

The Effects of Loanwords
on the Phonology
of
Contemporary Japanese

by

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to the required standard


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Abstract


This thesis is an attempt to revise the conventional mora table as well as the phonemic inventory of the Japanese language. Since foreign languages, especially English, have had a great impact on the Japanese language in its recent history, it appears appropriate that the Japanese phonological system should be re-interpreted to conform with the current phonological facts. This influence of foreign languages on Japanese phonology is due to the influx of large numbers of loanwords and the increasing tendency to minimize the distortion resulting from strict application of the native Japanese phonological rules. Thus, at first, the situation of loanwords in Japanese is discussed in Chapter I, then the concept known as *mora* in the Japanese language is introduced in Chapter II. This notion is closely connected to the perception of speech-sounds for the Japanese people.

For the purpose of clarifying the present analysis of Japanese phonology, the Japanese phonological system is discussed from various points of view


as presented in Chapter III. Since the recent phonological changes are caused by the effects of loanwords, language contact and interference is discussed from a general point of view in Chapter IV. Here, the phonological changes of Hawaiian Japanese are introduced for comparison with the Homeland Japanese.

The phonological system presented in Chapter V of this thesis, referred to as the "Expanded phonological system of Japanese" takes into account the effects of language contact. Innovations introduced in the phonology of Japanese through borrowing include new phonemic units, e.g. /ϕ/ and changes in the combinatorial arrangements of phonemes, e.g. /če/.

The last chapter represents a summary of the analysis and also include a discussion of the way in which the Japanese *Kana* orthography acts as a deterrent to the wholesale importation of phonic innovations.


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Chapter I. Introduction.

1.1. Aim. The purpose of this thesis is to investigate the effects of loanwords on Modern Japanese phonology. Such effects are regarded as an important aspect in modern Japanese because they are seen to be causing considerable phonological change in the language, especially in the last decade. For example, the appearance of a new distribution of morae and new phonemes is observed as a result of language contact. A revised analysis of the Japanese phonological system is thus needed in order to reflect the new phenomena in modern Japanese phonology. In this thesis I am proposing a revision of the conventional mora table as well as of the phonemic inventory of the language. In writing about the effect of loanwords, I am confining myself to a treatment of the influence which is currently being exerted of the Japanese language. That is to say, the thesis will not concern itself with earlier periods of heavy borrowing, such as occurred in the case of Sino-Japanese contacts.

The data used in this thesis are thus mainly collected from current Japanese newspapers, magazines and radio programmes. Two loanword dictionaries,

Kadokawa Gairaigo Jiten written by Soobei Arakawa and *Concise Gairaigo Jiten* by the Sanseido editorial staff are also used as references. Moreover, since English has had a greater impact on Japanese than any other foreign language, it follows that most examples cited will reflect borrowing from English.

1.2. The situation of loanwords in Japanese.

Gairaigo or loanwords are one of the most important features of the Japanese language. This is especially the case in the modern language.

The history of loanwords in Japanese goes back to the time of the first contacts with China, and those words which were borrowed from Chinese are known as Sino-Japanese vocabulary, which comprises a large proportion of the vocabulary of the Japanese language. Loanwords in general have played an important rôle in the language according to the needs of the times. At present, loanwords play an important rôle in the modern language even at the phonological level.

Japanese people make extensive use of foreign words in their daily life as a result of the Westernization process in their country. Those foreign words which are used quite often have gradually come to be established as loanwords. Languages such as Chinese borrow far less, and make much more use of loan translation.

But in the case of Japanese, loanwords are borrowed usually without any effort at translation. For instance, *television* and *jet plane* as loan concepts in both languages are illustrated below:

Japanese

terebi テレビ (contracted form)

jetto ki ジェット機 (*jet* + *machine*)

Chinese

diànshì 電視 (*electric* + *sight*)

pēnshèjī 噴射機 (*blast off* + *machine*)

One possible reason why Japanese do not utilize loan translation very much is seen in the existence of the *katakana* syllabary, which is largely reserved for loanwords or onomatopoeic forms.

Loanwords in earlier periods of borrowing were largely restricted to the fields of the propagation of Christianity and trade. They were also limited to noun forms, such as *bateren* meaning 'missionary' and *kurusu* 'cross' which were adapted from Portuguese *padre* and *crus* respectively in the Muromachi Era (16th century). Two examples from Dutch are *garasu* 'made of glass' and *buriki* 'tin'. These are adaptations of *glas* and *blik*, respectively dating from the Edo Era (17th century). Recently, however, loanwords have come to be used in every conceivable domain, and not

only nouns but also adjectives and even verb forms are often used in the Japanese language as loanwords. For example, *bibiddo* 'vivid' and *happii* 'happy' are used in the following passages, which were collected from a recent advertisement by a Japanese magazine and a TV broadcast, respectively.

bibiddo ni hareyaka ni shinsoo oopun
 vivid - ly gay - ly newly finished open
 'newly-finished store opens vividly and gaily.'
happii na kappuru ni kanpai
 happy couple to cheers
 'Cheers to the happy couple.'

As instances of verb borrowing, *oopun* 'open', *katto* 'cut' and *disukabaa* 'discover' can be cited as being often used in daily life. Examples are:

kono kiji ^{object}o katto - suru
 this article OBJ. cut do
 '(I) cut this article.'

disukabaa japan
 'Discover Japan.'

Disukabaa japan is used as an advertisement by the Japan National Railway. Even the J.N.R., which is a purely Japanese institution and is run by the Japanese Government, uses this English slogan as its catchphrase in advertising ——— which is somewhat unexpected.

The increase in the number of foreign words in Japanese from the infusion of loanwords during the past century can be gauged from the following statistics: In a Japanese dictionary called *Genkai* which was published in 1889, only 551 words out of 40,000 were listed as loanwords. This is 1.4% of the total. In a recent small pocket dictionary, on the other hand, about 5,000 words out of 58,000 are specified as loanwords; that is to say, 8.6% of the total are loans. On this basis there has been a six-fold increase in the proportion of loanwords in the language during the last ninety years. Furthermore, special loanword dictionaries have been compiled for the purpose of propagating the correct understanding of these forms. One of the most up-to-date dictionaries, published in 1976 in a second edition, contains over 20,000 loanwords. According to the compilers, these loans were in current use especially in the late 1960's and early 70's and even between the first edition, which was published in 1972 and the second edition (1976), 2,000 new loanwords were added.

It will be seen from the above that *Gairaigo* 外来語
or loanwords play an extremely important rôle in the modern Japanese language.

1.3. Overview of standard Japanese phonology

1.3.1 Vowels. Japanese has traditionally been analyzed as having a five-vowel system; i.e., /i, e, a, o, u/. In addition, vowel length is also distinctive. Long vowels are usually treated as geminates /VV/ (Bloch 1950, Hattori 1960) or the extra duration as a length phoneme /R/ (Kindaichi 1967, Joo 1977). The latter interpretation is followed in this thesis. The opposition between short and long vowels is shown in the following examples.

/i/	/oĵisaN/	'uncle'	/iR/	/oĵiRsaN/	'grandfather'
/e/	/kare/	'he'	/eR/	/kareR/	'curry'
/a/	/obasaN/	'aunt'	/aR/	/obaRsaN/	'grandmother'
/o/	/koJ/	'love'	/oR/	/koRi/	'kindness'
/u/	/kuki/	'stalk'	/uR/	/kuRki/	'air'

1.3.2. Consonants. Although there is no consensus on the analysis of consonant phonemes, the consonant system presented in Kess (1967), with one modification, is the one adapted in this discussion of the conservative dialect of Standard Japanese. The modification consists in the elimination of Kess' /ŋ/ (for a discussion of [ŋ], see 3.3.3). Thus the following consonant inventory is adopted in this thesis.

Stops:	/p,t,k,b,d,g/
Fricatives:	/s,z,h/
Nasals:	/m,n/
Liquids:	/r/
Semi-vowels:	/y,w/
Mora phonemes:	/J,R,N,Q/

The mora phoneme /J/ represents the desyllabification of /i/ as in /aJ/ 'love' , /oJ/ 'nephew', etc.. /R/ represents the length of vowels as illustrated above, and the mora phoneme /Q/ and /N/ are the so-called syllabic consonantal units, /N/ being a nasal which occurs only after vowels and /Q/ representing long or geminate consonants as well as the glottal constriction.

Of the leading scholars of modern linguistics in America, Bernard Bloch (1950) was the first to present a systematic analysis of Japanese phonemics. His approach to phonemic analysis emphasizes the principle of phonetic similarity, sometimes at the expense of the second principle, complementary distribution. This results in a considerably larger consonant inventory than that shown above. Since, in Bloch's view, a phonemic analysis should be completely autonomous, i.e., involve no grammatical considerations, several phonemes are posited which

can be shown to be phonologically conditioned variants and in complementary distribution. Thus, Bloch's analysis yields seven consonants in addition to the above inventory. i.e., /č, c, š, ĵ, ž, ŋ, ?/.

In Japan, one of the earlier scholars working within a modern linguistic theoretical framework is Shiroo Hattori. The phonemic analysis presented by Hattori (1955) also shows two additional phonemes, i.e., /c/ and /ŋ/ established on the basis of phonetic dissimilarity. In addition, Hattori posits a laryngeal phoneme, /'/, which is said to occur within vowel sequences (see 3.3.2 for further discussion).

Phonetically, this laryngeal phoneme is similar to Bloch's /?/, except that Bloch observed the glottal stop as occurring before a pause (and presumably after a vowel). Further references to the works of Bloch and Hattori are made throughout the thesis.

1.4. Japanese syllabary. Trubetzkoy (1939) noted that languages can be classed into two types with respect to the rhythmical timing of utterances: stress-timed and syllable-timed. English is a typically stress-timed language in that the intervals between stressed syllables are approximately isochronous. The rhythmical unit of Japanese, on the other hand, is the syllable, i.e., in Japanese, the duration of

1.5. Conventions.

1.5.1. Symbols. I.P.A. (International Phonetic Alphabet) symbols are adhered to in all phonetic transcriptions except for [č, ĵ, š], which are used in place of I.P.A. [tʃ, ʒ, ʃ] .

Square brackets [] are used to enclose phonetic transcriptions.

Virgules / / are used to enclose phonemic representations as well as morphophonemic representations.

[:] indicates the length of the nasal realizations [m:, n:, ŋ:] of the syllabic nasal /N/.

[pp], [tt], [kk], etc., indicate the length of obstruents, which is symbolized as /Q/ in phonemic representation (e.g. [ippon:] = /iQpoN/).

[ĩ] indicates the desyllabification of /i/, as in [kaĩ] 'meeting'.

1.5.2. Romanized forms. Most of the examples are transcribed using the Hepburn system. However, it is modified to the extent of doubling vowel symbols instead of using the circumflex as an indication of vocalic length.

Thus: *shoogakkoo* 'elementary school'
instead of *shôgakkô* .

Chapter II. Mora and Syllable.

2.1. The notion of Mora. Trubetzkoy (1939) introduced the useful notion of the mora, which is compared to the syllable in his *Grundzüge der Phonologie*.

Trubetzkoy states the relation between the mora and the syllable as follows;

Long vowels and diphthongs are regarded as syllable nuclei, having two mora, and short vowels as nuclei having one mora. (1939:174)

He classifies the various languages as "mora-counting" and "syllable-counting" languages. For instance, Lithuanian, Siamese, Slovenian and Japanese are classified as "mora-counting" languages since in these languages the smallest prosodic unit does not always coincide with the syllable, and Hungarian, Czech, German and English as "syllable-counting" languages, in which the prosodic units always coincide with the syllable.

McCawley, in turn, makes use of this classification by Trubetzkoy and enumerates several reasons why the notion of mora must be used in describing standard Japanese. According to McCawley (1968): 1) the mora functions as the unit of length in the language, such

that /moR/ 'already', /moN/ 'gate' and /mori/ 'forest' have roughly the same length which is approximately twice the duration of /mo/ 'seaweed' ; 2) the realization of Japanese accent can only be described by stating that high-pitched morae precede low-pitched morae, as in /ta ma go/ 'egg', where the accent on /ma/ is perceived due to the drop in pitch of the following mora ; 3) Japanese has phonological rules which depend on the number of morae, but none which depend on the number of syllables. For example, in a certain class of loanwords the accent falls three morae from the end of the word, as in /su to ra i ki/ 'labour strike'. McCawley continues:

The mora is thus the "unit of phonological distance" in Japanese, so that Japanese is a mora-counting language.

In his analysis of Japanese, McCawley (1968:131ff) makes use of the syllable as a prosodic unit in addition to the mora unit which particularly accounts for the rules governing the placement of accent.

It has been observed, by J. McCawley, that Japanese linguists traditionally use a unit *onsetsu* which, although commonly translated as 'syllable', actually corresponds to *mora*, and a distinction between mora and syllable is generally not made. However, the noted

Japanese linguist Shiro Hattori (1960), although not recognizing two distinct prosodic units (i.e., mora and syllable), shows that units equivalent to *mora* and *syllable* function in Japanese phonology.

Hattori (1960:361) adopted Trubetzkoy's notion of *mora* and takes the following position concerning the difference between mora and syllable: any Japanese word can be pronounced mora by mora when spoken very slowly. In such instances, in the sequence /VV/, /VN/ and /VQ/, each constituent is pronounced individually, i.e., /VV/ \longrightarrow /V/ + /V/, /VN/ \longrightarrow /V/ + /N/ and /VQ/ \longrightarrow /V/ + /Q/ .

