

PHONOLOGY

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Early Old Japanese had the distinct syllables shown in Table, illustrated with one representative man'yôgana for each syllable.

	伊 .i		衣 .e		阿 .a		於 .o		宇 .u
	為 wi		惠 we		和 wa		乎 wo		宇 .u
比 pi ₁		肥 pi ₂	平 pe ₁	戸 pe ₂	波 pa		富 po		布 pu
鼻 bi ₁		備 bi ₂	弁 be ₁	倍 be ₂	婆 ba	毛 mo ₁	煩 bo		夫 bu
美 mi ₁		未 mi ₂	売 me ₁	米 me ₂	麻 ma	古 ko ₁		母 mo ₂	牟 mu
支 ki ₁		貴 ki ₂	家 ke ₁	氣 ke ₂	加 ka	吳 go ₁		許 ko ₂	久 ku
祇 gi ₁		疑 gi ₂	牙 ge ₁	義 ge ₂	我 ga	刀 to ₁		其 go ₂	具 gu
	知 ti		天 te		多 ta	度 do ₁		止 to ₂	都 tu
	遲 di		田 de		陀 da	蘇 so ₁		特 do ₂	豆 du
	之 si		勢 se		左 sa	俗 zo ₁		會 so ₂	須 su
	自 zi		是 ze		射 za	努 no ₁		叙 zo ₂	受 zu
	爾 ni		尼 ne		奈 na	路 ro ₁		乃 no ₂	奴 nu
	利 ri		礼 re		良 ra	用 yo ₁		呂 ro ₂	流 ru
			延 ye		夜 ya			余 yo ₂	由 yu

Table. Orthographically distinct syllables in early Old Japanese.

1. *Kô-rui* and *otsu-rui* syllables.

OJ kept distinct so-called *kô-rui* (type A) and *otsu-rui* (type B) syllables, which merged in the transition to Early Middle Japanese. The difference is here noted by subscript '1' and '2'. Thus, the two distinct OJ syllables represented by,

amongst others, 売 and 米 respectively are termed me_1 (*kô-ruï me*) and me_2 (*otsu-ruï me*) because they merged and are reflected as EMJ (and NJ) *me*. The following are examples of *minimal pairs*.

OJ		EMJ	NJ
pi_1	'sun'	pi	hi
pi_2	'fire'		
me_1	'woman'	me	me
me_2	'eye'		
ko_1	'child'	ko	ko
ko_2	'this'		

Phonemically, the difference between the *kô* and *otsu* syllables is generally agreed to pertain to the post-consonantal part of each syllable. However, despite the subscript convention used here and elsewhere, and despite the way the orthographic *koo-otsu* distinction is often talked about, it is important to appreciate that OJ did not have 'two kinds of *i*', or *e* or *o*, any more than Classical Greek had 17 kinds of *i*. EMJ *i*, *e*, *o* each represents the outcome of a merger between two distinct sounds of OJ, just like Modern Greek /*i*/ represents the merger of 17 distinct sounds of Classical Greek.

The distinction between the *kô*- and *otsu-ruï* syllables disappeared completely in the transition to EMJ and is not reflected in the kana writing of EMJ or later periods. As each OJ syllable could be represented by different man'yôgana, the distinction was not conspicuous to later generations of readers and in fact it was only finally discovered in the beginning of the 20th century by Hashimoto Shinkichi, one of the great Japanese linguists and philologists. It is worth reading Hashimoto's own account of his discovery (1900; my translation).

While in February 1909 I was researching developments in the syntax of Japanese at the request of the Japanese Language Investigative Committee,¹ I noticed in the [eastern dialect] *Azuma Uta* in Vol. 14 of the Man'yôshû that the character 家 in not a few cases was written in places which ought to have the particle *ga*. This gave rise to the suspicion that the eastern dialect of that time had a particle *ke* which was used in the same way as *ga*. As a way of solving this I felt it necessary to check up on every single 家. First I examined Vol. 14, but to no avail. Because there are examples in Vol. 5 of 家 used in the meaning of *ga* I decided also to examine Vol. 5. This time I did not limit myself to the character 家, but collected every single kana for *ke*. I then found - and this had no bearing on the problem I was investigating - that forms such as *ni-keri* 'perfective-

¹ Kokugo Chôsa Iinkai; set up 1902, abandoned 1913; cf. Seeley 1991:144, 207.

modal.past', *ke-mu* 'past-conjectural', *kerasi* 'past.presumptive', and *kepu* 'today' were written exclusively with characters from one set, comprising e.g. 家 and 計, whereas words such as *take* 'bamboo', *sake* 'rice wine', and *take* 'mountain, peak', *nageki* 'sigh', *sigesi* 'thick, dense (of growths)' were written exclusively with characters from another set, comprising e.g. 氣 (*ke*) and 既 (*ke*), 宜 (*ge*). I discovered that among words written with *ke* some characters could be used interchangeably, while others could not, and that kana for *ke* accordingly fell in two groups; the distinction between these two groups was maintained consistently. I felt strange discovering this. Experiencing great interest I decided to proceed and examine the other volumes. I wanted to begin with the Eastern dialect and examined Vol. 20, but in the first half, which contains the [eastern dialect] *Sakimori Uta*, I was not able to verify this distinction, which made me feel greatly disappointed. However, in the poems in *yamato-kotoba* [the central dialect] in the second half of the volume, I found that this distinction clearly existed, and I thus came to the conclusion that this was a distinction which existed in the central dialect, but not in the eastern dialect.

