

The Short-Quantity Piece in English Lexical Items, and Its Vowel Systems*

R. K. SPRIGG

Formerly Department of Phonetics and Linguistics
School of Oriental and African Studies, University of London

Nowadays a man must master at least one tongue language and one hand language. His ears, however, have to understand quite a number of ear languages, principally dialects of his own country.

Firth (1937: 23)

1 The three-term junction-piece system: r, v, and c

At the first Firthian Phonology Colloquium, held at the University of York in 1984, I proposed a three-term prosodic system r, v(owel), c(onsonant), applicable to types of piece in junction at word boundaries, but also within the word, whereby every English lexical item can be classified as r piece, v piece, or c piece according to its final features in the junction piece:

r	[dɪə(ɹ)] <i>dear, dearest</i>	[deə(ɹ)] <i>dare, daring</i>	[fə:(ɹ)] <i>fur, furry</i>	[stɑ:(ɹ)] <i>star</i>	[-ə(ɹ)] <i>(sitt)er</i>
v	[ple:] <i>play</i>	[du:] <i>do</i>	[fla:] <i>fly</i>	[gəu:] <i>go</i>	[ʃɑ:] <i>shah</i>
c long quantity	[ple:n] <i>plain</i>	[du:f] <i>douche</i>	[fla:t] <i>flight</i>	[gəu:t] <i>goat</i>	[biə:d] <i>beard</i>
short quantity	[kæt:] <i>cat</i>	[dɒg:] <i>dog</i>	[fɪʃ:] <i>fish</i>	[bʌz:] <i>buzz</i>	

* Correspondence: spriggr@btinternet.com.

In my 1984 paper (see Sprigg, this volume) I studied the r-junction piece; in this article I have applied the same technique of analysis to the short-quantity sub-category of the c piece in mono-syllables and in polysyllabic words.

2 The c piece, short quantity

Characteristically, the phonetic criteria of the short-quantity piece are as follows:

[(-)ɪC:]	[(-)ɛC:]	[(-)æC:]	[(-)ɒC:]	[(-)ʌC:]	[(-)ʊC:]
[pɪt:]	[pɛt:]	[pæt:]	[pɒt:]	[pʌt:]	[put:]
<i>pit</i>	<i>pet</i>	<i>pat</i>	<i>pot</i>	<i>putt</i>	<i>put</i>
[(-)ɪC(:)C]	[(-)ɛC(:)C]	[(-)æC(:)C]	[(-)ɒC(:)C]	[(-)ʌC(:)C]	[(-)ʊC(:)C]
[hɪlt]	[hɛmp]	[pænt]	[pɒn:d]	[tʌsk]	[wʊlf]
<i>hilt</i>	<i>hemp</i>	<i>pant</i>	<i>pond</i>	<i>tusk</i>	<i>wolf</i>

Thus, the vowel features in this type of piece correspond, in the main, to the phonetic realisations of the six short-vowel phonemes /ɪ/, /ɛ/, /æ/, /ɒ/, /ʌ/, and /ʊ/ of Gimson (1962: 94–111); but, exceptionally, the two classes of lexical item described in Section 2.1, containing the short vowel [ʊ], I treat as long-quantity.

2.1 The short vowel [ʊ] in long-quantity lexical items

2.1.1 Lexical items that are both m-final-piece and r-initial-piece

The long vowel [u:] combines with a final [m] in such lexical items as *womb*, *tomb*, *boom*, *doom*, and *loom*; but there is something like a gap in the distribution of the [-u:m] series vis-à-vis [ɹ] in the initial. Such lexical items in [-u:m] as the three West-Country place-names *Frome* and the surname *Croome* are not enough to fill that gap. It should be filled by the type of piece in which it is the short vowel [ʊ] that is associated with the preceding fricative [ɹ], either singly or as the second element of an initial cluster: [(-)ɹʊm:]; e.g. *room*, *broom*, *Brougham*, *groom*. [(-)ɹʊm:] is in lexical contrast with, for example, [(-)ɹʌm:] in e.g. *rum*, *Bromley* (Kent), *Bromhead*, *grumble*; but, within Received Pronunciation (RP), it does not contrast lexically with [(-)ɹu:m]; for, in this type of lexical item, [(-)ɹu:m] is an alternative pronunciation to [(-)ɹʊm:] (nor, therefore, does [ʊ] contrast phonemically with [u:] in this environment). Accordingly, [(-)ɹʊm:] should be classified as a long-quantity piece, and *room*, *broom*, etc. as long-quantity lexical items.

2.1.2 Lexical items that are k-final-piece

The long vowel [u:] combines readily with a following voiceless labial or alveolar plosive, [p] or [t]; e.g. *poop, droop, troop, coop, snoop, loop, swoop, soup, boot, root, fruit, coot, moot, loor*; but with [-k] it combines only in the following five lexical items: *spook, fluke, snook* (fish, gesture), *stook*. My analysis again follows the same principle as for [-u:m] and [(-)u:m:] in (l) above: I take these lexical items to be insufficient to fill the [-u:k] place in the [-u:p/t/k] series. The pronunciation of most of these words varies between [-u:k] and [-uk:]. For example, for *snook* (gesture), the *English Pronouncing Dictionary (EPD)* gives [-u:k] ([-uk:]), and the *Concise English Dictionary (COD)* and Wyld (1932) give [-uk:]. For *snook* (fish), the *EPD* and the *COD* give [-u:k], and Wyld gives [-uk:]. For *stook*, the *EPD* gives [-uk:] ([-u:k]), and the *COD* and Wyld give [-uk:]. The *COD* gives *spook* and *snook* (fish) as loan-words from Dutch, and *stook* as 'chiefly Scots and northern' (I attribute my own pronunciation of *stook* with [-u:k] to having heard the word spoken only in rural eastern Leicestershire). Gimson (1962: 112) cites *cookery book* as an example of words spelt with *oo* having /u:/ in northern speech.

This partial gap in the [-u:k] series should be filled by the k-final piece: the short vowel [u] in association with the following voiceless velar plosive, [-uk:]; and lexical items containing the k-final piece should be classified as long-quantity; e.g. in lexically distinctive contrast with [-ʌk(s)]: [-uk:] *book, cook, took, crook, look, rook, forsook* vs. [-ʌk:] *buck, cucking-stool, tuck, crux, luck, ruck, suck*. If one ignores the difference in consonant length between [k:] and [k], the vowels [u] and [u:] in the finals [-uk:] and [-u:k] are in complementary distribution vis-à-vis the initial consonant.

2.1.3 Degrees of phonemicity

My phonological analysis is non-phonemic; but, even in a phonemic analysis, the phonemic distinction between /u/ and /u:/ in words such as *cookery book* vs. *snook* or *stook*, and even *hoop* or *boot*, cannot, it seems to me, be phonemic to the same degree as, for example, the distinction between /ʌ/ and /ʌ/ in, for example, *book* versus *buck*, or between /ʌ/ and /u:/ in *dumb* and *doom*. Where 'the northern pronunciation with /u:/ in many such words (mentioned above [e.g. *cookery book*]) retains the closer form, abandoned in the London region' (Gimson 1962: 113), the identity of all such lexical items as *cook* and *book* in spite of the phonetic difference between the [u] vowel of RP

and the [u:] vowel of 'northern pronunciation' must surely restrict, and therefore reduce, the significance of the phonemic distinction between /u/ and /u:/.

2.2 The short vowels [ʊ] and [ʌ] in short-quantity lexical items

By the analysis given in Section 2.1, all the lexical items in [(-)ʊm:] and [-ʊk:] are to be classified phonologically as long-quantity in spite of their containing the short vowel [ʊ]; consequently, [ʊ] in the remaining lexical items containing final [-ʊC:] might now appear to be a strong candidate for one of the phonemic units in a phonological vowel (or V) system applicable to short-quantity lexical items; but, before proceeding to identify the members of that system, or systems, it is instructive to compare those remaining lexical items in [ʊ] with lexical items containing [ʌ], and to contrast both of these sets with lexical items containing the long-quantity vowel [u:].

2.2.1 Lexical comparison of [ʌ], [ʊ], and [u:]

2.2.1.1 Final [-ʊŋ:] and [-ʊn:]

With the lexical items in [(-)ʊm:], e.g. *room*, *groom*, classified as long-quantity (see Section 2.1.1 above), such nasal-final lexical items as remain, those in [-ʊŋ:] and [-ʊn:] are obvious loans, and can be classified as exceptional within the short-quantity subcategory; e.g. [-ʊŋ:] *Jung*, *Jungfrau*, *Sung*, *kungfu* contrast with [-ʌŋ:] *young*, *sung*, *monk*; and [-ʊn:] *Kunming*, *shogun*,¹ *Grundig* contrast with [-ʌn:] *gun-dog*, *shot-gun*, *Grundy* and [-u:n] *coon*, *goon*, *croon*.

2.2.1.2 Other finals

Having disposed of lexical items ending in [-ʊm/ŋ/n], it is illuminating to study the degree to which [ʊ], [ʌ], and [u:] are distinctive in pieces ending in the remaining types of final:

¹ COD gives [-gu:n].