Consider the following examples;

1a. /koReN/ 'park'

2a. /gaQkoR/ 'school'

The above examples are thus pronounced [ko:en:] and [gakko:], respectively. These units based on the *kana* syllabary, which can be pronounced unit by unit, are referred to as *morae*. Thus, the above examples are analyzed by native speakers in terms of the *kana* representation as follows:

1b. コ う I ン
 /ko/ /R/ /e/ /N/

2b. カ ッ コ ウ
 /ga/ /Q/ /ko/ /R/

These examples, however, both consist of two syllables, i.e., /koR/ /eN/ and /gaQ/ /koR/, respectively.

Accordingly, the above examples consist of two syllables but four morae. With respect to the relation between mora and syllable, Hattori also introduces (1961:361) the following examples:

- | | | |
|------------|-----|--------------------|
| 3a. /kooo/ | 呼 応 | 'act in union' |
| 4a. /kooo/ | 好 悪 | 'like and dislike' |

Both of them consist of three morae namely, /ko/ /o/ /o/, but in terms of the syllable pattern, they show the following difference;

- | | |
|---------------|------------------------------------|
| 3b. /ko/ /oo/ | (/ko'oo/ Hattori's representation) |
| 4b. /koo/ /o/ | (/koo'o/ ") |

These examples provide further illustration of the fact that the mora and the syllable are two distinct units in Japanese. The internal syllable boundary ['] which Hattori refers to as the 'laryngeal phoneme', phonetically realized by glottalization, occurs in different positions in the two examples. A further observation is that while both examples consist of two syllables (of different structure), they both consist of the same three morae (length units).

Another leading Japanese linguist, Haruhiko Kindaichi (1967), instead of attempting to establish syllable boundaries (as Hattori's laryngeal phoneme)

solves the problem of vowel length by positing *hiki onsetsu* or a 'stretching unit' / \sim /. In this treatment 3a. /kooo/ is represented as /koo \sim / , i.e., /CVVR/ and 4a. /kooo/ as /ko \sim o/, i.e., /CVRV/. This analysis of vowel length is adopted in this thesis.

Although Hattori is the only Japanese linguist whose analysis may be construed as dealing with the prosodic unit syllable, as distinct from mora, even he does not make this distinction clear. In this thesis, I propose to show that Japanese can be analyzed in terms of using both syllable and mora as prosodic units in a non-transformational approach. I will attempt to show that the long vowel /VR/ and the vowel plus nasal /VN/, each comprise two morae but one syllable, thereby demonstrating that Japanese is a mora-counting syllable structure language.

2.2. Mora vs. Phoneme Let us now consider the analysis of word-units in terms of morae.

The Japanese language is recognized as an open-syllable, (C)V, language, which is to say, syllables do not terminate in consonants except for the mora nasal /N/. The simplest structure of the syllable, i.e. at most one onset consonant

plus a vowel, makes it possible to maintain isochrony between morae. In Japanese orthography each mora combination is represented by a single symbol giving rise to various kinds of *kana* or syllabic symbols: the roundish *hira-gana* 'smooth kana' stylized the shorthand forms of the characters; the squarish *kata-kana* 'fragment kana' took bits and pieces from the character to be abbreviated. Of the two parallel syllabaries, the *hira-gana* is used in combination with the *kanji* (Chinese characters) for most purposes of written expression. The *kata-kana* are mainly reserved for loanwords and onomatopoeic expressions and commercial use. An example of the two *kanas* is as follows:

[k] + [a] =	か	(<i>hira-gana</i>)	カ	(<i>kata-kana</i>)
[s] + [u] =	す	(")	ス	(")
[t] + [e] =	て	(")	テ	(")

Because the writing system has always been syllabic, it is widely accepted by Japanese that the minimum analysable unit in Japanese phonology is the mora, while languages using an alphabet, such as English and Italian, have the phoneme as a minimum analysable unit. By way of exemplification, let us consider the possibilities of creating anagrams of a typical English word. Given the English word 'time', the anagrams 'emit', 'mite' and

'item' can be generated (as well as the non-existent *tmie, *etim, etc.). The implication is that this word is perceived as a four-letter word without any visual aid. In Japanese, on the other hand, an anagram is formed by transposing entire morae, not segments. This is also related to the process of indigenizing words from foreign languages. To illustrate this, let us look at the stages in assimilating the English word 'time' into Japanese.

Initially, the foreign item is scanned for a possible matching of Japanese morae, starting from the beginning. The first CV [t^ha] of 'time' is a near match with the Japanese mora /ta/ タ, except for the aspiration. Next the y-glide of the diphthong /ay/ approximates the Japanese mora /i/ イ. This leaves [m] from 'time' , which does not correspond to any mora and therefore the mora /mu/ ム from the m-row is selected to substitute the final [m] in 'time'.

The process may be summarized by the following rules:

1. Deaspiration: /taym/
2. Segmentaion by mora: /ta/ /y/ /m/
3. Vowel-substitution: /ta/ /i/ /m/
4. Vowel-addition: /ta/ /i/ /mu/
5. The *kata-kana*
 representation: タ イ ム

(/ta/ = タ /i/ = イ /mu/ = ム)

Japanese speakers perceive the loanword /taimu/ as consisting of three minimal units as shown above. Consequently, this word can be anagrammatized in Japanese into /mu-i-ta/ 'peeled', /i-ta-mu/ 'lament' and /mu-ta-i/ 'unreasonable' (as well as the non-existent *ta-mu-i, *i-mu-ta, etc.). For an example of a native word, consider the well-known place-name, /yokohama/, which contains eight phonemes or in the alphabetic Roomaji system, eight alphabetic symbols. Since Roomaji is not widely used, this word is normally felt to consist of four — not eight — minimal sound units because it is represented by four *kana* symbols, /yo-ko-ha-ma/ ヨ コ ハ マ .

In this way, Japanese always treat a word or a segment in terms of the *kana* syllabaries, i.e., on the basis of the concept *mora*. Accordingly,

Japanese people perceive /CV/ as equating to one symbol, whereas English-speaking people perceive /C/ and /V/ as separate entities.

When borrowing took place in the past (up until about 1950) one of the most important problems was to determine how foreign words could be adapted into the *kata-kana*. At that stage, a foreign segment, per se, was neglected; only a conformity to the *kata-kana* was considered. To a large extent even today, this attitude

persists in the treatment of loanwords, especially from the point of view of orthography. Recently, however, since Japanese people have become fairly sensitive to the foreign pronunciation, they have been paying much more attention to the sounds of the language from which the borrowing takes place. Yet as far as phonic interference in Japanese is concerned, the concept of *mora* also has an important meaning, and treatment of the mora table should be carefully handled from the point of view of phonological change.

2.3. Distribution gaps in the conventional mora table.

Let us first examine the conventional Japanese mora table (1.4). When we look at the conventional Japanese mora table, we can easily find some distribution gaps in it. They exist in the /t/, /d/, /s/, /h/, /w/ and /y/ rows. There are also gaps in the palatalized series, such as /ky/, /gy/, /sy/, /zy/, /ty/, /ny/, /hy/, /py/, /by/, /my/ and /ry/, having a distribution gap in the combination of vowel /e/; i.e., /tye/ = [če], /sye/ = [še], /zye/ = [je], etc..

In the /t/ row, Japanese shows a distribution gap — there are no [ti] or [tu] combinations. In the /s/ row, the language does not have a phonetic [si] combination either. Hattori (1960) calls the former

akima, meaning 'gap' and the latter *sukima*, meaning 'absence' and makes a distinction between these two distribution gaps as illustrated below.

/ta	te	to	/				
/	ci	cu	cja	cju	cjo/		
/sa	si	su	se	so	sja	sju	sjo/

Hattori (1960:289) claims that there is no combination of /ti, tu, ... ; ca, ce, co/ in Japanese because *[ti], although expected does not actually occur as a realization of /ti/. The same holds for the case of *[tu] as a non-realization of /tu/ and *[ca] of /ca/. Thus, there are gaps in the mora distribution as shown in the above table. As noted, such a distribution gap is termed *akima*. In contradistinction, there is no gap in the case of /si/ as both [si] and [š̥i] are phonetically possible in Japanese. Since /si/ = [š̥i], with a palatalized allophone of /s/, Hattori is convinced that Japanese can pronounce the unpalatalized [s] in [si]. For this reason, he classifies [si] as *sukima*, indicating that it is merely absent from most speakers' pronunciation, but it does occur non-contrastively.

Following Hattori's interpretation, /di/ and /du/ of the /d/ row, /wi/, /we/, /wo/ of the /w/ row and /ye/ of the /y/ row are classified as *akima* or

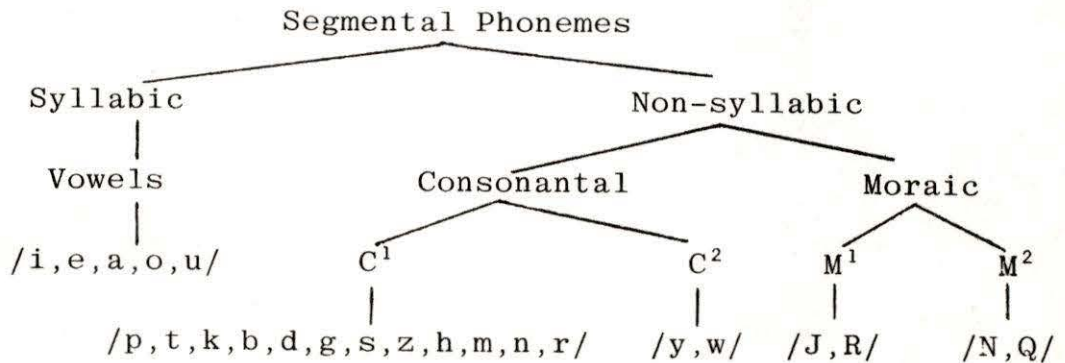
gaps, while /hi/ of the /h/ row is classified as *sukima*, since /hi/ is realized as [çi] with a palatalized allophone of /h/ (see 3.3.2).

In terms of what we have observed above, the conventional Japanese mora table shows a considerable number of gaps.

Chapter III. Segmental Phonology of Japanese.

3.1. Classification of segmental phonemes.

The traditional characterization of Japanese as a CV language has always involved the awkwardness of having to account for the exceptions; i.e., the so-called syllabic nasal /N/ and consonant gemination /Q/. Establishing a distinction between mora and syllable as functional units in the language provides a solution to this problem. What was previously analyzed as the syllable can now be classed as the rhythmic unit, the mora, leaving a higher unit, the syllable, to account for (i.e. include) final non-syllabic segments which have the same duration as the syllable units. These considerations lead to the classification of segmental phonemes as shown below. The superscripts in C¹, C² and M¹, M² indicate the place in the syllable structure in which these units may occur.



The syllable structure of Japanese can now be expressed as $(C^1)(C^2)V(M^1)(M^2)$, where the parentheses indicate that the enclosed elements optionally occur. The full range of possible syllable structures is given below.

1.	V	/i/	'stomach'
2.	V M ²	/eN/	'circle'
3.	VM ¹	/aJ/	'love'
4.	VM ¹ M ²	/aRN/	'waa..' (onomatopoeia)
5.	C ² V	/wa/	'wheel'
6.	C ² V M ²	/yoN/	'four'
7.	C ² VM ¹	/yoJ/	'good'
8.	C ² VM ¹ M ²	/waRQ/	'Hurrah'
9.	C ¹ V	/te/	'hand'
10.	C ¹ V M ²	/kiN/	'gold'
11.	C ¹ VM ¹	/soR/	'layer'
12.	C ¹ VM ¹ M ²	/soRQ/	'shh..' (onomatopoeia)
13.	C ¹ C ² V	/tya/	'tea'
14.	C ¹ C ² V M ²	/kyaN/	'yap,yelp'
15.	C ¹ C ² VM ¹	/gyoR/	'line'
16.	C ¹ C ² VM ¹ M ²	/byuRQ/	'whistle' (onamatopoeia)

From the diagram above showing the classification of the phonemic elements we can see that there are three main classes: 1.Vowels, 2.Consonants, 3.Mora phonemes. Vowels constitute the syllable nuclei (as well as mora), consonants

occur as syllable onset, and non-syllabic mora phonemes occur in syllable-final position.

3.2. Vowels. It will be noted from the above that the vowel system contains five vowels /i, e, a, o, u/. However, all vowels also contrast with respect to length, which would yield a system of five long vowels. Leading scholars, like Hattori and Bloch treat the long vowels as geminates; i.e., /VV/. The interpretation used in this thesis follows Kindaichi (1967) in treating the long vowels as vowel + length phoneme, /VR/. (For further discussion of /R/, see 3.4). Two main phonological variations of vowels are observed, devoicing and truncation, the former leading to the latter.

As Martin (1959) points out, it is a well known fact that the high vowels /i/ and /u/ when flanked by voiceless consonants are devoiced and even absent from the surface utterance in the Japanese language. These phenomena can be expressed in terms of the Vowel-Devoicing Rule for the former, and the Vowel-Truncation or Vowel-Deletion Rule for the latter. Thus, the following ordered rules can be set up.

1) the Vowel-Devoicing Rule:

$$\left[\begin{array}{l} +\text{syll} \\ +\text{high} \end{array} \right] \longrightarrow [-\text{voice}] / \left[\begin{array}{l} +\text{cons} \\ -\text{voice} \end{array} \right] \left\{ \begin{array}{l} [+ \text{cons} \\ - \text{voice}] \\ \# \end{array} \right\}$$

2) the Vowel-Truncation Rule:

$$\left[\begin{array}{l} +\text{syll} \\ +\text{high} \\ -\text{voice} \end{array} \right] \longrightarrow \emptyset$$

The above rules, however, are not universally applicable. They are subject to the following constraints.

