of the IPA chart and also evaluate the various changes brought about in these successive revisions[1].

1.2 The IPA (International Phonetic Association) met in August 1989 in Kiel, Germany, to discuss and revise the 1979 version of the IPA (International Phonetic Alphabet) chart. (I shall hereafter refer to the International Phonetic Alphabet chart as 'the IPA chart', as distinct from 'the IPA' which is to be taken in the sense of the International Phonetic Association.) A plenary session at Kiel gave approval to the IPA chart revised to 1989, which was subsequently approved by the Council of the IPA with 20 voting for and 3 against. (The Council consisted of 27 members as at 1989.) The revised 1989 version appeared in print for the first time in *Journal of the International Phonetic Association* (*JIPA*), Vol. 19, No. 2 (December 1989). Copies of this latest revised version are available from the Secretariat of the IPA.

The fact that 20 members of the IPA Council voted in favour of the 1989 version of the IPA chart will in all probability not mean that they all found the new version completely satisfactory; not a few of them must

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1 The whole of the present paper had been completed in December 1990. Due to particular circumstances, it was not till February 1991 that I was able to consult Pullum (1990). Subsequently I read Ladefoged (1990a) and Ladefoged (1990b). Having gone through Pullum (1990) and Ladefoged (1990a, 1990b), I came to the conclusion that just as the two authors' papers had apparently been written from two different independent points of view on non-identical issues, so my present paper, which was also written from a different independent point of view on issues generally different from those that the two other authors discussed, should better be published as it stood rather than being re-drafted in the light of what the two other authors had to say. There is just one specific point of substantial importance that Ladefoged mentions in both of his above-mentioned papers that I consider as deserving a discussion on my part, but I have chosen to defer such a discussion for a separate future treatment. Since I wrote up the present paper, there has appeared *JIPA*, Vol. 20, No. 2 (December 1990) whose publication had been delayed and in which I had previously understood (cf. *JIPA*, Vol. 20, No. 1, p. 54) that *JIPA* was to publish 'a consolidated account of all the comments that will have been received [on the new IPA chart, i.e. the 1989 version]'. The contents of those articles in that latest issue of *JIPA* which are reactions to the 1989 version of the IPA from some members of the IPA have turned out to be such that I do not consider it necessary for me to alter the contents of my present article.

have had varying degrees of reservations on specific points. It is equally likely that the 3 members who voted against presumably had major reservations. Be that as it may, it is important to remember that the Council members were given binary choices as to whether or not to accept the revised version *en bloc*.

Anything I say in what follows represents in no way official or corporate views of the IPA - I am not a member of the IPA nor did I attend the Kiel Convention - and expresses my own independent views. Any concurrence of views on particular points between me and any member(s) of the IPA should therefore be taken to be purely coincidental.

1.3 As I write these lines, I have in front of me three successive versions of the IPA chart, culminating in the 1989 revision. They were revised to 1951, 1979, and of course 1989. There may have been an earlier revision(s), but it (they) need not be taken into account for the purpose of the present paper.

The gap between 1951 and 1979, i.e. just short of three decades, is considerable. Contrast this with the gap of just a decade at the end of which the 1979 version of the IPA chart has been replaced by the subsequent and latest 1989 version. The continued use of the 1951 version of the IPA chart during the well-nigh three decades may reflect either the adequacy of the chart or apathy to it on the part of its users. I will suspend my own judgment. By contrast, the 'mere' ten-year span between 1979 and 1989 could well signify either increased/wider use of the 1979 version or a major perception by its users of a number of problems inherent in the 1979 version, or both. Again I will not be judgmental. It is undeniable at any rate that, recourse to the IPA chart (whichever revised version it may be) in books on linguistics has been substantial over the years, despite deliberate non-recourse to it in some quarters, notably the majority of U.S.-made dictionaries of the English language which continue to adhere to pseudo-phonetic symbols.

1.4 My ultimate aim in the present paper is to provide a critique of the latest 1989 version of the IPA chart. To do this satisfactorily, I find it necessary first of all to point out, either neutrally or critically, certain salient features contained in the 1951 and the 1979 versions. I will then conduct my discussions revolving round problems which I believe arise from a number of features found in the 1989 version. My preliminary look at the 1951 and the 1979 versions will the better put the 1989 version in perspective and facilitate our perceiving directions in which the successive revisions of the IPA chart may be taking and our assessing the sorts of amelioration which the IPA may have intended. In order to follow my discussions, the reader is requested to consult the reproductions of the 1951, the 1979 and the 1989 versions of the IPA chart which I have appended at the end of the present paper.

2.1 The 1951 version of the IPA chart tabularly sets out symbols for consonants and vowels in such a way that the two major components, i.e. 'consonants' and 'vowels', are not totally separated from each other. (Symbols for certain consonants and for some vowels and diacritic marks are placed outside the table.) This 'unified' presentation of symbols for consonants and those for vowels is to be largely abandoned in the subsequent versions.

2.2 In the 1951 version, there is a certain amount of duplication in the presentation of vowels in that (i) *all* vowels, which are classed as either 'front', 'central' or 'back', are presented in such a way that 'front' also corresponds to 'palatal', and 'back' also to 'velar', while 'central' corresponds to neither 'palatal' nor 'velar'; and (ii) rounded vowels only are presented under 'bi-labial' as well. Note in this connection that the IPA chart presents 'palatal', 'velar' and 'bi-labial' as three of the different places of articulation applicable, in the first place, to consonants. Finally, vowels are classed, so far as the heights of the tongue in their articulation are concerned, as 'close', 'half-close', 'half-open' and 'open'.

2.3 In the 1979 version, the classification of vowels into 'close', 'half-close', 'half-open' and 'open' is maintained. However, now that vowels are presented quite separately from consonants, there is no longer any

explicit indication of correspondence between 'front' and 'palatal', between 'back' and 'velar', or between 'rounded' and 'bi-labial', while 'central' disappears altogether. Furthermore, vowels are now presented in two clearly separate diagrams, one for unrounded vowels and the other for rounded vowels. In each of the two diagrams of vowels, 'front' and 'back', but not 'central', are overtly indicated. In the 1979 version, it is evident that vowels are first classified into unrounded and rounded vowels, and then unrounded vowels and rounded vowels are each classed into 'front' and 'back' on the one hand, and into 'close', 'half-close', 'half-open' and 'open' on the other. The primary classification of vowels into unrounded and rounded vowels is compatible with a view expressed by some sections of the IPA against Jones' dichotomy between the primary cardinal vowels and the secondary cardinal vowels in that it entails a mixture of unrounded and rounded vowels. The above-mentioned classification of the cardinal vowels into unrounded and rounded ones in the first place in the 1979 version is, however, to be abandoned in the 1989 version.

2.4 It should be pointed out straightaway that, in all three versions of the IPA chart with which we are concerned, the complement of vowels presented therein is larger in number than is the complement of the primary and secondary cardinal vowels (totalling eighteen) indicated by Jones. The 1951 version presents twenty vowels, and both the 1979 and the 1989 versions twenty-five.

3.1 As for consonants, the 1951 version presents sixty-one while the 1979 version presents seventy-two. In the 1989 version the number increases to seventy-four, but the difference between the three sets of different numbers is perhaps less significant than the classificatory fashion (i.e. as regards 'places of articulation' and 'manners of articulation') in which they are presented. So far as 'places of articulation' are concerned, the 1959 version operates with eleven 'places of articulation', viz. 'bi-labial', 'labio-dental' ('labiodental'?)[2], 'dental and alveolar' (thus presented

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2 It is not clear if the IPA meant 'labio-dental' or 'labiodental'. The former term appears in the IPA chart of 1951 probably because of the hyphenation necessitated by lack of space. Notice that 'bi-

together), 'retroflex', 'palato-alveolar', 'alveolo-palatal' ('alveolopala-tal'?)[3], 'palatal', 'velar', 'uvular', 'pharyngal', and 'glottal'. In the 1979 version, 'post-alveolar' is added to 'dental and alveolar' for all three to be placed together in the same grid, 'alveolo-palatal' is removed, while 'labial-palatal' and 'labial-velar' are introduced as two additional places of articulation, and the term 'pharyngeal' replaces 'pharyngal'.

3.2 Clearly, the choice of the new term 'labial-palatal' rather than, say, 'labio-palatal', and of the new term 'labial-velar' rather than, say, 'labio-velar', reflects the IPA's intention to emphasize non-hierarchical (i.e. equal) status of labialization (indicated by 'labial-') and palatalization ('-palatal') in 'labial-palatal', and of labialization ('labial-') and velarization ('-velar') in 'labial-velar', in the articulation of the sounds concerned. This pertains, of course, to what is known to as double articulation in articulatory phonetics[4]. Note in particular the fresh inclusion, under 'labial-velar' in the 1979 version, of k͡p and g͡b, and the transference of ʍ to 'labial-velar' from outside the table where it was in the 1951 version[5]. The IPA's introduction of the two new places of articulation, i.e. 'labial-palatal' and 'labial-velar', is explainable. We see that, in the 1951 version, ʍ and ɥ are each presented twice, i.e. under two places of articulation, hence w under 'bi-labial' and 'velar' and ɥ under 'bi-labial' and 'palatal'; their appearance under 'velar' (for w) and under 'palatal' (for ɥ)

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labial', not 'bilabial', occurs in the 1951 version of the IPA chart. The 1979 version gives 'labiodental' and 'bilabial'.

