The problem of /ʌ/ and /ə/ in British English

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At the outset of the present paper, I wish to point out that the type of spoken English with regard to which I discuss the question of /ʌ/ and /ə/ is, primarily, British English, in particular R.P. (Received Pronunciation), as the question treated in this paper does not directly apply to American English in general. Only in the final part of the present paper shall I make a few references to American English when I compare the pronunciation of a few of the relevant English words in American English with that in British English, while still on the subject of [ʌ] and [ə] and /ʌ/ and /ə/.

Daniel Jones (1950a: § 148) raises an interesting point about the phonological status of [ʌ] as in *humdrum* ([ʌ] in the second syllable) and of [ə] as in *conundrum* ([ə] in the third syllable). The question he poses is: do [ʌ] and [ə] in English in such cases belong to one and the same phoneme or not? Note straightaway that Jones is obviously concerned with [ʌ] and [ə] in *unaccented* syllables, in particular in unaccented closed syllables, as can be seen in his example words. His conclusion is as follows (*loc. cit.*).

> [...] I clearly feel ə and ʌ to belong to two separate phonemes in my type of English [...]

Jones himself, in the course of his discussion in various sections of his above-mentioned book, adduces some English words that contain [ʌ] in unaccented syllables and others that contain [ə] in unaccented syllables. In addition to *humdrum* ['hʌmdrʌm][1], Jones cites *hiccup* (his spelling) ['hɪkʌp] and *catapult* ['kætəpʌlt][2] as

[1] It is of course the second [ʌ] (occurring in the unaccented syllable) that both Jones and I are concerned with.

[2] Jones (1950a) employs the phonetic symbol **a** in the type of phonetic notation he adopts in his book in question. This symbol, of course, corresponds to the phonetic symbol æ which I am using here and below.

containing [ʌ] and, in addition to *conundrum* [kə'nʌndrəm],[3] he cites *syrup* ['sɪrəp][4] and *difficult* ['dɪfɪkəlt] as containing [ə].

One can easily multiply examples of the sort that Jones adduces. I will add a few below.

A few more examples of words containing [ʌ] are as follows: *humbug* ['hʌmbʌg] (the second [ʌ] being relevant to us), *umbilical* [ʌm'bɪlɪk(ə)l], *insult* ['ɪnsʌlt] (n.), *custodial* [kʌ'stəʊdɪəl],[5] *Dunsany* [dʌn'seɪnɪ], *inculcate* ['ɪnkʌlkeɪt], *hubbub* ['hʌbʌb] (the second [ʌ] being relevant to us), *bankrupt* ['bæŋkrʌpt], *tumult* ['tju:mʌlt], *adult* ['ædʌlt], etc. Some of these words have only [ʌ], while the others have [ə] as well as [ʌ], but they are all cited above since all of them satisfy the condition that [ʌ] occurs anyway in every one of these words. To the best of my knowledge, those of the above-cited words that have [ʌ] only (but not [ə] as well) are *umbilical*, *insult* (n.), *custodial*, *Dunsany*, *inculcate*, *hubbub* and *adult*, while those that have [ʌ] and [ə] are *bankrupt* and *tumult*.

A few more example words containing [ə] are as follows: *tantrum* ['tæntrəm], *hokum* ['həʊkəm], *Beckham* ['bekəm], *Beckford* ['bekfəd], *Beckton* ['bektən], *rudiment* ['ru:dɪmənt], *mammoth* ['mæməθ], *Sabbath* ['sæbəθ], *Herbert* ['hɜ:bət], *freedom* ['fri:dəm], *bedlam* ['bedləm], etc. None of these words have [ʌ] as well.

An essential point to be retained in our minds during the whole course of the present discussion is the occurrence of both [ʌ] and [ə] in *unaccented closed syllables*, though their occurrence in accented closed syllables is also relevant.

Various consonants constituting unaccented closed syllables in which [ʌ] occurs are identified as follows in connection with the example words adduced above. In indicating each of the unaccented closed syllables in question here and further below, I will indicate the syllable division by leaving spaces between

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[3] It is the second [ə] that we are concerned with.

[4] Jones (1950a) employs the phonetic symbol **i** in his book in question. This symbol corresponds to ɪ I am using here and below. I will hereafter make no explanatory remarks about the phonetic symbols I employ in my present paper in cases where the phonetic symbols Jones employs in his book in question differ from mine, as they will not require any particular explanations. Suffice it to say that I am employing the type of phonetic notation that Gimson (1962, 1970, 1980, 1989, 1994) does.

[5] In substantial numbers of cases there is divergence between syllabification in English words when spelled (as one sees in dictionaries) and that when pronounced. For instance, in *custodial*, the present example, the syllabification when spelled is *cus-to-di-al* but, when pronounced it is [kʌ-'stəʊd-ɪ-əl]. Witness, in comparison, *custody*, which is *cus-to-dy* (in written form) and ['kʌst-əd-ɪ] (in spoken form).

syllables by following Wells (1990)[6] for the benefit of those readers who may not be completely versed in English *phonetic* syllabification (not to be confused with orthographic syllabification) which is quite complex (even to many a native speaker of English).

[dr – m] (['hʌm drʌm]) (see the second syllable);
[– p] (['hɪk ʌp]);
[p – lt] (['kæt ə pʌlt]);
[b – g] (['hʌm bʌg]) (see the second syllable);
[– m] ([ʌm 'bɪl ɪk(ə)l]);
[s – lt] (['ɪn sʌlt] (n.));
[d – n] ([dʌn 'keld]);
[k – lk] (['ɪn kʌlk eɪt])[7];
[– b] (['hʌb ʌb]) (see the second syllable);
[r – pt] (['bæŋk rʌpt]);
[– lt] (['tju:m ʌlt], ['æd ʌlt]).

On the other hand, various consonants constituting unaccented closed syllables in which [ə] occurs are identified as follows in connection with the example words adduced above.

[dr – m] ([kə 'nʌn drəm])[8];
[– p] (['sɪr əp]);
[– lt] (['dɪf ɪk əlt])[9];
[– m] (['tæn trəm], ['həʊk əm], ['bek əm],[10] ['fri:d əm]));
[f – d] (['bek fəd]);

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6 See Wells (1990: xix-xxi, (i.e. **3.5 Syllabification**) and 697 (i.e. **SYLLABLES**)).

7 The syllabification of the word *inculate* as ['ɪn kʌlk eɪt], as shown here, which involves the unaccented closed syllable [k – lk], is the one indicated by Wells (1990: 363). Note that Wells's indication is not ['ɪn kʌl keɪt], which would involve [k - l] instead. That Wells's indication here is not an instance of typographical error is clear, seeing that Wells shows the syllabification of e.g. *inculpate*, whose spelling and pronunciation are identical with *inculcate* except for the difference between *-k-* [k] and *-p-* [p], as ['ɪn kʌlp eɪt], not ['ɪn kʌl peɪt].

8 For some reason unknown to me, Wells (1990) indicates the pronunciation of the word *conundrum* as [kə 'nʌndr əm], that is, ['nʌndr] as a single syllable. I have not followed his syllabification and indicate ['nʌn dr...] instead.

9 There exists an alternative pronunciation ['dɪf ɪ k̩lt] for the word *difficult*. Wells shows the pronunciation of this word as ['dɪf ɪkˢlt], a conflated notation of both ['dɪf ɪk əlt] and ['dɪf ɪ k̩lt] (with the syllabic [l̩]). However, I am concerned with only ['dɪf ɪk əlt], for the occurrence of [ə] (in the unaccented syllable [- lt]), and the other [ə]-less pronunciation is out of my consideration.

10 The word *Beckham* happens not to be entered in Wells (1990). If it were, the word would be found on p. 67. The indication of the pronunciation of the word syllabified, ['bek əm], is therefore mine.

[– n] (['bekt ən]);
[m – nt] (['ru:d ɪ mənt]);
[– θ] (['mæm əθ], ['sæb əθ]);
[– t] (['hɜ:b ət]);
[l – m] (['bed ləm]).

It will have been seen that the unaccented closed syllable [dr – m] is shared by ['hʌm drʌm] and [kə 'nʌn drəm] in which [ʌ] and [ə], respectively, occur in [dr – m] and that the unaccented closed syllable [– lt] is shared by ['tju:m ʌlt] and ['æd ʌlt] on the one hand and ['dɪf ɪk əlt] on the other in which [ʌ] and [ə], respectively, occur in [– lt]. Such cases are presumably small in number. Other various make-ups of unaccented closed syllables identified above happen not to be shared by some example words in which [ʌ] occurs and others in which [ə] occurs. These cases are apparently greater in number. It is a matter of conjecture that if we carried on looking for more and more potential example words, we would most likely find more example words in which *both* [ʌ] *and* [ə] occur in unaccented closed syllables of identical consonantal make-ups and also more example words in which *both* [ʌ] *and* [ə] do not share unaccented closed syllables of identical consonantal make-ups. It seems to me that the precise identities of the consonants forming individual unaccented closed syllables in which [ʌ] and [ə] occur are of minor importance. We cannot know for sure, based upon a tiny amount of data such as provided above, whether the unaccented closed syllables in which [ʌ] occurs and those in which [ə] occurs are in complementary distribution at all. In other words, we cannot confirm whether or not the occurrence of [ʌ] and that of [ə] are related to specific consonantal constituents of unaccented closed syllables. If an affirmative answer can be given, Jonesians and Bloomfieldians may be tempted to consider [ʌ] and [ə] as complementarily distributed phonetically similar variants (many would call them 'allophones') of a single phoneme, but they must at the same time concede the existence of the occurrence of both [ʌ] and [ə] in identical contexts (as in [dr – m] and [– lt], as we have seen above), which would lead them to establishing [ʌ] and [ə] as variants ('allophones') of two different phonemes. Having established the two separate phonemes, i.e. /ʌ/ and /ə/, they would identify [ʌ] and [ə] occurring in all other types of context as /ʌ/ and /ə/ on the strength of the principle 'once a phoneme, always a phoneme'. The solution to the problem of whether or not to regard [ʌ] and [ə] in unaccented closed syllables as a whole as being ascribable to a single phoneme or two separate phonemes would remain inconclusive to Jonesians and Bloomfieldians. I will show in detail further below that this sort of phonological analysis based on the criteria of phonetic similarity and complementary distribution, well known to Jonesians and Bloomfieldians, is not one I espouse.