Next, I examined those volumes of the Man'yōshū which are written almost entirely in kana, vols. 15, 17, 18. There would occasionally be a few exceptions, but I found that in almost all instances this distinction was there. When I looked at the remaining volumes of the Man'yōshū as well as the songs in Nihongi and Kojiki, apart from Volume 14 of the Man'yōshū the distinction between these two types was there, without a single exception. This led me to believe that this distinction generally held for the Nara period - excepting the eastern dialect. Going on to check the exceptions I had previously found in the Man'yōshū against an old copy of the Man'yōshū in the possession of Ōya Tôru [Kokugogakusha, 1850-1928] (belonging among the *kanpon*), I learned that almost all were not real exceptions, but mistakes in the (wood-block) printed editions, and I arrived at an even firmer belief in the existence of this distinction. (In the following year, 1910, I was able to take a look at a Genryaku-period [1184] manuscript of the Man'yōshū, which agrees with Ōya's. It was increasingly clear that the (wood-block) printed editions were mistaken.) When I next examined texts from the Nara period such as "[Jōgū Shōtoku-]Hōō Taisetsu" [late 7th century], [texts in] "Dai Nihon Komonjo" [compilation of *komonjo*, published 1901-40 by Tokyo University Press] and the *senmyō* [Imperial edicts] in Shoku Nihongi there was not a single exception. I wanted to look at the traces of the changes in this kana-use and therefore examined texts from the Heian period written in man'yōgana such as *senmyō* and songs contained in the official histories from "Nihon Kōki" [840] onwards, "Nihongi Kyōenka" [compilation from three occasions (882, 906, 943) of poems composed at the court], "Shinsen Jikyō" [dictionary, compiled ca. 898-901], and "Nihon Ryōiki" [collection of *setsuwa*, ca. 823]. In most it was not possible to observe this distinction. Thus, I was able to learn that this distinction between two types of onkana for *ke* existed in the Nara period, but had broken down in the Heian period.

While pursuing the investigation of onkana *ke*, I also examined the *k*-initial syllables in Volume 5 of the Man'yōshū in order to check if there was such a distinction for other kana. I was able to infer that besides *ke* there must have been also two types of *ki* and *ko*. I had previously gathered all the verbs in Nihongi and Kojiki according to inflected forms. Looking at these in the light of my research on *ke*, I was furthermore able to learn that there must have been two kinds

of *pi*, *mi*, *pe*, and *me*.²

Ever since Hashimoto's discovery of this orthographic distinction, the linguistic interpretation of it has been the dominant topic of research in Old Japanese phonology. It is a matter which continues to attract attention and different views. As there is no convenient way of representing the distinction in the present-day Japanese writing system in which OJ texts are usually rendered in popular editions, it remains widely ignored outside of linguistics. This is probably to some extent a consequence of the lack of consensus about the phonemic interpretation of it, but it is regrettable and makes difficult a full appreciation of the sound texture of OJ poetry.

As shown in Table, the earliest attested Old Japanese distinguished 88 syllables. The distinction between mo_1 and mo_2 is found in the Kojiki (712), but had merged in later sources. Sometimes a distinction is also posited between $po_1 \neq po_2$ and $bo_1 \neq bo_2$. It is questionable whether the existence of such an orthographic difference can be demonstrated within the OJ text corpus, but it is almost certain that $*po_1 \neq *po_2$ and $*bo_1 \neq *bo_2$ were phonologically distinct in slightly earlier Japanese. The syllable inventory in Table represents a system in change and the gradual break-down of the distinctions is evident through the OJ text corpus. The last syllable pair to be distinguished was $ko_1 \neq ko_2$ which were kept distinct into the early 10th century, but by then probably merely as an orthographic convention.

2 Hashimoto goes on to describe how he found that his was not the first discovery of this distinction:

"This kind of kana-use was something no one else had hitherto explained, and just when I thought that this was a discovery since Keichû [Kokugakusha; 1640-1701] and had decided to proceed with my investigation to each kana in larger materials, I accidentally looked at "Kogen Betsu'on Shô" [appr. 1849, by KUSAKADO Nobutaka, 1818-69] which had just been acquired by the Japanese Language Department [at Tokyo University]. Thereby I learnt that this kind of research had been done by someone else previously, and when I looked at "Kana-zukai no Oku no Yamamichi" [1798, by ISHIZUKA Tatsumaro, Kokugakusha, 1764-1823] on which that book is based, I realized that it shows that there was a distinction between two types of kana on a much grander scale than what I had researched and been able to infer. My discovery was really a rediscovery. Thus, this discovery of mine was a discovery in a two-fold sense. One was the rediscovery of this special kana-use, the other was the discovery of Ishizuka Tatsumaro's unknown studies in kana-use. If I had not on my own discovered this kana-use, I surely would not have been able to understand the importance of Oku no Yamamichi, or to appreciate its value. Thus, only because I had investigated this independently, I grasped the merits of the studies of that man of old."