3 The hyphenation in 'alveolo-palatal' is evidently inevitable because of lack of space in the 1951 version of the IPA chart. Whether the IPA meant 'alveolo-palatal' or 'alveolopalatal' is not clear. The 1979 version gives 'alveolo-palatal' (outside the tabular presentation).

4 By 'double articulation' here is meant concomitance of two articulations as for k͡p,g͡b , w, ʍ, ɥ, etc. This is not to be confused with the theory of double articulation propounded by A. Martinet in his writings. Martinet's double articulation is a linguistic theory, not a phonetic theory.

5 In the present paper, I shall reproduce in **boldface** the IPA symbols found in the IPA chart. This will not be case when the symbols are presented in phonetic notation. Whether the IPA symbols are to be taken phonetically or phonologically is a moot question (*pace* Ladefoged 1990a, 1990b) which I shall not go into in this paper.

is enclosed by parentheses. Such a presentation is clearly both arbitrary and unwise since both **w** and **ɥ** are doubly articulated and neither 'bi-la-bial' (for both **w** and **ɥ**) nor 'velar' (for **w**) or 'palatal' (for **ɥ**) is either a primary or a secondary articulation. The two articulations involved in **w** or **ɥ** are of equal rank. The introduction, in the 1979 version, of the two new places of articulation, i.e. 'labial-palatal' and 'labial-velar', is obviously intended to propose a solution to the earlier unsatisfactory presentation of **w** and **ɥ** in the 1951 version. The new provision, in the 1979 version, of 'labial-velar' allows the incorporation, in the table of 'consonants', of **ʍ** which, in the 1951 version, was not placed under either 'bilabial' or 'velar' (to intersect with 'fricative') but was listed under 'other sounds'. In the 1979 version, k͡p and g͡b which require double articulation are newly added to take full advantage of the new provision of 'labial-velar', and quite justifiably so. However, in the 1989 version, both 'labial-palatal' and 'labial-velar' are to disappear and all the relevant symbols are to be *relegated* to the section 'other symbols', as we shall see later.

3.3 So far as 'manners of articulation' are concerned, the most salient change from the 1951 version to the 1979 version in the classification of consonants is the introduction of the term 'approximant' to designate those sounds which were previously referred to by the terms 'frictionless continuants', 'semivowels' and 'lateral non-fricative[s]'. In my own view, there seem to be a number of problems revolving round the definitional concept of the term 'approximant' which I will discuss at length further below. A separate problem which concerns approximants and which I will point to straightaway here is one of a classificatory nature. The IPA presentation of approximants calls for a few remarks. In the 1979 version, the presentation of 'fricative' and 'approximant' which are each subdivided into 'median' and 'lateral' is curiously and irksomely asymmetrical. We find '(median) fricative' and '(median) approximant' presented in tandem, that is to say, as a group of consonants consisting of two types of '(median)s'. We then find 'lateral fricative' and 'lateral (approximant)' in tandem (but why the parentheses here?), not, as one might expect from the IPA's bringing together of '(median) fricative' and '(median) appro-

ximant', as a group consisting of two types of 'laterals', i.e. '(lateral) fri-
cative' and '(lateral) approximant'. In my view, it would be fair to un-
derstand that 'approximant' is directly distinguished from and is opposed
to 'fricative' and that they represent two different 'manners of articula-
tion', so that 'approximant' is characterized by open approximation and
'fricative' by close approximation. It would therefore be fair to unders-
tand that 'approximant' was introduced precisely for that reason. If so, it
would be logical and reasonable to first classify the relevant consonants
into fricatives on the one hand and approximants on the other, and then
subclassify fricatives and approximants, respectively, into 'median' and
'lateral'. It seems to me that the asymmetrical presentation of fricatives
and approximants is nothing but a product of a disorderly classification. It
might be counter-argued by the IPA that four 'manners of articulation'
are involved here, i.e. 'fricative', 'approximant', 'lateral', and 'median',
and that an optimum presentation of these four manners of articulation is
somewhat delicate. But this could not excuse a disorderly classification all
the same. Comparison between the 1951 version and the 1979 version
shows that 'lateral non-fricative' of 1951 was renamed as 'lateral
(approximant)' in 1979 while 'lateral fricative' of 1951 remained unchan-
ged in the 1979 version. It is understandable to a certain extent why a
pair of parentheses are used for 'median' in '(median) fricative' and
'(median) approximant', but it is difficult to understand why 'approxi-
mant' is enclosed by a pair of parentheses in 'lateral (approximant)'. As
we shall see later, 'lateral (approximant)' of 1979 is subsequently to be
changed to 'lateral approximant' in the 1989 version, which seems a
reasonable modification. A logical and satisfactory presentation that
should have been adopted in the 1979 version would be, to repeat: (i) to
begin with, the division between 'fricative' and 'approximant', and then,
(ii) the subdivision of each division into 'median' and 'lateral'. We shall
see further below, when I discuss the 1989 version of the IPA chart, that
the division and the subdivision of approximants I have just suggested are
to be actually implemented in that version. It should be noted here that
the 1979 version appropriately introduces the symbol for 'retroflex
(median) approximant', i.e ɻ, which symbol was absent in the 1951

version. This is an improvement which is to be maintained in the 1989 version.

3.4 Two of the manners of articulation mentioned in the 1951 version are 'rolled' and 'flapped'. They were terminologically changed to 'trill', and 'tap or flap', respectively, in the 1979 version. It may not be absolutely clear from this whether or not 'tap' and 'flap' are to be distinguished; in practice, some phoneticians do (cf. Ladefoged 1971: 50-51), while others do not (cf. Jones 1964: 195, Abercrombie 1967: 49-50; O'Connor 1973: 48).

3.5 The rest of the change - and it is a major one - between the 1951 version and the 1979 version so far as 'manners of articulation' are concerned consists in the inclusion, in the table of 'consonants', of 'ejective', 'implosive', '(median) click', and 'lateral click', which were all placed in the 1951 version outside the tables of 'vowels' and 'consonants' and listed - inasmuch as some of them were listed - as part of 'other sounds'. Further below, I shall have a few comments to offer on 'other sounds' presented outside the tables of 'consonants' and 'vowels' in the 1979 version.

3.6 Serious criticism must be levelled against the use of an identical symbol to stand for two distinct sounds in the IPA chart. Double use of a symbol, which is most unwise, occurs in both the 1951 version and the 1979 version. The symbol ʀ is used to stand for both 'uvular roll' and 'uvular flap' in the 1951 version, or for 'uvular trill' and 'uvular tap or flap' in the 1979 version. I am aware that the simultaneous use of a horizontal stroke underneath ʀ (thus ʀ̠) was suggested by some individuals and unofficially used by them. (As we shall see later, 'uvular tap or flap', hence any relevant symbols, is to be dropped in the 1989 version.) Furthermore, the symbol j is used to stand for both 'palatal fricative' and 'palatal semi-vowel' in the 1951 version, or for both 'palatal (median) fricative' and 'palatal (median) approximant' in the 1979 version. The retention of j to stand for both 'fricative' and 'approximant' in the 1979 version at the same time as introducing the new term 'approximant' (in an attempt to distinguish approximants from fricatives) in that same version is singularly inappropriate, contradictory and self-defeating. (As we shall

see later, the infelicitous double use of the symbol j is to be remedied at long last in the 1989 version.) At least one English phonetician, during the time when the 1951 and the 1979 versions were still in force, officially proposed the introduction and use of a new diagraphic symbol of his choice, jz to designate 'voiced palatal fricative' or 'voiced palatal (median) fricative', presumably in analogy to the already current official IPA use of ɮ standing for 'voiced lateral fricative'[6]. (I say 'presumably' because the proposer of jz makes no overt reference to ɮ.) But in vain. The fact that jz was proposed in connection with Spanish phonetics detracts in no way from the merit of the symbol which could have found its way into the IPA chart. The proposed symbol jz has never been adopted by the IPA to this day, either for that purpose or otherwise. I personally consider the proposed symbol an excellent one and superior to the new symbol ʝ which the 1989 version of the IPA chart has eventually come up with.

4.1 We see that the choice of the various 'manners of articulation' and the order in which they were presented in the 1951 version underwent some important change in the 1979 version (as can be seen by comparing the 1951 and the 1979 versions appended at the end of the present paper). They are to undergo further important change in the 1989 version. In fact, the presentation of 'manners of articulation' in the IPA chart has been modified from version to version, and there is no knowing what further modification may be in store for any future revisions. Let me mention once and for all at this juncture just one point which concerns the relationship and order between 'plosive' and 'nasal'. The 1951 version puts 'plosive' first and 'nasal' next, while the 1979 version reverses this order, only to revert to the previous order in the 1989 version. Evidently, the order chosen in the 1979 version is more logical in that 'nasal' is separated from all the other 'manners of articulation' including 'plosive' which are all 'non-nasal'.

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6 Woodhead (1957: 6).

4.2 Moreover, a new feature in the presentation of 'manners of articulation' in the 1979 version (only to be abandoned in the 1989 version) consists in the dichotomy between those 'manners of articulation' which involve 'pulmonic air-stream mechanism' and those which involve 'non-pulmonic air-stream mechanism' (as the IPA chart puts it). The reason for this dichotomy, which precludes the mention of the division between 've-laric air-stream mechanism' and 'glottalic air-stream mechanism', is not clear to me. Does the IPA dichotomy possibly reflect a view according to which pulmonic air-stream mechanism is accorded a major status while both velaric air-stream mechanism and glottalic air-stream mechanism are accorded a minor status? Or does it possibly reflect agreement on the IPA's part to operate with total binarism prevalent in certain cirlces of linguists at present?