THE SHORT-QUANTITY PIECE IN ENGLISH

[U]	<i>pull</i>	<i>full</i>	<i>cushion</i>	<i>Googe</i>	<i>Wombwell</i>
[A]	<i>pulse</i>	<i>fulsome</i>	<i>cushat</i>	<i>gudgeon</i>	<i>Wombwell</i>
[U]	<i>pool</i>	<i>fool</i>	<i>Hindu Kush</i>	<i>(Googe)</i>	<i>womb</i>
[U]	<i>Ulfilas</i>	<i>put</i>	<i>pudding</i>	<i>push</i>	<i>pruss</i>
[A]	<i>ullage</i>	<i>put(t)</i>	<i>puddle</i>	<i>Pushru</i>	<i>pus</i>
[U]	-	-	-	-	-
[U]	<i>foot</i>	<i>hood</i>	<i>could</i>	<i>should</i>	<i>stood</i>
[A]	<i>phut</i>	<i>Hudson</i>	<i>cud</i>	<i>shudder</i>	<i>stud</i>
[U]	-	-	-	-	-
[U]	<i>soot</i>	<i>Woof</i>	<i>Krupp</i>	<i>bull</i>	<i>Bulstrode</i>
[A]	<i>sutler</i>	-	<i>(Krupp)</i>	-	<i>Bulstrode</i>
[U]	-	<i>woof</i>	-	<i>boulevard</i>	-
[U]	<i>(whoopee)</i>	<i>wolf</i>	<i>wood</i>	<i>would</i>	<i>Wootton</i>
[A]	-	-	-	-	-
[U]	<i>whoopee</i>	-	-	-	-
[U]	<i>woman</i>	<i>Worcester</i>	<i>worsted</i>	<i>good</i>	<i>butcher</i>
[A]	-	-	-	-	-
[U]	-	-	-	-	-
[U]	<i>bush</i>	-	-	-	-
[A]	-	<i>Wuthering</i>	<i>Wotherspoon</i>	<i>wonder</i>	<i>won, one</i>
[U]	-	-	-	<i>wound</i>	<i>swoon</i>
[U]	-	-	-	-	-
[A]	<i>pup</i>	<i>cup</i>	<i>sup</i>	<i>tup</i>	<i>hut</i>
[U]	<i>poop</i>	<i>coop</i>	<i>soup</i>	<i>stoop</i>	<i>hoot</i>
[U]	-	-	-	-	-
[A]	<i>mutt</i>	<i>butt</i>	<i>Tutt</i>	<i>cut</i>	<i>jut</i>
[U]	<i>moot</i>	<i>boot</i>	<i>toot</i>	<i>coot</i>	<i>Jute</i>
[U]	-	-	-	-	-
[A]	<i>Lutterworth</i>	<i>rut</i>	<i>shut</i>	<i>dud</i>	<i>Judd</i>
[U]	<i>loot, lute</i>	<i>root</i>	<i>shoot</i>	<i>doodle</i>	<i>Jude</i>
[U]	-	-	-	-	-
[A]	<i>rud</i>	<i>fuddle</i>	<i>flutter</i>	<i>mud</i>	<i>hutch</i>
[U]	<i>rude</i>	<i>food</i>	<i>flute</i>	<i>mood</i>	<i>hooch</i>
[U]	-	-	-	-	-
[A]	<i>much</i>	<i>Rudge</i>	<i>sun</i>	<i>fun</i>	<i>Monday</i>
[U]	<i>mooch</i>	<i>rouge</i>	<i>soon</i>	<i>buffoon</i>	<i>moon</i>
[U]	-	-	-	-	-
[A]	<i>mun</i>	<i>Lunn</i>	<i>Dunn(e)</i>	<i>bun</i>	<i>spun</i>
[U]	<i>noon</i>	<i>loon</i>	<i>Doon(e)</i>	<i>boon</i>	<i>spoon</i>
[U]	-	-	-	-	-
[A]	<i>cull</i>	<i>skull</i>	<i>just</i>	<i>must</i>	<i>lust</i>
[U]	<i>cool</i>	<i>school</i>	<i>juice</i>	<i>mousse</i>	<i>loose</i>
[U]	-	-	-	-	-
[A]	<i>rust</i>	<i>crush</i>	<i>puff</i>	<i>Puck</i>	<i>luck</i>
[U]	<i>roost</i>	<i>crucial</i>	<i>pouf(fe)</i>	<i>spook</i>	<i>Luke</i>
[U]	-	-	-	-	-
[A]	<i>flux</i>	<i>bug</i>	<i>mug</i>	<i>rough</i>	<i>hover</i>
[U]	<i>fluke</i>	<i>boogie</i>	<i>moog</i>	<i>roof</i>	<i>Hoover</i>

Two things are to be noted here. The first concerns the relative number of lexical items. The number of lexical items listed above as examples of [u] is suggestively small when compared with those containing [ʌ] and [u:] or [uː]: 31 (in my usage) versus 68 and 56 respectively, to which I could add further examples to make a total of 165 for [ʌ] and 97 for [u:].

Secondly I note the relative number of distinctions. The vowel [ʌ] is lexically distinguished from [u:] in 54 pairs of examples in which the environment is phonetically identical apart from the length difference in the following consonant, [C:] to match [ʌ], and [C] to match [uː/]; but [ʌ] is lexically distinguished from [u] in only 13 pairs (*Wombwell* is common to both types of example).

2.2.2 The lip-rounded versus the lip-spread piece

A study of the syntagmatic relations of the lip-rounded vowel [u] with immediately following consonant features, contrasted with the lip-spread vowel [ʌ] shows the following combinations:

[-u] [t d s l lf tf dʒ ʃ]

e.g. *put, foot, soot, wood, good, puss, Worcester, pull, bull, full, wool, wolf, butcher, Gooze, push, bush*

[-ʌ] [t d s l lf tf dʒ ʃ ls nt nd ns
k ks g ŋ ŋk p b f v mp]

e.g. *put(t), sutler, puddle, shudder, pus, just, skull, pulse, hutch, much, Rudge, gudgeon, cushat, Pushtu, bun, won, punt, fund, wonder, once, luck, flux, bug, mug, bung, swung, bunk, funk, pup, cup, hub, pub, puff, rough, hover, above, rum, bum, pump, Wombwell*

On the basis of these associations a lip-rounded piece can be distinguished to associate the rounded vowel [u] with the alveolar and palato-alveolar places of articulation; it also associates [u] with plosion, affrication, friction, and laterality, and excludes nasality. The contrasting lip-spread piece, on the other hand, associates the spread vowel [ʌ] not only with the alveolar and palato-alveolar places of articulation but

also with the velar, labial, and dental; it also associates [ʌ] not only with plosion, affrication, friction, and laterality, but also with nasality.

A comparison of the lip-rounded piece with the lip-spread piece shows that they are to some extent in complementary distribution: [ʌ] combines with the velar, labial, and dental places of articulation to the exclusion of [u] apart from the Yorkshire place-name *Wombwell*, the word *woman*, the loan-word *Krupp*, the surname *Woof*, and the onomatopoe *woof*; *woman* is clearly irregular on account of its plural form *women* [wim-]. Further, the lip-spread piece combines with nasality to the exclusion of [u] apart, again, from *Wombwell* and *woman*. The two types of piece, however, are in parallel distribution as far as alveolar and palato-alveolar articulations are concerned, provided that these are non-nasal.

2.2.3 The labial-initial versus the general-initial piece

The initial consonants that can combine with [u], and the very wide range of consonants that combines with [ʌ], comprise:

[p b f w k kɪ g h ʃ st s] [u-]

e.g. *pull, bull, full, Woof, could, Krupp, good, hood, stood, soot*

[p b f w k kɪ g h ʃ st s
t d m n l ɹ tʃ dʒ v θ ð j] [ʌ-]

e.g. *pulse, butt, fulsome, Wuthering, cud, crumb, gut, hut, stud, sutler, tub, dub, mud, nut, Lunn, rud, chub, jut, vulpine, thud, thus, young*

The vowel [ʌ] can combine with all types of initial consonant, making a total of 23 (including the cluster [st] for the sake of contrasting *stud* with *stood*); [u], on the other hand, is limited to combining with only 12 types; but this figure is a little misleading, because 20 out of the 29 examples of [u] show a syntagmatic link with initial labiality [p/b/f/wu-]:

[p b f w] [u-]

e.g. *pull, put, pudding, push, puss, bull, Bulstrode* (also [baI-]),
butcher, bush, full, foot, Wombwell (also [wAm-] and [wɔm-]),
Woof, wool, wolf, wood, Wootton, woman, Worcester, worsted

This relationship supports the possibility of distinguishing a labial-initial piece. However, piece-initial labiality also combines with the lip-spreading feature of [ʌ] within the general-initial piece [p/b/f/wʌ-]:

[p b f w] [ʌ-]

e.g. *pulse, put(t), butt, Bulstrode* (also [bul-]), *fulsome* (also [ful-]),
fuddle, Wuthering, Wotherspoon

Initial labiality's being common to both types of piece gives rise to 12 pairs of examples of minimally distinctive pieces, of which four are also minimally distinctive lexical items (*full, put, puss, foot* vs. *ful-, put(t), pus, phut*), and three are also minimally distinctive words (*put, puss, foot* vs. *put(t), pus, phut*).