Incidentally, I note in passing two examples I have found of an unaccented *open* syllable in which both [ʌ] and [ə] occur. These are (*custodial* [kʌ 'stəʊd ɪ əl]

and *Cassandra* [kə 'sændr ə]), the unaccented open syllable in these words being of course [k –]. We should no doubt find more examples if we went on looking for them.

What is basically important is that in all the example words I have additionally cited above —and there would surely be more if we continued to search for more— [ʌ] and [ə] are found to occur predominantly, if not always, in *unaccented closed syllables*, irrespective of whether such unaccented closed syllables occur before accented syllables (as in [ʌm 'bɪl ɪ k(ə)l]) or after them (as in ['tæn trəm]). I have not been able to find examples in which [ə] occurs in *closed* syllables *before* accented syllables. On the other hand, I find a large number of examples in which [ə] occurs in *open* syllables *before* accented syllables (as in *sustain* [sə 'steɪn] and *astound* [ə 'staʊnd][11]). This means that a pair of examples like [ʌm 'bɪl ɪ k(ə)l] and [ə 'staʊnd] are not comparable in that [ʌ] here occurs in a closed syllable ([– m]) whereas [ə] here occurs in an open syllable ([–]). It should be noted, however, that [ə] is also susceptible of occurring in unaccented closed syllables not only in word-initial unaccented closed syllables (e.g. *Atlantic* [ət 'lænt ɪk]) but also in word-medial unaccented closed syllables (e.g. *canopy* ['kæn əp ɪ]) and in word-final unaccented closed syllables (e.g. *woman* ['wʊm ən]).

The occurrence of [ʌ] in an unaccented open syllable before an accented syllable —I have cited [kʌ 'stəʊd ɪ əl]— appears to be rare. At any rate, Jones does not seem to be centrally interested in such cases. I will hereafter leave such cases out of account in the present discussion.

There are two important points to be summarized at this juncture during my discussion.

(i) What is essentially important is that both [ʌ] and [ə] are susceptible of occurring in a comparable context, i.e. in unaccented closed syllables after accented syllables, and that it would be justified to ignore the precise consonantal make-up of the closed syllables, i.e. which consonant(s) begin(s) the syllable(s) and which end(s) them(it) in which [ʌ] and [ə] occur. In other words, the 'canonic context' we can operate with in the present discussion is 'unaccented closed syllable' *tout court*.

(ii) What we have not (yet) established is whether [ʌ] and [ə] are susceptible of occurring also in *accented* syllables (a fact that Jones implicitly acknowledges), and whether or not such accented syllables are open or closed. This point will prove significant in my present discussion, as we shall see much later.

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[11] Note that the syllable division is between [ə] and [s], not between [əs] and [t]. This means that [ə] occurs in an open syllable, not in a closed syllable. The word *sustain* is orthographically syllabified *sus-tain* but phonetically syllabified [sə 'steɪn] not [səs 'teɪn], and *astound* orthographically syllabified *as-tound* but phonetically syllabified [ə 'staʊnd] not [əs 'taʊnd].

But now it is necessary for me to return to what Jones (1950a: § 148) says. His quoted words below follow those words of his I have already quoted at the outset of the present paper. Jones writes as follows.

> [...] ʌ rarely occurs with weak stress [i.e. ʌ occurs as a rule accented, as I understand Jones's words as implying], while short ə is always weakly stressed [i.e unaccented, as I understand]. However, the fact that my speech contains such words as [I copy Jones's own phonetic notation[12]] **'hikʌp** (*hiccup*), **'hʌmdrʌm** (*humdrum*), **'katəpʌlt** (*catapult*) [...] **'sirəp** (*syrup*), **kə'nʌndrəm** (*conundrum*), **'difikəlt** (*difficult*) demonstrates the case to my satisfaction, since it cannot be maintained that the use of ʌ and ə in these weakly stressed positions [i.e. unaccented positions] is attributable in any way to the nature of the preceding sounds in the words.

Note, however, that, as we shall see later, Jones definitely seems to admit a contrary fact, i.e. that [ʌ] *can* occur, albeit rarely, in unaccented syllables as well, and that [ə] *can* occur, albeit in just a few words, in accented syllables.

I am less pessimistic than Jones in being able to find a sufficient number of the occurrence of [ʌ] in unaccented syllables, as the reader will have seen from my adducing a few relevant examples further above. On another point, I am in agreement with Jones when he says that the occurrence of [ʌ] and [ə] in unaccented syllables is in no way governed by the nature of the preceding sounds (nor, I would add, the following sounds) in the relevant words. It is easy to understand that Jones does not think that [ʌ] and [ə] in unaccented syllables are 'positional/contextual variants' of one and the same phoneme, whatever that phoneme may be. In fact, as we have already seen, Jones ascribes [ʌ] and [ə] in unaccented syllables to two separate phonemes (*op. cit.* § 148), a view I agree with. Jones further says conclusively as follows (*op. cit.* § 204).

> Personally, I take the view that both sounds occur in comparable phonetic contexts, such as those mentioned in **§148** [in *op. cit.*], and therefore constitute separate phonemes.

This view is obviously compatible with Jones's view that different sounds occurring in the same phonetic context belong to different phonemes, a view which, in turn, is a corollary of his definitional concept of the phoneme to the effect that

> NO ONE MEMBER [i.e. no 'allophone' of a phoneme] EVER OCCURS IN A WORD IN THE SAME PHONETIC CONTEXT AS ANY OTHER MEMBER [Jones's upper-case letters] (*op. cit.*: § 31).

In addition, Jones (1950a: § 147) says as follows.

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12 Jones's phonetic notation, despite a few differences in symbols from mine, denotes exactly the same pronunciation.

> If the observer knows that two sounds occur in a language but is unable to find a pair of words distinguished solely by an exchange of these sounds, he may still be able to prove that they belong to separate phonemes by finding two words containing the sounds in situations of sufficient similarity.

What is implied by Jones's words 'situations of sufficient similarity' (or what other researchers will call 'analogous contexts') is compatible with, and corresponds to, what I have expressed above in terms of 'unaccented closed syllable irrespective of different segmental make-ups', which I considered above as the 'canonic context' for the purposes of the present discussion.

Elsewhere, Jones expresses his view that he does not countenance the interpretation held by some that [ʌ] and [ə] belong to one and the same phoneme, viz. /ə/, that is to say, the interpretation according to which [ʌ] is the accented /ə/ while [ə] is the unaccented /ə/.

I am fundamentally in agreement with Jones's conclusion regarding the phonological status of [ʌ] and [ə] in unaccented syllables in British English, more precisely in the variety of English that Jones says he himself speaks. However, as a functionalist, I should be able to provide a phonological analysis that is perfectly acceptable from a functional point of view (a point of view not held by Jones), a phonological analysis whose conclusion happens to be in harmony with Jones's.

From a functionalist point of view, the occurrence of both [ʌ] and [ə] in unaccented syllables corresponds to the choice of the speaker, who opts to pronounce, for example, ['hʌm drʌm] and not ['hʌm drəm], and also [kə 'nʌn drəm] and not [kə 'nʌn drʌm]. It follows that [ʌ] in ['hʌm drʌm] (i.e. in the unaccented syllable) and [ə] in [kə 'nʌn drəm] (i.e. in the last, unaccented, syllable) are phonetic realizations of two separate distinctive units of the second articulation.[13] It is incumbent on me to identify these two distinctive units definable as two mutually different sums of relevant features. This is the only way that a functionalist is justified in his attempt to identify the two distinctive units in question. It would seem reasonable to assume the stability in the occurrence (which derives from the speaker's choice) of [ʌ] rather than [ə] in, say, ['hʌm drʌm] (in the second syllable), and that of [ə] rather than [ʌ] in, say, [kə 'nʌn drəm] (in the third syllable). (As I will say further below, there are words in the pronunciation of which there lacks stability in the choice of [ʌ] or [ə] from one speaker to another. This will be discussed later.) The occurrence of [ʌ] and [ə] (deriving from the speaker's choice) in comparable

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[13] According to André Martinet's theory of 'double articulation', human experience being communicated by means of a language is analyzed into a succession of significant units, i.e. monemes (a union of a signifier and a signified), this analytical stage being referred to as the first articulation, and the signifier of monemes is in turn articulated into a succession of distinctive units, i.e. phonemes, this analytical stage being referred to as the second articulation. There is no 'third' articulation since relevant features into which phonemes are analyzed are concomitant, not successive, units.

contexts, i.e. in unaccented closed syllables, is not random. This seems to me to be an important factor to be borne in mind from a functional point of view during the present discussion.

The sole functionalist analytical procedure whereby to identify the distinctive units of a given language is the commutation test which alone is definitive and theoretically tenable to functionalists. There are various types of distinctive units in a language, but the types of distinctive units I seek to identify in the present discussion are the relevant feature and the phoneme.

It seems appropriate and helpful to the reader for me to clarify at this juncture the concept of the phoneme I believe in and operate with in my phonological analyses along with fellow functionalists. In agreement with André Martinet, I define a phoneme as, in my words, 'a sum of multiple indissociable distinctive phonic properties in a given language'.[14] What I refer to as 'a sum of multiple indissociable distinctive phonic properties' is what I and other functionalists alternatively refer to by the technical term 'relevant feature' ('trait pertinent' in French). The concept of the relevant feature is absolutely functionalist. Unfortunately, it frequently defies correct understanding on the part of virtually all non-functionalist linguists. I dispense with any explanatory remarks about this concept here and refer any interested readers to pertinent literature. I will add another reference to another of Martinet's definitions of the phoneme that runs as follows: 'Un **phonème** [Martinet's boldface] peut être considéré comme un ensemble de traits pertinents qui se réalisent simultanément.' ['A **phoneme** can be considered as a sum of relevant features which are realized simultaneously.' (Transl. by T.A.)]. This definition is found in André Martinet (1956: 40).[15] Martinet's term 'trait pertinent' corresponds to 'relevant feature'.