1.1 *Co₁ versus Co₂.*

There are not many minimal pairs distinguished by the difference between *Co₁* and *Co₂* and it has been proposed (Matsumoto 1984) that *Co₁* and *Co₂* in fact did not represent distinct syllables, but were allographic variants, possibly standing for allophonic variants. This is a consequence of the following distributional differences between *Co₁* and *Co₂*: Most occurrences of *Co₁* are in morpheme final position and *Co₂* did not occur in a root morpheme with *Ca*, *Cu*, *Co₁*, see below. Also, there are not many monosyllabic lexical morphemes with *Co₂*. However, while the scope for opposition is fairly limited, there are minimal pairs, e.g. *ko₁* 'child' versus *ko₂* 'this', making clear that the two sets of graphs did stand for distinct syllables.

1.2 *Phonetic reconstruction and phonemic interpretation.*

We face two distinct, but interrelated, problems concerning the phonological understanding of the OJ syllable inventory: phonetic reconstruction and phonemic interpretation, in particular segmentation. *Phonetic reconstruction* is based mainly on the following two types of evidence: (a) *external*: comparison with the phonetics of other languages, first of all comparison with the (Early Middle) Chinese sound values of the sinographs used as *on-gana*; (b) *internal*: comparison with the phonetics of later stages and dialects of Japanese, and sound changes within Japanese, either documented changes in EMJ (or later) or reconstructed changes in pre-OJ. Such external and internal evidence can provide valuable input into our formation of hypotheses, but it must also be noted that both are fraught with uncertainty of interpretation and have a number of unknown factors. Arguments based on internal evidence run the evident risk of circularity. Regarding external evidence, as mentioned above, the choice of sinographs to act as phonograms was not exclusively based on phonological considerations; furthermore, the actual relation between EMC and OJ is anything but direct, as Chinese came to Japan by way of Korea and was very likely based on a different stage, if not variety, of Chinese; and finally, EMC is itself a reconstruct, i.e. hypothetical. For this type of reconstruction, Miyake 1999 is an extremely useful and well-documented study with an impressive command of all the relevant materials; it will remain the standard reference for a long time.

1.3 *Sound values.*

Phonetic reconstruction suggests that the syllable pairs phonetically differed in the following manner.

()	Examples			
Ci_1	more palatal	[Ci□i]	pi_1	[pi□i] 'sun'
Ci_2	more labial	[Cu□i, Cui□]	pi_2	[pu□i, pui□]
	'fire'			
	a falling diphthong			
Ce_1	more palatal; a rising diphthong	[Ci□e]	me_1	[mi□e] 'woman'
Ce_2	a falling diphthong	[Cei□, Cai□]	me_2	[mei□, mai□]
	'eye'			
Co_1	more labial	[Cu□o]	ko_1	[ku□o] 'child'
Co_2		[Co]	ko_2	[ko] 'this'

1.4 Phonemic interpretation.

The syllabic writing gives no clues regarding the organisation into segments of distinctive phonic qualities and that makes the phonemic interpretation difficult. Even so, the difference between the kô and otsu syllables is, as mentioned above, generally agreed to pertain to the post-consonantal part of each syllable.

Traditionally, the difference has been thought to be a distinction in vowel quality, leading to the hypothesis that OJ had *eight* distinct vowel phonemes, with many different proposals concerning the structural organization of these eight vowels. However, since Lange 1973, it is common to interpret the difference in terms of sequential diphthongs, i.e. as being due to the presence of a palatal or labial glide, /y/ or /w/, in one or the other member of the syllable pairs. () offers a simple phonemic interpretation which will be adopted here. (For reference, the Yale system of transcription (JLTT) and Ohno's, as for example in IKJ, are also included.) On this interpretation, Old Japanese had the five vowels also found in Middle and Modern Japanese: /i, e, a, o, u/. In addition to identifying the distinguishing property, the assignment of neutral syllables, i.e. syllables with undistinguished Ci , Ce , or Co , is an issue. As shown, they are here phonemically identified with Ci_1 , Ce_2 , and Co_2 , respectively.