Condition (1): Accented vowels do not undergo devoicing. That accent blocks the devoicing rule can be seen in the examples [kúsi] 'driving' and in [súsy] 'soot' where we would expect the first vowel to be devoiced as well as the second one.

Condition (2): Consecutive vowels cannot be devoiced. For example, a hypothetical sequence of five consecutive syllables to which the devoicing rules can apply, the first, third and fifth vowels are devoiced, but not the second, and fourth. In the example [icukúsímu] 'love' only the first devoicable vowel is devoiced. Although the next syllable also satisfies the phonetic environment for devoicing, it is not devoiced. In fact, nowhere in the language do two devoiced vowels occur in consecutive syllables.

Condition (3): The last syllable of atonic (lexical) items do not undergo devoicing.

It has long been observed (and regularly indicated in dictionaries) that, with respect to accentuation,

Japanese lexical items fall into two categories, tonic and atonic (Martin 1975). Tonic items are those in which a high-pitched mora is always followed by a precipitous drop in pitch on the following mora. This high-pitched mora is perceived as more prominent than the preceding and following morae and is thus designated as the accent of that item. Atonic items, on the other hand, do not exhibit a characteristic drop in pitch and the non-initial morae always remain high-pitched. In the case of lexical items consisting of a single mora or in which the accent falls on the last mora, the distinction between tonic and atonic items can be observed only in the behaviour of the following item (such as a particle) in the context of a grammatical phrase. If the last mora is accented the following mora will be lower pitched, if the item is atonic the following mora sustains the higher pitch.

As in the case of accent-bearing syllables, Condition (3) also blocks the application of the devoicing rule. This is illustrated in the examples of atonic items [š̌iš̌icu] 'the quality of paper' and [cṵkusi] 'a field horsetail', where only the first vowel is devoiced. Devoicing of the second vowel is prevented by Condition (2) and we would expect the

final vowel to be devoiced, but in all atonic items the final vowel is never devoiced.

As for the Vowel-Truncation Rule, it will be discussed in a later chapter (5.5) since this rule is not normally operational in the conservative dialect.

3.3. Consonants. The consonant phonemes of the conservative dialect of Japanese in this analysis are defined as non-syllabic occurring only in syllable-initial position, as opposed to the non-syllabic mora phonemes which occur in syllable-final position.

3.3.1. Obstruents: /p, t, k, b, d, g, s, z/. The main allophonic variations are observed in the alveolar obstruents /t, d, s, z/. These variations can be summarized in the following formulae;

$$\begin{array}{l}
 /t/ \longrightarrow \left\{ \begin{array}{l} [t] / \quad \underline{\quad} \begin{bmatrix} e \\ a \\ o \end{bmatrix} \\ [č] / \quad \underline{\quad} [i] \\ [c] / \quad \underline{\quad} [u] \end{array} \right. \\
 †/d/ \longrightarrow [d] / \quad \underline{\quad} \begin{bmatrix} e \\ a \\ o \end{bmatrix} \\
 /s/ \longrightarrow \left\{ \begin{array}{l} [s] / \quad \underline{\quad} \begin{bmatrix} e \\ a \\ o \\ u \end{bmatrix} \\ [š] / \quad \underline{\quad} [i] \end{array} \right. \\
 †/z/ \longrightarrow [z] / \quad \underline{\quad} \begin{bmatrix} e \\ a \\ o \end{bmatrix}
 \end{array}$$

†Incomplete; see below.

In the environment of the vowels /i/ and /u/ (/___ [i,u]) the contrast between /d/ and /z/ is neutralized. The phones [ʒ] and [j] occur before /i/; [ji] regularly occurs in word-initial position, but in the medial position, and especially in the final position, it is weakened to [ži]. For example, *jiko* 'ego' is always pronounced [jiko] but *fuji* 'wisteria', while it is permissible to pronounce it as [ɸuʒi], is in fact commonly pronounced [ɸuži]. It is therefore difficult to assign these phonetic realizations to /d/ or to /z/. Since [ži] is in free variation only in non-initial positions, one might be justified in assigning these allophones to /d/. However the Nippon Kokutei Romaji, the official romanization of Japanese, uses the spelling <zi> in both cases, thereby suggesting that the above are allophones of /z/ rather than /d/. In the case of /d/ or /z/ occurring before /u/ the situation is exactly analogous to that of /___ [i]. In word-initial position it is always [dzu] and in medial positions it is more frequently [zu] than [dzu]. It is interesting to note that in a dialect covering most of *Kyushuu* contrasts between [ji] and [zi], and [dzu] and [zu] are maintained; thus a four-way distinction is made. In the *Kanto* dialect on which standard Japanese is based, this is reduced to

a two-way distinction; while in the northern part of *Honshuu* all four possible contrasts, [ʃi, ʒi, dzɯ, zu] have been completely neutralized and replaced by either [ʃi] or [dzɯ] .

In Japanese, there is a contrast between [ta, to, cu] and [ča, čo, ču] on the analogy of the obviously palatalized series /py, by, ky, gy, my, ny, hy, ry/. The [ča, čo, ču] are interpreted as /tya, tyo, tyu/. This creates the problem of an overlapping between /t/ and /ty/, i.e., assigning [č] before /i/ to /t/ and [č] before /a, o, u/ to the sequence /ty/. For this reason, some linguists, e.g. Bloch (1950) and Uemura (1972) have posited a separate phoneme /č̃/. However, interpreting the [č] of [či] as /ty/ or as a distinctive unit /č̃/ runs counter to the process of phonetic assimilation clearly observable in morphophonemic variations; e.g. the verb stem /tat-/ 'to stand' conjugates in the following way:

/tat-/		'to stand'
/tati-masu/	[tači masu]	polite present
/tate-ba/	[tate ba]	conditional
/tata-nai/	[tata nai]	negative
/tato-o/	[tato:]	hortative
/tatu/	[tacu]	indicative

Whether one assigns the [č] of [či] to /ty/ or to a separate phoneme /č/ this problem remains. Therefore the phonemic system for the conservative dialect adopted here allows phonemic overlapping in order to preserve morphological identity.

The pattern of allophonic variation of /s/ is identical to that of /t/ in the context of /i/. As in the case of /t/, the interpretation of [ši] as /si/, rather than /sy/ or /š/, is mainly motivated by morphological considerations, as in the paradigm of /hanas-/ 'to speak' which is illustrated below:

/hanas-/		'to speak'
/hanasi-masu/	[hanaši masu]	polite present
/hanase-ba/	[hanase ba]	conditional
/hanasa-nai/	[hanasa nai]	negative
/hanaso-o/	[hanaso:]	hortative
/hanasu/	[hanasu]	indicative

3.3.2. Laryngeal /h/. With some qualifications /h/ can be shown to have the following allophones in specific environments.

/h/ →	[h]	_____	e
	[ç] /	_____	a
	[ϕ] /	_____	o
			i
			u

As seen in the cases of /t/ and /s/, before

the high front vowel /i/, /h/ is palatalized and realized as [ç]. The [ϕ] allophone (before /u/) shows considerable variation in terms of the intensity of the turbulence in the air-stream produced by the lips, and also by the different articulatory postures of the lower lip. It has been observed that fricative noise produced labially in some speakers is so slight as to be hardly distinguishable from [h]. This was also observed by Bloch (1950) who has [h] occur before /u/. This weak labial friction is especially noticed in the context of /huJ/ 'suddenness'. This has interesting implications for the advent of a potential contrast between [ϕ] and [f] discussed in Chapter V. With regard to the articulatory posture of the lower lip, it has been observed (Martin 1959) that many Japanese suffer a slight malformation of the upper denture resulting in an exaggerated over-bite. Such persons regularly produce a labio-dental fricative [f].

Partly on the basis of phonemic symmetry with respect to obstruents, Hattori (1960) posits a laryngeal phoneme /' / as the 'voiced' counterpart of /h/. If, as he does, /h/ is classed as a fricative, along with /s, z/, /h/ would be alone without a voiced counterpart, all other obstruents showing voicing opposition. He claims that this is not a 'zero phoneme' but a concrete

phoneme. According to Hattori (1961:13), when the syllable which begins with a vowel and the syllable which begins with /h-/ is compared, the former vowel is longer than the latter one. For example,

[ane]	'elder sister'	:	[hane]	'feather'
[oru]	'to break'	:	[horu]	'to dig'
[aka]	'red'	:	[haka]	'grave'

This suggests that there is a voiced phoneme of the same duration as /h/ which appears preceding the vowel. This is the reason why Hattori proposes the Laryngeal phoneme ['] from the phonetic point of view. Accordingly, the above examples are manifested as follows;

['ane]	:	[hane]
['oru]	:	[horu]
['aka]	:	[haka]

However, as McCawley (1968:67) points out, not all "mora initial" vowels are preceded by a glottal constriction and even if the mora-initial non-vocalic glottal constriction (/'/) of the above words such as /ane/, /oru/ and /aka/ is pronounced with a somewhat longer duration than that of the vowel after /h/, those words can still be analyzed as /ane/, /oru/ and /aka/. This fact suggests that the proposal of the laryngeal phoneme is not a critical one from

the phonemic point of view.

3.3.3. Free variation of [g] and [ŋ]. In addition to the phonemic elements thus far discussed, some linguists, such as Bloch and Hattori, include the phoneme /ŋ/. Although /ŋ/ regularly occurs as C¹ in the C¹VM syllable structure, it has not been shown as a distinctive (phonemic) unit because it is in variation with [g] and may therefore be analyzed as an allophone of /g/. For many speakers the initial /g/ of a morpheme becomes [ŋ] when that morpheme occurs non-initially in a compound; e.g. *gakkoo* 'school' is realized as [gakkɔ:], but in *shoogakkoo* 'elementary school', it becomes [šɔ:ŋakkɔ:]. It appears then that when /g/ is flanked by vowels, it is realized as [ŋ]. There is no obvious phonetic process to be observed. Furthermore, there is great inter-speaker and even intra-speaker variation in the use of [ŋ], and indeed, in some items [ŋ] is more preferred than in others. Although Hattori (1955) concedes that some speakers of the Tokyo dialect lack a phonetic [ŋ], he includes this as a separate phoneme. His reason is that there is no ground for claiming that [g] is assimilated to [ŋ] in the environment of the inter-vocalic position. Other scholars, such as Kindaichi (1968) or Joo (1977) have observed that [ŋ] is gradually

being replaced by /g/ in the Tokyo dialect, especially among the young generation. Joo (1974:141) postulates the decline of [ŋ] from the point of view of Martinet's *rendement fonctionnel*.¹ That is to say, the oppositions [b:m], [d:n], [g:ŋ] are made on the basis of the resonance of the nasal cavity. That is, the former member of each pair does not have nasal resonance while the latter has resonance of the nasal cavity. Compared to the first two pairs, [ŋ] of the last pair is observed to have a low percentage of *rendement fonctionnel*.

That is why even if [ŋ] is regarded as having been in opposition to [g] in the previous decades, the words which were pronounced with [ŋ] now tend to be pronounced with [g], as in both *oogarasu* [o:ŋarasu] 'big crow' and *oogarasu* [o:garasu] 'big glass' ; these are now both pronounced [o:garasu] and can be interpreted as /oRgarasu/.

Kindaichi (1968:179ff) conducted a survey on 13 items showing [ŋ] - [g] divided usage and found that 28% of informants used [ŋ] only, 30% used [g] and the other 42% used both [ŋ] and [g] freely.

[ŋ] and [g] can thus be seen as occurring in free variation and can both be assigned to the phoneme /g/.

¹ Le rendement fonctionnel d'une opposition phonologique est à considérer parmi les facteurs qui constituent l'économie d'un système phonologique. Par rendement fonctionnel, on entend l'importance d'une opposition dans une langue donnée : on peut poser qu'une opposition de bas rendement fonctionnel est moins économique et de ce fait moins stable qu'une opposition de haut rendement fonctionnel. (Martinet 1969)

3.4. Mora phonemes.

3.4.1. Overview. Two non-vocalic units /N/ and /Q/ have been referred to as *hatsuon* /N/ and *sokuon* /Q/. i.e., the nasalized mora consonant and the non-nasalized mora consonant, respectively. Examples of these are shown below.

hatsuon or the nasalized mora consonant /N/.

<i>hon</i>	'book'
<i>tonbo</i>	'dragonfly'
<i>denwa</i>	'telephone'

sokuon or the non-nasalized mora consonant /Q/.

<i>kappatsu</i>	'activity'
<i>yatto</i>	'at last'
<i>hakka</i>	'peppermint'

These are treated by linguists from various points of view. Bloch (1950) represents the nasalized mora consonants as a separate phoneme, / \bar{n} /, while the non-nasalized mora consonants are regarded as the first member of consonant geminates. Thus, according to his interpretation, the above examples are phonemically represented as follows:

/ho \bar{n} / , /to \bar{n} bo/ , /de \bar{n} wa/
/kappacu/ , /yatto/ , /hakka/

Hattori (1955), however, claimed that the non-

nasalized mora consonants should be represented by a separate phoneme, as well as the nasalized mora consonants. He proposed the term *mora phoneme* and used the symbols /N/ and /Q/ for the representation of the nasalized mora consonants and the non-nasalized mora consonants, respectively. The above examples would have then the following phonemic interpretation:

/hoN/ , /toNbo/ , /deNwa/
 /kaQpacu/ , /yaQto/ , /haQka/

It should be noted that the mora consonants /N/ and /Q/ clearly have a contrastive function.