It behoves me to identify in what follows all the monophthongal vowel phonemes in British English by performing the commutation test with an ultimate view to finding my solution to the phonological problem posed in the present discussion about the phonological status of [ʌ] and [ə] in British English.

It is first of all necessary to obtain those commutative series in which a *maximum* number of minimal multiplets and —in case of unavailability of minimal multiplets —near-minimal multiplets are available, *to the extent it is possible to be.*

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[14] This is my own convenient paraphrasing of Martinet's own words which run (in Martinet 1957: 83) as follows: '[...] [un trait pertinent est] un ensemble de caractéristiques phoniques distinctives qui ne se trouvent dissociées nulle part dans le système [...]'. Martinet (1957) has subsequently been reproduced, with some modifications, in Martinet (1965: 124-40). The above-cited words of Martinet appear in Martinet (1965: 138). My paraphrasing of his words can be found in Akamatsu (2000: 22). The phrase 'in a given language', which is extremely important, happens not to be added in the relevant paraphrase of mine in my book as the immediate context makes it implicitly plain.

[15] Martinet's words 'traits pertinents qui se réalisent simultanément' clearly imply that 'third articulation' is not at all contemplated, as I always said in footnote 13.

(The implication of my words 'to the extent it is possible to be' is that, with many accidental gaps existing in any languages including English, there are inevitably lacunae in many commutative series.) Such commutative series relate to contexts of maximum differentiation. For the purpose of the present discussion, I have sampled only *closed* syllables, either accented or unaccented. Note in particular that when performing the commutation test, I operate not with the so-called 'minimal pairs' (which traditionally receive excessive, sometimes exclusive, attention) but with what I call 'minimal multiplets'.[16] In my considered view, minimal pairs are both theoretically and practically inadequate for the purpose of identifying distinctive units of the second articulation, that is to say, in terms of all the relevant features that define the distinctive units. For example, it would be impossible to identify *all* the relevant features of either /p/ or /b/ in English by merely opposing e.g. *pin* and *bin*, that is, by resorting to a minimal pair. How about the relevant features "non-nasal" and "plosive" and "labial" which are also part and parcel of the definition of both /p/ and /b/ in English? We need to have recourse to a different procedure of phonological analysis by operating with 'minimal multiplets', as this allows us to perform the commutation test and to establish all the relevant features of /p/ or /b/ in English. According to my own analysis, /p/ is characterized as "voiceless labial non-nasal plosive" and /b/ as "voiced labial non-nasal plosive".

'Minimal multiplets' is the concept and the term I employ whereby to designate all the items which together constitute the respective commutative series. In short, by minimal multiplets I mean those (two or more) multiplets that are distinguished from one another through minimal difference (cf. e.g. *hid* vs. *head* vs. *had* vs. *hod* vs. *Hudd* vs. *hood* vs. *heed* vs. *hard* vs. *heard* vs. *horde*; i.e. [ɪ] vs. [e] vs. [æ] vs. [ɒ] vs. [ʌ] vs. [ʊ] vs. [iː] vs. [ɑː] vs. [ɜː] vs. [ɔː]). It is not enough to establish just a single commutative series. We need a number of commutative series each of which consists of minimal multiplets or, in many cases, may include near-minimal multiplets as well. I have in the past explained in detail how the commutation test, as I understand, is conducted.[17] Note that I recognize the legitimacy of allowing for *near-minimal* multiplets which we need where minimal multiplets happen not to be available to us and the validity of recourse to both minimal multiplets and near-minimal multiplets in performing the commutation test.

Here below are a few commutative series I have established with an ultimate view to determining the phonological status of [ʌ] and [ə] in closed (accented or unaccented) syllables in English. I attach the symbol * at the end of all those of the near-minimal multiplets that I will make some necessary remarks on after the presentation of the commutative series below.

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16 For the notion and term of 'minimal multiplets' see Akamatsu (1992: 52) and/or Akamatsu (2000: 42 *et passim*). Both the term 'multiplets' and the term 'minimal multiplets', as employed in connection with the commutation test, are my coinages.

17 See Akamatsu (1992: Chap. 6) or Akamatsu (2000: Chap. 7).

TABLE OF COMMUTATIVE SERIES

	Commutative Series 1 ['p – t]	**Commutative Series 2** ['t – m]	**Commutative Series 3** ['s – p]	**Commutative Series 4** ['k – z]
[ɪ]	*pit*	*Tim*	*sip*	*Kizz(i)*
[e]	*pet*	*tem(per)*	*sep(arate)*	*Kes(wick)*
[æ]	*pat*	*tam*	*sap*	*chas(m)*
[ɒ]	*pot*	*Tom*	*sop*	*cos(mos)*
[ʌ]	*putt*	*tum*	*sup*	*cous(in)*
[ʊ]	*put*	*wom(an)**	*soot*	*Mus(lim)**
[iː]	*peat*	*team*	*seep*	*Keyes*
[uː]	*boot**	*tomb*	*soup*	*coos*
[ɑː]	*part*	*tarm(ac)*	*carp**	*cars*
[ɜː]	*pert*	*term*	*serp(ent)*	*Curz(on)*
[ɔː]	*port*	*torm(ent)* (n.)	*sorb(itol)**	*cause*
[ə]	*(be)cause**[18]	*(be)cause**[18]	*(be)cause**[18]	*(be)cause*[18]

[18] Some readers may be puzzled why I put the word *(be)cause* in whose pronunciation the part *-cause* is supposed to correspond to ['kəz], i.e. an accented syllable whose nucleus is [ə]. See footnote 23 for my explanation.

	Commutative Series 5 [m – n]	**Commutative Series 6** [r – m]	**Commutative Series 7** [k – n]	**Commutative Series 8** [l – m]
[ɪ]	*(ver)min*	*(inte)rim*	*(bod)kin*	*lim(pidity)*
[e]	*men(dacity)*	*ren(dition)**	*Ken(tucky)*	*lem(niscus)*
[æ]	*(mer)man*	*(wig)wam**	*can(torial)*	*lam(bast)*
[ɒ]	*Mon(tana)*	*(pom)pom**	*(sit)com**	*(dia)tom**
[ʌ]	*mun(dane)*[19]	*(hum)drum**	*cun(ctator)**	*(bread)crumb**
[ʊ]	*mun(icipal)**	*(bridge)groom**	*Goon(hilly)**	
[iː]	*(ever)green**	*(sun)beam**	*(ever)green**	
[uː]	*(fore)noon**	*(bed)room*[20]	*(fore)noon**	*(heir)loom*
[ɑː]	*marm(oreal)**			*(Is)lam*
[ɜː]	*merc(aptan)**	*(hau)berk**	*Kirk(lees)**	*(endo)derm**
[ɔː]	*morph(emic)**	*(toma)hawk**	*(lepre)chaun*	*(uni)form**
[ə]	*mon(adnock)*	*(conun)drum**	*con(sider)*	*(bed)lam*

The following remarks are in order about the eight commutative series presented above.

(1) I have presented above four commutative series (1 to 4) associated with four different phonetic contexts all of which are *accented closed syllables* and four other commutative series (5 to 8) associated with four different phonetic contexts all of which are *unaccented closed syllables*. All the individual multiplets (be they minimal or near-minimal) in a given commutative series share an identical suprasegmental context, that is to say, the syllables in which the target vowels occur

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[19] This is a somewhat problematic example but I adduce it here simply because Wells (1990: 465) enters the pronunciations of the the word as [mʌn 'deɪn] and [ˌmʌn 'deɪn] (main pronunciations) and as ['mʌn deɪn] (alternative pronunciation). It is interesting to note here that in *EPD* (*An English Pronouncing Dictionary*), the word *mundane* is entered consistently with the sole pronunciation ['mʌn deɪn] from the 1st ed. to the 12th ed. Subsequently the word is entered with both ['mʌn deɪn] (primary pronunciation) and ['mʌn 'deɪn] (secondary pronunciation) in the 13th ed., then with [ˌmʌn 'deɪn] (primary pronunciation) and ['mʌn deɪn] (secondary pronunciation) in the 14th ed. In the 15th, 16th and 17th eds., the word is entered with [mʌn 'deɪn] (primary pronunciation) and ['mʌn deɪn] (secondary pronunciation). All this information shows instability over time in the pronunciations of the word *mundane* and no definite statement can be made as to whether the part *mun-* carries accent or not. Secondary accent (noted with a lowered accent mark) is *linguistically* irrelevant and is equivalent to absence of accent, but at the same time it is conceivable to understand that it is a sort of reflection of what used to be for a long-time primary accent on *mun-*.

[20] As is well known, the word *bedroom* has two alternative pronunciations, viz. ['bedruːm] and ['bedrʊm]. In citing this word in this commutative series in connection with [uː], I am referring to one of the alternative pronunciations, i.e. ['bedruːm]. The distinction between [uː] and [ʊ] generally relates to the phonological difference between /uː/ and /ʊ/, as in *pool* [puːl] /pul/ vs. *pull* [pʊl] /pʊl/ and *fool* [fuːl] /ful/ vs. *full* [fʊl] /fʊl/. The word *bedroom* has two variant signifiers, /'bedrum/ and /'bedrʊm/. I am citing *bedroom* ['bedruːm] /'bedrum/ in Commutative Series 6.

are either accented (Commutative Series 1 to 4) or unaccented (Commutative Series 5 to 8).[21] Choosing these eight phonetic contexts above was random in principle. There are, of course, potentially a good number of other possible phonetic contexts (both accented and unaccented closed syllables) which would then have led to my establishing further commutative series, had it not been for limitation of space and time available. Phonetic contexts such as the following could have been additionally chosen as well to establish the associated commutative series: ['h – m], ['n – n], ['h – k], ['st – d], [– l], ['s – r], ['k – t], [k – p], [– m], ['b – l], [s – lt], [d – kt], [k –], ['d – f], ['k – ld], [k – t], ['– n], [– n], ['h – b], ['b – ŋk], [– lt], ['tj – m], [– p], ['t – n], [tr – m], ['h – k], ['b – k], ['fr – d], [f –], [t – n], ['r – d], ['m – m], ['s – b], [b – d], etc. Further different phonetic contexts could also have been taken into account. As a matter of fact, it would be little necessary whether I did or did not do so because, as I have already emphasized, the precise and different segmental make-ups of these and any other closed syllables are not so important as the fact that I only need to work with *any* closed syllables, which are either accented or unaccented, as the case may be.