4.3 I have shown in the course of the foregoing comparison between the 1951 version and the 1979 version of the IPA chart a number of salient features found in these versions. We have seen that substantial modifications were effected in the latter version, be they for better or for worse. Considerable dissatisfaction must have been expressed by those who used the 1979 version of the IPA chart, and the IPA took steps to produce yet another revised version, which is the 1989 version. I will now proceed to look at this latest version in some detail. It will be seen in the course of my following discussion of the 1989 version (in comparison with the two previous versions, where necessary) that a state of flux is the hallmark of the various versions of the IPA chart and that there is as much progression as regression between the different versions.

5.1 It seems fair to assume that the intention of the IPA in revising each preceding version of the IPA chart is to 'improve' on the existing version at a given date. If so, the degree of success in any new version of the IPA chart is to be measured in terms of ameliorations achieved either in general or in particular or both. There will probably be no definitive version available, and a few controversial aspects will continue to remain on which there is no general agreement among members of the IPA.

5.2 The 1989 version of the IPA chart consists of five parts, i.e. 'consonants', 'vowels', 'other symbols', 'diacritics', and 'suprasegmen-tals'. For reason of limitation of space, I can, in what follows, only look selectively at some of the symbols and address some possible problems.

5.3 'Vowels' are presented in a *single* diagram (not two as in the previous versions). Twenty-five vowels in all are presented, exactly the same number and exactly the same vowels as in the 1979 version. Just a few of the vowels are now given slightly different symbols compared with those in the previous versions, but none of these symbols are unfamiliar to practising phoneticians. Otherwise, all the symbols remain the same as before. The major dichotomy between 'unrounded' and 'rounded' introduced in the 1979 version has been abandoned, and the terms 'rounded' and 'unrounded' themselves do not occur. This change from the former separate presentation of the 'rounded' vowels and the 'unrounded' vowels (in the 1979 version) to a unified presentation is compatible with the caption in the 1989 version which reads: 'Where symbols appear in pairs, the one to the right represents a rounded vowel.' The terms 'front', 'central' and 'back' and the associated three-way classification of 'vowels', which were presented in the 1951 version, if not in the 1979 version (where we see 'front' and 'back' only), have been brought back.

5.4 What is particularly noticeable in the presentation of 'vowels' in the 1989 version when compared with the previous versions is that the four-term set of 'close', 'close-mid', 'open-mid', and 'open' have now replaced another four-term set of 'close', 'half-close', 'half-open', and 'open', which was traditional for many years. (It should be remembered that the latter series of four terms was used by Jones in his cardinal vowel diagram.). This terminological modification seems to reflect significantly a corresponding conceptual modification. The two terms, 'half-close' and 'half-open', imply that 'half-close' refers to a degree of closeness, and 'half-open' refers to a degree of openness. In other words, the major division is between 'close' and 'open' and this division is further so subdivided that we have 'half-close' and 'half-open' as well. Altogether, then, the relevant axis is divided into four degrees. But the two newly introduced terms, 'close-mid' and 'open-mid', seem to suggest that the major

division is actually three-way so that we have 'close', 'mid', and 'open', and then 'mid' is subdivided into 'close-mid' and 'open-mid'. The relevant axis remains still divided into four degrees, at least on the face of it, but with a conceptual difference. I am not certain whether the new four-way division into 'close', 'close-mid', 'open-mid', and 'open', is effectively based on, or at least reflects, the sort of major *three*-way division I have suggested above, as I have not at all been involved in the revision of the IPA chart. If my interpretation is correct, it is regrettable that the 1989 version of the IPA chart should have come up with the new set of four terms we have seen above which, in spite of their being four in number as in the past, paradoxically departs from the original spirit inhering in Jones' cardinal vowel system. The adoption of the new set of four terms seems to have modified the basic concept of the original cardinal vowel system entertained by Jones.

6.1 I now turn my attention to 'consonants'. The first thing that strikes anyone who has been accustomed to the previous versions of the IPA chart is the substantial increase in the number of symbols standing for ejectives and implosives in the 1989 version. Whereas we had no symbols for ejectives or implosives in the 1951 version (though a few were under 'other sounds') and there were ten such symbols in the 1979 version, we find in the 1989 version as many as sixteen for the categories 'ejective stop' and 'implosive' (as the IPA now calls them). Furthermore, clicks (i.e. five clicks) now appear under 'other symbols'. All four clicks that were in the 1979 version have now been *relegated* to 'other symbols', where one more click not appearing previously in the 1979 version, i.e. what is termed '(post)alveolar click' symbolized by !, has been added. Neither the reason for augmenting the classes of 'ejective stop' and 'implosive' nor the reason for transferring all clicks to 'other symbols' is clear to me.

6.2 The augmentation effected under 'implosive' in the 1989 version is considerable. In contrast to three symbols (for 'bilabial implosive', 'alveolar implosive' and 'velar implosive') in the 1979 version, we now have in the 1989 version ten symbols altogether. The breakdown of these ten symbols are as follows: two symbols (one for the voiced and the other

for the voiceless) for each of 'bilabial implosive', 'alveolar implosive', 'palatal implosive', 'velar implosive' and 'uvular implosive'. How does one explain this sudden proliferation of symbols for implosives in the latest version? It is quite true that we have come a long way from the days when only a few implosives were mentioned in introductory books on the phonetics of African languages (see e.g. Westermann & Ward 1964: 94-96). But it is equally true that even recent average phonetic works of descriptive nature on sounds of the world are normally content to mention just a few[7], and implosives are known to occur in languages which are spoken not only in Africa but elsewhere as well (consider Amerindian languages, and Sindhi, in particular)[8]. Whether the sudden proliferation of symbols for implosives witnessed in the 1989 version has to do with any equally sudden flourishing studies and/or discoveries of relevant sounds (in African, Amerindian, or other languages), or a desire for completing the voiced-voiceless pairs under 'implosive', or any other factor, justifiable or not, I cannot say.

6.3 The 1989 version of the IPA chart has doubled the number of what it now calls 'ejective stops' (not 'ejectives' as it formerly did) so that there are now six; the three additional ones are those whose places of articulation are 'retroflex', 'palatal', and 'uvular'. My only query concerns the term 'ejective *stop* [my italics]'[9]. We know that ejectives can be stops, fricatives or affricates, as the case may be. This said, my only complaint is that the use of the term 'stop' in 'ejective stop' in the 1989 version is redundant since no ejective fricatives or ejectives affricates are indicated in the same version. (It is anyway not clear to me whether or not 'stop' in 'ejective stop' should be taken as synonymous with 'plosive'.) The inclusion of the term 'stop' here does not even have the justification that the

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7 For example, Ladefoged (1971: 122) mentions three, i.e. those that the 1979 version of the IPA chart presents. Ladefoged (1975) does likewise on the last (unnumbered) page. However, a specialist work like Maddieson (1984: 217-221) mentions quite a few implosives, i.e. sixty-one.

8 Sindhi is mentioned in this connection by e.g. Ladefoged (1971: 26).

9 'Ejective stop' is used in Ladefoged (1971: 25, 1975: 121) in opposition to those ejectives which are not stops.

inclusion of the term 'lateral' in 'lateral approximant' in the same version could be said to have on the grounds that 'approximant' (in the sense equivalent to 'median approximant') is also provided. If the inclusion of the term 'stop' in 'ejective stop' is simply meant to be a descriptive label and not a classificatory one, it would be preferable to leave it out in the 1989 version.

6.4 My reservations expressed above about 'implosive' and 'ejective stop' should be contrasted with my reservations about 'click' being *relegated* under 'other symbols' in the 1989 version. I deplore this *relegation*. My reservations about clicks extend to the very symbols newly devised for most of them. Symbols may and can, if necessary and justified, be arbitrary to more or less extent, but this does not seem to be the case with the symbols for clicks in the 1989 version, except for the symbol ʘ for 'bilabial click' (at least, it has the advantage of being iconic) which was already used in the 1979 version. All the other newly introduced symbols for the other clicks in the 1989 version happen to be those which have long been used by certain Africanists (notably those of Khosian languages) but are certainly no improvements on those in the previous versions where the symbols for clicks were at least easier to memorize (at least for non-Africanists). True, symbols for clicks have undergone some changes in the distant past[10]. But such changes have been ones involving different letters or letter-shapes and still retained their mnemonic usefulness so far as average users of the IPA chart are concerned. (Mnemonic aspects of symbols in the IPA charts should not be neglected.) They do not compare in any way with the newly introduced symbols which are graphic figures of some sort resembling each other and are quite difficult to be memorized by any average non-Africanists that may be willing to use those symbols. I, for one, am certainly unwilling to use for my own work any one of the newly introduced symbols for clicks except the one for 'bilabial click'. The newly introduced symbols for clicks are non-starters. It would have been wiser to retain the old symbols. Besides, it is a foregone conclusion that the use of some of the new symbols for clicks and the sym-

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10 For example, Westermann & Ward (1964: 99) refer to this kind of change in the symbols.

bols for 'minor (foot) group' (i.e. ǀ) and 'major (intonation) group' (i.e. ǁ) placed next to each other will be totally unsatisfactory because visually confusing or even intolerable. Imagine, for example, in phonetic or phonological notation, placing next to each other the symbol for 'alveolar lateral click' (i.e. ǁ) and that for 'major (intonation) group' (i.e. ǁ), which resemble each other overmuch[11], or the symbol for 'dental click' (i.e. ǀ) and that for 'minor (foot) group' (i.e. ǀ) which also resemble each other overmuch[12]. Quite apart from this sort of notational problem, the new symbol for '(post)alveolar click' (i.e. !) makes it visually very awkward to place an exclamation mark (not in bolfdface) next to this symbol in phonetic or phonological notation because the two symbols are exceedingly similar to each other. Moreover, it may be difficult for an average user of the IPA chart to distinguish between e.g. [ǀi] (a dental click followed by a vowel) and [li] (a lateral followed by the same vowel). I strongly suggest that the IPA should reconsider the majority of the newly introduced symbols for clicks in future revisions of the IPA chart.