Consider the following examples:

A.	B.
/N/ : /simi/ 'stain'	/siNmi/ 'kind'
/kana/ 'kana syllabary'	/kaNna/ 'plane'
/Q/ : /ita/ 'was, were'	/iQta/ 'went'
/isi/ 'stone'	/iQsi/ 'one child'

According to Hattori's analysis, the words listed above all consist of 2 syllables. In terms of the mora, however, the words in column A consist of 2 morae, while those in column B consist of 3 morae, which is to say, it is obvious that /N/ and /Q/ are counted as one mora each and make it possible to

differentiate the meaning of words.

In addition of the above two mora phonemes, i.e., /N/ and /Q/, I am including the following two mora phonemes in my phonemic inventory of modern Japanese.

/J/ : This represents the desyllabification of /i/. e.g. /aJ/ 'love', /oJ/ 'nephew', etc.

/R/ : This represents the length of vowels.

e.g. /obaRsaN/ 'grandmother' ,

/suRri/ 'mathematical principle', etc.

Consequently, the four mora phonemes are put forward for the Japanese phonemic inventory. As I stated previously, those mora phonemes are classified as Class 1 mora phonemes and Class 2 mora phonemes. This classification is based on the distribution with respect to the syllable structure, i.e., Class 1 mora phonemes always precede Class 2 mora phonemes.

Then, consider the following syllable structure.

1. VM¹M²

/aRN/ 'waa...' (onomatopoeia)

/eJQ/ 'Confound it'

/oRQ/ 'Oh !'

2. C²VM¹M²

/waJN/ 'wine' (recent loanwords)

/waRN/ 'waa..' (onomatopoeia)

/yaJQ/ 'Hey !'

/yaRQ/ 'Hi !'

3. C¹VM¹M²

/boJN/ 'crush...' (onomatopoeia)

/goRN/ 'gong' (onomatopoeia)

/koJQ/ 'Come !'

/soRQ/ 'shh....' (onomatopoeia)

4. C¹C²VM¹M²

/syaJN/ 'employee'

/tyaRN/ 'tinkle' (onomatopoeia)

/pyoJQ/ 'skip.' (onomatopoeia)

/kyaRQ/ 'Eek !'

As we can see above, there is no possibility of the occurrence of */aN¹R/, */yaQJ/, */kyaQR/, etc., because /J/ and /R/ are phonetically vowel peak * satellites.

Thus,

Class 1 mora phonemes: /J/ , /R/

Class 2 mora phonemes: /N/ , /Q/

The following is a discussion of each of the mora phonemes, /J/, /R/, /N/, /Q/ from various points of view with emphasis on the results of spectrographic analysis.

3.4.2. Class 1 mora phonemes, /J/ , /R/.

According to Hattori (1951.b. 52, 185) the diphthong of Japanese is a falling diphthong and the off-glide is realized only as [ĩ] as in [kaĩ]

'meeting' , [koǐ] 'love' or [kuǐ] 'stake'. Other vowel sequences are pronounced as two syllables, such as [ie] 'house' , [ao] 'blue' , [kau] 'to buy' , etc.. The obvious characteristics of off-glide from the preceding vowel to the glide [ǐ] can be observed on the spectrograms of [eǐ]. of [teǐneǐ] 'polite' and [oǐ] of [poǐpoǐ] 'toss away' (onomatopoeia). It means that this [ǐ] has surely different characteristics from the vowel [i]. Thus, it is quite reasonable to posit /J/ as a separate mora phoneme.

One of the most interesting arguments to support the positing of /R/ as the vowel length phoneme can be found in the case of distinctions between *satooya* ' foster parent' and *satooya* ' sugar vendor' or *suuri* ' vinegar vendor' and *suuri* ' mathematical principle' and other similar pairs. Bloch (1950) treats these merely as vowel sequences /oo/ and /uu/ for both cases. Hattori (1961), however, proposes a laryngeal phoneme /' / and analyzed these sequences as /o'o/, /u'u/ and /oo/ , /uu/, respectively. But as far as the vowels are concerned, they are also treated as in Bloch as sequences, i.e., /VV/. Kindaichi (1968) maintains that the long vowel is produced by the stretching or lengthening of one *haku* (similar to mora) and he refers to it as *hiki onsetsu*. Thus, he puts forward

the notion of a lengthening phoneme (*hiki onsetsu*) / \sim /, and treats the vocalics of the above examples as /o#o/, /u#u/ (# = morpheme boundary) and /o \sim /, /u \sim /, respectively. In the body of his article, Kindaichi uses the symbol / \sim / to represent the *hiki onsetsu*. In a footnote (1968:153), however, he suggests the use of /R/ to represent lengthening. Thus, the above examples would have the following four interpretations:

	'foster parent' 'vinegar vendor'	'sugar vendor' 'mathematical principle'
1. Bloch	/satooya/ /suuri/	/satooya/ /suuri/
2. Hattori	/sato'oya/ /su'uri/	/satooya/ /suuri/
3. Kindaichi	/sato#oya/ /su#uri/	/sato \sim ya/ /su \sim ri/
4. Tatsuki	/sato#oya/ /su#uri/	/satoRya/ /suRri/

Bloch's treatment fails to make the distinction between them, Hattori's can be seen to be based on morphological considerations. That is, the laryngeal phoneme seems to indicate the morpheme boundary rather than a phonological boundary. One argument in favour of the interpretation of long vowels as a sequence of two vowels, /VV/, is the possibility of speakers pronouncing them individually in slow and careful speech by introducing

a brief hiatus between them. (This may occur when a speaker wishes to disambiguate an utterance.) Kindaichi himself admits that his *hiki onsetsu* /v/ ignores the potential isolation of each half of the long vowel, thereby rendering his /v/ concept rather abstract. However, 'abstractness' is not seen here as a valid reason for rejection provided it enhances the explanatory adequacy. After all, the units /N/ and /Q/ are also established on abstract concepts and these two phonemes are widely accepted. With regard to the possibility of pronouncing long vowels as two individual short vowels, Kindaichi warns that such pronunciation is artificial and contrary to the speaker's 'native intuition of pronunciation'. So, he suggests that if one really wants to make a distinction between the two, one may pronounce /sa-to-o-ya/ for 'foster parent' and /sa-toR-ya/ for 'sugar vendor' rather than /sa-to-o-ya/ for both of them. This may be true in terms of a native speakers' intuition but his 'intention of pronunciation' is an ambiguous concept; so this speculation seems not to be enough evidence to account for the so-called artificial pronunciation. These words, however, such as /oRi/ meaning 'many' and /kuRki/ 'air' are pronounced with the mora phoneme /R/ as indicated above especially among the young people. It is interesting to note that

in loanwords, such as /maRtyi/ 'march' , /keRki/ 'cake' or /paRtiR/ 'party', the long vowels are never pronounced as a sequence suggested by /maatyi/, /keeki/ and /paatii/, respectively. With respect to the above fact, the vowel sequence (e.g. /ao/, /ue/) and the lengthening of the preceding vowel, namely /R/, have different characteristics in terms of the pronunciation.

It is a fact that all the vowels which are pronounced as a long vowel, in other words, those which contain the /R/ phoneme show about 1.5 times the duration of the short vowels studied in the spectrograms. This means that long vowels do not have exactly double the duration of short vowels. Thus, Hattori's and Bloch's analysis /VV/ for the long vowel is not an appropriate manifestation from the phonetic point of view. Rather, the symbol /R/ which implies the notion of lengthening the duration or stretching of the preceding vowel is more appropriate and it also suggests that the long vowel is not interpreted as merely a duplication of the single vowel. Judging from the above fact, it is quite reasonable to put forward the /R/ phoneme which represents the lengthening of the preceding vowel phoneme.

As I stated previously, Class 1 mora phonemes occur immediately after vowels. Thus, we get /eJ, aJ, oJ, uJ/ and /iR, eR, aR, oR, uR/. Since these Class 1 mora phonemes are tightly connected to the preceding vowels, these phonemes are produced as the result of anticipatory assimilation. Thus these are referred to as 'vocalic' from the phonetic point of view.

3.4.3. Class 2 mora phonemes, /N/ , /ŋ/.

Consider the following allophonic variants of the long nasal which is represented as the /N/ mora phoneme.

1. /hoN/	[hon:]	'book'
2. /kaNsiN/	[kan:sin:]	'admirable'
3. /kaNna/	[kan:ná]	'plane'
4. /tankoR/	[taŋ:ko:]	'coal mine'
5. /saŋgai/	[saŋ:gai]	'third floor'
6. /siNpo/	[sim:po]	'progress'
7. /toNbo/	[tom:bo]	'dragonfly'
8. /siNmi/	[sim:mi]	'kind'

As listed above, the mora phoneme /N/ has a number of allophonic variations in the Japanese language. According to the result of spectrographic analysis, some of these allophonic variants, which occur in the word medial position are produced as the result of the regressive assimilation to the

following consonant. That is, /N/ of /siNmi/ is produced by regressive assimilation of the following consonant[m] and the meaning difference between /simi/ 'stain' and /siNmi/ 'kind' is perceived as resulting from the difference of the duration of [m].

A similar observation can be made with regard to the mora phoneme /Q/. The difference between /ita/ 'was, were' and /iQta/ 'went' appears as the difference of the duration of the voiceless part, i.e., the /Q/ of /iQta/ shows a glottal constriction prolonging the voiceless portion. In the case of /isi/ 'stone' versus /iQsi/ 'one child', however, the difference, namely the /Q/ appears as the double duration of the fricative part in contrast to the voiceless part (glottal constriction) of the former case. It means that the /Q/ of /iQsi/ is produced by the regressive assimilation of the following consonant[ʃ] as well as in the case of /N/ of /siNmi/. Accordingly, it appears that the /N/ and /Q/ are produced by regressive assimilation. In the case of /Q/, the phonetic process may be seen as a glottal occlusion preceding stops and following vocalic elements (see pp 37-38), and in /Qs/ the fricative portion is lengthened.

The real time pronunciation of each item is listed below. For the purpose of acquiring a more

accurate measurement of duration of each mora phoneme, measurements of the mora phoneme as well as the duration of the whole items were made.

Thus, the results of each item are as follows;

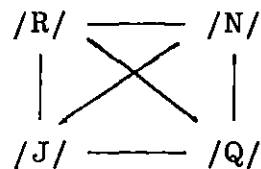
1.	/simi/	vs.	/siNmi/	Difference.
	a.	/simi/	— 0.5250 sec.	
		/siNmi/	— 0.7000 sec.	0.1750 sec.
	b.	/m/	— 0.1000 sec.	
		/Nm/	— 0.3000 sec.	0.2000 sec.
2.	/kana/	vs.	/kaNna/	
	a.	/kana/	— 0.4750 sec.	
		/kaNna/	— 0.6000 sec.	0.1250 sec.
	b.	/n/	— 0.0875 sec.	
		/Nn/	— 0.2750 sec.	0.1875 sec.
3.	/ita/	vs.	/iQta/	
	a.	/ita/	— 0.4125 sec.	
		/iQta/	— 0.5875 sec.	0.1750 sec.
	b.	/t/	— 0.1375 sec.	
		/Qt/	— 0.3250 sec.	0.1875 sec.
4.	/isi/	vs.	/iQsi/	
	a.	/isi/	— 0.4125 sec.	
		/iQsi/	— 0.6625 sec.	0.2500 sec.
	b.	/s/	— 0.1750 sec.	
		/Qs/	— 0.3750 sec.	0.1875 sec.

As illustrated above, the duration of mora phonemes /N/ and /Q/ measures roughly between 0.18 and 0.20 second. Thus, we can say that the duration of the mora phonemes /N/ and /Q/ are approximately 0.2 seconds compared to an overall average mora length of 0.22 seconds.

The Class 2 mora phonemes are referred to as 'consonantal' in contrast to the Class 1 mora phonemes which are referred to as 'vocalic' from the phonetic point of view, because they involve the same articulatory gestures as do the other consonants. That is, oral occlusion occurs in the case of /N/ exclusively, and occlusion or spirantization in the case of /Q/. It is interesting to note that the Class 2 mora phonemes are tightly connected to the following consonant since they are produced as the result of regressive assimilation while the Class 1 mora phonemes are tightly connected to the preceding vowel since they are produced as the result of anticipatory assimilation.

3.4.4. Conclusions. It should be noted that there is a well-established morphological relationship among the four mora phonemes. For example, in the case of /ma/ meaning 'true' or 'very' in the following case, the /N/ and the /Q/ are interchangeable, as in /maNnaka/

'very center' and /maQkuro/ 'very black' depending on the phonetic environment. In colloquial or dialectal speech, the alternative expressions such as /syoRbeN/ and /syoNbeN/ 'urine' or /aruJte/ and /aruQte/ 'to walk' (verbal gerund form) can be observed (see Joo 1977). The above examples show the alternation of /R/ and /N/ and that of /J/ and /Q/. The relationship or alternation among the four mora phonemes are illustrated below;



1. /R/ ~ /N/: /syoRbeN/ ~ †/syoNbeN/ 'urine'
2. /N/ ~ /Q/: /maN(naka)/ ~ /maQ(kuro)/ 'very'
3. /Q/ ~ /J/: †/aruQte/ ~ /aruJte/ 'to walk'
4. /J/ ~ /R/: /teJneJ/ ~ /teRneR/ 'polite'
5. /R/ ~ /Q/: /oRkii/ ~ /oQkii/ 'big'
6. /J/ ~ /N/: /kaJda/ ~ †/kaNda/ 'smelt'

N.B. † indicates dialectal form.