(2) In establishing different commutative series for the purpose of performing the commutation test for the English language, such as I have presented above, it is generally easier to establish such commutative series as relate to accented syllables (e.g. ['s – p]; see Commutative Series 3) than those relating to unaccented syllables (e.g. [r – m]; see Commutative Series 6). There are two main reasons why this is so. First, in English, all the different English vowels (i.e. 12 monophthongs and 9 diphthongs) are susceptible of occurring in *accented* closed syllables in a larger number of different phonetic contexts, the multiplets making up commutative series being minimal multiplets (e.g. *pit*, *pet*, *pat*, etc. in Commutative Series 1) or near-minimal multiplets (e.g. *wom*(*an*) in Commutative Series 2; *sorb*(*itol*) in Commutative Series 3). These multiplets are, often but not necessarily, words that can occur independently (e.g. *sip* in Commutative Series 3) or not (e.g. *serp*(*ent*) also in Commutative Series 3). On the other hand, it is much more difficult to obtain in *unaccented* closed syllables such multiplets as can occur independently. Therefore, these multiplets are parts of words and besides they are very often near-minimal multiplets (e.g. (*ever*)*green* and (*fore*)*noon* in Commutative Series 5), rarely minimal multiplets (e.g. (*ver*)*min* and *men*(*dacity*) also in Commutative Series 5). These near-minimal mutiplets do not perfectly fit a specific phonetic context (e.g. [m – n]) with which a specific commutative series (Commutative Series 5) is associated. Note that the validity of recourse to these near-minimal multiplets is in no doubt.

(3) It is important to know, however, that all the English vowels, *not just* [ə], [ɪ] and [ʊ], are susceptible of occurring in unaccented syllables as well.[22]

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[21] Martinet (1960: section 3.31) writes: "Lorsque le mot est isolé, la mise en valeur accentuelle est toujours réalisée." ['When the word is in isolation, accentual prominence is always realized.' (Transl. by T.A.)]. Even a monosyllabic English word can be considered accented as it occurs in a flow of speech, hence my indication of phonetic contexts ['p – t], ['t – m], ['s – p] and ['k – z], with accent marks, in Commutative Series 1, 2, 3 and 4.

[22] See Akamatsu (1998).

Incidentally, I am deliberately leaving out of account the 9 English diphthongs in the present discussion, as the identification of the phonological status of [ʌ] and [ə] lies outside the consideration of the phonological status of these diphthongs and does not affect in any way the identification of the phonological status of [ʌ] and [ə].

(4) The inclusion in Commutative Series 1 to 4 of the word *because*, which I have presented in the form of *(be)cause* when pronounced with 'accented [ə]', should not surprise the reader. Its inclusion is perfectly legitimate. There are two points I should mention in this regard. First, the inclusion of *because* in Commutative Series 1 to 4 associated with four mutually different phonetic contexts, only one of which happens to be ['k – z], is not invalid. We do not strictly need the phonetic context ['k – z] for including the word *because* pronounced with 'accented [ə]' for the simple reason that the sole type of syllable we require for our present commutation test is, as I have already mentioned further above, any closed syllables, either accented or unaccented, irrespective of the precise segmental make-ups of these syllables. We only need *any accented closed syllables* for Commutative Series 1 to 4 (and any unaccented closed syllables for Commutative Series 5 to 8). Secondly, the pronunciation of the word *because* with 'accented [ə]' in the second syllable, not necessarily with 'accented [ɒ]', has been documented for a long time.[23]

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[23] Here below are a few relevant passages quoted from Jones's writings. "With many Southern English speakers the case is proved by the existence of a few words containing strongly stressed short ə, and notably the words pronounced by them **bi'kəz** and **dʒəst** (adverb) [...]" (Jones 1950a: 40 in fn. 3). "Many Southern speakers use ə for ʌ in a few words, even when they are strongly stressed. The most notable of these are *just* (the adverb), *because* and *such* which they pronounce **dʒəst, bi'kəz** and **səʧ** in place of the traditional **dʒʌst, bi'kɔz** and **sʌʧ**." (Jones 1950b: §136). "The word *because* (which is normally **bi'kɔz**) is sometimes pronounced with an unstressed ə (**bikəz**) or even with a stressed ə (**bi'kəz**)." (Jones 1963: § 103*a*).

Wells (1990: 66) gives an explanatory remark in connection with the pronunciations of the word *because* and writes among other things that "*Some...also use an irregular strong form* [Wells's italics] bɪ 'kəz, bə 'kəz.". *EPD* (1997, 15th ed.: 49) follows Wells (1990) and provides a note saying that 'The form /bɪ'kəz/ or /bə-/ is unusual in having a stressed schwa vowel. This is found only in a few phrases, most commonly in "because of the/a..." '. Wells (1990: 387) also notes [dʒəst] and [dʒest] as alternative pronunciations to [dʒʌst], all three of which he considers as the strong forms (and accented) of these words. He does so without putting accent-marks for these three 'strong form' pronunciations, however. On the other hand, Wells (1990: 688), unlike Jones, presents [səʧ] as 'occasional weak form' with the implication that this pronunciation is unaccented.

I myself briefly referred to 'accented [ə]', referring to some of the above-mentioned works, in Akamatsu (1998: 86). Note that, curiously, the pronunciation [bɪ'kəz] or [bə-] does not figure in the 14th or earlier editions of *EPD*.

A further example of a word that occurs occasionally pronounced with an accented [ə] is the definite article *the*. Wells (1990: 714) notes as follows in this connection: "*Furthermore, some speakers use stressed* ðə *as a strong form, rather than the usual* ðiː." [Wells's italics].

(5) The reader will have noticed that some of the commutative series are incomplete in different degrees. However, all this difference in the completeness or otherwise of the multiplets of different commutative series is of little importance to the validity of the commutative series established. Some of the lacunae are due to accidental gaps, i.e. there merely happen not to exist in current (British) English such words as could fill the lacunae but perhaps could or might come into existence as they present no difficulty for current or future native speakers of (British) English to pronounce. To take just one such example, the lacuna in the shape of an English word pronounced [lʊm], whatever its spelling and its meaning might be, could occur in Commutative Series 8 (the associated phonetic context being [l – m]). Such a lacuna constitutes no threat to the validity of the commutative series in question. In fact, such a lacuna can be considered as potentially acceptable in Commutative Series 8, and I could have filled the lacuna accordingly. Lacunae of such or similar nature are found in some other commutative series I have established, as the reader can spot for himself. To all intents and purposes, it is enough for us to operate with a relatively small number of commutative series for our present discussion. This is both theoretically and practically justified. I happen to have established four commutative series (relating to accented closed syllables) and four other commutative series (relating to unaccented closed syllables). Given time and space, I could have established more commutative series – with or without lacunae – associated with additional mutually different phonetic contexts, but with progressively diminishing returns.

(6) With regard to some of the examples given in Commutative Series 5 to 8, it will have been noticed that the quality of the vowels occurring in the unaccented syllables (see e.g. *(fore)noon*, *(bread)crumb*, *(ever)green*, *(uni)form*) can be regarded as either a retention or a reflection of the relevant constituents of the compounds when occurring as independent non-compounds, which is not the case with some other examples. The fact remains that the vowels in question do occur in unaccented syllables and I have decided to retain them in Commutative Series 5 to 8.

(7) Some readers may be concerned to see that it is only in varying measures that the words I have elicited in the respective commutative series comply with the different phonetic contexts which are associated with the commutative series in question. For example, of the words of which Commutative Series 1 consists, 10 words fit in perfectly with the associated phonetic context (['p – t]) and only 2 words do not (i.e. *boot*, *(be)cause*), while of the 12 words which Commutative Series 5

I myself have actually heard from the mouth of native speakers of English the use of the accented ['ðə] where I would have expected to hear ['ðiː] in such an utterance as *That's the* ['ðə] *man I was talking to you about.*

Finally, a very important point I wish to emphasize is that citing the word *because* pronounced [bɪ'kəz] as a multiplet (more exactly, as a near-minimal multiplet in Commutative Series 1 to 3, and as a minimal multiplet in Commutative Series 4) is perfectly valid even if ['kəz] of [bɪ'kəz] less than completely fits the phonetic context associated with Commutative Series 1 to 3 while completely fitting the phonetic context associated with Commutative Series 4.

consists of, 6 words (i.e. *(ver)min*, *men(dacity)*, *(mer)man*, *Mon(tana)*, *mun(dane)*, *mon(adnock)*) fit the associated phonetic context ([m – n]) while 6 words do not (*mun(icipal)*, *(ever)green*, *(fore)noon*, *marm(oreal)*, *merc(aptan)*, *morph(emic)*). The other commutative series I have presented find themselves at different points along the spectrum between Commutative Series 1 and 5 in this respect, some nearer Commutative Series 1 (e.g. Commutative Series 3) and others nearer Commutative Series 5 to various extents.

Related to the point noted in the preceding paragraph is the justification of allowing, in connection with some of the multiplets, for such phonetic contexts in a given commutative series as do not completely fit the phonetic context associated with the commutative series. For example, the question may be asked whether it is allowed to incorporate in Commutative Series 1 (associated with the phonetic context ['p – t]) the word *boot*, for example, which fits the phonetic context ['b – t] but not ['p – t]. The answer is in the affirmative. The difference between [p] (voiceless) and [b] (voiced) cannot be considered to be such that the occurrence of [b] (cf. *boot* in the present case) instead of [p] will necessarily cause the occurrence of some vowel other than [u:]. In the absence of a word pronounced ['pu:t] (presumably spelled something like **poot*) in current English, my choice and incorporation of *boot* in Commutative Series 1 must be regarded as justified. Even if I choose, say, *coot* [ku:t], in which [k] differs by being dorso-velar from [p] which is bilabial, the difference between dorso-velar articulation and bilabial articulation could not be regarded as necessarily producing some other vowel than [u:], hence the justification of my choosing and incorporating *coot*, for example. I have given an explanation on this particular aspect of the commutation test in Akamatsu (2000: 44-46).