7.1 I will next examine a good number of the symbols which figure in the part called 'consonants' in the 1989 version.

7.2 Under 'plosive', two plosives, k͡p and g͡b, which were introduced in the 1979 version, have now been removed from the table of 'consonants' and seem at first sight to be *relegated* (in reality, only k͡p is present, while g͡b is now simply absent) to the bottom of 'other symbols'. In actual fact, k͡p is as good as not even *relegated* there because k͡p figures under 'other symbols' (along with t͡s) for the purpose not so much of referring to the plosive concerned as of illustrating the use of a semi-circle ligature in symbolizing affricates and doubly articulated sounds. This means that neither k͡p nor g͡b is actually presented in its own right at all in the 1989

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11 The difference between these two symbols (as presented in the 1989 version), which difference I cannot precisely replicate in the text of the present paper, is that the former (ǁ) is 5mm long and is not in boldface, and the latter (ǁ) is 4mm long and is in boldface.

12 The difference between these two symbols (as presented in the 1989 version), which difference I again cannot precisely replicate in the text of my paper, is that the former (ǀ) is 5 mm long and is not in boldface and the latter (ǀ) is 4 mm long and is in boldface.

version. It seems that the IPA's latest disregard of k͡p and g͡b in the 1989 version has nothing to do with any disregard of the importance of these consonants in many languages (cf. Yoruba, Ewe, Tiv, etc.). One is instead rather led to wonder if this is not because the IPA wished to eliminate 'labial-velar', a place of articulation which figured in the 1979 version, so that the four symbols, k͡p, g͡b, ʍ and w could all be transferred to 'other symbols'. ʍ and w *are* found under 'other symbols'. It is important to note that the 1989 version has also eliminated 'labial-palatal', another place of articulation which figured in the 1979 version and under which ɥ was presented. ɥ also has now been transferred to 'other symbols'. In other words, the IPA's intention in the 1989 version appears to be to eliminate both 'labial-velar' and 'labial-palatal' which relate to double articulation. I shall have occasion to discuss this point about double articulation further below. We shall see that this seeming policy on the part of the IPA has failed, in the event, to be consistently carried out.

7.3 Next comes 'trill' which would have been identical with what we saw in the 1951 version and the 1979 version but for the addition of ʙ for a bilabial trill attested in a few languages (see Ladefoged 1975: 156).

In the 1987 version of the IPA, 'tap or flap' is placed immediately below 'trill' as in the two previous versions, though it should be pointed out at this juncture that both 'trill' and 'tap or flap' were placed further down in the IPA chart in the two previous versions. The reason for the IPA's latest decision about their new placement is unknown to me.

7.4 'Fricative' has always been the largest class of 'consonants' in the IPA chart. The 1951 version had twenty-five. The 1979 version had twenty-three and gone were the alveolar (or rather, post-alveolar) fricative (ɹ), and the voiceless and voiced alveolo-palatal (ç, z), but ʍ was added. Note that ç and z, in spite of their 'relative importance' or 'relative frequency of use' (cf. Polish, Japanese, Chinese, etc.), seem to have been definitively banished from the table of 'consonants' and transferred to 'other symbols', unless they are to be salvaged in a future revision. Here again, the IPA's policy is difficult to understand. So far as 'fricative' is concerned, there is just one point to be made. Further above in this

paper, I referred to the symbol jz which had been proposed by an English phonetician to designate 'voiced palatal fricative' (of the 1951 version) or 'voiced palatal (median) fricative' (of the 1979 version) out of his dissatisfaction with the symbol j having to do the double duty (in both the 1951 and the 1979 versions) of standing for 'voiced palatal fricative' and 'voiced palatal (median) approximant'. I have earlier in this paper already expressed my support for the symbol jz which has never been adopted by the IPA. The IPA has now come out in the 1989 version with a new symbol for 'voiced palatal fricative' in an attempt to leave the symbol j to designate 'palatal approximant' only. The new symbol is ʝ. The erstwhile inconvenience seems at first glance to have been removed. The trouble with the new symbol ʝ , however, is that it would be so easy for many of us to write the symbol j (for 'palatal approximant') inadvertently in such a way (i.e. with a loop at the bottom) that it would be frequently confused with the new symbol ʝ which stands for 'voiced palatal fricative'. I do not think that the new symbol ʝ is the best possible invention and I maintain that jz is definitely preferable.

8.1 I will now discuss the following four 'manners of articulation' as presented in the 1989 version; namely, 'fricative', 'lateral fricative', 'approximant', and 'lateral approximant'. The latest presentation of these four 'manners of articulation' in the 1989 version is in line with what I earlier in this paper described as 'a more logical presentation' than the asymmetrical presentation seen in the 1979 version that I criticized. The reader may recall what I characterized as 'a logical and reasonable presentation', i.e. first a division into 'fricative' and 'approximant' and then a subdivision of each of them into 'median' and 'lateral'. This would have resulted in 'median fricative', 'lateral fricative', 'median approximant', and 'lateral approximant'. This effectively corresponds one by one to the afore-mentioned four-way division which does appear in the 1989 version. The order in which the four 'manners of articulation' are presented in the 1989 version is different, and amelioratively so, from that presented in the 1979 version. This said, I should qualify my approval by suggesting yet another (better) presentation which could be adopted in the future but which I suspect would be contrary to the IPA's presumed pol-

icy not to subdivide *a* 'manner of articulation'. My proposal consists, of course, in first providing 'fricative' and 'approximant' and then subdividing each into 'median' and 'lateral'. In other words, instead of separately presenting 'fricative' and 'lateral fricative' as in the 1989 version, and instead of separately presenting 'approximant' and 'lateral approximant' as in the 1989 version, it would be preferable to reclassify them so that the former two will form a single group ('fricative') subdivided (into 'median' and 'lateral') and the latter two will form a single group ('approximant') subdivided (into 'median' and 'lateral'). This proposed reclassification would look something like the following in the IPA chart:

....

(median)

fricative

(lateral)

fricative

....

(median)

approximant

(lateral)

approximant

....
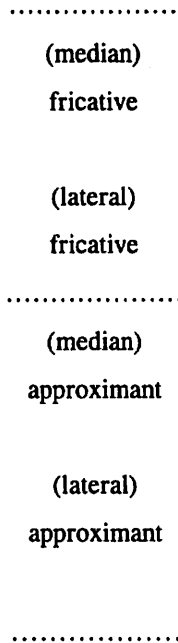
Such a reclassification should really have appeared in the 1979 version. But now back to the 1989 version.

8.2 As will have been guessed from the foregoing, my dissatisfaction with the 1989 version, so far as the presentation of 'fricative' and 'approximant' is concerned, is that the IPA presents simply 'fricative' rather than 'median fricative' (as distinct from 'lateral fricative') and likewise simply 'approximant' rather than 'median approximant' (as distinct from 'lateral approximant'). In other words, the term 'median' has been eliminated altogether in the 1989 version. The 1989 version, in this respect, remains still somewhat asymmetrical, if much less so than the 1979 version. I take it that, in the 1989 version, the IPA employs the term 'fricative' as implicitly equivalent to 'median fricative' and the term 'approximant' as implicitly equivalent to 'median approximant', which would give rise to a certain amount of terminological ambiguity. Anyway, I personally believe that the term 'median' should have been retained, in the sense that 'lateral' is opposed to 'median'. I suggest that both the terms 'median' and 'lateral' should be restored, either with or without the use of parentheses as the IPA wishes, in connection with both 'fricative' and 'approximant'. The justification of the term 'median' as a classificatory label is fully evident in those cases where we have a pair of 'fricative' and 'approximant' which are differentiated from each other through one being 'lateral' and the other 'median' (cf. 'alveolar median fricative' vs. 'alveolar lateral fricative', or 'retroflex median approximant' vs. 'retroflex lateral approximant'). I am fully aware, however, that the term 'median' should be taken less as a classificatory label than merely a descriptive one in those cases where no such pair of the type mentioned just above exist (cf. 'uvular median fricative' which has no such counterpart as 'uvular lateral fricative', or 'labiodental median approximant' which has no such counterpart as 'labiodental lateral approximant'). But even where the term 'median' cannot serve as a classificatory label, this should not be confused with the use of, for example, the term 'stop' in 'ejective stop' because the term 'stop' here should be interpreted as a classificatory label, not a mere descriptive label as in the 1989 version.

9.1 I will now concentrate in some detail on the IPA's treatment of what it calls approximants. I am dissatisfied with the IPA's current refusal (in both the 1979 and the 1989 versions) to incorporate some symbol which

would stand for 'uvular approximant'. The symbol ʁ figured in the 1951 version to designate what was called 'uvular frictionless continuant'. The snag was that this symbol did the double duty of standing for both 'uvular frictionless continuant' (which should presumably be called 'uvular approximant' now) and 'voiced uvular fricative'. The reference to 'uvular approximant' was altogether dropped in the 1979 version and continues to be absent in the 1989 version as well. Why this is so is not clear to me. In my view, a uvular approximant deserves to be inclued in the IPA chart. It is an important enough sound in a number of European languages and is even employed as distinct from an alveolar flap in a language like Arabic. It would of course be necessary to devise a new symbol for 'uvular approximant', i.e. a symbol that differs from ʁ which has traditionally been used for 'voiced uvular fricative'. A possible symbol, say ⱨ, may be obtained by appropriately turning over ʀ twice after the fashion of ɹ (from r)[13].