I account for these minimally distinctive pairs by introducing the concept of non-comparability on grammatical or lexical (stylistic) grounds. Firstly, three pairs depend on proper names: *Ulfilas, Googe* (alternatively [-u:dʒ]), *Pushtu*. Secondly, three pairs depend on Romanic versus Teutonic vocabulary: *pulse, pus, cushion* vs. *pull, puss, cushat*. Thirdly, two pairs depend on grammatically non-comparable forms: *could* (verb) vs. *cud* (noun); *should* (past tense) vs. *shudder* (present tense or noun). Fourthly, one pair depends on a difference in dialect: *put* (English) vs. *put(t)* (Scots) (Grant and Dixon 1921: 54). Finally, two pairs depend on foreign loans: *phut* (Hindustani), *sutler* (Dutch).

2.2.4 [u] and [ʌ] as phonetic exponents of U

If the above five factors are accepted as excluding [u] from direct contrast with [ʌ] in the lexical items containing either of these two vowels, only *pudding* and *puddle* and *full* and *fulsome* are left in which [u] is directly in contrast with [ʌ] in the same environment, not only phonetically but also grammatically and stylistically (the lexical item *ful* of *fulsome* is, incidentally, the same etymologically as *full*); otherwise, [u] and [ʌ] are in complementary distribution, either phonetically or, in the above 12 pairs,

grammatically and stylistically. If I am allowed these two pairs as legitimate exceptions, I can then go on to attribute [ʊ] and [ʌ] as phonetic exponents to a single phonological V term, for which the symbol U seems appropriate. Cf. Gimson (1962: 112-113):

ME short [ʊ] has a regular development to PresE /ʌ/. A number of cases of ME [ʊ], however, whether from OE sources (*full, bull, wolf, wool, wood*) or from OF sources (*push, butcher, pulley*), have retained their [ʊ] quality; the presence of a preceding labial consonant may be said to account for the retention of a lip-rounded vowel, but there are several cases where /ʌ/ has developed despite a labial consonant (*butter, bud, pulse*). In another group of words, PresE /ʊ/ derives from a ME [o:] which regularly gives PresE /u:/ (*food, moon*); such words are *good, foot, stood, book, look*, for which alternative pronunciations with /u:/ or /ʊ/ existed into the seventeenth century. The northern pronunciation with /u:/ in many such words (mentioned above) retains the closer form, abandoned in the London region.

As many as 148 of the 165 lexical items exemplifying [ʌ] have that vowel symbolised in the orthography by *u* (approximately 90%); and 13 of the 31 exemplifying [ʊ] also have *u* in the spelling (9 have *wo-* and *woo-*, leaving a balance of 9). The intuition of literate native speakers is, I believe, that *u* is pronounced [ʌ] except for a handful of words in which it is pronounced [ʊ]; in the main the orthography supports my position with regard to ascribing [ʌ] and [ʊ] to a single unit at the phonological level. To do so reduces the characteristic vowels of short-quantity lexical items from six to the following five: [ɪ], [e], [æ], [ɒ], [ʌ]/[ʊ].

2.3 The front vowels [ɪ] and [e]

2.3.1 Final piece

Following the general principle of dealing with easier before more difficult data, in the hope that solving problems in the one may lead to a solution of problems in the other, I take next the short vowels [ɪ] and [e], in their syntagmatic relations with a following consonant or following consonants within a lexical item. These two vowels combine with all types of plosive, stop, affricate, fricative, nasal, or lateral, whether labial, dental, alveolar, palato-alveolar, or velar:

[i-ɛ] [p i k ʃ b d g dʒ m n ŋ l f s ʃ θ v z ð
 pt ps kt ks mp mf nt ns lp lt lf ls ʃ θ lv
 lz lk lm ln ft sp st sk ts ŋk ŋks ld ldʒ lg]

e.g. *pip, pit, pick, pitch, bib, bid, pig, bridge, dim, pin, sting, ill, if, kiss, dish, pith, give, is, with, crypt, Phipps, strict, six, Fitzalan, crimp, nymph, hint, mince, think, mix, Quilp, hilt, build, sylph, milk, grille, filch, filth, bilge, film, kiln, gift, crisp, list, frisk, Wills, pep, pet, peck, ketch, web, bed, peg, edge, stem, pen, strength, hell, deaf, guess, mesh, death, heaven, sez, -, inept, -, insect, sex, Metz, Kemp, -, dent, hence, -, -, help, belt, weld, elf, whelk, else, Welsh, stealth, -, delve, elm, -, left, -, chest, Esk, Glenelg, Wells*

2.3.2 Initial piece¹

The position is not quite as straightforward for the initial piece, because it is not clear whether the vowel [i] has the power to combine with a preceding non-syllabic front spread vowel [j]. Certainly [ɛ] has this power; e.g. *yet, yell, yes, yelk, yelp, yellow*; but [ji-] occurs only in *Yiddish*, a loan-word from German, and its back form *Yid*. Since, however, the power of combination of [j] with the other short vowels [æ], [ɒ] and [ʌ] is also limited, the absence of a native word in [ji-] may be fortuitous. If not, its absence would force a prosodic difference between [ɛ], which implies the possibility of combining with [j-], and [i], which would be taken to imply the impossibility, apart from *Yid* and *Yiddish*, of any such lexical-item-initial combination as [ji-].

Both [i] and [ɛ] can be initial in lexical items; e.g. *ictus, id, if, ill, ilk, is, in* and *ex, egg, est, ell, else, Ethel, end, em*.

2.3.3 w-initial and the non-w-initial pieces

Anticipating the distinction that has to be made, on syntagmatic grounds, between a w-initial piece and a non-w-initial piece (see Sections 2.4 and 2.5 below) I note that a voiceless non-syllabic back rounded vowel [w] combines freely with [i] and [ɛ]; and so does the corresponding voiced sound [w], whether single or combined with a preceding consonant [k], [t], [g], [d], [s] or cluster [sk]:

¹ For the criteria and other details and a full account of the five prosodic types of syllable-initial piece, the y, the w, the r, the l, and the z, see Sprigg (this volume).

[w kw tw gw dw sw skw] [i-/e-]

e.g. *wig, wisp, whiff, with, win, whim, Wilks, wing, wink, quit, quilt, Quilt, twin, Gwyn, dwindle, squint, squirrel, wealth, whet, west, weather, wen, went, Wembley, Wexford, welt, whelk, wherry, quest, twenty, Gwent, Guelf, dwell, squelch*

2.3.4 Vowel units

In the type of short-quantity piece containing either [i] or [e] two V units can be distinguished, I and E; and [i] and [e] can be treated as symbolising their respective exponents.

2.4 The type of piece containing [æ], and, where appropriate, [ɒ], [ɑ:] and [ɔ:]

The type of piece containing the more open front vowel [æ], between open and half-open, differs markedly from the type of piece considered in Section 2.3 above: it shows considerable variation in vowel features between [æ] and the more or less complementarily distributed open vowels [ɒ] and [ɑ:], and the half-open vowel [ɔ:]; and, consequently, needs to have several prosodic sub-categories of piece distinguished. The four types of vowel sound are syntagmatically related to initial features in the lexical item, w versus non-w piece, and to features following the syllabic vowel. The dimensions of the problem set by this type of short-quantity piece can be seen from the following series of typical examples:

[i-ε] [p t k ʃ b d g dʒ m n ŋ l f s ʃ θ v z ð
 pʰ tʰ kʰ kʰ mʰ nʰ lʰ fʰ sʰ ʃʰ θʰ vʰ zʰ ðʰ
 lʰ kʰ lʰ mʰ lʰ nʰ fʰ sʰ tʰ sʰ kʰ tʰ ŋkʰ ŋkʰ lʰ dʒ lʒ lʒ]

e.g. *pip, pit, pick, pitch, bib, bid, pig, bridge, dim, pin, sting, ill, if, hiss, fish, fish, give, it, with, crypt, Phipps, strict, six, Fitzalan, crimp, nymph, hint, mince, think, minx, Quilp, hilt, build, sylph, milk, grille, filch, filth, bilge, film, kiln, gift, crisp, list, frisk, Wills, pep, pet, peck, letch, web, bed, peg, edge, stem, pen, strength, hell, deaf, guess, mesh, death, heaven, sez, -, inept, -, insect, sex, Metz, Kemp, -, dent, hence, -, -, help, belt, weld, elf, whelk, else, Welsh, stealth, -, delve, elm, -, left, -, chest, Esk, Glenelg, Wells*

2.3.2 Initial piece¹

The position is not quite as straightforward for the initial piece, because it is not clear whether the vowel [i] has the power to combine with a preceding non-syllabic front spread vowel [j]. Certainly [ε] has this power; e.g. *yet, yell, yes, yelk, yelp, yellow*; but [ji-] occurs only in *Yiddish*, a loan-word from German, and its back form *Yid*. Since, however, the power of combination of [j] with the other short vowels [æ], [ɒ] and [ʌ] is also limited, the absence of a native word in [ji-] may be fortuitous. If not, its absence would force a prosodic difference between [ε], which implies the possibility of combining with [j-], and [i], which would be taken to imply the impossibility, apart from *Yid* and *Yiddish*, of any such lexical-item-initial combination as [ji-].