(8) The reader will have noticed that a number of multiplets that figure in the commutative series presented further above have been marked with the symbol *, for example, *wom(an)** and *be(cause)** in Commutative Series 2 which is associated with the phonetic context ['t – m]. I earlier said that near-minimal multiplets are just as valid as minimal multiplets in their capacity as constituent items of commutative series. I cited *wom(an)* in the absence of such a word as is pronounced ['tʊm(...)], and *be(cause)** in the absence of such a word as is pronounced ['təm(...)] in present-day British English. Had it been otherwise, I would have cited corresponding minimal multiplets instead. Note that it is *wom-*, not *woman*, the whole word, that is the near-minimal multiplet. Likewise, in Commutative Series 4 associated with the phonetic context ['k – z], *Kizz-* of *Kizzi*, *Kes-* of *Keswick*, *chas-* of *chasm*, *cos-* of *cosmos*, *cous-* of *cousin*, *Curz-* of *Curzon*, and *-cause* of *because*, are minimal multiplets but are parts of the words, while *Mus-* of *Muslim* is a near-minimal multiplet and a part of the word. *Keyes*, *coos*, *cars*, and *cause* are minimal multiplets as well as whole words. There is thus, in commutative series, no necessary correlation between a minimal multiplet or a near-minimal multiplet on the one hand, and a part or the whole of a word on the other. Note that one and the same multiplet, *-cause* (when pronounced ['kəz]) of *because*, is regarded, and functions, as a minimal multiplet and a part of the word in Commutative Series 4 associated with the phonetic context ['k –

z] but as a near-minimal multiplet and a part of the word in Commutative Series 1 to 3 associated with ['p – t], ['t – m] and ['s – p], respectively. Note finally that the word *cause* is regarded, and functions, as a minimal multiplet and a whole word in connection with [ɔ:] in Commutative Series 4 associated with ['k – z].

General principles of what I have said about near-minimal multiplets as well as minimal multiplets in connection with instances occurring in Commutative Series 1 to 4 (associated with *accented* closed syllables) apply equally to those in connection with instances occurring in Commutative Series 5 to 8 (associated with *unaccented* closed syllables).

(9) I will now explain why it is justified to allow, for inclusion, near-minimal multiplets alongside minimal multiplets in the commutative series. The explanations I will provide with regard to some near-minimal multiplets apply with equal validity to the rest of near-minimal multiplets occurring in all eight commutative series I presented further above, in fact, to all cases of near-minimal multiplets in commutative series in phonological analyses of any languages.

I cited the word *woman* in Commutative Series 2 associated with the phonetic context ['t – m], in connection with [ʊ], thus *wom(an)*, of which *wom-* is a near-minimal multiplet. The near-minimal multiplet, *wom-*, is pronounced [wʊm]. Comparison between [wʊm] and [tʊm(...)] which would the pronunciation of a *minimal* multiplet shows that the sole phonetic difference is that between [w] and [t], the rest being identical. The question we should ask is as follows. Would the occurrence of [w] instead of [t] be thought to necessarily cause some other English vowel instead of [ʊ]? In other words, would the quality of [w] which is of voiced labiovelar spirant articulation exert such necessary influence on a vowel occurring flanked between [w] (preceding it) and [m] (following it) as to necessarily be some other English vowel than [ʊ]? Are native speakers of British English deprived of a choice to select [ʊ] in [w – m] (as in *wom(an)*)? Negative answers can be given to these questions, as the speakers *can* certainly choose – (instead of [wʊm]) – [wæm] *wham*, [wɜ:m] *worm*, [wɪm] *whim*, [wem] *Wem(bley)*, [wɒm] *wom(bat)*, [wɔ:m] *warm*, [wu:m] *womb*, and so on. This means that [ʊ] of [wʊm] represents a choice of this particular vowel, i.e. [ʊ], on the part of the speakers. In other words, [ʊ] is here purposely chosen by the speakers as distinct from other English vowels. Our conclusion is that the occurrence of [ʊ] in [wʊm] is not consequent on the occurrence of [w]. This justifies my citing ['wʊm(ən)], of which [wʊm] is a near-minimal multiplet, in Commutative Series 2.

Let us consider the instance of another near-minimal multiplet. I cited *Mus(lim)* in connection with [ʊ] in Commutative Series 4 associated with the phonetic context ['k – z]. We see that [m] occurs instead of [k] while [z] occurs as in the phonetic context ['k – z]. The same kind of question should be asked as in the case of the near-minimal multiplet [wʊm]. Does the occurrence of [m] instead of [k]

have the effect of necessarily causing the occurrence of some other vowel than [ʊ] in the phonetic context ['m – z]? The fact is that we find [mɪz] *Ms.*, [mɑːz] *Mars*, ['mʌz(l)] *muzz(le)*, ['mɪz(n)] *mizz(en)*, ['miːz(lɪ)] *meas(ly)*, [mɔːz] *Moore's*, ['mez(mə)] *Mes(mer)*, ['mæz(ərɪn)] *Maz(arin)*, ['mɒz(lɪ)] *Mos(ley)*, [muːz] *moos*, ['mɜːz(ɪ)] *Mers(ey)*, and so on. This shows that [ʊ] in [mʊz] is deliberately chosen by the speakers as distinct from other English vowels in the phonetic context ['m – z] and that the occurrence of [ʊ] in [mʊz] is not consequent on the occurrence of [m] instead of [k]. If there is to be any influence exerted by [m] which is of nasal articulation on a vowel occurring immediately after it, it would conceivably be nasalization of the vowel; indeed [ʊ] in [mʊz] may be somewhat nasalized through progressive assimilation in English, with nasalization of [ʊ] having no linguistic significance (i.e. distinctive significance) in English. (Nasalization or otherwise in English vowels has a totally different linguistic consequence from nasalization or otherwise such as occurs in French, Portuguese, etc.) The bilabial articulation of [m] instead of the dorso-velar articulation of [k] would have no effect on the occurrence of any other particular English vowel than [ʊ] instead. If any effect were to occur, the vowel to replace [ʊ] would be a bilabially articulated one. Some would indeed argue that [ʊ] *is* a bilabially articulated vowel (just as some have described e.g. [i] as a palatal vowel), but so would [uː], [ɒ] and [ɔː] be as well. But which of these vowels could definitely be the one that occurs under the influence of [m] that precedes it? It would be impossible to definitively answer this question. We have seen above that [ʊ] (in ['mʊz(lɪm)] *Mus(lim)*), [ɒ] (in ['mɒz(lɪ)] *Mos(ley)*), [ɔː] (in [mɔːz] *Moore's*) and [uː] (in [muːz] *moos*) could all of them be considered as bilabially articulated. However, as I have clearly indicated above, each of these different vowels is expressly chosen by the speakers instead of another, so that the different choices relate to different English words. In conclusion, I will say that the bilabial articulation of [m] instead of [t] in the phonetic context with which Commutative Series 4 is associated has no such effect as to compulsorily produce some other vowel than [ʊ] in the near-minimal multiplet I have cited, viz., ['mʊz] (from ['mʊzlɪm] *Muslim*).

I have gone to a fair length to explain the validity of operating with near-minimal multiplets (in those case where corresponding minimal multiplets are unavailable) in the commutation test by taking a couple of instances of near-minimal multiplets I included in Commutative Series 2 and 4. Essentially similar explanations can be provided in all the other instances of near-minimal multiplets in the rest of the commutative series I have presented further above, in fact in instances of any appropriate near-minimal multiplets in any commutative series in phonological analyses of any languages. The actual contents of the explanations would vary from being fairly simple to fairly complex, depending on what phonetic segments are involved in the near-minimal multiplets in relation to the phonetic contexts associated with specific commutative series, but all the explanations about all the appropriate near-minimal multiplets would testify to the validity of the near-minimal multiplets. I have deliberately dwelt on my above explanations because of the widespread myth,

on the part of many phonologists, about what they call 'minimal pairs' and their non-recourse to the commutation test in identifying the units of the second articulation, i.e. the distinctive units such as relevant features, phonemes, archiphonemes, and, in tonal languages, tonemes and architonemes as well.

(10) In my present discussion during the course of which I seek to determine the phonological status of [ʌ] and [ə] in English, what is of especial importance is the fact that the conflation of Commutative Series 1 to 4 demonstrates the occurrence of all 12 monophthongs in *accented closed syllables*, and likewise, the conflation of Commutative Series 5 to 8 equally demonstrates the occurrence of all 12 monophthongs in *unaccented closed syllables*. It may be recalled, incidentally, that Jones is concerned principally with the phonological status of [ʌ] and [ə] in unaccented syllables only (he does not specifically mention *closed* unaccented syllables), while he is at the same time aware that [ə] (as well as [ʌ]) is susceptible of occurring in accented syllables. My concern with the question of the phonological status of [ʌ] and [ə] can be said to be wider in scope in that accented closed syllables are also considered.

With the establishment of Commutative Series 1 to 8, as shown above, I can now proceed to the next stage of my attempt to determine the phonological status of [ʌ] and [ə], which is the objective of Jones as we saw at the outset of my present discussion.

I repeat that the functionalist identification of distinctive units (phonemes, archiphonemes, tonemes, architonemes) is in terms of the sum of relevant features of which each distinctive unit consists. This procedure is carried out, I again repeat, on the basis of the information provided by the commutative series in hand. We have seen that Commutative Series 1 to 4 exhibit contexts of maximum differentiation in that *all* 12 vowels differentiate themselves from each other in the specific phonetic contexts with which these commutative series are, respectively, associated. (The adherence of these specific phonetic contexts is appropriately relaxed where near-minimal multiplets are introduced due to the unavailability of the corresponding minimal multiplets.) It is with regard to contexts of maximum differentiation that we can identify all the distinctive units concerned, in the present case all the 12 monophthongal vowel phonemes. The identification of these vowel phonemes coincides with that of the different sums of the relevant features of these vowel phonemes. We therefore need to look at the phonic substance of all 12 vowels in the words appearing in Commutative Series 1 to 4 and also *the oppositional possibility* that these vowels exhibit with each other *within each of these commutative series*.