Such alternation provides further motivation for establishing the above four mora phonemes, /J/, /R/, /N/, /Q/. Judging from the various points of view, as stated above, these phonemes contribute towards an explanation of the patterning in the present-day Japanese language.

Chapter IV. Language contact and Interference.

4.1. Overview of phonic interference in language.

The effects of loanwords on the phonology of modern Japanese can usefully be regarded as belonging to the study of contact or interference between languages. This phenomenon was studied extensively by Weinreich. I will begin with a consideration of the nature of language contact or language interference in general.

Weinreich (1974) calls the language which interferes *secondary* and the language which is affected by the contact *primary*. Considering the nature of 'phonic interference', he states (1974:14):

The problem of phonic interference concerns the manner in which a speaker perceives and produces the sounds of one language, which might be designated secondary in terms of another to be called primary.

He continues:

Interference arises when a bilingual identifies a phoneme of the secondary system with one in the primary system and in reproducing it, subjects it to the phonetic rules of the primary language.

In terms of Weinreich's analysis, we can designate Japanese as the primary language and other foreign languages in contact with Japanese such as English, Italian and Russian as the secondary languages.

When borrowing takes place in a language, several possible factors may be present. According to Weinreich (1974:26ff) the first one is:

If the speaker is bilingual, he attempts to reproduce the borrowed morpheme with its original sounds. If he is unilingual he is more likely to force the loanwords to conform to the native phonetic pattern.

He gives as an example the rendering of English 'automobile' by the unilingual Menomini speaker as /atamo:pen/, while the bilingual says /atamo:pil/. Similar examples can be found in Nyangumarda, which is spoken in the north-western part of Australia. The data were collected by O'Grady in 1955.

Some examples are as follows:

/pat ^y ikil/	'bicycle'
/pit ^y init ^y i/	'business'
/pituRul/	'gasoline' (< petrol)

The above examples are as used by older speakers whose knowledge of English was limited. Full bilinguals, however, pronounced these words as [paysIkəl], [pɪznəs] and [petrəl] respectively. Nowadays their pronunciation

of loan items approximates closely to that of Australian English.

With respect to the use of Japanese in the homeland, most speakers are monolingual; and most of those who have studied English have an imperfect control of the phonology; therefore it is rather difficult to find data which deal with bilingual usage. Words which were borrowed in the 1930's, for example, are pronounced in such a way as to conform to the native phonetic pattern. Examples of these are:

[čiketto]	'ticket'
[či:mu]	'team'
[zeri:]	'jelly'
[ju:su]	'deuce' (term used for tennis.)

Judging from the above data, it will be seen that the [ti] of 'ticket' and the [ti] of 'team' as well as [jɛ] in 'jelly' and [dyu] in 'deuce', underwent phonological substitution in Japanese.

The second factor Weinreich (1974:27) states as follows:


If that language enjoys great cultural or social prestige in the P-language community, the pronunciation of loanwords in a phonic form close to the original S may serve as a mark of education or status.

Weinreich gives 'salon' as an example of an English loanword from French to illustrate the above point. It follows that in certain English-speaking circles it is very important whether a speaker pronounces 'salon' as [sa|^ó] or [sá|ⁿⁿ], regardless of whether the speaker is bilingual or not. Another example is the word 'garage' which is pronounced by English speakers in a variety of ways: [gárIʃ], [geráʒ] and so forth. Such variation in pronunciation may also correlate with social factors.

The above two examples show that modern French phonological features may be preserved in loanwords into English. My next example shows that English phonological features may in turn affect other languages, such as German and Japanese.

The English term 'spikes', meaning a snow-tire with spikes, is used quite freely in Austrian German. It is well known in the linguistic literature that /šp/ normally occurs in High German as an initial cluster to the exclusion of */sp/. Examples are *Spiel* /špil/ 'play', *Spinne* /špInə/ 'spider' and *spät* /špet/ 'late'. The word *Spikes*, however, is not pronounced *[špayks] but [spayks]. This word illustrates Weinreich's second point very directly. The examples taken together provide strong evidence for French influence

on the phonology of English as well as more recent English influence on the phonology of Austrian German. Similarly, such phenomena are found very often in the Japanese language as spoken in the second half of the twentieth century. This is an important factor from a sociolinguistic point of view.


 Until the early 1960's, many Japanese used [pa:či:] for 'party', [pi:či:e:] for 'P.T.A.' or 'Parents' and Teachers' Association', [zettoki] for 'jet (plane)' and [zeri:] for 'jelly'. Recently, however, these pronunciations can hardly be heard in ordinary conversations in Japan. They are now replaced by [pa:ti:], [pi:ti:e:], [jettoki] and [jeri:] respectively. The reason for this innovation is that many Japanese are familiar with the foreign sounds partly because of the effect of mass communication, and partly because of the prestige factor, i.e., Weinreich's second point.

8 for j dʒ f
 still
 [zeri:]
 テリ (7E)

In my own primary school experience, beginning in 1954, it happened repeatedly that a child who used the pronunciation [pi:či:e:] in referring to 'P.T.A.' was immediately corrected by the teacher. Ironically enough, the same child when speaking to his or her parents later in the day was typically reprimanded for saying [pi:ti:e:]. In later years, the pronunciation with

[ti] has steadily gained ground. Nowadays, in fact, I would estimate that at least 80% of urban speakers habitually use the pronunciation [pi:ti:e:].

It should be noted that with regard to the final two morae [e:], i.e. /eR/, the characteristic English native speaker's [ey]-pronunciation has even today not been fully mirrored. The sociolinguistic implications of these changes are quite complex. On the one hand, there is ample evidence to show that a present-

day Japanese speaker who uses the pronunciation [pi:či:e:] for 'P.T.A.' or [či:] for 'English tea' would be looked down upon as being ignorant. There

is another side to the coin, however. A present-day Japanese speaker whose degree of adaptation to the native English pronunciation of an item is felt to be too great will likely be stereotyped as 'snobbish'. Thus, if a speaker uses the pronunciations [tu:] for 'two' or [tua:] for 'tour', instead of [cu:] and [cua:] respectively, he will definitely be regarded by other speakers as being snobbish. The extreme in snobbism would be represented by the use of the native English pronunciations [tuw] and [tuwr] for the same items embedded in an ordinary Japanese conversational situation. This illustrates the fact that phonetic importation from English into Japanese only proceeds

motA
A
[ey]
↓
SH ||
[e:]
y č i i
Ti:
already

Snobbish

up to a certain point: the social factor of snobbism acts as a brake in Japanese verbal communication. } ☆

Therefore, the prestige factor encourages adaptation to the English model up to a certain point only; beyond that point, however, fear of being labelled 'snobbish' curtails the use of English phonetic material in the context of daily conversations in the Japanese language. } autonomy?

The degree of phonic interference is thus determined by several factors. The simplest and most common substitution is that which takes place when a native sound sequence is used to imitate a foreign one. Early loanwords are therefore assumed to be essentially assimilated to the phonology of the P-language, while late loans are more similar to their models in the S-language. As example of the former is [konsirɔ:] in the Japanese language of the 1880's, a native substitution for English 'consul'. Further to the above, Haugen (1950:216) points out in his article the following: } ☆

First, that a bilingual speaker introduces a new loanword in a phonetic form as near that of the model language as he can. Secondly, that if he has occasion to repeat it, or if other speakers also take to using it, a further substitution of native elements will take place. Thirdly, that if monolinguals learn it, a total or practically total substitution will be made.

☆ Hawaiian example →

☆

At this second stage in phonic interference, the speaker of the P-language reproduces the S-language pronunciation as closely as possible.

The results of this are eventually as follows:

1. The fleshing out of the combinatorial possibilities of segments.
2. The filling of gaps or holes in the P-language's phonemic inventory.

An example of the former is the addition of [j̃e] to the four other long-established [j̃V] combinations, namely, [j̃i, j̃a, j̃o, j̃u] already discussed in a previous section (2.3). The latter effect is seen in the addition of several new phonemes to the Japanese phonological system, which will be treated in detail in Chapter V. Similarly, in modern Czech /g/ is found initially only in loanwords; elsewhere it is only an allophone of /k/ (see Haugen 1950:217).

4.2. English influence on Hawaiian Japanese.

The aim of this section is to present an overview of the phenomena resulting from the influence of English on the phonology of Japanese as spoken in Hawaii. The speakers of Hawaiian Japanese (HJ) are bilingual — they also speak English. The general situation of the Japanese language in Hawaii is thus quite different from that of Japanese as spoken

in the homeland. However, there are few data which deal with the effect of English on Japanese as spoken by bilinguals. With respect to this point, the data to be presented below are thus especially appropriate in comparing the effect of a foreign language (in this case English) on the usage of monolingual (Homeland Japanese) and bilingual (HJ) speakers of Japanese. Thus, Weinreich's observations (1974) are particularly pertinent here. The data used in the following discussion are taken from Joseph F. Kess (1967). According to Kess, the English influences on HJ are classed into four major categories as listed below.

1. New phonemes:

a. initial position: /č- f- ĵ- v-/
 b. final position: /-c -č -f/

2. New distributions:

a. initial position: /t- d- w-/
 b. final position: /-p -t -k -s -m -ŋ/

3. Clusters:

/fr- sp- st- sk-/
 -sk- -st- -sp- -fr- /

4. New combinations:

/-fk- -ft- -ks- -kt- -mt- -ŋm- -ŋs-
 -sf- -tm- /

In previous sections (2:3, 4:1), I have pointed out that the freedom of occurrence of certain consonants is restricted to fewer vowel environments than others and that there is a recent tendency to extend the combinatorial range of these consonants in the pronunciation of loanwords. Kess reports the same phenomenon for HJ. His analysis shows that in utterance-initial position [t, d] occur before [i, u] and /w/ occurs before /i, e/. Kess sees this change in the CV combinations as a step towards greater symmetry in the syllable patterning of HJ. He also states in his footnote that /t, d, w/ do occur in initial position in Homeland Japanese but only before certain vowels; in other words, this statement implies that /t, d, w/ have distribution gaps in regard to the vowels with which they combine.

It is interesting to note that HJ has already filled the distribution gaps of the /w/ row: the innovative combination /wi/ occurs in such forms as /mawi/ 'Maui' and /we/ in /aNdaweəR/ 'underwear'.

Concerning the new phonemes, Kess classifies these into two categories in terms of the positions in which they occur; i.e., initial position (/č- f- ĵ- v-/) and final position (/ -c -č -f/). With respect to the initial position Kess' new phonemes

/č- ĵ-/ occur only in combination with the vowel /e/, as in /čeRmaN/ 'chairman', /čekas/ 'checkers', /ĵeQto/ 'jet' and /paĵeNto/ 'pageant'. Since /č/ and /ĵ/ are regarded as members of the palatalized series in Japanese, it seems natural to treat these two consonants as being involved in a new combination before /e/ i.e., /če/ and /ĵe/, and they are regarded as filling distribution gaps in the conservative dialect. As for final position, /-c/ and /-č/ are regarded as a result of the Vowel-deletion Rule which I mentioned in a previous section (3.2). After all, the real new phonemes in HJ are /f/ and /v/, which are acquired as a result of English influence.

Examples of clusters listed by Kess appear in /spesyaru/ 'special', /staĵru/ 'style' and /haĵskuru/ 'high school', which are all observed in initial position. Examples of new combinations are /haRfkap/ 'half-cup', /dokta/ 'doctor', /hifti/ 'fifty', which are appeared in medial position. The forms /paRk/ 'park', /kop/ 'cup', /bas/ 'bus' /ofis/ 'office' and /ĵuRs/ 'juice' are listed as examples of consonants appearing in final position.

is there
a vowel
between
consonant
segments

An examination of Kess' data leads me to the following conclusions:

1. The consonants which have come to occur in final position, i.e. /-p, -k, -s, -m, -n/ are all voiceless except the two nasals, whose occurrence here is quite restricted.
2. Clusters and new combinations have mainly appeared in the environment of the voiceless consonants.

What I would like to claim concerning the above two points is that the final clusters and new combinations which were evident in HJ in the 1960's are the result of a process of drift: a parallel development is assumed for the Homeland Japanese at the 1970's. The high back vowel truncation rule which had appeared in HJ by the time Kess carried out his study is only now being paralleled by a similar development in the language spoken in the Homeland (see 5.5). In other words, as a result of English influence on HJ, the vowel devoicing phenomenon enables HJ to have clusters or new combinations with complete vowel deletion preceding and following voiceless consonants. It seems that the presence of the vowel devoicing and vowel truncation rules in the conservative dialect has facilitated the phonological changes in HJ under the influence of English.

It should be noted that /čeriburasam/ 'Cherry

Blossom', /homraN/ 'home run' and /apaRtmeN/ 'apartment' have also appeared in HJ. I assume that /-m/ and /-mr-/ in the above examples occur as the result of the high back vowel truncation rule, but the environment is not appropriate for the rule to operate in. Furthermore, in the case of /apaRtmeN/, the mid back vowel /o/ truncation phenomenon is assumed to produce this new combination. This supposition is based on the pronunciation of the Homeland Japanese loanword derived from English 'apartment', namely [apa:tomento] (/apaRtomeNto/) or [apa:to] (/apaRto/).