9.2. I am also dissatisfied with the fact that both ɥ and w - formerly called 'labial-palatal (median) approximant' and 'labial-velar (median) approximant', respectively, in the 1979 version - have been dropped from the table of 'consonants'. This, I suspect, is compatible with the seeming new IPA policy to eliminate from the table of 'consonants' all sounds which involve double articulation. (The same policy seems responsible for the removal of k͡p, g͡b, and ʍ as well.) By contrast, the 1989 version does retain ɰ for 'velar (median) approximant' which the 1979 version incorporated in the IPA chart for the first time. The retention of ɰ is certainly for the reason that ɰ does not involve double articulation. The two 'places of articulation' involved in double articulation for ɥ, w, ʍ, k͡p and g͡b are of course 'bilabial' and 'velar'.

9.3 I am further dissatisfied with the inclusion in the IPA chart (for the first time, in the 1989 version) of ʟ ('velar lateral approximant') which seems to be infrequent compared with, say, ʁ ('uvular approximant')

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13 This is the very symbol that Passy (1906: 21) uses for the 'parisian *r*' ('*r* parisien' as he calls it) whereby, however, Passy appears to mean [χ], in fact.

which neither the 1979 version nor the 1989 version includes in the first place. To my limited knowledge, ʟ occurs as a speech defect in replacement of l.

9.4 Over and above the afore-mentioned dissatisfaction with the IPA's treatment of what it calls approximants, my major disquiet concerns the very definitional concept of 'approximant' which has officially been accepted by the IPA (since the 1979 version) and appears to be here to stay in the IPA chart.

9.5 The term 'approximant' was first proposed most probably to replace the up-till-then traditional term 'frictionless continuant' and 'semi-vowel' and was defined by Ladefoged (1964: 25) as 'a sound which belongs to the phonetic class vocoid or central resonant oral (Pike, 1943) and simultaneously to the phonological class consonant . . .' Quite paradoxically, Ladefoged (1964), in Table 1 inserted between pages 2 and 3, includes l and ʎ (both being voiced laterals) among approximants; this contradicts his own definition of 'approximant' in which he refers to '*central* [my italics] resonant oral' . The term 'approximant', if not the original definitional concept, is subsequently introduced into the 1979 version of the IPA chart to refer to three types (with regard to 'manners of articulation') of consonant which were formerly (in the 1951 version) classified as 'frictionless continuant', 'semi-vowel' and 'lateral non-fricative', respectively. As can be easily seen, Ladefoged's original definition of the term 'approximant' has since undergone modification, both conceptually and formulaically, so that his later definitions read variously as follows: 'Approximation of two articulators without producing a turbulent airstream' (Ladefoged 1971: 46; 1975: 157); or 'An articulation in which one articulator is close to another, but without the vocal tract being narrowed to such an extent that a turbulent airstream is produced' (Ladefoged 1975: 10). The vocal tract is said to be 'The air passages above the larynx . . .' (Ladefoged 1975: 3). It is notable that the qualification 'central' which was in his original definition of 'approximant' has disappeared in his subsequent definitions and, as a result, Ladefoged allows laterals as well to be approximants. The criterion for establishing a certain group of sounds as a class of consonants characterizable as ap-

proximants would therefore seem to be twofold: (i) narrowing between two articulators (an articulatory posture) and (ii) the absence, in spite of the said narrowing, of a turbulent airstream (an acoustic fact). Fricatives fail to meet the criterion concerned because they require such a degree of narrowing between articulators as produces a turbulent airstream. Note that approximants are supposed to include non-fricaive *laterals* as well in spite of the closure between two articulators obligatory in the articulation of any laterals (this contact between the two articulators is evidently expressly disregarded) and that non-fricative laterals would qualify as approximants by virtue of various degrees (fairly open to fairly close) of narrowing between articulators elsewhere but where the above-mentioned closure occurs. Anyway the inclusion of non-fricative laterals among approximants may give rise to a problem which I will not go into in the present paper. The reference to 'narrowing' in the definition of the term 'approximant' implicitly excludes plosives, and also affricates which, incidentally, haved never been accorded proper treatment in the IPA chart. The fact that the term 'approximant' is supposed to apply exclusively to what the IPA calls 'consonants' in the IPA chart would seem to exclude by implication what they call 'vowels'. Yet in the 1979 version, w, ɥ and j (which were formerly presented as 'semi-vowels' in the 1951 version) figure together with some consonants proper as '(median) approximants'. It is well known, however, that semi-vowels are, articulatorily, nothing but (close or fairly close) vowels. The inclusion of w, ɥ and j as '(median) approximants' by aligning them with some consonants proper reflects an additional implicit consideration, that is, the function of w, ɥ and j as marginals within syllable structure, though this function is not specified in Ladefoged's later definitions of 'approximant'. The inclusion of ɰ, also as a '(median) approximant', in the 1979 version, is evidently again based on the function, within syllable structure, of another close vowel, ɯ. (I have a few remarks to make further below about ɰ which we find in the 1979 and the 1989 versions.) A welcome addition to the 1979 version as 'retroflex (median) approximant' is ɻ . Be that as it may, one is tempted to ask: is an approximant a consonant or a vowel or both? It should be pointed out in this connection that Ladefoged (1971: 46) even

includes a as an approximant. But [a] would be far from an appropriate candidate for an approximant.

9.6 It is clear that so far as the IPA is concerned, the concept of 'approximant' is, at least in principle, directly opposed to that of 'fricative'; that is how the former designation arose in the first place in the recent past (i.e. in 1964). What is rather serious is that there even appears to be confusion between 'fricative' and 'approximant' in the minds of some associated with the IPA. For example, reading what Ladefoged (1975: 61-62) has to say about approximants is enough to give little credence to the definitional concept of 'approximant', so far as those outside the IPA are concerned. I will raise a few concrete points. I will dismiss out of hand as simply wrong Ladefoged's reference to the second segment in [pɹei] *pray*, [tɹai] *try* or [kɹai] *cry* as a *voiceless* approximant. The second segment in question is a fricative (cf. Gimson 1989: 208), not an approximant. At any rate, a voiceless approximant should be silence, as O'Connor (1973: 61) rightly points out[14]. Ladefoged (1971: 122) presents [h] as 'glottal (central) approximant', i.e. 'glottal (median) approximant', but [h] is a fricative, not an approximant. Here too Ladefoged seems to be wrong about what he considers a voiceless approximant. Lastly I should note that, though Ladefoged (1964) and his subsequent works include laterals as approximants, Abercrombie seems to exclude laterals from the category of approximants[15], with which Ladefoged will most likely disagree. It seems to be Ladefoged's stance that is reflected in the 1979 and the 1989 versions of the IPA. The definitional concept of 'approximant' is far from uniform, and there are still problems to be tackled and resolved.

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14 'There are no voiceless frictionless continuants because this would imply silence; the voiceless counterpart of the frictionless continuant is the voiceless fricative.' Note that O'Connor seems to avoid the term 'approximant'. The view that a voiceless frictionless continuant would be silence seems to be shared, independently, by Arnold (1963: 4) who writes: '. . . voiceless frictionless continuants, though articulatorily feasible, are perceptually impossible since they produce no audible effect.'

9.7 At this juncture, two important facts should be pointed out. First, the category of consonants (note, not vowels as well) which corresponds to that of approximants was proposed, independently and nearly a decade earlier than Ladefoged (1964), by Martinet (1956: 24-25) under the name of 'spirant', most probably without Ladefoged being aware of it, and was briefly repeated by Martinet (1960: 48). Second, apart from the distinction between a fricative and a spirant, Martinet in his various publications presents a spirant in connection with a plosive (notice, not a fricative); that is to say, a spirant is a consonant which results from a lax articulation of its corresponding plosive. A spirant results from an imperfect closure of a plosive without producing a fricative. Martinet (1956: 24) refers to a lax articulation of *d* in the Spanish word *ocupado*. Martinet (1980-1981: 437) and Martinet (1981: 147) compare *cada* in which *d* corresponds to a spirant with *caza* in which *z* corresponds to a fricative (be it [θ] or [s]). All this suggests that an approximant, which corresponds at least in part to a spirant, can be considerd to relate primarily to a plosive when it is badly articulated in the sense that its closure is imperfectly made. This is clear when one reads Martinet (1980-1981: 437) saying that '. . . on a . . . dans *cada* relâchement d'une occlusion' and Martinet (1981: 147) saying that '[-ð-] of *cada* is an imperfectly articulated [d]'[16]. Martinet (1980-1981), particularly in section 1 (436-440) entitled 'Fricatives - Spirantes' and the whole of Martinet (1981) make illuminating reading on the matter under consideation here.

9.8 Why is it that the IPA chart in the 1979 and 1989 versions retains the inclusion of ɰ which stands for 'velar approximant', or more appropriately 'velar median approximant', without also including a symbol standing for 'bilabial median approximant' and a symbol standing for

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15 'APPROXIMANT. With open approximation of the articulators, and *central* [my italics] passage of the air-stream .'

16 In the light of Martinet (1980-1981: 439, 440) and Martinet (1981: 150) who propose the use of the symbol σ for a spirant rather than ð (for a fricative), I believe that the symbol ð in this quoted phrase is a misprint for σ.