From my phonological analysis based on the commutation test (I have presented eight commutative series further above with which I have performed the commutation test) there emerges the total of twelve (monophthongal) vowel phonemes in British English. These vowel phonemes can be subdivided on the basis of three relevant features which are shared by the vowel phonemes of the three respective sub-groups. The phonemes of the first sub-group share the relevant feature

"front", those of the second sub-group share the relevant feature "central", and finally those of the third sub-group share the relevant feature "back". The first sub-group consists of /i/, /ɪ/, /e/ and /æ/, the second sub-group consists of /ɜ/, /ə/ and /ʌ/, and the third sub-group consists of /u/, /ʊ/, /ɔ/, /ɒ/ and /ɑ/. Each sub-group of the vowel phonemes constitutes what Martinet would call a 'series' all the members of which share a given relevant feature.

The four vowel phonemes of the first sub-group are distinguished from each other through being characterized as "close (opening)" (/i/), "half-close (opening)" (/ɪ/), "half-open (opening)" (/e/) and "open (opening)" (/æ/), respectively. These are the four mutually opposable relevant features by virtue of which the four vowel phonemes in the first sub-group are distinguished from each other. In the rest of the discussion, I will dispense with the explicatory label (opening).

The three vowel phonemes of the second sub-group are distinguished from each other through the opposition between the three relevant features that I designate as "high" (/ɜ/), "mid" (/ə/) and "low" (/ʌ/).

The five vowel phonemes of the third sub-group are distinguished from each other through the opposition between the relevant features that I designate as "1st" (/u/), "2nd" (/ʊ/), "3rd" (/ɔ/), "4th" (/ɒ/) and "5th" (/ɑ/).

A few remarks are necessary here in order to discuss certain points that have arisen in arriving at some of the relevant features of these vowel phonemes.

(1) It will have been noticed that length-marks used for some of the vowels in multiplets of the commutative series do not occur in the presentation of the corresponding vowel phonemes above. I refer to the length-marks occurring in the presentation of the following vowel sounds: [iː], [uː], [ɔː], [ɜː] and [ɑː]. It is a fact that these (British) English vowel sounds are in each case a complex of quality and quantity which are indissociable, so that when occurring in an identical phonetic context, [iː] is longer than [ɪ] (cf. *beat* [biːt] vs. *bit* [bɪt]), [uː] is longer than [ʊ] (cf. *pool* [puːl] vs. *pull* [pʊl]), [ɜː] is longer than [ə] (cf. *foreword* ['fɔːwɜːd] vs. *forward* ['fɔːwəd]), and [ɔː] is longer than [ɒ] (cf. *dawn* [dɔːn] vs. *don* [dɒn]). This fact is generally accepted by phoneticians and phonologists alike, so far as R.P. and certain other types of British English pronunciation are concerned. Some phoneticians go so far as to pair off [ɑː] and [æ] (cf. *cart* [kɑːt] vs. *cat* [kæt]) as well, though I do not go along with them on this point, as there exists a clear-cut qualitative difference between [ɑː] and [æ] that I consider as crucial. In all these cases, there *is* a difference in the quality between the paired vowel sounds. It is generally recognized by phoneticians and phonologists alike that, with regard to certain British English dialectal pronunciations as well as R.P., the quality, rather than the quantity, of the vowel sounds plays a dominant role for them to be differentiated from each other in spoken English, though their quantity should not be altogether ignored. I have therefore dispensed with marking the length difference between [iː] and [ɪ], [uː] and

[ʊ], [ɔ:] and [ɒ] altogether when presenting their corresponding vowel phonemes in phonological notation, hence /i/, /ɪ/, /u/, /ʊ/, /ɔ/ and /ɒ/. (But see (2) immediately below as regards [ɜ:] and [ə].) The vowel phonemes /æ/, /e/ and /ʌ/ present no problems arising from the question of length such as are posed in the case of /i/, /ɪ/, /u/, /ʊ/, /ɔ/ and /ɒ/.

(2) There is a small problem concerning the two relevant features, "high" and "low", which I shall ascribe to /ɜ/ and /ə/, respectively. Jones (1964: 64), in Fig. 34 (a vowel diagram), indicates [ɜ:] (his notation being [ə:]) as being *closer than* [ə]. The height of the tongue in the articulation of [ɜ:] is said by Jones (1964: 89) to be 'about half-way between 'half-open' and 'half-close'', which is understood to imply that the height of the tongue in the articulation of [ə] is *lower than* about half-way between 'open' and 'close'. My attempt to characterize /ɜ/ and /ə/ as two different sums of relevant features, as seen below, is based on Jones's above-mentioned description of [ɜ:] and [ə]. If my phonological analysis here is to be conducted strictly on the basis of Jones's own description of [ɜ:] and [ə] I have referred to above, there would be no problem in ascribing the relevant feature "high" to /ɜ/ and the relevant feature "mid" to /ə/ (with the relevant feature "low" being attributed to /ʌ/). The matter, however, is in fact less simple than what has been indicated and calls for some discussion. Indeed the complexity involving [ə] is explained elsewhere by Jones (1964) himself. However, within the confines of my present paper whose objective it is to determine the phonological status of [ʌ] as in *humdrum* ([ʌ] in the second syllable) and of [ə] as in *conundrum* ([ə] in the third syllable), the question has no direct and crucial relevance. I leave this matter undiscussed in this paper.

Here then are the 12 vowel phonemes defined in terms of relevant features.

/i/....."front close"
/ɪ/....."front half-close"
/e/....."front half-open"
/æ/....."front open"
/ɜ/....."central high"
/ə/....."central mid"
/ʌ/....."central low"
/u/....."back 1st"
/ʊ/....."back 2nd"
/ɔ/....."back 3rd"
/ɒ/....."back 4th"
/ɑ/....."back 5th"

I will now present all these 12 vowel phonemes in a diagrammatic fashion.

/i/....."front close"		/u/....."back 1st"
	/ɜ/....."central high"	
		/ʊ/....."back 2nd"
/ɪ/....."front half-close"		
		/ɔ/....."back 3rd"
	/ə/..... "central mid"	
		/ɒ/....."back 4th"
/e/....."front half-open"		
	/ʌ/....."central low"	
/æ/....."front open"		/ɑ/..... "back 5th"

It may be wondered why, in identifying /i/ as "front close", /ɪ/ as "front half-close", /e/ as "front half-open" and /æ/ as "front open", I designate the four relevant features by virtue of which these four vowel phonemes are distinguished from each other as "close", "half-close", "half-open" and "open" (instead of, say, "1st", "2nd", "3rd" and "4th", respectively), why I designate as "high", "mid" and "low" (instead of, say, "1st", "2nd" and "3rd") the three relevant features which serve to distinguish from each other the three vowel phonemes /ɜ/, /ə/ and /ʌ/, and finally why I designate as "1st", "2nd", "3rd", "4th" and "5th" the relevant features by means of which the five vowels, /u/, /ʊ/, /ɔ/, /ɒ/ and /ɑ/ are differentiated from each other. Here are my explanations intended to answer these possible three related queries.

The above-mentioned three different groups of relevant features, (i.e. "close", "half-close", "half-open", "open"; "high", "mid", "low"; "1st", "2nd", "3rd", "4th", "5th") pertain to different *degrees of opening* (i.e. different degrees of mandibular lowering in the articulations of vowel sounds) between the vowel phonemes in the three different series (i.e. the "front" series, "central" series and "back" series, respectively) consisting of three different numbers (four, three and five, respectively) of vowel phonemes. The fundamental reason why I have chosen the above-mentioned designations for the relevant features for the three separate series is that the oppositional value of each of the relevant features pertaining to different degrees of opening of one series (say, the "front" series) differs from the oppositional value of each of the relevant features of either of the other series (i.e. the "central" series, the "back" series). The relevant features "close", "half-close", "half-open" and "open" are *four* terms of an opposition. The relevant features "high", "mid" and "low" are *three* terms of an opposition. The relevant features "1st", "2nd", "3rd", "4th" and "5th" are *five* terms of an opposition. Consequently, it is apposite and desirable to choose such designations for all these twelve relevant features as eschew any potential misapprehension that, for example, "close" in the "front" series can be equated with "high" in the "central" series and with "1st" in the "back" series. For want of better labels I cannot think of at present, I have conveniently used the nomenclatures '1st', '2nd', '3rd', '4th' and '5th' for the vowel phonemes of the "back" series, though I have obviously no objection to employing five other mutually

different labels with which to replace "1st", "2nd", "3rd", "4th" and "5th", if such can be found.

I now return to the main discussion.

The two mutually equivalent (tabular and schematic) presentations above of these 12 vowel phonemes, identified as a result of the examination of Commutative Series 1 to 8, are valid for both accented closed syllables and unaccented closed syllables. We see that /ə/ and /ʌ/ occur both in accented closed syllables (cf. Commutative Series 1 to 4) and in unaccented closed syllables (cf. Commutative Series 5 to 8).

All instances of [ʌ]'s, whether occurring in accented closed syllables or unaccented closed syllables, can now be confirmed to be phonetic realizations of /ʌ/ in those example words we have seen in the foregoing part of this paper. These example words were as follows.

(i) [ʌ] occurring in accented closed syllables: *conundrum* [kə 'nʌn drəm], *hubbub* ['hʌb ʌb] (in the first syllable), *humbug* ['hʌm bʌg] (in the first syllable), *humdrum* ['hʌm drʌm] (in the first syllable), *putt* [pʌt], *sup* [sʌp], *tum* [tʌm], etc. (Recall that monosyllabic English words are considered accented.)

(ii) [ʌ] occurring in unaccented closed syllables: *adult* ['æd ʌlt], *bankrupt* ['bæŋk rʌpt], *catapult* ['kæt ə pʌlt], *Dunkeld* [dʌn 'keld], *Dunsany* [dʌn 'seɪn ɪ], *hiccup* ['hɪk ʌp], *hubbub* ['hʌb ʌb] (in the second syllable), *humbug* ['hʌm bʌg] (in the second syllable), *humdrum* ['hʌm drʌm] (in the second syllable) *inculcate* ['ɪn kʌlk eɪt], *insult* ['ɪn sʌlt] (n.), *mundane* [mʌn 'deɪn], *tumult* ['tju:m ʌlt], *umbilical* [ʌm 'bɪl ɪk(ə)l], etc.