Both [i] and [ε] can be initial in lexical items; e.g. *ictus, id, if, ill, ilk, is, in* and *ex, egg, est, ell, else, Ethel, end, em*.

2.3.3 w-Initial and the non-w-initial pieces

Anticipating the distinction that has to be made, on syntagmatic grounds, between a w-initial piece and a non-w-initial piece (see Sections 2.4 and 2.5 below) I note that a voiceless non-syllabic back rounded vowel [w] combines freely with [i] and [ε]; and so does the corresponding voiced sound [w], whether single or combined with a preceding consonant [k], [t], [g], [d], [s] or cluster [sk]:

¹ For the criteria and other details and a full account of the five prosodic types of syllable-initial piece, the y, the w, the r, the l, and the z, see Sprigg (this volume).

[w kw tw gw dw sw skw] [ɪ-/e-]

e.g. *wig, wisp, whiff, with, win, whim, Wilks, wing, wink, quit, quilt, Quilp, twin, Gwyn, dwindle, squint, squirrel, wealth, whet, west, weather, wen, went, Wembley, Wexford, welt, wheelk, wherry, quest, twenty, Gwent, Guelf, dwell, squelch*

2.3.4 Vowel units

In the type of short-quantity piece containing either [ɪ] or [e] two V units can be distinguished, I and E; and [ɪ] and [e] can be treated as symbolising their respective exponents.

2.4 The type of piece containing [æ], and, where appropriate, [ɒ], [ɑː] and [ɔː]

The type of piece containing the more open front vowel [æ], between open and half-open, differs markedly from the type of piece considered in Section 2.3 above: it shows considerable variation in vowel features between [æ] and the more or less complementarily distributed open vowels [ɒ] and [ɑː], and the half-open vowel [ɔː]; and, consequently, needs to have several prosodic sub-categories of piece distinguished. The four types of vowel sound are syntagmatically related to initial features in the lexical item, w versus non-w piece, and to features following the syllabic vowel. The dimensions of the problem set by this type of short-quantity piece can be seen from the following series of typical examples:

[e]	putt, whack	lung, twang	bank, swank	lamp, swam	lamp
[o]	-	-	-	-	swamp
[a]	-	-	-	-	-
[ɪ]	-	-	-	-	-
[æ]	cup	put	Fun	put	franchise
[o]	swup	what	Wan	word	-
[a]	-	-	-	plant	branch
[ɪ]	-	-	-	-	-
[e]	putt	epitaph, Wuff	osteopath	shall	talk
[o]	wup	Swiffham	Wath	Walham	-
[a]	putt	stuff, quiff	Path	-	-
[ɪ]	-	-	swath, wrath	oll, wall	talk, walk, Paik
[æ]	scup	-	palmate	Aln	salve
[o]	-	-	-	-	-
[a]	-	-	palm, qualm	Calne	halve
[ɪ]	-	salt, Walt	Walm(e)sley	Alne	-
[æ]	-	-	-	-	-
[o]	-	-	-	-	-
[a]	-	-	Snarl	park, Marx	harp
[ɪ]	Altham	fulse, waltz	Quarles	-	warp
[æ]	-	-	-	-	-
[o]	-	-	-	-	-
[a]	part	farm	Barn	carve, scarf	hearth
[ɪ]	wart	warm	Warn	wharf	swarthy
[æ]	-	-	-	-	-
[o]	-	-	-	-	-
[a]	sparse	-	-	-	-
[ɪ]	-	-	-	-	-

2.4.1 Occlusive-final piece

Clearly the most comprehensive type of piece is that containing the vowel [æ] in association with occlusion as a feature of the following consonant; so it is convenient to take this type of piece first, and consider it in lexical items in which the initial is non-w, to be followed by w-initial-piece lexical items.

2.4.1.1 Lexical items in which the initial piece is non-w

In lexical items in which the initial piece is non-w, and therefore, z-piece (e.g. *pack, tang*) or, less commonly, r-piece (e.g. *franchise, branch*) or l-piece (e.g. *plant*), the function of the occlusive-final piece is to associate the vowel [æ] with plosion or stop, affrication, or nasality as a feature of the immediately following consonant, whence the term *occlusion*. It also regularly associates [æ] with friction where its place of articulation is palato-alveolar, [ʃ], and, to some extent, where its place of articulation is

alveolar, dental, or labio-dental; to a minor extent it associates [æ] with a following lateral consonant:

[(-)æ] [k kt ks p pt ps t ts g b d dz ʃ dʒ ʒ
 ŋ ŋk ŋks m mp mb n nt nd ns nʃ ndʒ
 f ʃ s sp st sk θ v z l lp lb lt lk
 lg lj ldʒ lm ln lv ls]

e.g. *pack, pact, axe, cap, apt, apse, hat, Katz, bag, cab, mad, adze, latch, badge, ash, bang, bank, Manx, lamb, lamp, lamb, man, ant, band, expanse, franchise, flange, gaff, Taft (also [-ɑːŋ]), mass, asp, bast, Aske, osteopath, have, jazz, Mall, scalp, alb, alt, talc, algold, Lochalsh, Algy, psalmodic, Alm(mouth), salve (save), Hals*

2.4.1.1.1 *n-cluster piece* I consider firstly the n-cluster piece. Lexical items containing an alveolar nasal in a cluster [-nt/d/s/ʃ] show variation in enough lexical items for it to be necessary to distinguish a special type of piece in order to accommodate them. The occlusive-final piece includes among its 48 phonetically different types of final four in which the nasal consonant [n], as the first member of a cluster, combines with a homorganic plosive or fricative [t], [d] or [s], or with a palato-alveolar fricative [ʃ]:

[(-)æ] [nt nd ns nʃ]

e.g. *ant, cant, mantle, sand, gland, candle, rance, expanse, romance, transfer, franchise*

In contrast with these nasal-cluster examples of the occlusive-final piece there is a group of lexical items in which the vowel that combines with [-nt/d/s/ʃ] is not [æ] but [ɑː], having the features backness, openness, and length:

[(-)ɑː] [nt nd ns nʃ]

e.g. *chant, grant, plant, command, chandler, Sanders, glanders, France, trance, dance, advance, branch, ranch, blanch*

The majority of lexical items belonging to the n-cluster-piece type are loans from French, and continue to be distinguishable as such in RP, with backness, length, and openness as loan features (Gimson 1962: 106 refers to the Old French origin of *aunt*, *branch*, *command*, and *chant* as a source for [ɑ] and [ɑː]).

The basis for distinguishing the n-cluster piece from the occlusive-final piece is, therefore, not phonetic but lexical, for neither type of piece shows a regular distinctive syntagmatic relationship with a feature or features of the initial or of a following syllable initial; but it so happens that the two types of piece are all but in complementary distribution vis-à-vis initial-consonant features: the only minimally distinctive pair are the vowel-initial lexical items *aunt* and *aunt*. The comparative frequency of the occlusive-final piece as against the n-cluster piece is, in monosyllables:

[(-)ænt]	7	[(-)ɑːnt]	5
[(-)æːnd]	10	[-ɑːnd]	1
[-æns]	3	[-ɑːns]	9
[-æːn]	0	[-ɑːn]	4

In northern and Midland dialects there is no n-cluster piece; and lexical items classed as n-cluster-piece in RP are occlusive-final piece in those dialects. In eastern Leicestershire, for example, both the RP classes of lexical item have final [(-)ænt/d/s/]. Since n-cluster-piece lexical items are readily understood by speakers of dialects other than RP, one can say that within English in general an alternation in type of piece between n-cluster and occlusive-final is part of the phonetic and phonological expectancy of lexical items such as *chant*, *command*, *dance*, and *ranch*, governed to some extent by difference in dialect, and to some extent by difference in type of situation: my father, for example, used the Leicestershire alternative when speaking to his employees in his factory, and the n-piece alternative in other circumstances. At all events the two types of piece must be closely associated, as they are here within the type of piece containing [æ] and, where appropriate, [ɒ], [ɑː] and [ɔː]. 'Nowadays a man must master at least one tongue language and one hand language. His ears, however, have to understand quite a number of ear languages, principally dialects of his own country' (Firth 1937: 23). Firth was, no doubt, thinking chiefly of Wharfedale.