'dental (or alveolar) median approximant'? These latter are to 'voiced bilabial plosive' [b] and 'voiced dental (or alveolar) plosive' [d] what 'velar median approximant' is to 'voiced velar plosive'. It is desirable for the IPA to add these extra symbols. The two approximants in question occur frequently in e.g. Spanish and Portuguese, and the symbols ƀ and đ are often allotted to them by many Hispanists. The symbols ǥ is also used by many Hispanists to stand for the sound which the IPA symbolizes by ɰ[17]. The fact that ƀ, đ and ǥ (or ɰ) occur as variants, not as phonemes, in these languages should constitute no deterrent to the IPA incorporating them in the IPA chart. In theory, there should be an approximant corresponding to every voiced plosive. Obviously, the IPA is entitled to choose whichever approximants it wants to include, but it would be desirable to include at least ƀ and đ as well if ǥ (or ɰ) is to be included in the first place. The problem of whether or not the IPA chart should include ƀ and đ (in addition to ǥ) is linked to the question of what status the IPA means to accord to the symbols in the IPA chart, a question I shall not deal with in the present paper.

10.1 I will next look at 'places of articulation' in the 1989 version of the IPA chart. Eleven places of articulation are indicated instead of fourteen in the 1979 version. (I have counted 'dental, alveolar, or post-alveolar' in the 1979 version as *three* places of articulation.) As mentioned earlier, 'labial-palatal' and 'labial-velar' were abolished in the 1989 version presumably because they involve double articulation. 'Bilabial', 'labiodental', 'dental', 'alveolar', 'postalveolar' (spelled thus without a hyphen), 'retroflex', 'palatal', 'velar', 'uvular', 'pharyngeal', and 'glottal', are all retained as before. However, it is very important to stress that the mere use, as above, of different terms for various places of arti-

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17 Martinet (1980-1981: 439-440) and Martinet (1981: 149-150) propose two series of symbols, one for a series of stops and the other a series of continuants. His symbols do not include ƀ, đ or ǥ which I use here and elsewhere. But I refrain from going into a discussion of Martinet's proposal in this paper. Quite apart from the question of symbols, Martinet's treatment is superior to the IPA's treatment in that Martinet deals in a balanced manner with the distinction between spirants and fricatives while the IPA does not.

culation is highly deceptive with regard to some of them. It is imperative to compare the places of articulation as indicated in the 1989 version with those in the 1979 version for us to realize the partial modification that has been brought about in the 1989 version.

10.2 In the 1979 version, 'dental', 'alveolar' and 'post-alveolar' were placed together in one grid. In the 1989 version, 'dental', 'alveolar' and 'post-alveolar' (the last-mentioned new term replaces 'palato-alveolar') constitute three clearly separate 'places of articulation'. In the 1979 version, 'post-alveolar' referred to e.g. ɹ (as in *rose*), and 'palato-alveolar' to ʃ (as in *she)* and ʒ (as in *measure*). In the 1989 version, the term 'palato-alveolar' has been abolished and replaced by the term 'postalveolar', so that 'postalveolar' now applies to ʃ while ɹ which was under 'post-alveolar' in the 1979 version is now under 'alveolar' in the 1989 version. The abolition of 'palato-alveolar' in favour of 'postalveolar', coupled with the abolition of the distinction between 'alveolar' and 'post-alveolar' in favour of 'alveolar' in the 1989 version, poses a major problem, which I will proceed to discuss.

10.3 The designation of ʃ and ʒ as 'palato-alveolar', as was the practice in both the 1951 and the 1979 versions, must be considered preferable. Both ʃ and ʒ involve two concomitant articulations (i.e. double articulation) one of which is primary (i.e. post-alveolar articulation) and the other secondary (i.e. palatal articulation)[18]. The term 'palato-alveolar' aptly expresses this double articulation (one primary, the other secondary) except that it would be more correct to talk about 'palato-postalveolar' instead. By contrast, the designation of ʃ and ʒ as 'postalveolar', as occurs in the 1989 version, is quite inappropriate as it refers to only a single articulation which is the post-alveolar articulation (i.e. the primary articulation) by ignoring the other necessary articulation, i.e. the palatal articulation

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18 O'Connor (1973: 57) says: 'The English *sh* sound has a primary articulation which is post-alveolar and fricative, and a secondary palatal articulation; we call this a *palato-alveolar* fricative.' Note that, by contrast, Ladefoged (1975: 7) refers to post-alveolar articulation only and says (1982: 147) that 'palato-alveolar' is equivalent to laminal post-alveolar.' Ladefoged's belief that 'palato-alveolar' is equivalent to 'laminal post-alveolar' is also evident in Ladefoged (1971: 39, 102).

(i.e. the secondary articulation). One wonders if this new designation is again in line with the IPA's seeming policy to banish from the table of 'consonants' all sounds which involve double articulation. It is not surprising, for that matter, that ç and z too, which are alveolo-palatal fricatives and involve double articulation, figure under 'other symbols' in the 1989 version as they did in the 1979 version. They were still in the table of 'consonants' in the 1951 version. ç and z also each involve two concomitant articulations (i.e. double articulation) one of which is primary (i.e. palatal articulation) and the other secondary (i.e. alveolar articulation)[19], which the term 'alveolo-palatal' appropriately expresses[20]. If it is indeed the case that, according to the IPA, ç and z should not figure in the table of 'consonants' because of their double articulation (any more than should w, ʍ, ɥ, k͡p and g͡b), then ʃ and ʒ should also be banished from the table of 'consonants' to be placed under 'other symbols'. This, however, is not done in the 1989 version. This is due either to inconsistency in the treatment of doubly articulated consonants or to mistaken disregard of a secondary articulation in the double articulation of ʃ and ʒ. I should point out lastly that the replacement by the term 'postalveolar' of the term 'palato-alveolar' in exclusive reference to ʃ and ʒ in the 1989 version leads to both ambiguity and inadequacy. We know that Ladefoged (1971: 36, 38) considers both 'palato-alveolar' and 'retroflex', as traditionally referred to, as being 'postalveolar' and subdivides 'postalveolar' into 'laminal postalveolar' (said to be equivalent to 'palato-alveolar') and 'apical postalveolar' (said to be equivalent to 'retroflex'). Should it be the case that Ladefoged's view is at all reflected or taken into account in the adoption of both 'postalveolar' (cf. ʃ and ʒ) and 'retroflex' (cf. ʂ, ʐ , etc.) in the 1989 version, then we could say that 'palato-alveolar' and 'retroflex' are underdifferentiated or that 'postalveolar' should actually be taken in the sense of 'palato-alveolar' (which would bring us back to square

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19 O'Connor (1973: 57) says that 'In Polish . . . the sound written ś has a primary palatal articulation and a secondary alveolar one, and is called an *alveolo-palatal* fricative.'

20 It is surprising that Ladefoged (1971, 1975, 1982) should make no reference at all to alveolo-palatal fricatives.

one). I do not think that the substitution of 'palato-alveolar' by 'postalveo-lar' in the 1989 version has resulted in any improvement.

10.4 At any rate, I do not think much good is gained as a result of the new use of the term 'postalveolar' introduced in the 1989 version. On the contrary, much confusion and inaccuracy result. It is strongly suggested that 'post-alveolar' should be restored, and so should 'alveolo-palatal'.

10.5 As for the term 'alveolar' in the 1989 version, this is meant to re-fer to both 'alveolar' and 'post-alveolar', i.e. to refer to **t, d, n**, etc. not only when articulated alveolarly but also when articulated post-alveolarly, as well as to **ɹ** which is properly presented as 'post-alveolar' in the 1951 and the 1979 versions. Furthermore, we confirm that 'post-alveolar' was provided in the 1979 version to refer specifically to **ɹ, ʃ** and **ʒ**.

11.1 There is one particular consonant the placement of whose symbol in the 1989 version of the IPA chart seems to me to be especially contro-versial. The consonant in question is 'glottal plosive' symbolized by **ʔ**. In the 1951 version, this symbol is placed in the middle of a grid, which re-flects the view that a glottal plosive is neither voiced nor voiceless, both phonetically and phonologically. It is indeed impossible to produce a *voi-ced* glottal plosive since a glottal plosive by its very nature obligatorily requires for its articulation the closure of the glottis by means of the vocal folds. Since placing the diacritic ˷ under the symbol for a glottal plosive is simply not done, it seems fair to understand that **ʔ** is not at all meant to stand for a voiced consonant, either. Looking at the 1989 version, we are in for a surprise when we notice that **ʔ** is placed in such a way as to be unambiguously aligned with **h** ('voiceless glottal fricative') which is pla-ced to the left of **ɦ** ('voiced glottal fricative'). I say 'unambiguously' be-cause the space which might be occupied by another symbol which, thou-gh unlikely in my view, would stand for '*voiceless* glottal plosive' is ex-plicitly obliterated by means of a shaded area[21]. As I see it, this oblitera-

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21 'Report' (1989: 69) in *JIPA*, Vol. 19 (1989) says: 'Some kind of shading or light cross hatching should fill the blank spaces which represent "impossible" places of articulation.' Note that, actually,

tion coupled with the afore-mentioned particular placement of ʔ seems to imply two associated points of view. One of the points of view is that a glottal plosive is voiceless, not voiced. The other point of view is that a glottal plosive cannot be voiced. The first point of view is, as I see it, wrong, for a glottal plosive cannot be voiced; it is therefore equally wrong to place ʔ in the way it is done in the 1989 version. The second point of view is wrong by implication that it is voiceless. What is interesting about the second point of view, as I see it, is that it seems to be actually a veiled assertion on the part of the IPA whereby to officially reject a view previously advanced in some quarters that a *voiced* glottal plosive is a possibility (Halle & Stevens 1971: 208, 209). Be that as it may, it is indeed strange to see the symbol for 'glottal plosive' placed in such a way as to stand explicitly for a voiceless consonant. The placement of this symbol in the 1989 version seems to be perverse. The IPA would have to either reconsider and rework the placement of ʔ or alternatively re-define the concept of voicelessness altogether.