()	Examples		Yale	IKJ
Ci_1	/Ci/	pi_1 /pi/ 'sun'	pyi	pi
Ci	/Ci/	ti /ti/ 'blood'	ti	ti
Ci_2	/Cwi/	pi_2 /pwi/ 'fire'	piy	pī
Ce_1	/Cye/	me_1 /mye/ 'woman'	mye	me
Ce	/Ce/	te /te/ 'hand'	te	te
Ce_2	/Ce/	me_2 /me/ 'eye'	mey	mē
Co_2	/Co/	ko_2 /ko/ 'this'	<u>ko</u>	kō
Co	/Co/	po /po/ 'ear (of rice)'	pō	pō

Co ₁	/Cwo/	ko ₁	/kwo/	'child'		kwo	ko
	.i		.e	.a	.o		.u
	wi		we	wa	wo		
	pi	pwi	pye	pe	pa	po	pu
	bi	bwi	bye	be	ba	bo	bu
	mi	mwi	mye	me	ma	mo	mwo
	ki	kwi	kye	ke	ka	ko	kwo
	gi	gwi	gye	ge	ga	go	gwo
	ti		te	ta	to	two	tu
	di		de	da	do	dwo	du
	si		se	sa	so	swo	su
	zi		ze	za	zo	zwo	zu
	ni		ne	na	no	nwo	nu
	ri		re	ra	ro	rwo	ru
			ye	ya	yo	ywo	yu

Table. Phonemic syllables in OJ.

All diphthongal proposals suffer from some awkwardness from a structural point of view in the distribution of glides, mainly because they usually incorporate diachronic considerations. The one adopted here has the advantage of positing only sequential diphthongs that are also found as free syllables. For some of the syllables involving the labial glide, in particular /mwo, nwo, ywo, rwo; pwi, bwi, mwi/, it seems reasonable to assume a pronunciation like [uo] and [ui], that is, with a shift in phonetic sonority peak from the vowel to the glide.

1.5 Neutralization.

It is notable that *i* and *wi*, and *ye* and *e* only were kept distinct after /p, b, m, k, g/; after glides and alveo-dental consonants the distinction was neutralized, cf. the Yodan Imperative and Exclamatory forms in () and the Yodan and Kami Nidan Gerund forms in ().

()	Base	Imperative	Exclamatory
	<i>kak-</i> 'write'	<i>kakye</i>	<i>kake</i>
	<i>mat-</i> 'wait'	//matye// => <i>mate</i>	<i>mate</i>
()	Base	Gerund	
Yodan	<i>ok-</i> 'put'	<i>okite</i>	
	<i>or-</i> 'weave'	<i>orite</i>	
Nidan	<i>ori-</i> 'descend'	<i>orite</i>	
	<i>okwi-</i> 'arise'	<i>okwite</i>	

It is likely that there earlier was a distinction *i* ≠ *wi* and *ye* ≠ *e* after all true consonants and that the state exhibited by OJ reflects a system in collapse. On the other hand, /p, b, m, k, g/ constitute the class of *grave* consonants and the environment of distinction is therefore general. It is thus also quite possible that the OJ state reflects a stable stage of some standing.

The distinction between *mwo* and *mo* is found only in the Kojiki. In the later sources *Cwo* and *Co* were only kept distinct where *C* was not a labial consonant. This, however, does not reflect systematic neutralization, but simply the short term course of the merger of the distinction. Thus we assume that there was distinction between **pwo* ≠ **po* and **bwo* ≠ **bo* in slightly earlier Japanese.

2. Consonants.

Old Japanese had the following inventory of consonant phonemes. The mediae (/b, d, g, z/) and the liquid (/r/) did not occur word initially, see below. There is nothing remarkable about the phonetics and phonology of the nasals, glides, and the liquid. The liquid was a flap, like its Modern Japanese reflex: [ʳ], in the following simply noted by [r]. Note that the palatal glide /y/ will be noted by IPA [j] in phonetic transcription.

()		labial	alveo- dental	palatal	velar
	tenuis	p	t, s		k
	media	b	d, z		g
	nasal	m	n		
	liquid		r		
	glide	w		y	

2.1 Obstruents.

The obstruents, on the other hand, exhibited several interesting features. The main phonetic variants may be thought to have been as in Table, noted in a broad transcription.

Phoneme	Phonetic realization			Phonological classification	
	word initial	word medial			
p	[p ~ φ]	[b ~ β]	}	non-sibilant	tenuis (<i>sei'on</i>)
t	[t]	[d]			
k	[k ~ x]	[g ~ γ]			
s	[s ~ ^t s]	[z ~ ^d z]		sibilant	
b		[^m b ~ ^m β]	}	non-sibilant	media (<i>daku'on</i>)
d		[ⁿ d]			
g		[ⁿ g ~ ⁿ γ]			
z		[ⁿ z ~ nd z]		sibilant	

Phonologically, the phonetic system manifested in Table may be understood in terms of four overlapping sets of obstruents: tenuis versus media, and sibilant versus non-sibilant obstruent, which were distinguished by two distinctive feature categories, *tenseness* (+/-tense) and *stridency* (+/-strident),

and which displayed phonetic variation with regard to *voicing*, *nasality*, and *continuousness*.

2.2 *Tenues versus mediae.*

The traditional Japanese terms for *tenues* and *mediae* are *sei'on* ('clear sounds') and *daku'on* ('muddy sounds'), respectively. The *mediae* (/b, d, g, z/) were *pre-nasalized*. That is to say, they had a nasal onset or onglide. This feature of pronunciation is generally thought not to have been lost until early in the NJ period. It will be referred to simply as *pre-nasalization*. Evidence comes both from EMC sound values for the *ongana* for syllables with initial *mediae* and from a number of sound changes in which nasals and *mediae* behave alike, e.g. the *onbin* sound changes which took place in the transition from OJ to EMJ (see below), cf. OJ *yomite* > EMJ *yoNde*, OJ *ywobite* > EMJ *yoNde*. Note in this connection that to all appearances vowels before nasals and *mediae* were allophonically nasalized.