2.4.1.1.2 *Fricative-final piece* In the matter of the second major category, the fricative-final piece, the examples in the table at the beginning of Section 2.4 show significant differences in vowel features related to alveolar, labio-dental, and dental, but not palato-alveolar, friction in the following consonant. On syntagmatic grounds, therefore, it becomes necessary to distinguish a fricative-final piece, which comprises *s*-final, *f*-final and *θ*-final pieces.

s-final Among the 48 phonetically different types of final comprised in the occlusive-final piece given at the beginning of Section 2.4.1.1 there are four in which the short front vowel [æ] combines with a following voiceless alveolar fricative, either single or as the first sound of a cluster [(-)æs(p/t/k)]:

[(-)æ] [s sp st sk]

e.g. *bass, gas, mass, crass, asp, bast, contrast, drastic,*
plastic, paederast, Aske, paschal

In contrast with these four types exemplifying the occlusive-final piece I need to recognise a type of final piece in which [-s(p/t/k)] combine not with [æ] but with the vowel features backness, openness, and length [ɑ]:

[(-)ɑ] [s sp st sk]

e.g. *ass, pass, gasp, hasp, past, ghastly, ask, mask*

Again (cf. the *n*-cluster piece above), no regular association with features of the initial can be called on to account for the *s*-final (fricative) piece rather than the occlusive-final piece. The basis for the difference in type of piece is, therefore, lexical; but each of the four types of *s*-final piece, [(-)ɑ's], [-ɑ'sp], [-ɑ'st], and [-ɑ'sk], comes near to being in complementary distribution with its corresponding occlusive-final piece, [-æ's], [(-)æ'sp], [-æ'st], and [(-)æ'sk], in relation to initial consonant features; e.g. *pass, alas, class, hasp, mast, blast, cask* vs. *Paston, lass, classic, asp, mastoid, epiblast, paschal*; these examples include four minimally distinctive pairs of lexical items; but there seems to be only one minimally distinctive pair of words: *ask* vs. *Aske*.

Clearly, loan lexical items immediately from Greek, such as (-)blast(-), ultimately from Greek, such as *asp*, or through Greek, such as *Pasch*-, are to be expected in the same prosodic category as *bat*, *map*, and *back*, exemplifying the occlusive-final piece, and the same is true of loan words and lexical items immediately from Latin such as *crass*. Indeed *crass* can be used to illustrate the difficulties of the young English-speaker in pronouncing unfamiliar lexical items containing one or other of these two types of piece: on first meeting *crass* in reading I treated it as an example of the fricative (s-final) piece on the model of *brass*, and had later to re-assign it to the occlusive-final type of piece on hearing it in the phrase *crass stupidity*, a favourite with schoolmasters. Still later I learnt of its etymological connection with the Latin *crass-* *us/-al/-um*.

Comparative figures for the s-final fricative piece versus the occlusive piece, as exemplified in monosyllables are:

[(-)ɑ's]	6	[-æs]	9
[-ɑ'sp]	5	[æsp]	1
[-ɑ'st]	7	[-æst]	1
[(-)ɑ'sk]	6	[æsk]	1

It is important to associate these two types of piece closely, as having the same vowel unit, A, under alternative prosodic conditions: Gimson (1962: 106) cites *lather*, *transfer*, *elastic*, *plastic*, *gymnastic*, and *Atlantic* as 'words in which either /æ/ or /ɑ:/ may be heard', i.e. either type of prosodic piece may be observed from RP-speakers (in my usage all six are examples of the occlusive-final piece). Further, the s-final-piece lexical items, together with those of the occlusive-final piece distinguished from them in the RP dialect may be heard pronounced without distinction in 'many regional forms of English', according to Gimson, with 'a vowel in the region of C[ardinal] [a]' (105). In eastern Leicestershire this non-distinguishing vowel is [æ], with the result that both eastern-Leicestershire speakers and RP speakers soon learn to have a double phonetic expectancy for such s-final-piece lexical items as *pass*, *hasp*, *blast*, and *cask*. In this respect they may grow up with a bi-dialectal phonology.

Gimson (1962: 106) cites *pass*, *ask*, and *cast* among examples of 'lengthening of [a] or [æ] > /ɑ:/, due to the following fricative (especially /f, θ, s/), incipient at the end of the seventeenth century' as one of the sources for his /ɑ:/ phoneme; by my analysis,

though, the phonematic vowel unit remains one and the same, A, with alternative phonetic exponents according to type of piece, [æ] in the occlusive-final piece but [ɑ:] in the fricative-final piece; and the two types of piece are complementarily distributed on a lexical basis, and approach complementary distribution on a phonetic basis, with *ask* and *Aske* being the only minimally distinctive pair of words.

f-final The occlusive-final piece described at the beginning of Section 2.4.1.1 provides examples of lexical items in which the vowel [æ] combines with a following voiceless labio-dental fricative, either single or as the first sound of a cluster [-æf(t)]; e.g. *gaff*, *chiff-chaff*, *chaffinch*, *riff-raff*, *gaffe*, *graph*, *epitaph*, *scaphold*, *Taft* (also [-ɑ:ft]); but these examples are few and curious: a proportion of them are immediately or ultimately of Greek or French origin; *chiff-chaff* is onomatopoeic. Numerous lexical items in common use in which [-f(t)] combines with backness, openness, and length [ɑ:] include *chaff*, *staff*, *laugh*, *draught*, *daft*, *aft*, *Taft* (also [-æft]); they too require the fricative-final piece to cover this syntagmatic relationship.

Gimson (1962: 106) cites *staff* and *after* as examples of the 'lengthening of [a] or [æ] to /ɑ:/ due to the following friction'. In the pronunciation of eastern Leicestershire there is no f-final piece; and these examples of the f-final piece in RP must all be classified as exemplifying the occlusive-final piece, which needs to be recognised for that dialect as well as for RP. This double expectancy on the part of *staff*, *after*, etc., combined with easy intelligibility as between dialects, supports the need to associate both types of final piece closely. This I have done in this analysis by classifying both types of final piece as short-quantity-piece, with the same phonematic vowel unit, A, in spite of the difference in the vowel features length and backness vs. frontness.

In monosyllables the relative frequency of the f-final (fricative) piece as against the occlusive-final piece is as follows. There are no minimally distinctive pairs.

[-ɑ:f]	4
[(-)ɑ:ft]	9
[-æf]	4
[-æft]	1

θ-final In the occlusive-final piece described at the beginning of Section 2.4.1.1, there are examples in which [æ] combines with a following dental fricative [θ]; e.g. *Bathurst*, *psychoputh*, *polymuth*, *aftermath* (also [-ɑθ]), *strath*, *Gath*; with the exception of *Bath* in the place-name *Bathurst*, and the lexical item *-math* of the word *aftermath*, these lexical items are all loans, from Greek, Gaelic, or Hebrew. In contrast with these the fricative piece associates dental friction with backness, openness, and length [-ɑθ], alternating with [-ɑð] in corresponding plural forms; e.g. *path*, *paths*, *bath*, *baths*, *lath*, *laths*. Gimson (1962/3: 106) cites *path* and *bath* as examples of the 'lengthening of [a] or [æ] to /ɑ:/ due to the following friction', leading to a phonemic distinction; but my prosodic treatment enables me to have the same V term, A, in either type of piece.

In eastern Leicestershire it is [æ] that occurs in these examples of the RP θ-final piece. Here again, the importance of associating the fricative piece distinguished in my analysis of RP with Midland and northern dialect forms, for reasons of mutual expectancy, I take to be enough to over-ride the length difference, and to justify classifying these dental examples of the fricative piece as a sub-category of the short-quantity piece.

2.4.1.2 *Lexical items in which the initial piece is w*

The w-initial piece associates a non-syllabic back rounded vowel [w] with a preceding consonant, limited to [s], [t], [d], [k], [(s)k/t/d/w-], or [w], with appropriate features of the syllabic vowel, most commonly the lip-rounding, openness, and backness of [ɔ], but, in other types of piece, lip-rounding, half-openness, and length [ɔː], lip-spreading, backness, and length [ɑː], and lip-spreading, frontness, and shortness [æ]. It is convenient to deal first with this last type, because it most resembles the occlusive-final piece in non-w-initial-piece lexical items described at the beginning of Section 2.4.1.1.

2.4.1.2.1 *Velar-final piece* In the velar-final piece it is the vowel [æ] that is associated with velarity in the following consonant:

[-æ] [k ks ɡ ɲ ŋk ŋks]

e.g. *whack, wax, wag, quagmire, twang, swank, Manx*

2.4.1.2.2 *Labial and tongue-front final piece* Where, on the other hand, there is labiality or, alternatively, a tongue-front feature immediately following the syllabic

vowel (except for lateral consonants, to be dealt with in Section 2.4.2 below), the lip-rounding and backness of [w] or [ɰ] in the initial piece, [ɰ/(s)(C)wɒ], also characterise the syllabic vowel, together with openness:

[-ɒ] [p b mp t d nt nd tʃ ʃ s sp st z θ]

e.g. *whop, swab, swamp, what, wad, wan, quant, watch, squash, wand, Wass, wassail, wasp, Wast, was, Cornwall*

Labial nasality in the final presents something of a problem: *swamp* shows the characteristic features of the labial- and tongue-front-final piece; and so do the loanwords *wampum* and *wampee*, in all three of which the labial nasal can be taken as part of a cluster; but two lexical items, the past-tense verb form *swam* and the loan-word *wigwam*, containing a single final labial nasal, have the vowel features appropriate to a lexical item whose initial piece is non-w [-æm], like *ram, ma'am, lamb, and ramp*. They can only be treated as exceptions.