11.2 Not unrelated to the question of the symbol ʔ for 'glottal plosive' is a wider issue of how to place symbols for pairs of voiced and voiceless consonants in the IPA chart. It has become a conventional practice in the IPA chart that a pair of symbols, one of which represents a voiceless consonant and the other its voiced counterpart, are placed side by side in such a way that the former appears on the left and the latter on the right. This principle can be accepted as uncontroversial. This placement is observed in all the three versions of the IPA chart under discussion. However, in certain cases in which there is only one symbol which, according to the IPA, is supposed to stand for a voiced consonant, there has been a change in practice between the 1951 version on the one hand and the 1979 and the 1989 versions on the other. In the 1951 version, to take the example of the nasal consonants - but other relevant examples would do just as well - the symbols are placed in the middle so that, for example, **m**

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shading rather than light cross hatching has ultimately been adopted in the 1989 version of the IPA chart.

is not aligned with either, among others, **p** or **b**. Also in the 1951 version, under 'modifiers', the diacritic ₀ is provided with which to indicate a voiceless counterpart of ɱ (ḷ, ʀ , etc.), thus ɱ (ḷ, ʀ , etc.). It is therefore not absolutely clear if the middle placement of e.g. **m** is supposed to present **m** as (i) being neutral to voiced-voiceless distinction or (ii) being voiced. The middle placement is in a way non-commital but interesting. When we look at the 1979 version, however, we notice that **m**, for example, is placed in such a way that it is definitely aligned with, among others, **b** but not **p**, which suggests that **m** is definitely presented as voiced. Note that the same ₀ diacriticis provided under 'diacritics' in the 1979 version as in the 1951 version. In a way, this is a committed placement of e.g. **m** whereby the non-inclusion, in the table of 'consonants' itself, of ɱ (the voiceless counterpart of **m**) as in Burmese is deliberate. The same placement of, for example, **m** (aligned with **b**) is retained in the 1989 version. It seems fair to understand that the symbol **m**, for example, is not to be taken as being neutral to voiced-voiceless distinction in the IPA chart, certainly not in the 1979 and the 1989 versions, and not even in the 1951 version (despite its middle placement). Incidentally, all this means that if the functionalist wishes to use **m** to stand for the phoneme /m/ in e.g. English in which /m/ is phonologically neither "voiced" nor "voiceless" - note that "voiced" and "voiceless" are here two relevanat features - he should forget about all possible implications deriving from the placement of **m**, one way or another, in the IPA chart.

12 The 1989 version has shaded areas here and there to indicate what are described as ' "impossible" places of articulation'[22]. As a matter of fact, it is more sensible to speak of ' "impossible" intersections of places of articulation and manners of articulation'. I agree, in principle, with the placement of the shaded areas. It is important to remember that the IPA is supposed to be talking about articulations of 'all the possible *sounds* of the world's *languages* [my italics]'[23]. If it were not for this qualification (i.e.

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22 As in the preceding note.

23 'Report' (1989: 67) in *JIPA*, Vol. 19 (1989) says; 'The IPA is intended to be a set of symbols for representing all the possible sounds of the world's languages.'

only 'sounds of . . . languages'), articulations corresponding to a few of
the shaded areas *would* be possible; for example, 'glottal tap or flap' and
'glottal implosive'. Note, incidentally, that the 1989 version contains a
number of unshaded areas corresponding to the intersections of some of
the places of articulation and some of the manners of articulation, in
which no symbols occur. Presumably no such sounds of languages as
might be recorded in those unshaded areas are supposed to occur, and this
is justifiable in the case of some of the unshaded areas. But one wonders
if it is not possible to fill the unshaded area representing the intersection
of 'labiodental' and 'plosive' (cf. p as in *cupful*, ḅ as in *subvert*), that re-
presenting the intersection of 'uvular' and 'tap or flap'[24], that represent-
ing the interaction of 'bilabial' and 'approximant' (cf. ƀ as in *hablar*),
that representing the interaction of 'dental' and 'approximant' (cf. đ as in
admirar) or that representing the intersection of 'uvular' and 'approxi-
mant' (cf. [ʁ] as in *carré*)[25].

13 Finally, I have a few things to say about 'other symbols'. (I will
leave 'diacritics' and 'suprasegmentals' undiscussed in the present paper
as they do not directly pertain to sounds in the sense that symbols under
'consonants', 'vowels' and 'other symbols' do.) We notice, in the 1989
version, the introduction of three new symbols which were not found in
the previous versions and which stand for three different epiglottal conso-
nants. They are H ('voiceless epiglottal fricative'), ʕ ('voiced epiglottal
fricative') and ʡ ('epiglottal plosive'). Quite apart from the justification or
otherwise of adding these three symbols, there could initially be some
confusion for those many phoneticians, so far as H and ʕ are concerned,
who are aware that the articulation of a voiceless pharyngeal fricative [ħ]
and that of a voiced pharyngeal fricative [ʕ] has been described, possibly
erroneously, as involving the epiglottis (cf. Ladefoged 1975: 149) rather

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24 This appears in both the 1951 and the 1979 versions, the symbol being ʀ, but has been dropped in
the 1989 version.

25 It should be recalled that I would prefer to have a different symbol like ꭒ for 'uvular approx-
imant' instead of ʁ.

than the tongue root. Presumably, it would be more correct to describe [h
] and [ʕ] as a voiceless radico-pharyngeal fricative (i.e. articulated be-
tween the tongue root and the pharyngeal wall) and a voiced radico-pha-
ryngeal fricative, respectively, as distinct from [H] and [ʕ] which are a
voiceless epiglotto-pharyngeal fricative (i.e. articulated between the epi-
glottis and the pharyngeal wall) and a voiced epiglotto-pharyngeal frica-
tive, respectively. It may be pointed out in this connection that an epiglot-
tal plosive has been said to be an impossible sound for many people (cf.
Ladefoged 1975: 149).

14 As I emerge from the foregoing discussion of the 1951, the 1979 and
the 1989 versions of the IPA chart, my feeling is to echo the well-known
phrase of Alphonse Karr: 'Plus ça change, plus c'est la même chose'. On
the other hand, I would say that in spite of a wide-ranging criticism I have
levelled at the three versions of the IPA chart, especially the latest version
to date, the very principle and aim of the IPA to provide in its chart a
number of individual symbols for individual sounds of languages deserve
all linguists' support.

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THE INTERNATIONAL PHONETIC ALPHABET.

(Revised to 1951.)

		Bi-labial	Labio-dental	Dental and Alveolar	Retroflex	Palato-alveolar	Alveolo-palatal	Palatal	Velar	Uvular	Pharyngal	Glottal
CONSONANTS	Plosive . . .	p b		t d	ʈ ɖ			c ɟ	k g	q ɢ		ʔ
	Nasal . . .	m	ɱ	n	ɳ			ɲ	ŋ	N		
	Lateral Fricative .			ɬ ɮ								
	Lateral Non-fricative .			l	ɭ			ʎ				
	Rolled . . .			r						R		
	Flapped . . .			ɾ	ɽ					R		
	Fricative . . .	ɸ β	f v	θ ð | s z ɹ	ʂ ʐ	ʃ ʒ	ɕ ʑ	ç j	x ɣ	χ ʁ	ħ ʕ	h ɦ
	Frictionless Continuants and Semi-vowels	w ɥ	ʋ		ɻ			j (ɥ)	(w)	ʁ		
VOWELS								Front Central Back				
	Close . . .	(y ʉ u)						i y ɨ u ɯ u				
	Half-close . . .	(ø o)						θ ø ɤ o				
	Half-open . . .	(œ ɔ)						ɛ œ ʌ ɔ				
								æ ɐ				
	Open . . .	(ɒ)						a ɑ ɒ				

(Secondary articulations are shown by symbols in brackets.)

OTHER SOUNDS.—Palatalized consonants: ţ, ḑ, etc.; palatalized ʃ, ʒ: ʆ, ʓ. Velarized or pharyngalized consonants: ɫ, ɖ, s, etc. Ejective consonants (with simultaneous glottal stop): p', t', etc. Implosive voiced consonants: ɓ, ɗ, etc. ɼ fricative trill. σ, ϙ (labialized θ, ð, or s, z). ʖ, ʓ (labialized ʃ, ʒ). ʇ, ʗ, ʘ (clicks, Zulu c, q, x). ɹ (a sound between r and l). ŋ Japanese syllabic nasal. ʅ (combination of x and ʃ). ʍ (voiceless w). ɪ, ʏ, ʊ (lowered varieties of i, y, u). ɜ (a variety of ə). ɵ (a vowel between ø and o).

Affricates are normally represented by groups of two consonants (ts, tʃ, dʒ, etc.), but, when necessary, ligatures are used (ʦ, ʧ, ʤ, etc.), or the marks ͡ or ͜ (t͡s or t͜s, etc.). ͡ ͜ also denote synchronic articulation (m͡ŋ = simultaneous m and ŋ). c, ɟ may occasionally be used in place of tʃ, dʒ, and ʃ, ʒ for ts, dz. Aspirated plosives: ph, th, etc. r-coloured vowels: ɛɹ, aɹ, ɔɹ, etc., or eʴ, aʴ, ɔʴ, etc., or ę, ą, ǫ, etc.; r-coloured ə: əɹ or əʴ or ɹ or ą or ɚ.