The *tenues* (/p, t, k, s/) were distinguished from the *mediae* in terms of the phonetic parameter of *tenseness*: the *tenues* being *tense* and the *mediae* *lax*. The *tenues* (/p, t, k, s/) were allophonically *voiced* in word medial position. In a narrow phonetic transcription this might be noted: [p, t, k, s], but for the sake of convenience [b, d, g, z] will be used here. *Voicing*, then, was subject to variation and was assigned by a redundancy rule; it was not a distinctive phonetic feature in Old Japanese. This is the reason that we prefer to speak of /p, t, k, s/ as *tenues* and of /b, d, g, z/ as *mediae*, rather than as unvoiced and voiced obstruents. Voicing of tense obstruents in word medial position will be referred to in the following simply as *medial voicing*. The hypothesis of medial voicing is due to Wenck (1954, 1959). Evidence for it comes mainly from sound changes, first of all /-p/ [-b ~ -β] merging with /-w/ in EMJ (see below), secondarily from the kind of syllable weakening involved in the *onbin* sound changes.

Thus, the distinction between tense and lax obstruents in word medial position was phonetically manifested primarily as one of prenasalization, cf. *pata* 'flag', *pada* 'skin', and *pana* 'flower':

<i>tenuis</i>	<i>media</i>	<i>nasal</i>
/ pata	pada	pana /
[pada	pã ⁿ da	pãna]

2.3 *Non-sibilant versus sibilant obstruents.*

The sibilants (/s, z/) were pronounced with a sibilant (high intensity) noise and were distinguished thereby from the non-sibilant obstruents (/p, t, k, b, d, g/) which were pronounced with no such noise. However, both sibilant and non-sibilant

obstruents exhibited variation with regard to *continuousness*. That is to say, both continuant (fricative) and abrupt (occlusive and affricative) sound types are found among both classes of phonemes. This is the reason we prefer to speak of /s, z/ versus /p, t, k, b, d, g/ as *sibilant* versus *non-sibilant* obstruents, rather than as fricatives versus stops. The sibilants had both fricative, [s-, -z; -ⁿz], and affricated, [^ts-, -^dz; -ndz], variants. The distribution seems to have been conditioned by the following vowel (here following Kobayashi 1981 and extending her findings to /-s, z/):

	Word initial	word medial	
	/ s-	-s-	-z- /
/-a/	[^t sa]	[^d za]	[nd za]
/-o/	[^t so]	[^d zo]	[nd zo]
/-u/	[su ~ ^t su]	[zu ~ ^d zu]	[ⁿ zu ~ nd zu]
/-wo/	[swo]	[zwo]	[ⁿ zwo]
/-i/	[·i]	[ʏi]	[ⁿ ʏi]
/-e/	[·e]	[ʏe]	[ⁿ ʏe]

The phonetic reconstruction of /s, z/ remains debated, with proposals ranging from fricatives only (e.g. Sandness 1987, Miyake 1999) to affricates only (e.g. Ogura 1998). If any, the consensus view is probably the one adopted here with variation between [ts] and [s]. The debate is to some extent confused by less than clear distinctions between phonetic and phonological reconstruction. It should be noted that common to all proposals, though not explicitly addressed, is that /s, z/ are manifested as sibilant sound types. The evidence concerning the reconstruction of /s, z/ comes from two main sources: (a) reconstructed EMC sound values for the *ongana* for syllables with initial /s, z/. Miyake's material clearly shows that among the *ongana* for *sa*, *so*, and *su*, many, some, and a few, respectively, are reconstructed with initial fricative. For *zV*, many of the *ongana* are reconstructed with initial affricate, though not as neatly distributed as for *sV*. (b) The priest Ennin's *Zaitôki* (858), in which he described Sanskrit sounds by means of illustration with phonograms used for their Japanese or Chinese sound values. Ennin seems to equate the pronunciation of Sanskrit .a ([t·a]) with Japanese *sa* and that is often taken as evidence for an affricative sound value for /s/, at least before /a/. Apart from the fact that *Zaitôki* primarily concerns EMJ and not OJ, the interpretation of the text is far from straightforward, as pointed out by e.g. Sandness (1987). Finally, Ainu .asi [t·asi] borrowed from OJ *sasi* 'castle' (in turn borrowed from a Korean language, reflected as MK *cas*) also points towards an affricative pronunciation of OJ /s/, at least before /a/.