(iii) [ʌ] occurring in unaccented *open* syllables: *custodial* [kʌ 'stəʊd ɪ əl].

Likewise, all instances of [ə]'s, whether occurring in accented closed syllables or unaccented closed syllables, can now be confirmed to be phonetic realizations of /ə/ in the example words we have earlier seen. These example words were as follows.

(i) [ə] occurring in accented closed syllables: *because* [bɪ 'kəz]. (To this word we can add *such* and *just* (adv.) which we shall see further below as being adduced by Jones.)

(ii) [ə] occurring in unaccented closed syllables: *Atlantic* [ət 'lænt ɪk], *Beckham* ['bek əm], *Beckford* ['bek fəd], *Beckton* ['bekt ən], *bedlam* ['bed ləm], *conumdrum* [kə 'nʌn drəm] (in the third syllable), *custodial* [kʌ 'stəʊd ɪ əl], *difficult* ['dɪf ɪk əlt], *freedom* ['fri:d əm], *Herbert* ['hɜ:b ət], *hokum* ['həʊk əm], *mammoth* ['mæm əθ], *rudiment* ['ru:d ɪ mənt], *Sabbath* ['sæb əθ], *syrup* ['sɪr əp], *tantrum* ['tæn

trəm], *umbilical* [ʌm 'bɪl ɪk(ə)l] (in the alternative pronunciation in which [ə] occurs), *woman* ['wʊm ən], etc.

(iii) [ə] occurring in unaccented *open* syllables: *astound* [ə 'staʊnd], *Cassandra* [kə 'sændr ə] (the first and third syllables), *catapult* ['kæt ə pʌlt].

I wish to emphasize that my attributing [ʌ] and [ə] to /ʌ/ and /ə/ in the above words and many other relevant words occurring in closed or open syllables, accented or unaccented, in British English, is not based on, or compatible with, the principle of 'once a phoneme, always a phoneme', a principle I neither espouse nor operate with, but results from the consequence of having carried out the commutation test as illustrated further above.

The vowel phonemes that we are concerned with in particular, i.e. /ʌ/ and /ə/ in the present discussion, are clearly two separate vowel phonemes which are definable as "central low" and "central mid", respectively, that is to say, two different phonemes whose phonological contents, i.e. the sums of the relevant features characterizing the two phonemes, are *different* from each other.

This said, I must recall that there is a residual and ancillary problem concerning the definition of /ə/ as "central mid" and that of /ɜ/ as "central high" (though the latter definition has no direct relevance to the subject of the present discussion). Should /ə/ be defined as "central mid" and /ɜ/ as "central high " as I have done above, or inversely, should /ɜ/ be defined as "central mid" and /ə/ as "central high"? In either case, the problem does not crucially affect my conclusion that /ʌ/ and /ə/ occur in both accented closed syllables and unaccented closed syllables. (We have also found that /ʌ/ and /ə/ occur in unaccented open syllables as well, though we have not encountered the case of /ʌ/ or /ə/ occurring in accented open syllables.). What matters is that /ʌ/ "central low" is a separate vowel phoneme from both /ə/ and /ɜ/, irrespective of how the latter two vowel phonemes are to be defined in respect to each other.

Here I turn my attention to Jones again. His fundamental concern is, as we have seen at the outset of this paper, whether or not [ʌ] and [ə] in unaccented closed syllables, for example [ʌ] in the second syllable of *humdrum* ['hʌm drʌm] and [ə] in the third syllable of *conundrum* [kə 'nʌn drəm], belong to two separate phonemes. Jones's concern here is with unaccented (though he does not specifically say 'closed') syllables. His conclusion is that [ʌ] and [ə] belong to two separate phonemes because members of one and the same phoneme do not appear in an identical context ([dr – m] in this case), a conclusion which is compatible with a corollary of his defining concept of the phoneme and because of his rejection —I agree with him on this point— of the view held by some other researchers that [ʌ] as in the second syllable of ['hʌm drʌm] is 'accented /ə/' and that [ə] in the third

syllable of [kə 'nʌn drəm] is 'unaccented /ə/'. According to these researchers, unaccented /ə/ occurs in [drəm] of [kə 'nʌn drəm] while accented /ə/ occurs in [drʌm] of *humdrum* ['hʌm drʌm]. I do not agree with them. As we shall see towards the end of the present paper, the word *humdrum* and *humbug*, for example, receive secondary accent on the second syllable in American English but are indicated as ['hʌm ˌdrʌm] and ['hʌm ˌbʌg], and not ['hʌm ˌdrəm] and ['hʌm ˌbəg], in the two American dictionaries I have consulted.

Jones is concerned with the question of whether [ʌ] and [ə] occurring in *unaccented* closed syllables are ascribable to two separate phonemes, i.e. /ʌ/ and /ə/. As will have been shown in the course of the present discussion, I agree with Jones, though he and I do not share the same analytical procedures whereby we arrive at the same conclusion. Jones is well aware that in *accented* syllables, not only [ʌ] occurs, but albeit rarely, [ə] also does in one of the possible pronunciations of *because* [bɪ'kəz, bə-] and in those of *such* and *just* (adv.).[24] Along with Jones, I acknowledge these pronunciations of *because*, *such* and *just*. I also agree with Jones about the occurrence of [ʌ] and [ə] in accented syllables and the assignment of [ʌ] and [ə], accordingly, to two separate phonemes, /ʌ/ and /ə/.

Do other researchers know or accept this particular occurrence of [ə], in [bɪ'kəz], ['sətʃ] and ['dʒəst] in accented closed syllables? If they do, the only way to show that [ə] occurs accented but retaining the quality of [ə] would be [bɪ'kəz, bə-], which is identical with Jones's phonetic notation.

I have shown in the foregoing part of the present discussion that both /ʌ/ and /ə/ are susceptible of occurring in *unaccented* syllables (which is the point Jones raises), be they in closed or open syllables, in English and of being therefore opposable to each other and the other vowel phonemes. I have also shown that both /ʌ/ and /ə/ are also susceptible of occurring in *accented* syllables (though this is not a point Jones is primarily concerned with), be they in closed or open syllables, and of being opposable to each other and the other vowel phonemes.

Having reached the conclusion shown above, I will add that for those English words which have alternative pronunciations with [ʌ] or [ə] in unaccented syllables, we need to talk about 'flottement'[25] (Fr.) between /ʌ/ and /ə/ in these unaccented

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[24] See e.g. Jones (1950b: § 136) or Jones (1963: § 136).

[25] Regarding the concept of "flottement" (as distinct from "fluctuation" (Fr., E.)), I quote the following passage, which affords us a concise definitional statement about this concept, from Martin (1988: 223): "Dans la suite des idées d'André MARTINET, de Kenneth PIKE, de Mary Ritchie KEY, de Christos CLAIRIS et d'Hentriette WALTER, qui, notamment, ont traité du sujet, je définis une *fluctuation* comme une utilisation, par un même individu, d'unités distinctives différentes (y compris les archiphonèmes et les prosodèmes) pour un même monème, dans une position de la chaîne, une partie appréciable du vocabulaire étant affectée. Le *flottement* est une pareille alternance

syllables and consequently recognize variants of the signifiers (Fr. *signifiants*) of these words. Thus, for instance, a fair number of English words such as *bankrupt* (accent on the first syllable, and [ʌ] or [ə] in the second syllable), *conduct* (n.) (accent on the first syllable, and [ʌ] or [ə] in the second syllable), *guffaw* (accent on the second syllable, and [ʌ] or [ə] in the first syllable) and *moribund* (accent on the first syllable, and [ʌ] or [ə] in the second syllable) can be said to possess two variants of the signifiers of the respective words. Thus, for example, the two variants of the signifier of the English moneme *bankrupt* are /'bæNkrʌpT/ and /'bæNkrəpT/ (where /N/ and /T/ are archiphonemes which can alternatively be notated as /m-n-ŋ/ and /t-d/, respectively, and are definable as "nasal" and "apical non-nasal plosive", respectively). These variants of the signifier are instances of 'flottement'. These two variants of the signifier of the moneme *bankrupt* occur in the speech of *different individuals* of an English-speaking community, some individuals being in the habit of using one of the two variants and others in the habit of using the other variant. An instance of 'flottement' is a phenomenon of *inter*-individual nature and differs from an instance of fluctuation which is a phenomenon of *intra*-individual nature so that an individual of a given speech community (in the present case, an English-speaking community) fluctuates between variants of the signifier of a given moneme, for example, the word *finger* is pronounced indiscriminately ['fɪŋgə] or ['fɪŋə], hence /'fɪNgə/ or /'fɪŋə/, which are the two variants of the signifier of the moneme *finger*, without the speaker being aware of the fluctuation.[26]

The principal objective of my present paper is to determine the phonological status of [ʌ] and [ə] occurring in unaccented closed syllables, and the task I set for myself can therefore be said to have been completed. However, one may wonder why, in the first place, the use of /ʌ/ in *humdrum* (in the unaccented second syllable) and that of /ə/ in *conundrum* (in the unaccented third syllable) have been persistent in English. These are the particular words, along with a few other words, that Jones

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mais chez des individus différents connaissant les mêmes oppositions, sans qu'il puisse s'agir de fluctuations ni chez l'un, ni chez l'autre. La fluctuation est donc une variation phonologique intra-individuelle, alors que le flottement est une variation phonologique inter-individuelle." ['Following the ideas of André MARTINET, Kenneth PIKE, Mary Ritchie KEY, Christos CLAIRIS and Henriette WALTER who notably treated of this subject, I define *fluctuation* as the use, by one and the same individual, of different distinctive units (archiphonemes and prosodemes included) for the same moneme, at a given point of the speech chain, a substantial part of the vocabulary being affected. *Flottement* is a similar alternation but in the speech of different individuals who operate with the same phonological oppositions, but without involving fluctuations in one individual or another. Fluctuation is therefore an intra-individual phonological variation, whereas flottement is an inter-individual phonological variation.' (Transl. by T.A.)]. In the above quoted passage, the italics are Martin's.