The above examples are here considered to be innovative forms resulting from a combination of the effects of English phonological patterns and the native Japanese vowel truncation phenomenon.

At any rate, the above data are illuminating and may be seen as pointers toward future phonological changes in Homeland Japanese. It is reasonable to predict from the data under study that Homeland Japanese phonology will continue to change in a direction involving the development of further consonant clusters and the emergence of more final consonants. These changes will result from a generalizing of the vowel truncation phenomenon, probably accelerated through continuing contact with English.

Chapter V. Expanded Japanese Phonological system.

5.1. Phonological innovations in Japanese.

Phonological innovations due to foreign languages in the Japanese language have already been observed by Bloch (1950) and Martin (1959) even in the 1950's. That is, almost 30 years have passed since Bloch pointed out this phenomenon referred to as the innovating dialect. The appearance of new phonemes and new distributions which are observed by Bloch are more or less the same even in the present-day Japanese. The changes observed in the 1950's are already firmly established and need no longer be viewed as innovations. However, the process of introducing loanwords with new phonemic arrangements and with phonic units not found in the conservative dialect has greatly intensified in subsequent years. Furthermore, the frequency of usage and acceptability of those phonemes and distributions have incredibly increased compared to those which appeared in the 1950's. Also, the divided usage between innovative forms of loanwords and those subjected to the rules of the conservative dialect in present-day Japanese has largely disappeared. For example, Bloch (1950) points out the co-existence of the innovative and conservative forms among speakers, as in

[yutirity] vs. [yučiriči] 'utility'
 [kyadii] vs. [kyaĵi] 'caddy'
 [handikyappu] vs. [hanĵikyappu] 'handycap'

The latter conservative pronunciations can hardly be heard in present-day Japanese and the pronunciations [kyaĵi] or [hanĵi] are not understood in the language at all. It therefore seems appropriate now to formulate a system of Japanese phonemes which will account for all pronunciations of the standard dialect, rather than treating loanwords apart from the mainstream of the language. This entails a reinterpretation and expansion of the phonemic system applying to the conservative dialect only. I will henceforth refer to this analysis (i.e., including both innovative and conservative dialects) as the Expanded Phonology.

Bloch (1950:346) enumerates the following three points which are used to differentiate the innovating dialect from the conservative one.

1. certain of its phonemes have a wider distribution entering into combinations that are foreign to the conservative dialect;
2. it exhibits a phonemic distinction between two sound types which in the conservative dialect are allophones of a single phoneme;

3. it contains one sound type, consisting of a new phoneme, which is not present in the conservative dialect at all.

Based on the above observations, Bloch (1950) added two new phonemes, /f/ and /v/, in his innovating dialect. Also, the following distributions are listed as new over the conservative dialect.

/ti/	/vaniti/	'vanity'
/di/	/kyadi/	'caddy'
/wi/	/wiŋgu/	'wing' (of an airplane)
/we/	/weRtaR/	'waiter'
/wo/	/woRmiŋguaQpu/	'warming up'
/ϕi/	/ϕirumu/	'film'
/ϕe/	/ϕeRa/	'fair (ball)'
/ϕa/	/ϕauru/	'foul'
/ϕo/	/ϕoRku/	'fork'
/fi/	No specific examples. Bloch mentioned that this palatalized labiodental spirant occurs before /i,y/ as an allophone of /ϕ/.	
/fy/		
/vi/ and /vo/	/voRdoviru/	'vaudeville'
/va/	/vaniti/	'vanity'
/vu/	/ravu/	'love'

According to Bloch, these data were also presented by noted linguist Sanki Ichikawa in 1930. However, in all likelihood these pronunciations were used only by foreign-educated bilinguals. Most loanwords introduced

before 1950 are still subject to the rules of the conservative dialect (see 4.1). Loanwords which have gained wide currency from an earlier period seldom are re-analyzed in terms of the innovative phonology. However, there are exceptions as with 'P.T.A.' which was commonly pronounced [pi:či:e:] has recently been re-analyzed as [pi:ti:e:] (see 4.1). Thus, it is quite doubtful that many Japanese people in the 1950's could manage to pronounce the above combinations, such as /fi/, /vi/, /wi/, etc. (for further discussion, see 5.2 and 5.3).

It is interesting to note, however, that additionally Bloch states that long consonant ^{+ gemination} ^{is there a difference} allophones of /b, d, g/ occur before certain consonants. According to Bloch (1950:103), [b[•]] and [g[•]] occur before [b] and [g] respectively; [d[•]] occurs before [d] and [dž]. Examples (using Bloch's notation) are as follows:

[b [•]]	[mob [•] bu]	'mob'
[d [•]]	[bed [•] do]	'bed'
	[kared [•] dž <i>i</i>]	'college'
[g [•]]	[hog [•] gu]	'hog'(in engineering)

With respect to these long consonant, Martin (1959) also shows several examples, and interestingly, he points out the laryngeal /h/ gemination, as well. For example, [bahha] 'Bach' and [gohho] '(Van) Gogh'

Based on these notable observations which were made by two leading linguists, I will discuss the recent phonological change in the present-day Japanese with emphasis on the notion of the *Distribution Gap* in the language. By distribution gap is meant the following two interpretations;

1. the potential CV combinations not occurring in the conservative dialect and as illustrated by the traditional mora table.
2. the potential phonemes which are interpreted as allophonic variations of the conservative dialect, or not occurring in the conservative dialect.

5.2. Reinterpretation of the affricate series.

As I have already discussed in 3.3., Japanese has an overlapping problem between the non-palatalized series and palatalized series, especially, as it relates to the combination with the vowel /i/, such as assigning [č̣] before /i/ to /t/ and [č̣] before /a, o, u/ to the sequence /ty/ or /cy/ of Hattori (1960), since there is no occurrence of the phonetic [ti] in the non-palatalized series /t/. This makes the treatment of the conventional /t/ row one of the major problems in Japanese phonology as well as the interpretation of the palatalized series of [č̣] which

is treated as either a separate phoneme /č/ (Bloch 1950, Uemura 1972) or a /c/ + /y/ = /cy/ (Hattori 1960, Joo 1977). (/t/ + /y/ = /ty/, Tatsuki's interpretation for the conservative dialect)

Only the /t/ has three different realizations, i.e., the dental stop [t], the alveo-palatal affricate [č] and the dental affricate [c]. The alveo-palatal affricate [č] precedes the vowel /i/ and this [či] occurs in place of [ti] and the dental affricate [c] precedes the vowel /u/ and this [cu] occurs in place of [tu]. Thus, the conventional /t/ row is realized as follows;

[ta, či, cu, te, to]

The segments [č] and [c] of the /t/ row are traditionally considered to be allophones of /t/ which occur preceding high front vowel /i/ and high back vowel /u/ (see 3.3.). However, it should be noted that as a result of contact with foreign languages, especially English, phonetic [ti] has appeared in the Japanese language, as in [pa:ti:] 'party' or [ti:] 'English tea'. Interestingly enough, the new phonetic combination [ti] thus comes into contrast with [či]. Examples are as follows;

1. [ci:] 'scissors of finger flashing game'
- [ti:] 'English tea'

2. [naǐči] 'the interior of the country, or home'

[naǐti] 'night dress for ladies, nightie'

Moreover, the new combination [ti] occurs frequently in every position in the word:

1. word initial position:

[ti:] 'English tea' [tissu:] 'tissue paper'

2. word medial position:

[aǐden:titi:] 'identity' [kattiŋ:gu] 'cutting'

3. word final position:

[naǐti] 'nightie' [pa:ti:] 'party'

Suffice it to say that the distribution gap involving phonetic [ti] in the /t/ row is thus filled with this new combination.

The [či] combination can thus be regarded as having been expelled from the /t/ row. It so happens, Japanese has the palatalized series [ča, čo, ču] and the introduction of [ti] in the phonology now displaces the [či] in the /c/ row. Here also, another new combination [če] has been acquired by the same process of phonic interference from English.

Examples are [čekku] 'check', [česu] 'chess', [če:n:] 'chain' and [čen:ji] 'to change'. As a result, a distributionally complete /č/ row has been created with [či] losing its place in the /t/ row and with

the introduction of [č̣].

Thus, [č̣i, č̣e, č̣a, č̣o, č̣u]

The reassignment of [č̣] in [č̣i] now obviates the problem of phonetic overlapping and shows greater symmetry concerning the distribution of [t] and [č̣]. The separate phoneme /č̣/ is thus established in the language, in contrast to the interpretation of /ty/ which was adopted earlier in this thesis as applicable to the conservative dialect.

Another allophonic variant in the /t/ row appears in [cu]. In present-day Japanese, the [tu] combination is very rare, even allowing for the many recent loanwords. This is partly because the social factor of snobbism acts as a brake for its acquisition (see 4.1) and another reason for this delay in acquisition of phonetic [tu] is the interference of the kana orthography. The traditional /tu/ in the /t/ row is symbolized by ツ and pronounced [cu], whereas for the innovative [tu], the symbols ト_ɥ are used. Literally, the symbols ト_ɥ is interpreted as /to_u/, and is pronounced as [tu]. This means that the new combination [tu] is associated with a modification of the traditional [to], ト, which is perceived as a closer pronunciation to [t] plus [u], which is represented by the subscript letter ɥ.

Therefore, although the use of [tu] pronunciation in loans is gaining acceptance, there is still a strong tendency to transcribe (and hence pronounce) popular English loans, such as *tour*, *two* and *twin* using [cu], as in [cua:], [cu:] and [cuin:] respectively.

The dental affricate [c] and alveo-palatal affricate [č] are phonemically distinct. This is demonstrated by occurrence of the phonetic sequences [ci] in [soručeni:cin:] 'Solzhenitsyn' or [ci:ru] 'Ziel' in Russian and German loans, respectively. Moreover, phonetic [ce], [ca], [co] occur in loans of various European languages as shown below;

*kana for other
new phoneme
[ce]
[bi]*

[ce]:	[cecebae]	'tsetse fly'
	[cepperin:]	'Zeppelin'
	[kon:ceruun:]	'Konzern'
[ca]:	[ca:]	'Tsar'
	[caracu:suutora]	'Zarathustra'
	[picca]	'pizza'
[co]	[kan:co:ne]	'kanzone'
	[suikeruoco]	'scherzo'
	[coisu]	'Zeus' (of German)

These pronunciations commonly used amongst Japanese people of the younger generations. The emergence of these combinations flesh out the gaps in distribution

in the /c/ row which are now grouped with the conservative [cu].

Consequently, as well as the traditional /t/ row, the two complete mora rows, i.e., the /č/ and /c/ rows as an expanded distribution, have been established.

Thus,

/t/ row: /ti, te, ta, to, tu/

/č/ row: /či, če, ča, čo, ču/

/c/ row: /ci, ce, ca, co, cu/

Corresponding phonological changes are also observed in the /d/ row, the /s/ row, the /š/ row and the /j/ row. Accordingly, the distribution gaps in the above rows are filled with new mora combinations as a result of the effect of foreign languages. The new distribution which makes new mora combinations of each row and examples of loanwords are as follows;

[di] of the /d/ row:

[disukw] 'disk'

[dina:] 'dinner'

[o:dio] 'audio'

[komedi:] 'comedy'

[du] of the /d/ row:

[du:den:] 'Duden' (Dictionary of W.Ger.)

[paddodu:] 'pas de deux'

[si] of the /s/ row:

[si:] 'letter C'

[sitto in] 'sit in'

[še] of the /š/ row:

[še:ka:] 'shaker'

[še:do] 'shade'

[miššeru] 'Michel'

[je] of the /j/ row:

[jettoki] 'jet plane'

[jenere:šon:] 'generation'

[mikeran:jero] 'Michelangelo'

In these cases, phonological interpretation follows the same argument as in the case of [či] being re-analyzed as /či/. That is, [ji] and [ši] are the realizations of /ji/ and /ši/, respectively, rather than /di/ and /si/.

Consequently, [c, č, š, j] in the expanded phonological system in the language must be assigned to separate phonemes. Since these four expanded phonemes are classified as affricates, the distribution gap of the affricate series of the Japanese phonemic inventory is thus filled with these expanded phonemes.

Furthermore, with regard to the expanded distribution, a completely new distribution pattern involving [dyu] and [tyu] as in [purodyu:sa:] 'producer' or

[dyuetto] 'duetto' and [tyu:ta:] 'tutor' have appeared. This is further evidence that [č] and [j] should not be assigned to the /ty/ and /dy/ phonemic sequences in the expanded phonological system in the language. The introduction of [dyu] and [tyu] also complement the /Cy/ series.

Before the closing of this section, the /w/ row will be discussed with respect to the distribution gaps.

It has been noted that Hawaiian Japanese has already filled the distribution gaps of the /w/ row (see 4.2.). Although the combination of /wi/ and /we/ are not yet firmly established in the Homeland Japanese, they are quite often used as in [wi:ku] 'week', [witto] 'wit' and [wisuki:] 'whisky' for the /wi/ distribution and [wediŋ:ɡw] 'wedding', [wetto] 'wet' and [we:deruun:] 'wedeln' for the /we/ distribution. One main reason preventing the creation of the above two new combinations is the tendency for the semi-vowel [w] is to be replaced by the high back vowel [u] and pronounced as a vowel sequence /ui/ or /ue/ (see Bloch 1950). Interestingly, in spite of this tendency, Bloch cited several /wi/, /we/ and /wo/ combinations for the innovative dialect in 1950. It may [^]that Bloch's examples were used amongst a very limited number of speakers who had considerable

knowledge of English since the emergence of these in popular usage is very recent. However, an orthographic convention already exists to accommodate /wi/, /we/, and /wo/ as ウ_I , ウ_I , and ウ_f , respectively. Indications are that in time, these new mora combinations will become firmly established to complete the /w/ row, as happened in Hawaiian Japanese.