/p/ had both occlusive (abrupt), [p-, -b], and fricative

(continuant), [Φ-, -β] variants. It is not possible to identify any conditioning phonological environment for this variation, so it is possible that [p-, -b] and [Φ-, -β] may have been in free variation. Earlier it was thought that /p/ had already shifted completely to [Φ] in OJ, but there is little to support that view. It seems that similar variation was displayed by other non-sibilant obstruents; in particular /k, b, g/ seem to have had both abrupt and continuant variants. Some of this variation was likely subject to stylistic variation, with abrupt variants being more characteristic of careful and continuant variants more characteristic of casual speech. Evidence for continuousness variation for the non-sibilant obstruents comes from sound changes, first of all /-p/ [-b ~ -β] merging with /-w/ in EMJ (see below), secondarily from the kind of syllable weakening involved in the *onbin* sound changes (below).

In this way, *continuousness* was subject to variation and both of its values were represented in the realization of members of both sibilant and non-sibilant obstruents. This phonetic variation will be referred to as *continuousness variation*.

	Non-sibilant									sibilant		
	<i>Mellow</i>									<i>strident</i>		
	/ p-	t-	k-	-p	-t	-k	-b	-d	-g	s-	-s	-z /
abrupt	[p	t	k	b	d	g	^m b	ⁿ d	^ŋ g	^t s	^d z	nd z]
continuant	[Φ		(x)	β		(γ)	(^m β)		(^ŋ γ)	s	z	ⁿ z]

3. Other allophonic variation.

Two fairly low level phonetic allophonic rules may be posited, () and (), exemplified in ().

() *Nasalization of vowels*

Vowels before nasals or mediae were phonetically nasalized.

Nasalization probably also to some smaller extent applied to vowels *after* nasals.

() *Sharpening of consonants*

Consonants before /i, y/ were phonetically sharpened (palatalized).

()	<i>kimi</i> 'lord'	<i>ywobi</i> 'calling'	<i>pikye</i> 'pull!'
	[k _j i _m j _i	yu ^o _{ɔ̃} ^m b _j i	p _j igje]

Sharpening probably also to some extent applied to consonants before /e/, see (). That is to say, 'neutral Ce' was phonemically like Ce₂, but phonetically more like Ce₁. Presumably, the gradual emergence of sharpening before /e/ is what led to the disappearance of a distinctive phonemic glide in Ce₁ (Cye) syllables.

()	Ce ₁	me ₁ 'woman'	/Cye/ /mye/	[Cje] [mje]
	Ce	te 'hand'	/Ce/ /te/	[C _j e] [t _j e]

Ce₂ me₂ 'eye'

/Ce/ /me/

[Ce] [me]

4. Phonetic transcription of a text

On this background it is now possible to illustrate what OJ probably sounded like, giving a broad, but still reasonably detailed, phonetic transcription of a short text, with a. illustrating more careful and b. more casual diction.

() Kojiki (K 1)

	夜久毛 多都 <i>yakumwo tatu</i>	伊豆毛 夜幣賀岐 <i>idumwo yapyegaki</i>	都麻基微 爾 <i>tumagomwi ni</i>
a.	[jaɡũmu□o tadu	ĩ ⁿ dũmu□o jabjẽ ^ɔ gag _j i	tũmã ^ɔ gõmu□i n _j i]
b.	[jaɣũmu□o tadu	ĩ ⁿ dũmu□o jaβjẽ ^ɔ ɣaɣ _j i	tũmã ^ɔ ɣõmu□i n _j i]

	夜幣賀岐 <i>yapyegaki</i>	都久流 <i>tukuru</i>	曾 能 夜幣賀岐 <i>so no yapyegaki wo</i>
a.	[jabjẽ ^ɔ gag _j i	tuguru	˚sõ no jabjẽ ^ɔ gag _j i wo]
b.	[jaβjẽ ^ɔ ɣaɣ _j i	tuxuru	sõ no jaβjẽ ^ɔ ɣaɣ _j i wo]

5. Syllable and word structure.

As seen in Table above, OJ syllables have the following structure: **(C) (G)V**. Syllables consisting of a single vowel are generally restricted to word initial position, except for a few exceptions, including a single noun, *ka.i*, and inflected forms in the secondary (Nidan) conjugations with glide initial final syllables, such as *ku.i* (<= //kuyi//, cf. Conclusive *kuyu* <= //kuyi-u//) and *ku.u* (<= //kuwu// <= //kuwe-u//, cf. Base *kuwe*-). Thus all syllables are open and short, surface forms having to conform to repetition of the simple C(G)V pattern.

A number of distributional facts about OJ sounds are best understood in diachronic terms and will be explained in the section on proto-Japanese: no word initial mediae or liquid; Arisaka'a Law; limited distribution of *Cwo*, *Cye*, *Ce*, and *Cwi*; noun apophony.

6. Morphophonemics.

6.1 Vowel deletion.

When in morphological derivation or word formation two vowels come together without an intervening consonant, one is elided. Depending on the number of syllables (one or more) in the two morphemes, the following rules apply. The second vowel is only elided when a monosyllabic morpheme is followed by a vowel initial polysyllabic morpheme, i.e. ()a; elsewhere the first vowel is elided, ()b-d.