2.4.1.2.3 *Fricative-final piece* In lexical items whose initial piece is non-w the vowel features are uniformly open, back, spread, and long [ɑː] for alveolar, labio-dental, and dental fricatives; e.g. *pass, hasp, staff, raft, path* (see Section 2.4.1.1.2 above); but where the lexical item has the w-initial piece, place of articulation can make a difference. This is not so, however, where the friction is alveolar: [-ɒs(p/t)]; e.g. *Wass, wassail, wasp, Wast, wast, swastika, was*; this type of final has already been assigned to the labial and tongue-front final piece.

f-final It is in lexical items in which the final piece is labio-dental that the matching vowel features are different from those of the labial and tongue-front final piece [ɒ], and the same as for non-w-initial lexical items; so it becomes necessary to distinguish a *f-final* piece in order to associate [-f(t)] with [ɑː]; e.g. *quaff, waft*. The alternative pronunciations [-ɒf(t)] recognised for *waft* by the *COD* and for both by the *EPD* are regular in being those of the labial and tongue-front final piece described above; the *EPD* also recognises [-ɔːf(t)] for *waft*, which corresponds in vowel features to the θ-final type of fricative piece. The place-name *Swaffham* exemplifies the labial and tongue-front final piece [-ɒf]. *Waaf* [wæf], from the acronym *W.A.A.F.*, is best treated simply as an exception.

l-final Where the place of articulation of the friction feature is dental, the matching vowel features are half-openness, lip-rounding, and length, [-ɔθ], sharing in the lip-rounding that occurs in the initial [sw-], e.g. *swath* (probably also *wrath*); with *Wath* (Yorkshire, also [-æθ]), and the lexical item *-wath* of *Cornwath* (Cumberland), exceptionally, as regular examples of the labial and tongue-front initial piece [-oθ].

2.4.2 Types of l-final piece

The table at the beginning of Section 2.4 shows the front short vowel [æ] combining with either a single (velarised) following lateral or a lateral as the first member of a cluster; and this syntagmatic relationship has been incorporated in the more general type of piece termed the occlusive-final piece, described in Section 2.4.1. For lexical items in which the initial piece is non-w these features have been shown, in Section 2.4.1.1, as:

[(-)æ] [l lp lb lt lk lg lf ldʒ lm ln lv ls]

e.g. *shall, Hal, pal, Mall, Falmouth, scalp, palp, alb, alt, talc,*
algold, Lochalsh, Algy, psalmodic, Aln, salve (save), Hals

For lexical items in which the initial is w-piece, on the other hand, the associated features are [-o]); e.g. *Walham*. This set of examples is, apart from *scalp* and the irregular verb *shall*, clearly somewhat unusual: it comprises place-names and personal names, and loan-words, from Gipsy, Late Latin, Italian, and French. Where, however, a syllabic or non-syllabic vowel follows, as in the [(-)æ|V/j] piece, examples are more representative; e.g. *alley, tally, pallor, balance, value, stallion, medallion* (in this type of piece the lateral is palatalised).

More representative by far is the l-final piece, within which three prosodic sub-categories need to be distinguished: the tongue-front final piece, the k-final piece, and the m- and f/v-final piece.

2.4.2.1 Tongue-front final piece

The most general of these three sub-categories, the tongue-front final piece, associates the vowel features backness, lip-rounding, length, and half-openness with the velarisation feature of the following lateral, which may be single [l] or the first component of a cluster in which it combines with a tongue-front plosive or fricative [t], [s] [ʃ], [θ] or [d]:

 [-ɔ:] [l l s lʃ lθ]

 e.g. *salt, halt, false, Balsham, Altham*

[(-)ɔ:] [l ld]

 e.g. *all, hall, ball, tall, small, fall, thrall, bald, scald*

Lexical items containing a w-initial piece have the same vowel features as those above, in which the initial piece is non-w; e.g. *wall, squall, Ethelwald, Walt, waltz, Welsh, Waltham-on-the-Wolds*.

2.4.2.2 k-final piece

There are examples of alveolar plosives in the clusters of the l-final piece, [-ɔ:ld] and [-ɔ:lt]; but no examples of a velar plosive ([-ɔ:lk] in *Palk* is a solitary exception); tongue-back consonants such as dorso-velars combine not with a preceding (velarised) lateral but directly with the syllabic vowel in a separate sub-category of l-final piece, the k-final sub-category: [-ɔ:k]; e.g. *talk, balk, chalk, walk* (cf. also *falcon*). This [-ɔ:k] piece is in complementary distribution with [-ɔ:lt], on the one hand, and, on the other, with the type of short-quantity piece stated above in Section 2.3 containing the finals [(-)ilk]; and [(-)elk]; e.g. *ilk, milk, Wilks, elk, yelk, and whelk*, and with the type of short-quantity piece containing final [-ɔlk]; e.g. *hulk, bulk, sulk* (see Section 2.2).

2.4.2.3 m- and f/v-final piece

Clusters containing a lateral and a bilabial plosive, as in *scalp, palp, alp*, and *alb*, have already been classified as examples of the occlusive-final piece, in Section 2.4.1.1 above: [(-)ælp/b]; but no such combination is to be found where the bilabial consonant is nasal or where it is labio-dental (except for [-ælv] in *salve* (save), and *valve*). Since, however, clusters comprising a lateral and a labial nasal or a labio-dental fricative are to be found in the short-quantity piece containing [ɪ] and [e], e.g. *film, elm, helm, sylph, elf*, and *self*, and [ʌ/ʊ], e.g. *culm, pulmometry, gulf*, and *wolf*, the same cluster, or something similar, is to be expected in this type of short-quantity piece too.

Unlike the two sub-categories of l-final piece stated in Sections 2.4.2.1 and 2.4.2.2, [(-)ɔ:l(d)], [-ɔ:lt/s/θ] and [-ɔ:k], the vowel in this, the m- and f/v-final piece, has lip-spreading as a feature, combined with openness: [-ɑ:m/v] and [-ɑ:f]. These features apply to lexical items containing a w-initial or a non-w-initial piece alike; e.g.

alm, *palm*, *culm*, *bulm*, *psalm*, *qualm*.³ *half*, *halve*, *culf*, *culve*, *salve* (also [-ɛlv]); possibly the Lancashire place-name *Culme* [-ɛm] also belongs here; in which case the term *m-final* should be changed to *m-l-final*.

Where labial-nasal lexical items of this sub-category are compounded with a vowel-initial lexical item, a lateral consonant appears in the *m-final* piece in certain combinations, hence an alternative type of piece, drawing on parts of two syllables, the final part of one and the initial part of the following syllable, has to be recognised. In this complementarily distributed type of piece the vowel is front, short, and between open and half-open: ((-)ɛ|mV-); e.g. *palmate*, *calmative*, *psalmody* (and, for some speakers, *almoner*).

2.4.3 *r-final* piece

The *r-final* piece has a noteworthy feature in common with the *k* sub-category of the *l-final* piece, the *ʊv-final*, and, to some extent (in monosyllables), the *m-final* (see Sections 2.4.2.2 and 2.4.2.3 above), e.g. *talk*, *walk*, *half*, *halve*, *palm*, *qualm*; just as the *l-final* piece has no lateral consonant in its phonetic exponency in these sub-categories, but a [-V/:C] sequence, so the *r-final* piece has no non-syllabic central vowel [ɹ] or post-alveolar fricative or rolled consonant [ɹ] or [r], but a [-V/:C] sequence. Just as the lateral consonant was earlier vocalised ('approximately in the 17th century', according to Gimson 1962: 110); so, similarly, the post-vocalic non-syllabic vowel, or consonant, was absorbed into the syllabic vowel ('in the 15th century', according to Gimson 1962: 106); not merely in [k/f/v/m]-final lexical items, but in RP [C]-final lexical items. Consequently, the *r-final* piece can be identified only by the characteristic vowel features: firstly in lexical items containing the non-w initial piece, openness, backness, spreading and length, combined with a following single consonant, plosive, affricate, fricative, nasal, or lateral [-ɔ/:C], and with the cluster [lz]; and secondly, where the initial piece is w, [-ɔ/:C] and [-ɔ:lz]:

³ Also [-ɔ:m] (EPD, COD). *Walm(e)sbury* and *Walmsbury* have [-ɔ:m]; and, if treated as examples of the *l-final* rather than the *r-final* piece, e.g. *warm*, *swarm*, must be regarded as place-name exceptions.

 [(-)ə:] [p t k ɪʃ s θ ŋ]

 e.g. *harp, art, ark, arch, harsh, sparse, hearth, scarf*

 [(-)ɑ:] [b d g dʒ z v m n l lz]

 e.g. *barb, hard, Argive, large, parse, scarves, farm, barn, snarl, Charles*

 [-ɔ:] [p t k ŋ]

 e.g. *warp, thwart,⁴ Wark (Northumberland), quark, dwarf*

 [-ɔ:] [b d m n ð lz]

 e.g. *warble, sword, swarm, warn, swarthy, Quarles*

The absence of a rolled or fricative consonant [r] or [ɹ] or a non-syllabic central vowel [ɹ] from the r-final type of c-final piece results in identical exponency with certain other types of c-final piece. One such type of piece is the fricative-final (see Section 2.4.1.1 above), but only where that type of piece contains a single consonant: [-ɑːs/ɪ/θ]; e.g. *pass, glass, staff, chaff, path, lath*, vs. *arse, sparse, farce, scarf, hearth, garth*. At the phonetic level there is nothing within RP to distinguish such examples of the r-final piece as these latter from the fricative-final type; but the overall phonetic expectancy of *pass, staff, path*, etc. is different from that of *sparse, scarf*, and *hearth*: the former alternate with forms in [a] and [æ] in Midland and northern dialects, with [-æːs/ɪ/θ] in eastern Leicestershire, for example, while the latter contrast with them, as [-ɑːs/ɪ/θ]: (the contrast is still greater with the dialects that Wells has termed *rhotic*, on account of their final cluster).⁵

The examples of the fricative-final piece that I have given above are all from lexical items in which the initial is non-w; in w-initial lexical items the r-final piece is distinguished from the f-final piece by [-ɔːf] as against [-ɑːf]; e.g. *wharf, dwarf, swarf* vs. *quaff* (also [-ɒf]).