5.3. Emergence of sound types not present in the conservative dialect. According to the Kess data Hawaiian Japanese has already rendered /f/ and /v/ as new phonemes, so does Homeland Japanese based on Bloch data. However, as far as my observation is concerned, both the voiced [v] and the voiceless [f] labio-dental fricatives have not fully been adopted in terms of the expanded phonemic system which especially express loanwords containing /f/ and /v/ phonemes, such as *fixer*, *safari*, *calf*, *video*, *adventure* and *fever* (especially, *fixer* and *fever* are established as loans very recent, i.e., 1976 and 1978, respectively) of the S-language.

As Martin (1959) observed, [f] for a labio-dental variant of [ϕ] as well as labio-dental variants of [b, p, m] can be frequently heard. This [f], however, is not pronounced from the motivation of an [f]

pronunciation but merely as an idiosyncratic variant due to the anatomical structure of the upper jaw of some individuals. So, it is reasonable to assume that /f/ as a separate phoneme as well as /v/ are still not adopted in the present-day Japanese, i.e., expanded phonological system of Japanese.

In the case of loanwords from European languages containing [v], this sound is interpreted as a [b] by Japanese speakers. Examples from English are [baŋorin:] 'violin', [daĩba:] 'diver', [bake:šon:] 'vacation', [bibiddo] 'vivid', [bibarudi:] 'Vivaldi', etc..

Interestingly enough, however, the voiceless labio-dental fricative [f] is not replaced by [p] which is a voiceless counterpart of [b], since [p] in native Japanese mainly occurs in words of onomatopoeic origin. Instead, either the glottal fricative [h] or the voiceless bilabial fricative [ɸ] replace the voiceless labio-dental fricative [f] on the phonetic level. Some linguists, such as McCawley (1968:77ff) analyze Japanese [h], [ç] and [ɸ] as allophones of /p/ (concerning /h/, see 3.3.)

Thus, as I stated above, the very recent English loans, *fever* which contains both [v] and [f] is pronounced as [ɸi:ba:], as of 1979. (not [fi:ba:], [ɸi:va:], [fi:va:])

English loans with the phonetic makeup of *hit* (/hiQto/ : [çitto]) do not affect the system: [ç] here still appears in its environment characteristic of the conservative form of the language. However, English loans with /f/ followed by /i/ are pronounced with [ϕi], so that a contrast between the morae [çi] and [ϕi] is introduced into the language. The segments [ç] and [ϕ] formerly in complementary distribution, thus enter into a contrastive relationship. The following is an example illustrating this contrast:

1. [çi] vs. [ϕi]
 - [çitto] : /hiQto/ 'hit' (as in baseball or song hit)
 - [ϕitto] : /ϕiQto/ 'fit'

The /h/ : /ϕ/ contrast before /e/ is illustrated in a following sub-minimal pair:

2. [he] vs. [ϕe]
 - [hen:su:] : /heNsuR/ 'variable'
 - [ϕen:su] : /ϕeNsu/ 'fence'

Before /a/, the contrast is seen in

3. [ha] vs. [ϕa]
 - [haĩru] : /haJru/ 'to enter'
 - [ϕaĩru] : /ϕaJru/ 'file'

And preceding /o/:

4. [ho] vs. [ϕo]
 - [ho:mu] : /hoRmu/ 'home'
 - [ϕo:mu] : /ϕoRmu/ 'form'

The newly evolved /h/ : /ϕ/ contrast is thus established before the vowels /i, e, a, o/. Preceding the vowel /u/, the situation is entirely different. English *food* and *hood* have both entered the Japanese language as loans, and native speakers do not distinguish them on the phonological level. That is, both items fluctuate in pronunciation in the same way, as in [hu:do] ~ [ϕu:do]. The situation as reported by Bloch (1950:343) — free variations between [h] and [ϕ] before /u/ — is thus maintained. Accordingly, the above items are considered as in

5. [hu] ~ [ϕu]
 [hu:do] ~ [ϕu:do] /huRdo/ 'hood'
 [hu:do] ~ [ϕu:do] /huRdo/ 'food'

Judging from the above data, the bilabial fricative [ϕ] is established as a separate phoneme /ϕ/ in the expanded phonemic inventory. And the new distribution of [ϕ] with /i, e, a, o, u/ appeared in the expanded mora combinations as well.

5.4. Expanded treatment of the mora phonemes.

Of the four mora phonemes, /Q/ is the only one that plays an important rôle in the re-interpretation of the expanded phonology of Japanese due to the effects of borrowing.

/Q/, in the conservative dialect represents long

or geminate *voiceless* consonants as well as glottal constriction (see 3.4.). In the expanded phonological system, however, geminate or long consonants occur not only preceding voiceless consonants /p, t, k, s/ but also before their voiced counterpart. i.e., /b, d, g, z/. As previously stated, Bloch (1950) and Martin (1959) have already drawn attention to this pattern. Examples of long voiced consonants from data collected for this thesis are given below. Some of these have been previously cited by Martin (1959), however, most of the examples are not duplicated from the previous data.

/Qb/:	[gubbaɪ]	'good bye'
	[bobbu]	'Bob' or 'bob'
	[hebbəu]	'Hebbel'
/Qd/:	[bibiddo]	'vivid'
	[baraddo]	'ballad'
	[heddo raɪto]	'head light'
/Qd ^z /	[mod ^z d ^z u]	'moderns'
	[harod ^z d ^z u]	'Harrods' (Whisky's name)
/Qj/:	[buuri jji]	'bridge'
	[eji]	'edge'
/Qg/:	[baggū]	'bag'
	[φuroggū reggū]	'flog leg'
	[taggū mačči]	'tag match'

Furthermore, the voiceless obstruents, [č̣], [c] and [ϕ] (not included by Bloch and Martin) also occur as long or geminate consonants. The affricates [č̣] and [c] of course, commonly occurs as geminates in the conservative dialect, but were analyzed as variations in the lengthening of /t/. Thus, a long [č̣] was interpreted as either /tt/ in the context of /i/ following or /tty/ in other contexts, and the geminate of [c] as /t/ in the context of /u/ following. In the expanded phonology proposed here, however, these are analyzed as /Qč̣/ and /Qc/.

As was shown in 5.3., a contrast between [ϕ] and [h] has developed as a result of [ϕ] being associated with [f] of foreign words in all vowel contexts. Geminations of these consonants /Qh/ and /Qϕ/ occur only in loanwords, not in the conservative dialect. Examples are as follows;

/Qč̣/:	[kyačč̣i]	'catch'
	[tačč̣i]	'touch'
	[mačč̣i]	'match'
	[kyačč̣a:]	'catcher'
	[sūtorečč̣a:]	'stretcher' (in a hospital)
/Qc/	[picca]	'pizza'
	[gaccu]	'guts'
	[kyaccu ai]	'cat's eye' (jewel)

/QΦ/	[baΦΦi:]	'baffy'
	[maΦΦin:]	'muffin'
	[baΦΦaro:]	'Buffalo'
	[saΦΦo:]	'Sappho'
	[raΦΦurw]	'ruffle'

In addition, as Martin pointed out /h/ geminates are still commonly used as in [bahha] 'Bach', [pahheruberw] 'Pachelbel', [zahha torute] 'Sacher Torte', etc..

In summary, the freedom of occurrence of /Q/ in the expanded phonology can be shown by comparing it with that of the conservative dialect.

Conservative dialect:

/Qp, Qt, Qk, Qs/ (if [č], [c] and [š] were given phonemic status, there would also be /Qč/, /Qc/ and /Qš/.)

Expanded phonology:

/Qp, Qb, Qt, Qd, Qd^z, Qj, Qk, Qg, Qč, Qc, Qs
Qš, Qh, QΦ /

The expanded phonology thus includes /Qb, Qd, Qg, Qd^z, Qj, Qh, QΦ/ which have been introduced as a result of borrowing. /Qč, Qc, Qš/ are the products of re-interpreting the phonemic system.

5.5. Effects of vowel devoicing and deletion leading to further innovations. With respect to the vowels, as stated previously (see 3.2.), two phonological rules, 1) the Vowel-Devoicing Rule (and will be hereafter referred to as Rule (1)) and 2) the Vowel-Truncation or Deletion Rule (Rule (2)) are highly significant in contributing to the expanded phonology. Since Rule (2) is not obligatory in the conservative dialect, in most cases when the high vowel, /i/ and /u/ are flanked by the voiceless consonants they undergo only Rule (1). Only the word final high back vowel in this context optionally undergoes Rule (2).

Examples are as follows;

	Rule (1)	Rule (2)	
[desu]	[des _o]	[des]	'copula'
[masu]	[mas _o]	[mas]	'verb ending'

In the expanded phonology, Rule (2) is still optional. However, Rule (2) can apply even in an environment where the high back vowel is flanked by voiceless consonants.

Relevant examples are:

	Rule (1) <i>devoicing</i>	Rule (2) <i>deletion</i>	
[sɯpon:sa:]	[s _o ɯpon:sa:]	[spon:sa:]	'sponsor'
[sɯpesaru]	[s _o ɯpesaru]	[spešaru]	'special'
[sɯtoraiki]	[s _o ɯtoraiki]	[storaiki]	'labor strike'

[suutoraĩku]	[su _o to _o raĩku]	[straĩk]	'strike'
[sukeju:ru]	[su _o keju:ru]	[skej _u :ru]	'schedule'
[suku:ru]	[su _o ku:ru]	[sku:ru]	'school'

The following arguments should be considered to account for the application of Rule (2) which applies after Rule (1).

In certain class of loanwords which consist of more than three morae, the accent falls three morae from the end of the word: Examples are illustrated below; (superimposed line shows the extent of the high-pitched morae)

/su /po R cu ma N/	'sportsman'
/su /po Q to ra J to/	'spot light'
/su /to ra J ku/	'baseball strike'
/su /to re R to/	'straight'
/su /ku e ya R da N su/	'square dance'
/se /ke Q ěi bu Q ku/	'sketch book'

From the indications of the pitch contours in the examples above, it will be observed that the first mora is low-pitched, followed by a series of high-pitched morae and ending in two low-pitched morae, the last of the high-pitched mora being perceived as accented. In other words, the above examples are represented as Low-High-Low in terms of the tone pattern. Consider the following interpretation with regard to the L-H-L tone pattern.

/su	po	R	cu	ma	N/
L	H			L	

/su	to	ra	J	ku/
L	H		L	

/su	ku	e	ya	R	da	N	su/
L	H				L		

These tone patterns of a first low-pitched syllable in multi-mora lexical items, when that mora is not accented, is characteristic of the language. Since low-pitched vowels are less prominent than high-pitched vowels, especially when followed immediately by a high-pitched mora, this suggests that /u/ in the examples is weakened due to the transition to the higher

pitch, thus making Rule (1) obligatory, and also providing optional conditions for vowel deletion, i.e., Rule (2) is applied optionally.

Another consideration in this environment is the fact that the high back vowel is used as an epenthetic vowel to conform with the native /CV/ pattern, since Japanese does not allow initial or final obstruent clusters. Thus, the borrowing has taken place, vowel epenthesis is naturally involved (see 2.2.). This means that the epenthetic vowel /u/ in the above environment has a special status in loanwords.

In the native pattern, Rule (1) applies to /u/ in the same context, but Rule (2) does not apply. Consider the following examples;

1. /u/ of the native pattern:

	Rule (1)	Rule (2)	
[sukosi]	[s _o ukosi]	∅	'little'
[sukima]	[s _o ukima]	∅	'absence'
[suisono]	[s _o uisono]	∅	'the skirts of the mountain'

2. /u/ of the loanwords, i.e. epenthetic vowel.

	Rule (1)	Rule (2)	
[supai]	[s _o upaĩ]	[spai]	'spy'
[sutaĩru]	[s _o utaĩru]	[staiĩru]	'style'
[sukaĩ]	[s _o ukaĩ]	[skai]	'sky'

Furthermore, the vowel deletion of /u/ is mainly observed in the case of /sp/, /st/, /sk/ in the initial position and in word final position. Also, interestingly enough, contrary to the pattern of the conservative dialect, epenthetic mid back vowel /o/, which occurs in word final position of loanwords undergoes Rule (1), i.e., the vowel /o/ tends to be devoiced. Thus, Rule (1) which applies only for the high back vowels should be modified to include not only high vowels but also the mid back vowel /o/, for the expanded phonology. Accordingly, Rule (1) in the following examples are modified as Rule (1)'.
 X {

Rule (1)'		
[katto]	[katto _o]	'to cut'
[apa:to]	[apa:t _o]	'apartment'
[setto]	[setto _o]	'to set'

Moreover, the epenthetic /o/ following a voiced stop undergoes vowel reduction which may be set up as the Vowel-Reduction Rule or Rule (3);

Examples are

	Rule (1)	Rule (2)	Rule (3)	
[supi:do]	[supi:do _o]	[spi:do]	[spi:də]	'speed'
[sutoraido]	[sutoraido _o]	[straido]	[straidə]	'stride'
[rikiddo]	∅	∅	[rikiddə]	'liquid'

depends on speaker

2) Expanded mora table.