() Synchronic rules of vowel deletion

- a. $V_1+V_2 \Rightarrow V_1$:
 // -CV₁+V₂CV // => /CV₁CV/
 wa+ga+**i**pye ' I+Gen+house' wagapye 'my house'
- b. $V_1+V_2 \Rightarrow V_2$ elsewhere:
 //CVCV₁+V₂// => /CVCV₂ /
 ka**e**+u 'redde+Concl' aku 'redde.Concl'
- //CVCV₁+V₂CV// => /CVCV₂CV/
 mye**s**i+age 'see.Hon+raise' myesage- 'summon'
 wa**g**a+**i**pye 'my+house' wagipye 'my house'
- //CV₁+V₂/ => /CV₂/
 ko**t**i 'come+Inf' ki 'come.Inf'

It should be noted that there are apparent counterexamples to ()a., such as the competing form *wagipye*. However, in such cases a different constituent structure may be assumed for the underlying form, here *waga-ipye* with univerbation between pronoun and Genitive particle. Another similar set of forms are those where the existential verb *ar-* seems to fuse with a preceding grammatical monosyllabic morpheme: the Periphrastic Stative *-te-ar-* being contracted to *-tar-*, the extended Negative *-(a)zu-ar-* to *-(a)zar-*, and the extended adjective predication *-ku-ar-* to *-kar-* (see below about *ar-* extension). In these cases, however, *ari* must be thought to fuse with the full inflected form, not just the suffix: *kakite-ar-* => *kakitar-*, *kakazu-ar-* => *kakazar-*, *akaku-ar-* => *akakar-*. In OJ all such forms were simple contractions, but in EMJ they were reanalyzed to give rise to the morphemes *-tar-*, *-zar-*, and *-kar-*. Similarly, the inflected copula *nar-* seems to be contracted from *ni-ar-*, but also here an intermediary step must be posited: *ikusa-ni ar-* => *ikusani-ar-* => *ikusanar-*. Such forms were subsequently reanalyzed as *ikusa-nar-*. (The same holds for the copula *tar-* which is found from EMJ and which is formed from the nonfinite copula *to* and *ar-*.)

The synchronic productive morphophonemic rules in () must be distinguished sharply from the pre-OJ diachronic laws of vowel contractions which gave rise to secondary vowels and diphthongs, summarized in (), but see further below. The synchronic vowel deletion rules are generative processes which take place in the course of speech production, more specifically in the formation of a phonological word from a morphologically complex underlying representation. The diachronic laws of vowel contraction, on the other hand, reflect diachronic reanalyses of adjacent vowels in surface forms. The vowel sequences which were contracted were either (a) simple juxtapositions; in such cases, the vowels were contracted where univerbation took place. Or (b), sequences which arose through loss of an intervocalic consonant; see below about consonant loss.

Both of these two different phenomena are represented in and may be exemplified by the form *myesage-* above: *myesi+age-* => *myesage-* is a generative process which takes place in the course of speech production. On the other hand, *myes-* itself is a contraction of **mi as-* ('see Honorific') as a diachronic reanalysis of the surface form **mias-*: **mias-* > *myes-*; and the same holds for base of the Nidan verb *age-*: *age* < **agai* (< **aga-Ci*), see below.

() Diachronic laws of vowel contraction.

<i>*ua, *uC</i>	>	<i>wo</i>
<i>*ia, *iC</i>	>	<i>ye</i>
<i>*ui, *U</i>	>	<i>wi</i>
<i>*ai, *Ci</i>	>	<i>e</i>

() *myesage-*

a. vowel deletion in production

//*myesi+age*// => *myesage-*

b. vowel contraction; reanalysis of surface form

*//*mi as-*// 'see honorific' => **mias-* > *myes-*
**aga-Ci* > *agai* > *age-*

The synchronic productive morphophonemic rules in () appear to have been active through the pre-OJ period. They played an important role in the formation of the inflectional system of OJ verbs. The pre-OJ laws of vowel contractions, on the other hand, played an equally important part in the formation of the secondary (Nidan) verb classes.

6.2 Rendaku.

In the morphophonemic process known as 'rendaku', an initial tenuis in the second component of a compound changed to a media to express close compounding. 'Rendaku' is usually rendered 'sequential voicing' in English, but as voicing was not the phonetic feature which distinguished tenuis from media, that is an inappropriate translation, so here 'rendaku' will simply be retained.³ It is thought that this process originated in the reduction of a particle with initial nasal, usually identified with OJ Genitive *no* or Dative *ni*. Thus *sakurabana* is thought etymologically to derive from *sakura-no-pana*, or *yamadori* from *yama-no-tori*. However, examples such as () show that *rendaku* already in OJ was established as a morphophonemic process, for they cannot be etymologized with *no* or *ni*: *na* 'you' invariably takes *ga* as Genitive particle, never *no*, and *yomwi ni kapyer-* would mean 'return to Hades', not *from*. Examples such as *tuma-gomwi* 'wife-enclosing' and *tuma-gwopwi* 'wife-loving' incorporate a direct object, again not directly derivable from *no* or *ni* or any other *n*-initial

³ 'Sequential lenition' is much better; Wenck's 'Erweichung bei der Wortzusammensetzung' is a cumbersome, but precise description.

particle.