[26] In connection with this example, I quote the following passage from Jones (1950a: § 631): "[...] ŋg and ŋ [...] in the speech of Midland districts of England (Birmingham, Chester, etc). Many English people from these districts use the two indiscriminately, both in words such as *finger*, *longest* [...] and in words like *singer*, *longing* [...]. Without training they cannot hear the difference between ŋg and ŋ, nor can they make the difference at will."

himself adduces at the outset of his discussion of the phonological status of [ʌ] and [ə]. The fact that the phonetic contexts in which [ʌ] and [ə] occur in these two words are identical, that is, unaccented closed syllables, naturally induces us to wonder why the occurrence of [ʌ] and that of [ə] persist in the manner we have observed. We could perhaps be tempted to seek an etymological fact for an explanation. The early form of *humdrum* is *humtrum* which was a rhyming compound based on *hum*[27] and this may possibly be a factor to have so worked as to maintain [ʌ] in the second syllable of *humdrum*, while *conundrum* has no such etymological history and in fact originates from a pseudo-Latin word of obscure origin.[28] This etymological difference for the two words may perhaps account for the different accentuation of *humdrum* and *conundrum* in American English in that *humdrum* has secondary accent in the second syllable (['hʌm ˌdrʌm]) while this is not the case with *conundrum* ([kə 'nʌn drəm]). What has been said about the etymology of *humdrum* just above does not, however, apply to a word like *humbug* (the second syllable with [ʌ] bearing secondary accent in American English) whose etymology is simply 'origin uncertain',[29] and the persistence of [ʌ] in *humbug* resists a plausible explanation. Another example word that Jones gives as having only [ʌ], i.e. *hiccup* ['hɪkʌp], has both [ʌ] (primary choice) and [ə] (secondary choice) in current British English as well as in American English. The etymology of *hiccup* fails to account for the occurrence of [ʌ] in this word. The case of *catapult* ['kætəpʌlt] is interesting in that, apart from the occurrence of [ʌ], the occurrence of [ʊ] is recorded but characterized as non-RP,[30] while in American English [ʌ] occurs but neither [ə] nor [ʊ] does,[31] or both [ʌ] and [ʊ] occur but [ə] does not[32]. The word *difficult* ['dif ɪk əlt] which Jones cites as containing [ə] may have [ʌ] instead of [ə] in the third syllable but this is characterized as non-RP,[33] while both variant pronunciations are admitted as equally acceptable alternatives in American English, though it must be noted that the occurrence of [ʌ] bears secondary accent but that of [ə] does not.[34] Some of the above-cited English example words are those adduced by Jones himself. It may be remembered that I added on the second page of this paper a few more English examples in which [ʌ] occurs in *unaccented* closed syllables as further data for

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27 Cf. *RHDEL* (1987: 932).

28 Cf. *RHDEL* (1987: 443).

29 Cf. *RHDEL* (1987: 932).

30 Cf. Wells (1990: 115).

31 Cf. *PDAE* (1951: 72).

32 *RHDEL* (1987: 326). Note that in both *PDAE* (*loc. cit.*) and *RHDEL* (*loc. cit*), the second syllable of *catapult* is shown to receive secondary accent, unlike in British English.

33 Cf. Wells (1990: 206).

34 Cf. *PDAE* (1951: 126) and *RHDEL* (1987: 552).

examination. I have checked if the occurrence of [ʌ] in those words also happens in American English by consulting two works (*PDAE* and *RHDEL*) that I have already been referring to in footnotes 27, 28, 29, 31, 32 and 34, and obtained a few interesting results as follows. (I am perfectly aware that these are just an insubstantial amount of sources, but they nevertheless provide us with some indication of the reality anyway.) The following words have only [ʌ] (but not [ə]) in American English as in British English: *umbilical*, *insult* (n.), *Dunsany*, *inculcate* (when accent falls on the first syllable), *hubbub*, and *adult* (when accent falls on the first syllable). In none of these words does the syllable containing [ʌ] receive secondary accent. However, *humbug* is a notable exception in that the (second) syllable containing [ʌ] to the exclusion of [ə] does bear secondary accent in American English (as revealed in my two sources). Despite this exceptional case, it seems to me that the syllable in which [ʌ] occurs in English (be it British or American) is *not necessarily* associated with secondary accent in the syllable in which [ʌ] occurs. The rest of the words have either both [ʌ] and [ə], or only [ʌ]. Thus *bankrupt* has both [ʌ] and [ə] (the syllable containing [ʌ] carries no secondary accent), and *tumult* has only [ʌ] (*PDAE*) but without secondary accent or only [ə] (*RHDEL*).

If only on the basis of the very brief and limited survey above, it seems to me that the persistent occurrence of [ʌ] to the exclusion of [ə] in words like *humdrum*, *umbilical*, *insult* (n.), *Dunsany*, *inculcate*, *hubbub* and *adult* (and perhaps also *catapult*) in both British and American English has been buoyed up purely and simply by tradition and has stuck with native speakers of English. There does not seem to be another, significant, reason why, in the *unaccented* closed syllables concerned, [ʌ] persists in occurring to the exclusion of [ə], not that I consider the occurrence of [ʌ] unusual in unaccented syllables. In fact I have been of the opinion that all 21 English vowels occur in unaccented syllables as well as accented syllables (20 if [ɔə] which is being progressively losing ground in favour of [ɔ:] in current British English is left out). Perhaps *humdrum* can be set apart from the above-cited group of words in that the two syllables of *humdrum* are felt to represent a sort of phonetic reduplication ([ʌ] of the first syllable is repeated in the second), to judge from the word's etymology. In addition, in American English, the second syllable in which the [ʌ] we are interested in bears secondary accent, unlike in the case of the other above-cited words which are *umbilical*, *insult* (n.), *Dunsany*, *inclucate*, *hubbub* and *adult.* The word *custodial* which is not cited along with the others above seems to have [ʌ] in the first (unaccented) syllable as a reflection of the word *custody* ['kʌst əd ɪ] from which *custodial* [kʌ 'stɔʊd ɪ əl] is derived, just as the vowel [ɑ:] is retained in the word *artistic* [ɑ: 'tɪst ɪk] which is derived from *art* [ɑ:t].

We should not forget that other words such as *hiccup*, *bankrupt* and *tumult* cited further above appear to have [ʌ] and [ə] as alternatives in unaccented syllables, though Jones himself admits only [ʌ] for *hiccup* while not citing *bankrupt* and *tumult*

in his discussion. The reason for [ʌ] and [ə] existing as alternatives in *hiccup*, *bankrupt* and *tumult* (and any other words we could cite in this connection) seems difficult to find.

The above brief survey about the persistent occurrence of [ʌ] in certain words we have looked at lies outside Jones's and my immediate concern with the phonological status of [ʌ]. The main thrust of the argument in my present paper is that we have two separate phonemes /ʌ/ (realized by [ʌ]) and /ə/ ([ə]) in English wherever they occur. Why /ʌ/ persistently occurs in words like *umbilical*, *insult* (n.), *Dunsany*, *inculcate*, *hubbub* and *adult* (and perhaps also *catapult*) while /ə/ occurs in addition to /ʌ/ in words like *bankrupt* and *tumult* (and perhaps also *hiccup*) is another issue to be discussed in full elsewhere.

REFERENCES

EPD (= *An English Pronouncing Dictionary*).

An English Pronouncing Dictionary (1917, 1st ed.; 1924, 2nd ed.; 1926, 3rd ed.; 1937, 4th ed.; 1940, 5th ed.; 1944, 6th ed.; 1945, 7th ed.; 1947, 8th ed.; 1948, 9th ed.; 1949, 10th ed.; 1956, 11th ed.; 1963, 12th ed.; 1967, 13th ed.; 1977, 14th ed.). London: Dent. (1997, 15th ed.; 2003, 16th ed.; 2006, 17th ed.). Cambridge: Cambridge University Press [under the new title *Cambridge English Pronouncing Dictionary*].

PDAE (= *A Pronouncing Dictionary of American English*).

A Pronouncing Dictionary of American English (1951): Compil. by KENYON, John Samuel and KNOTT, Thomas Albert. Springfield, Mass.: Merriam Company.

RHDEL (= *The Random House Dictionary of the English Language*).

The Random House Dictionary of the English Language (1987, 2nd ed., unabridged). New York: Random House.

AKAMATSU, Tsutomu (1992): *Essentials of Functional Phonology*. Louvain-la-Neuve: Peeters.

——— (1998): "More about Vowels in Unaccented Syllables in Current British English", *La Linguistique* 34/1, 73-86.

——— (2000): *Japanese Phonology: A Functional Approach*. München: Lincom Europa.

GIMSON, Alfred Charles (1962, 1st ed.; 1970, 2nd ed.; 1980; 3rd ed.; 1989; 4th ed.; 1994, 5th ed.): *An Introduction to the Pronunciation of English*. London: Arnold.

JONES, Daniel (1950a, 1st ed.; 1962, 2nd ed.; 1967, 3rd ed.): *The Phoneme: Its Nature and Use*. Cambridge: Heffer.

——— (1950b, 3rd ed.; 1963, 4th ed.): *The Pronunciation of English*. Cambridge: Cambridge University Press.

——— (1964, 9th ed.): *An Outline of English Phonetics*. Cambridge: Heffer.

MARTIN, Pierre (1988): "Fluctuations et flottements vocaliques en franco-canadien", *Actes du XIVe colloque international de linguistique fonctionnelle* (Elseneur, Danemark. 29 juin - 4 juillet 1987). Louvain-la Neuve: Peeters, 223-28.

MARTINET, André (1956): *La description phonologique, avec application au parler franco-provençal d'Hauteville (Savoie)*. Genève: Droz. Paris: Minard.

——— (1957): "Substance phonique et traits distinctifs", *Bulletin de la Société de Linguistique de Paris* 53, 72-85.

——— (1960): *Éléments de linguistique générale*. Paris: Armand Colin.
——— (1965): *La linguistique synchronique: Études et Recherches*. Paris: Presses Universitaires de France.
WELLS, John Christopher (1990, 1st ed.; 2000, 2nd ed.): *Longman Pronunciation Dictionary*. Harlow: Longman.