/ i	e	a	o	u			ya	yo	yu/
/pi	pe	pa	po	pu			pya	pyo	pyu/
/bi	be	ba	bo	bu			bya	byo	byu/
/* ϕ i	* ϕ e	* ϕ a	* ϕ o	* ϕ u			-	-	- /
/mi	me	ma	mo	mu			mya	myo	myu/
/ni	ne	na	no	nu			nya	nyo	nyu/
/*ti	te	ta	to	*tu	* \check{c} i	* \check{c} e	* \check{c} a	* \check{c} o	* \check{c} u *tyu/
/*ci	*ce	*ca	*co	*cu			-	-	- /
/*di	de	da	do	*du			-	-	- *dyu/
/*si	se	sa	so	su	ši	*še	ša	šo	šu/
/ -	ze	za	zo	zu	ji	*je	ja	jo	ju/
/ri	re	ra	ro	ru			rya	ryo	ryu/
/hi	he	ha	ho	hu			hya	hyo	hyu/
					*wi	*we	wa	*wo	- /
					/J	R	N	Q/	

Innovations in the traditional table resulting from phonemic reinterpretation and the introduction of new combinations are marked with asterisk, i.e., * .

Chapter VI. Conclusions.

Since foreign languages, especially English have had a great impact on the Japanese language, the Japanese phonological system should be re-interpreted to conform with the current phonological facts as well as the other domains of the language. A new phoneme /ϕ/ is established and /č/, /c/, /š/ and /ǰ/ as an affricate series are included in the expanded phonological system from the point of view of re-interpreting the allophonic variants. With the aid of the above new phonemes, the conventional distribution gaps of the mora table have been filled with new combinations. These recent phonological changes are all brought to the language as a result of borrowing from the foreign languages. According to Martinet (1952:22-23):

There will always be holes in pattern and phonemes moving in to fill them. New series and new orders will appear resulting either from general reshufflings or from the coalescence of successive phonemes of the spoken chain, the result of new accentual conditions, articulatory imitations, etc. These new series and orders will not always be complete from the start; for some time there will remain gaps which ensuing generations may fill through either sound change or borrowing.

The Japanese language also follows Martinet's observation, thus, the several discussions which account for the appearance of the new phonemes and a new distribution in the expanded phonology are based on the notion of *Distribution Gaps*. Interestingly enough, not all the new phonemes and the new distributions which are found in the S-language are fully rendered automatically. Such examples are found in the case of /f/, /v/ phonemes and the combination with high back vowel of the voiceless alveolar stop, i.e., [tu]. Furthermore, such phonemes as /θ/, /ð/, /r/ and /l/ have not yet been brought into the Japanese language as a phonetic importation even though there is such frequent contact with foreign languages. It seems that those phonemes which are not phonetically represented in the native pattern resist adaptation by the P-language. In the near future, however, it is conceivable that phonetic segments unrelated to the native phonology may appear with phonemic status in the language, but this prediction is quite doubtful.

Another factor preventing the wholesale phonic importation from foreign languages is the interference of the orthography of Japanese. That is, the rendering of loanwords in *Katakana*. Recently, however, some modifications have been introduced in the use of *Katakana*

to transcribe recent loans, for the purpose of expressing the loanwords more closely to their form and pronunciation in the S-language. For example, the following orthographic devices are regularly used to represent foreign words.

1. /vi, ve, va, vo, vu/

ウ^ゝ_イ ウ^ゝ_エ ウ^ゝ_ア ウ^ゝ_オ ウ^ゝ

2. /ϕi, ϕe, ϕa, ϕo, ϕu/ (instead of /f/)

フ_イ フ_エ フ_ア フ_オ フ

3. /wi, we, wa, wo, -/

ウ_イ ウ_エ ワ ウ_オ

Moreover, $\bar{\tau}$ _イ and τ _ウ are commonly used for /ti/ and /tu/ respectively, to distinguish them from the conventional manifestation of 子 and っ which are used for the conventional /či/ and /cu/ respectively. However, an attempt to show the distinction between /θ/ from /s/, and /ð/ from /z/ has not been made so far, nor has there been any attempt made to discriminate between /r/ and /l/. With regard to the distinction between /r/ and /l/, a possible way in which to make this distinction would be to use the *hiragana* for /r/ and *katakana* for /l/, since /l/ appears only in loanwords.

Tentative examples are as follows

/ri, re, ra, ro, ru/

り れ ら ろ る

/li, le, la, lo, lu/

リ レ ラ ロ ル

e.g. /raJto/ らイト 'r^hight'

/laJto/ ライト 'l^hight'

Another method would be to devise completely new symbols for representing this distinction. In this way, new sounds might be accommodated. Until such time, the importation of completely foreign sounds will continue to be blocked and the present system, i.e., the expanded phonological system of Japanese presented in this thesis will be firmly established without any conspicuous phonological changes.

Weinreich (1974:28) also discusses the interference by the *katakana* as a visual aid from a different direction.

English loanwords have been treated differently in Hawaiian spoken Japanese, which received many of them by the 'ear route' and in standard Japanese, which (until 1945 at least) its English material from the printed page. The standard Japanese borrowed 'gasoline' in its spelled form and obtained /gasorin/; colloquial Japanese in Hawaii has /g'aswrin/, since the Japanese hear the initial English consonant as a palatal and the /ə/ as mostly nearly w.

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The above passage suggests that Japanese people perceive the foreign sounds with the aid of *katakana*, that is /CV/, rather than a phone.

✕ And once it is so perceived through the visual aid, i.e., *katakana* it is very difficult to compensate the sounds to adjust to the original sounds of the S-language.

Consequently, the following hierarchical order of phonic importation may be applicable to the Japanese language.

- ✕ 1. New sound perceived as to conform to the native phonetic pattern as a sequence of /CV/ based on the concept of *mora*, i.e., *Kana* syllabaries.
2. If the sound ends a word, i.e., word final, the importation appears with a vowel addition, which is referred to as an epenthetic vowel in this thesis.
3. Filling the distribution gap in the conventional *mora* table as a new combination of the expanded phonology.
4. the epenthetic vowel now undergoes the vowel deletion rule.
5. Establishing a new phoneme not based on the combination /CV/ in terms of the *mora* but a single unit or phoneme.

In this way, as far as the Japanese language is concerned, new phonemes as separate units are established in the very last stage of the phonetic importation. On the other hand, in the majority of other languages of which the writing system is alphabetic, new sounds and phonemes are more easily assimilated at an earlier stage. In Japanese, however, the *Kana* orthography acts a great barrier to the perception of segmental sounds as opposed to morae.

The phonological changes in the Japanese language were first systematically treated by Bloch (1950). Then Martin (1959) developed Bloch's idea and several new observations were made by him. In Japan, however, this field is fairly new, and recently, some linguists, such as Kawamoto (1976), Joo (1977) and Koizumi (1978) are beginning to mention the importance of reinterpreting the Japanese phonological system. Yet, no integrated study based on purely synchronic considerations has been made, to my knowledge. Thus, based on the linguistic principle that "language is always changing", the adjustment of the language description should be studied from the synchronic[?]₀ point of view.

In that sense, the need for much deeper studies is obvious and I hope the present thesis will be of some help to future studies in this field.

Bibliography

- Arakawa, Soobei (1967). *Kadokawa Gairaigo Jiten* (Kadokawa Loanwords Dictionary), Tokyo, Kadokawa shoten.
- ✓Block, Bernard (1950). Studies in Colloquial Japanese IV. Phonemics. *Language*, 26, pp. 86-125.
- ✓Chomsky, Noam & Halle, Morris (1968). *The Sound Pattern of English*. New York, Harper.
- Haugen, Einer (1950). The Analysis of Linguistic Borrowing. *Language*, 26, pp. 211-231.
- _____ (1972). Japanese Phonemics: Some Alternative Solutions. *Studies by Einer Haugen, presented on the occasion of his 65th birthday April 19, 1971*. The Hague Mouton.
- Hattori, Shiroo (1951.a). *On'inron to Seishohoo* (Phonology and Orthography). Tokyo, Kenkyuusha.
- _____ (1951.b). *Onseigaku* (phonetics). Tokyo, Iwanami.
- _____ (1955). Japanese Phonemes, *Sekaijengo Gaisetsu* (Overview of the World's Languages), Vol 2. ed. S. Ichikawa and S. Hattori. Tokyo, Kenkyuusha.
- _____ (1960). *Gengogaku no Hoohoo* (Methods in Linguistics). Tokyo, Iwanami.
- _____ (1961). Prosodeme, Syllable Structure, and Laryngeal Phonemes. *The Study of Sounds* Vol.9. The Phonetic Society of Japan.

Hirayama, Teruo (1960). *Zenkoku Akusento Jiten* (Dictionary of Japanese Accent). Tokyo, Tokyoodo.

_____ (1975). *Nihongo no Onsei* (Japanese Phonemes). *Shin Nihongo Kooza* (New Japanese Course). Vol.3. Tokyo, Shiobunsha.

Ishiwata, Toshio (1976). *Gairaigo* (Loanwords). In T. Shibata (ed.) *Gendai Nihongo* (Modern Japanese). Asahi Shinbunsha.

Joo, Hakutaroo (1977). *Gendai Nihongo no On'in* (Phonology of Modern Japanese). *Iwanami Kooza Nihongo* (Iwanami course the Japanese Language). Vol.5. Tokyo, Iwanami.

Kawamoto, Shigeo (1976). *Nihongo to Gaikokugo to no Sesshoku* (The Contact between Japanese and Foreign languages).

Iwanami Kooza Nihongo Vol.1. Tokyo, Iwanami.

Kess, F. Joseph (1967). English Influence in the Phonology of Japanese as spoken in Hawaii. *Te Reo*. Vol.10, pp. 27-38.

Kindaichi, Haruhiko (1968). *Nihongo On'in no Kenkyuu* (Studies on Japanese Phonology). Tokyo, Tokyoodo.

Koizumi, Tamotsu (1978). *Nihongo no Seishohoo* (The Orthography of Japanese). Tokyo, Taishuukan.

_____ (1979). 'fiibaa' wa Nihongo ? (Is *fiibaa* (fever) Japanese ?). *Gengo* (language) Vol.8. No.5. pp.14-19. Tokyo, Taishuukan.

Kuroda, Shige-Yuki (1965). *Generative Grammatical Studies in the Japanese Language*. Ph.D. Dissertation. M.I.T.

- Kusakabe, Fumio (1962). Syllable Pattern of the Tokyo Dialect.
The Study of Sounds. Vol.10. The Phonetic Society of Japan.
- Martin, Samuel, E. (1959). Review of *Japanische Phonetik* by
 Günther Wenck. *Language*, 35, pp.370-382.
- _____ (1975). *A Reference Grammar of Japanese*.
 New Haven, Yale University Press.
- Martinet, André (1952). Function, Structure, and Sound Change
Word, 8, pp.1-32.
- _____ (1962). *A Functional View of Languages*.
 Oxford University Press.
- _____ (1969). *La Linguistique: Guide Alphabetique*.
 Paris, Editions Denoël.
- McCawley, James, D. (1968). *The Phonological Component of a
 Grammar of Japanese*. The Hague, Mouton.
- O'Grady, Geoffrey, N. (1960). New Concepts in Nyagumarda:
 Some Data on Linguistic Acculturation. *Anthropological
 Linguistics*, Vol.2. No.1. pp.1-6.
- Ohtomo, Shin'ichi (1962). The Appearance of Phoneme /h/ in
 the Japanese Phonemic Pattern. *The Study of Sounds*.
 Vol.10. The Phonetic Society of Japan.
- _____ (1966). Should phonemic analysis be made
 synchronically? *The Study of Sounds*. Vol.12.
 The Phonetic Society of Japan.
- Sanseido Editorial Staff (1976). *Concise Gairaigo Jiten*.
 (Concise Loanwords Dictionary). Tokyo, Sanseido.

- Sloat, C., Taylor, S.H., Hoard, J.E. (1978). *Introduction to Phonology*. Englewood Cliff, N.J., Prentice-Hall Inc.
- Tatsuki, Masaaki (1979). Gendai Nihongo On'in ni okeru Onseigaku to On'inron no Kangeki (The Gap between Phonetics and Phonology in Modern Japanese Phonological system). *Shuryuu* (Mainstream), Vol.40. pp.35-51. Kyoto, English Literary Society of Doshisha University.
- Trubetzkoy, N. (1939/69). *Principles of Phonology*. Originally published in German (*Grundzüge der Phonologie*) as *Travaux du Cercle Linguistique de Prague* 7. Translated by Christiane A. M. Baltaxe. Berkeley and Los Angeles, University of California Press.
- Uemura, Yukio (1972). Gendai no On'in (Phonology of Modern Japanese). *Kooza Kokugoshi* (Course, History of the Japanese language). Vol.2. pp.271-309. Tokyo, Taishuukan.
- ✓Weinreich, Uriel (1974). *Language in Contact (Findings and Problems)*. The Hague, Mouton.
- Yatabe, Shooichi (1961). On Japanese phonemes. *Study of Sounds* Vol.9. Tokyo, The Phonetic Society of Japan.

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Kyoto, English Literary Society of Doshisha University, 1979.

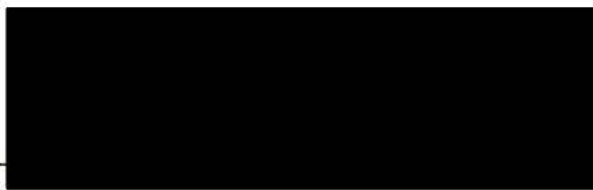
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