LENGTH, STRESS, PITCH.— : (full length). · (half length). ' (stress, placed at beginning of the stressed syllable). ˌ (secondary stress). ¯ (high level pitch); _ (low level); ´ (high rising); ˏ (low rising); ˋ (high falling); ˎ (low falling); ^ (rise-fall); ˇ (fall-rise).

MODIFIERS.— ~ nasality. ̥ breath (l̥ = breathed l). ̬ voice (s̬ = z). ʻ slight aspiration following p, t, etc. ̫ labialization (n̫ = labialized n). ̪ dental articulation (t̪ = dental t). ʼ palatalization (ẕ = ʒ). ̣ specially close vowel (ẹ = a very close e). ̨ specially open vowel (ę = a rather open e). ̺ tongue raised (e̺ or ẹ = e). ̜ tongue lowered (e̜ or ȩ = ɛ). ̟ tongue advanced (u̟ or u̠ = an advanced u, t̟ = ţ). - or ̠ tongue retracted (i̠ or i̠ = ɨ˗, t̠ = alveolar t). ̹ lips more rounded. ̜ lips more spread. Central vowels: ï(= ɨ), ü(= ʉ), ë(= ɘˌ), ö(= ɵ), ɛ̈, ö̈. ̩ (e.g. n̩) syllabic consonant. ̯ consonantal vowel. ʃˏ variety of ʃ resembling s, etc.

THE INTERNATIONAL PHONETIC ALPHABET

(Revised to 1979)

		Bilabial	Labiodental	Dental, Alveolar, or Post-alveolar	Retroflex	Palato-alveolar	Palatal	Velar	Uvular	Labial-Palatal	Labial-Velar	Pharyngeal	Glottal
SONANTS (pulmonic air-stream mechanism)	Nasal	m	ɱ	n	ɳ		ɲ	ŋ	ɴ				
	Plosive	p b		t d	ʈ ɖ		c ɟ	k g	q ɢ		k͡p g͡b		ʔ
	(Median) Fricative	ɸ β	f v	θ ð s z	ʂ ʐ	ʃ ʒ	ç j	x ɣ	χ ʁ		ʍ	ħ ʕ	h ɦ
	(Median) Approximant		ʋ	ɹ	ɻ		j	ɰ		ɥ	w		
NON-SONANTS	Lateral Fricative			ɬ ɮ									
	Lateral (Approximant)			l	ɭ		ʎ						
	Trill			r					ʀ				
	Tap or Flap			ɾ	ɽ				ʀ				
CONS (non-pulmonic air-stream)	Ejective	p'		t'				k'					
	Implosive	ɓ		ɗ				ɠ					
	(Median) Click	ʘ		ʇ ʗ									
	Lateral Click			ʖ									

DIACRITICS

- ̥ Voiceless n̥ d̥
- ̬ Voiced s̬ t̬
- ʰ Aspirated tʰ
- ̤ Breathy-voiced b̤ a̤
- ̪ Dental t̪
- ̫ Labialized t̫
- ̡ Palatalized t̡
- ~ Velarized or Pharyngealized ɫ, l̴
- ̩ Syllabic n̩ l̩
- ˆ or ̯ Simultaneous sʃ (but see also under the heading Affricates)

- ˙ or · Raised e˙, e̮, e̮ w
- ˎ or ˏ Lowered e·, e̮, e̮ ɣ
- ˖ Advanced u̟+, u̟
- ˗ or – Retracted i̠, i·, t̠
- ̈ Centralized ë
- ̃ Nasalized ã
- ˞, ˞, ˞ r-coloured a˞
- ː Long aː
- ˑ Half-long a·
- ̆ Non-syllabic ŭ
- ˒ More rounded ɔ˒
- ˓ Less rounded y˓

OTHER SYMBOLS

- ɕ, ʑ Alveolo-palatal fricatives
- ʃ, ʒ Palatalized ʃ, ʒ
- ɼ Alveolar fricative trill
- ɺ Alveolar lateral flap
- ɧ Simultaneous ʃ and x
- ʃ Variety of ʃ resembling s, etc.
- ɪ = ι
- ʊ = o
- ɔ = Variety of ə
- ɚ = r-coloured ə

VOWELS

Front — Back (Unrounded): i ɨ ɯ / ι / e ə ɤ / ɛ / æ ɐ / a ɑ

Front — Back (Rounded): y ʉ u / ʏ ʊ / ø ɵ o / œ ɔ / ɶ ɒ

Close / Half-close / Half-open / Open
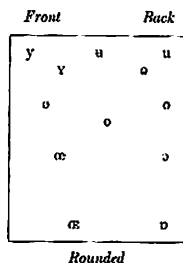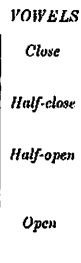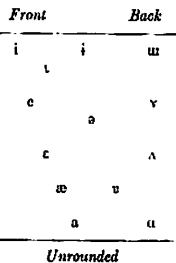
STRESS, TONE (PITCH)

- ˈ stress, placed at beginning of stressed syllable:
- ˌ secondary stress: ˉ high level pitch, high tone:
- ˍ low level: ˊ high rising:
- ˏ low rising: ˋ high falling:
- ˎ low falling: ˆ rise-fall:
- ˇ fall-rise.

AFFRICATES can be written as digraphs, as ligatures, or with slur marks; thus ts, tʃ, dʒ: ʦ t͡ʃ d͡ʒ: ʦ t͡ʃ d͡ʒ. c, ɟ may occasionally be used for tʃ, dʒ.
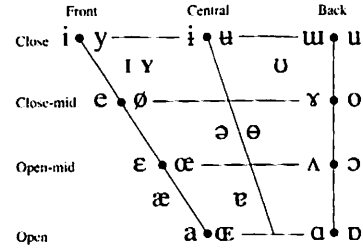
THE INTERNATIONAL PHONETIC ALPHABET (revised to 1989)

CONSONANTS

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	N		
Trill	B			r					R		
Tap or Flap				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
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			
Ejective stop	pʼ			tʼ		ʈʼ	cʼ	kʼ	qʼ		
Implosive	ɓ ɓ			ɗ ɗ			ʄ ʄ	ɠ ɠ	ʛ ʛ		

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

VOWELS

Front — Central — Back

Close: i y — ɨ ʉ — ɯ u
ɪ ʏ ʊ
Close-mid: e ø — ɤ o
ə ɵ
Open-mid: ɛ œ — ʌ ɔ
æ ɐ
Open: a ɶ — ɑ ɒ

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

OTHER SYMBOLS

ʍ Voiceless labial-velar fricative	⊙ Bilabial click
w Voiced labial-velar approximant	ǀ Dental click
ɥ Voiced labial-palatal approximant	! (Postalveolar click
H Voiceless epiglottal fricative	ǂ Palatoalveolar click
ʕ Voiced epiglottal fricative	‖ Alveolar lateral click
ʔ Epiglottal plosive	ɺ Alveolar lateral flap
ɕ ʑ Alveolo-palatal fricatives	ʩ Simultaneous ʃ and X
ɞ Additional mid central vowel	

Affricates and double articulations can be represented by two symbols joined by a tie bar if necessary. k͡p t͡s

DIACRITICS

̥ Voiceless	n̥ d̥	̹ More rounded	ɔ̹	ʷ Labialized	tʷ dʷ	̃ Nasalized ẽ
̬ Voiced	s̬ t̬	̜ Less rounded	ɔ̜	ʲ Palatalized	tʲ dʲ	ⁿ Nasal release dⁿ
ʰ Aspirated	tʰ dʰ	̟ Advanced	u̟	ˠ Velarized	tˠ dˠ	ˡ Lateral release dˡ
̤ Breathy voiced	b̤ a̤	̠ Retracted	i̠	ˤ Pharyngealized	tˤ dˤ	̚ No audible release d̚
̰ Creaky voiced	b̰ a̰	̈ Centralized	ë	̴ Velarized or pharyngealized ɫ		
̼ Linguolabial	t̼ d̼	̽ Mid centralized	ë̽	̝ Raised	e̝ (ɹ̝ = voiced alveolar fricative)	
̪ Dental	t̪ d̪	̩ Syllabic	l̩	̞ Lowered	e̞ (β̞ = voiced bilabial approximant)	
̺ Apical	t̺ d̺	̯ Non-syllabic	e̯	̘ Advanced Tongue Root	e̘	
̻ Laminal	t̻ d̻	˞ Rhoticity	ə˞	̙ Retracted Tongue Root	e̙	

SUPRASEGMENTALS

ˈ Primary stress	ˌfoʊnəˈtɪʃən
ˌ Secondary stress	
ː Long	eː
ˑ Half long	eˑ
̆ Extra-short	ĕ
. Syllable break	ɹi.ækt
ǀ Minor (foot) group	
‖ Major (intonation) group	
‿ Linking (absence of a break)	
↗ Global rise	
↘ Global fall	

TONES & WORD ACCENTS

LEVEL		CONTOUR	
e̋ or ˥ Extra high		ě or ˄ Rising	
é ˦ High		ê ˅ Falling	
ē ˧ Mid		e̋ ˧˥ High rising	
è ˨ Low		ȅ ˩˧ Low rising	
ȅ ˩ Extra low		ê˥˩ Rising-falling etc.	
↓ Downstep			
↑ Upstep			