⁴ It is only in a lexical item containing this type of piece, -ArT, that the initial cluster [θw-] occurs in a short-quantity lexical item.

⁵ For *rhotic* see Wells (1980: 77); but I think it was in a paper read at the Eighth International Congress of Phonetic Sciences, Leeds, 1975, that Wells introduced this useful term.

There are no examples of the r-final piece in w-initial-piece lexical items in [-s] or [-ʃ] to compare with the s-final or the θ-final piece, as described in Section 2.4.1.2 above, e.g. *Wass, wasp, wast, swath* (and probably *wrath*), though the lexical item *swath* of the adjective word *swathy* rhymes with the lexical item *swath* of the noun-plural word *swaths*: [-ɔ:ð].

There are also two sub-categories of l-final piece that are phonetically identical with the r-final piece: the m- and /v-final piece in non-w-initial lexical items (see Section 2.4.2.3 above); e.g. *alms, Palm, calm* vs. *arm, farm, charm*; and *half, calf, halve, calve* vs. *scarf, carve*, of which *calve* and *carve* are phonetically identical in RP; and the k-final-piece in w-initial lexical items (see Section 2.4.2.2 above); e.g. *walk* vs. *Wark* (Northumberland), *quark*. To some extent the m-final lexical items are distinguishable as such because of the lateral consonant that is part of the phonetic exponency of lm-final lexical items in the disyllabic piece: [(-)ælmV-]; e.g. *palmate, calmative*; otherwise, it is possible to appeal to the difference in the phonetic expectancy of lexical items containing the rM type of final, e.g. *arms, farm, charm*, and the rF and rV types, e.g. *scarf, carve*, in the rhotic dialects, West-Country, Scottish, Irish, and American. The number of lexical items concerned is, in any case, small.

In non-w-initial lexical items the lK piece is distinguished from the rK by vowel features: [ɔ:] vs. [ɑ:]; e.g. *talk, ba(u)lk* vs. *stark, bark*; but in w-initial lexical items the two types of piece are identical in vowel features: [ɔ:]; e.g. *walk* vs. *Wark, quark*; but the number of examples is very small.

2.5 The type of piece containing [ɒ], and, where appropriate, [ɔ:] and [əʊ]

Like the type of piece dealt with in Section 2.4, in which there is alternation in vowel between [æ] and [ɒ], [ɑ:], or [ɔ:], this type of piece also shows alternation in vowel quality; less than the preceding type, but more than the [ʌ/ʊ] type, described in Section 2.2 above. The vowel in this type of piece has lip-rounding, [ɒ] or [ɔ:], or partial lip-rounding, [əʊ], in all circumstances, and is either pure, with backness, and openness or half-openness, [ɒ] or [ɔ:], or diphthongal, with movement from a central and spread position to a somewhat back and closer position, with liprounding, [əʊ]. The scope of the variation can be seen from the following table:

[ɒ]	<i>lock, Jabberwock</i>	<i>bomb</i>	<i>pomp</i>	<i>top</i>	<i>font</i>
[ɔ]	-	-	-	-	-
[əʊ]	-	-	-	-	-
[ɒ]	<i>gloss</i>	<i>scoff</i>	<i>moth</i>	<i>poll, Poll</i>	-
[ɔ]	<i>loss</i>	<i>off</i>	<i>cloth</i>	-	-
[əʊ]	-	-	-	<i>poll, Poll</i>	<i>folk</i>
[ɒ]	-	-	-	<i>Rolf(e), golf</i>	<i>solve</i>
[ɔ]	-	-	-	-	-
[əʊ]	<i>colt</i>	<i>holm</i>	<i>Colne</i>	<i>Rolf(e)</i>	-
[ɒ]	-	-	-	-	-
[ɔ]	<i>park</i>	<i>orb</i>	<i>port</i>	<i>form</i>	<i>horn, worn</i>
[əʊ]	-	-	-	-	-
[ɒ]	-	-	-	-	-
[ɔ]	<i>horse</i>	<i>porch</i>	<i>Gorleston</i>	-	-
[əʊ]	-	-	-	-	-

2.5.1 Occlusive-final piece

The vowel [ɒ] combines freely with plosion, occlusion, affrication, or nasality as a feature of a following consonant (cf. also [æ] in Section 2.4.1 above); it also combines with friction equally freely where the place of articulation is palato-alveolar [ʃ], and somewhat less freely where it is alveolar, labio-dental, or dental; and, to a limited extent, it combines with a following lateral consonant:

[(-)ɒ] [k kt ks p pt ps t ts g b d tʃ dʒ ʃ
 ŋ ŋk ŋks ŋg n nt nd ns nz f ʃ
 s st sk θ v z l lf lv]

e.g. *dock, concoct, fox, hop, opt, copse, pot, Potsdam, dog, knob, god, scotch, lodge, cosh, song, conch, Bronx, diphthongal, bomb, pomp, rhomb ([-ml/-mb]), John, font, bond, sconce, bronze, doff, toft, gloss, nostalgia, bosk, moth, of, Boz, poll, golf, solve*

In Section 2.4 above it was important to distinguish w-initial from non-w-initial lexical items, in sub-sections 2.4.1.1 and 2.4.1.2; but a syntagmatic association of [ɒ] with a non-syllabic back rounded vowel [w] in the initial of a lexical item, [wɒ-], is almost non-existent; and such examples of this combination as there are, are curiosities; e.g. *jabberwock, gollywog, Wong, wonky (Worplesdon, Quorn, worn, and sworn* will be considered separately, in the r-final piece, in Section 2.5.4 below). These few examples are treated as exceptions; with the result that no regular w or non-w initial piece can be recognised for lexical items containing this type of piece: [(-)ɒC(C)]. It is noteworthy

that these [wɒ-] examples are all dero-velar-final: [wɒk/ɔʔ(k)]; they occupy the vacuum left by the association of velicity with fricativity in the case of examples such as *wheel, wear, wing, wrong, and wound* (see Section 2.4.1.1.1 above): [-ɛk], [-ɛks], [-ɛŋ], [-ɛŋk], *not* [-ɔk], [-ɔks], [-ɔŋ], [-ɔŋk], [-ɔp], [-ɔpk]

The short vowel [ɒ] combines with friction in a following consonant to the exclusion of [ɔ:] and [ɔu:] where that friction is accompanied by voice, palato-alveolarity, or alveolarity as the initial element of a cluster [-sk]: e.g. (voice) *of, Box, Summer*, (palato-alveolarity) *crack, shock, both*, (alveolarity) *lost, lust*.

2.5.2 Fricative-final piece

Where, however, the friction is accompanied by both voicelessness and an alveolar, labio-dental, or dental place of articulation, the vowel features that combine with these consonantal features are half-openness and length [ɔ:]:

[(-)ɔ:] [s st f θ 0]

e.g. *loss, cross, cost, lost, frost, off, often, soften, oft, soft, loft, craft, cloth*, to which some RP-speakers would add *toss, cough, and trough*

Gimson (1962: 109) refers to the appearance of 'the lengthened form of ME [ɔ] before /f, θ, s/' as being 'in the second half of the seventeenth century'. This fricative-final piece parallels the fricative-final piece described in Section 2.4.1.1.2 above; e.g. *ass, pass, past, ghastly, chaff, staff, daft, raft, path, bath*; and, like that fricative-final piece, alternates with the occlusive-final piece of northern and Midland dialects. In eastern Leicestershire, for example, *loss, cost, off, soft, and cloth* rhyme with *gloss, host(age), scoff, toft, and moth* respectively; and this is also the case for some RP-speakers, with the result that for them there is no such piece as the fricative-final piece described here; and the scope of the occlusive-final piece, despite the term *occlusive*, must be understood to include friction equally with occlusion, plosion, and nasality.

Such lexical items as *loss, off, and cloth*, therefore, alternate within RP between fricative-final and occlusive-final piece, the former being probably confined to elderly speakers; other lexical items with alveolar, labio-dental, or dental fricative final consonants show no such alternation, and can be classified as exclusively occlusive-final piece, as in Section 2.5.1 above:

[-ɒ] [s st f ŋ ʒ]

e.g. *toss, doss, dross, Gross, gloss, Ross, boss, goshawk, jost-
stick, moss, fosse, floss, throstle, hostage, posture, doff,
trough, cough, Gough, toft, Goth, moth*

The basis for the distribution of lexical items as between the two types of final piece, fricative-final and occlusive-final, is, therefore, like that in Section 2.4.1.1 above, not phonetic but lexical.

To a greater extent than final friction the feature laterality, when immediately following the syllabic vowel, differs from the features plosion, occlusion, affrication, and nasality that are characteristic of the occlusive-final piece described in Section 2.5.1. The occlusive-final piece does provide examples in which the pure short vowel [ɒ] is combined with a final lateral; e.g. *poll, Poll, Tollemache, Stoll* (also [-ɔʊl]), *doll, col, moll, loll, sol-fa, Rolfe* (also [-ɔʊf]); so it cannot be said that laterality is excluded from the occlusive-final piece; but these examples look like curiosities when compared with the much more numerous and typical lexical items that exemplify the lateral-final piece, to which we now turn.

2.5.3 Types of lateral-final piece

2.5.3.1 Tongue-front piece

One of the functions of the lateral-final piece is to associate a final velarised lateral, whether single or the first component of a cluster, with the diphthong [ɔʊ^h]:

[(-)ɔʊ:] [l ld]

e.g. *poll, boll, toll, Stoll* (also [-ɒl]), *troll, stroll, knoll, roll, old, hold, wold, bold, cold, scold, gold*

[-ɔʊ] [lt lst]

e.g. *holt, bolt, dolt, colt, jolt, Holst*

These examples fill the partial vacuum left by [-ɒ] and the vacuum left by *[-ɒl/d]. Further grounds for classifying the type of piece that they represent as short-quantity come from the fact that the short vowels [ɪ], [ɛ] and [ʌ] regularly combine with [-lb], [-ld], [-ldʒ], [-lp], [-lt] and [-lʃ]; e.g. *ill, hell, hull, bulb, build, geld, bulge, Quilp,*

wholly, pulp, hilt, welt, end, fish, Welsh, madk. It is also the case that the clusters [-li] and [-lp] do not combine with the long vowels [ɛ], [ɛ:] and [ɜ:], and that [-ld] combines only with [i], e.g. *folld, yield, wild*, and with [ɜ:] only in the personal name *Gould*.

In a very few instances [-ɔ:k] alternates with [-oɪ] for a given lexical item; e.g. *vent, suller(y), post, postcard*, the [-oɪ] alternative appears in disyllabic pieces in which a vowel follows: [-oɪVɔ:] (cf. also Section 2.4.2.3).

2.3.3.2 k-final piece

In the k sub-category of l-final piece (see Section 2.4.2.2 above), [-k] was associated directly with the syllabic vowel [ɔ:], there being no lateral consonant. Here it is the vowel [ɔ:] that [-k] is associated with; e.g. *folk, yolk* (but [-lk], exceptionally, in the place-name *Holkham*). This interpretation of [-ɔ:k] as short-quantity is supported by the fact that [-ɔ:k] is in complementary distribution with [-ɪlk], [-ɛlk], and [-Alk] in e.g. *milk, Wilks, elk, wheel, hulk, bulk*; and with [-ɔ:k] in *talk, walk*.

2.3.3.3 m- and fv-final pieces

In the m- and fv-final sub-category of the l-final piece (see Section 2.4.2.3 above), e.g. *palm, palm, half, calf, halve, calve*, [-m], [-ŋ], and [-v] were associated directly with the syllabic vowel [ɑ:], there being no lateral consonant; the same is the case for [-m] and [-ŋ] here: [-ɔ:um]; e.g. *holm-oak, Holmes*; and [-ɔ:uŋ]; e.g. *Rolfe* (also [-ɔ:lf]). This interpretation, too, rests on the complementary distribution of [-ɔ:um] as regards [-ɪlm], [(-)ɛlm], and [-Alm]; e.g. *film, helm, and culm*, as well as [(-)ɑ:m]; e.g. *alms, palm*; and for [-ɔ:uŋ] in *Rolf(e)* (also [-ɔ:lf]), on complementary distribution with regard to [-ɪlf], [(-)ɛlf], and [-Alf] in e.g. *sylph, elf, self, and gulf*, and [-ɑ:f] in *half and calf*.

In a literate society it is proper to take account of such orthographic differences as distinguish the short-quantity lexical items such as *folk, yolk*, and *holm-* from long-quantity lexical items such as *yoke, soak, oak, woke, home, dome, loam, foam* (my mispronunciation of *Holmes* as ['hɒlmiːz] was corrected at a very early age). Unlike *Holmes* and *holm* the initial lexical item of the place-name *Colnbrook* has alternative pronunciations [kəʊ:ln-] and [kəʊ:n-]; and so, according to the *EPD*, has *Colne*; but *Broadcast English* gives only [-ɔ:un-].

2.5.4 r-final piece

A r-final piece has already been stated to account for the relations of [ɔː/] in non-w-initial lexical items, and [ɔː/] in w-initial lexical items, with a following consonant, plosive, affricate, nasal, fricative, or lateral, in Section 2.4.3 above; in the type of piece containing the syllabic vowel [ɹ] and associated vowels it is the half-open back rounded long vowel that needs to be associated with those same types of single consonant:

[ɔː] [p t k ʃ f s ʋ]

e.g. *thorj(e), fort, pork, porch, Orphic, horse, north*

[(-)ɔː] [b d g dʒ m n l v ð]

e.g. *orb, cord, morgue, George, form, thorn, Gorleston, corvine, northern*

In RP the r-final piece overlaps the fricative-final piece; e.g. *horse, gorse, Corse, north, forth* vs. *loss, cross, off, cloth*; but the fricative-final-piece lexical items differ in expectancy: they have an alternative pronunciation in [ɔ]; the r-final-piece lexical items also differ in expectancy: they are widely known to have a 'r sound' in the rhotic dialects, West Country, Scots, Irish, and American.

Rhyming lexical items with [w] in the initial are too few to be regarded as anything but exceptions: *Worplesdon, Quorn, worn, sworn*.⁶ The two verb-root lexical items [wɔː-] and [swɔː-] are forms of the r-junction-piece strong verbs [wɛə:(ɪ)]/[wɔə:(ɪ)] and [swɛə:(ɪ)]/[swɔə:(ɪ)], and are exceptional in not being *[wɔə:-] and *[swɔə:-] (cf. Sprigg, this volume); the two place-names may either be treated as exceptions or as regular examples of the Ar piece, like *warp* and *warn*.

2.6 The r-final piece containing the vowel [əː/]

Unlike the r-final piece containing the vowel [ɔː/], the type of r-final piece containing the vowel [əː/] does indeed require w-initial-piece lexical items to be distinguished from non-w-initial; but this is because of the range of possible initial consonants that can combine with [w]: [(s)k], [t] and [s]; not because of an alternation in vowel features. The vowel features are the same in both types of lexical item: half-close central spread long: [əː/]; e.g. (non-w) *chirp, hurt, shirk, church, purse, surf, earth,*

⁶ On old maps of Leicestershire *Quorn* is shown as *Quarendon*; cf. *warren*.

Firth, term, burn, hurt, curve vs. (=) *twirp, squirt, work, worse, worth, squirm, quern, swirl, swerve, whirl*.

There is no doubt that, on grounds of inter-dialectal expectancy, these examples belong, like the *Ar* and *Or* types of *r*-final piece described in Sections 2.4.3 and 2.5.4 above, to a type of *r*-final piece, but their vowel features do not make it readily possible to associate them with one of the remaining vowels, I, E, or U. If orthography is taken into account, the vowel unit U is a weak candidate, because *sqw-, tw-, dw-, qu-*, and so on do not combine with *u* or *o*, but they do combine with *i* and *e*; e.g. *squirt, squirm, quirk, quern, whirl, twirp/twirp, swirl, swerve*.

One solution would be to divide this third class of lexical item containing a *r*-final piece [-*r*/C] between the vowel units I, E, and U in accordance with *i, e, and o* in the orthography wherever this division was supported by dialects that make such a threefold distinction: 'A pronunciation with vowel (usually [i, e, ʌ] or [u]) + /r/ is retained in many types of English where post-vocalic /r/ is still pronounced, e.g. Scottish English and some kinds of northern English' (Gimson 1962: 117). This would please the historically conscious; but I cannot say that my own interdialectal expectancy extends to this threefold distinction. The alternative would be to acknowledge that for RP at least no such threefold distinction can any longer be justified phonetically, and recognise a third vowel unit for the *r*-final piece, symbolised by *ə*, perhaps, or by Y, in contrast with A and O, and having the same relationship with each of the three remaining vowel units, I, E, and U, that have to be recognised in types of piece other than the *r*-final (see Sections 2.2 and 2.3 above).

A prosodic analysis of English on the lines of this analysis of the short-quantity piece goes a long way towards justifying English orthography against the over-phonetic results of a phonemic analysis: once a lexical item, always a lexical item.

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Editors:
John Kelly
Leendert Plug

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DEPARTMENT OF LANGUAGE AND LINGUISTIC SCIENCE
UNIVERSITY OF YORK, HESLINGTON, YORK, YO10 5DD



Editorial note

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