- () sakura 'cherry' + pana 'flower' => sakurabana 'cherry-flower'
 yama 'mountain' + tori 'bird' => yamadori 'copper-pheasant'
- () na 'you' + tori 'bird' => nadori 'your bird'
 yomwi 'Hades' + kapyer- 'return' => yomwigapyer- 'revive (intr.)'

6.2.1 Lyman's Law.

Being a morphophonological process, *rendaku* is not phonologically predictable. It is, however, blocked when the second component contains an internal media, e.g. *kamu-* 'spirit' + *kaze* 'wind' => *kamukaze* 'divine wind', not **kamugaze*. This regularity is known as 'Lyman's Law' (B.S. Lyman 1894). It continues to hold in NJ where *rendaku* is still very active.

7. Proto-Japanese.

Proto-Japanese phonology may be reconstructed to some extent, but not exhaustively. There are still a number of points of dispute and of unresolved problems. This section gives a brief introductory overview, but cannot do justice to the issues involved. The main point of interest is that some phonemes and diphthongs of OJ arose through contraction of sequences of segments in pre-OJ.

() Old Japanese	Proto-Japanese
<i>i</i>	* <i>i</i>
<i>i, ye</i>	* <i>e</i>
<i>a</i>	* <i>a</i>
<i>u, wo</i>	* <i>o</i>
<i>u</i>	* <i>u</i>
<i>o</i>	* <i>ʋ</i>
<i>o</i>	* <i>C</i>
Secondary OJ vowels and diphthongs	Pre-OJ sequence
<i>wi</i>	* <i>ui, *iʋ</i>
<i>ye</i>	* <i>ia, *iC</i>
<i>e</i>	* <i>ai, *Ci</i>
<i>wo</i>	* <i>uo, *ua</i>
Old Japanese	Proto-Japanese
<i>p</i>	* <i>p</i>
<i>t</i>	* <i>t</i>
<i>k</i>	* <i>k</i>
<i>s</i>	* <i>s</i>
<i>w</i>	* <i>b</i>
<i>y</i>	* <i>d</i>
<i>∅</i>	* <i>g</i>
<i>∅</i>	* <i>z</i>
<i>m</i>	* <i>m</i>
<i>n</i>	* <i>n</i>
? <i>∅</i> , ? <i>g</i>	* <i>ŋ</i>
<i>r</i>	* <i>r</i>

Secondary OJ consonants

b

d

g

z

Pre-OJ sequence

**mVp*, **nVp*; **np*

**mVt*, **nVt*; **nt*

**mVk*, **nVk*; **nk*

**mVs*, **nVs*; **ns*

7.1 Vowels and diphthongs.

7.1.1 Primary vowels.

Until recently the main view held that there were only four primary pJ vowels: **i*, **a*, **u*, **C* reflected as OJ *i*, *a*, *u*, *o*. This view was adopted, for example, in JLTT. While these were the main vowels in OJ, it has proven premature to reduce the number of pJ vowel phonemes to four and here the seven primary vowels of Frellesvig and Whitman (2004) are posited. The primary vowels took part in two main changes to give the OJ reflexes shown in () above.

7.1.1.1 Mid vowel raising

The mid pJ vowels **e* and **o* raised as in (). Raising followed the course of a gradual phonetic diphthongization, eventually giving a high vowel, except in an environment which be defined as final. In these environments the diphthongal realization was phonemicized as a diphthong, see (). It appears that there were dialectal differences in what constituted 'final position' for these sound changes.

() **e* > *ye* in final position; *i* elsewhere
**o* > *wo* in final position; *u* elsewhere

() **o* > [^w*o* > *u*] -> /*wo*, *u*/
**e* > [^j*e* > *i*] -> /*ye*, *i*/

() **me* 'woman' > OJ *mye* ~ *womina* 'id'
**e* 'placenta' > OJ *ye* ~ *iro-* 'of same mother'

**yo(-)ri* 'behind' > OJ *ywo(-)ri* ~ *yuri* 'from; behind'
**no* 'field' > OJ *nwo* ~ *nu-* (Eastern OJ; cf. also *numa* 'marsh')
**moko* 'partner, bridegroom' > OJ *mwokwo* ~ *mukwo* > EMJ *muko*

7.1.1.2 Merger and backing of central vowels.

The two central vowels, **V* and **C*, merged and eventually gave OJ *o*. They did, however, give different outcomes when contracted with **i*, see below. It is not always possible to know which of the two central vowels an instance of OJ *o* goes back to, but () gives some examples.

() pJ **C*, **V* > OJ *o*.

**V* > *o*

**ɸV* 'big' > *opo-*

**kV* 'tree' > *ko*

**kV* 'this' > *ko*

**tɸV* 'scarce' > *tomo*

**tɸ-* 'take' > *tor-*

*C > o
 *tCnC 'palace' > *tono*
 *sC 'do' > *so*
 *tCr(-i) 'bird' > *tori*
 *kCtC- 'resemble' > *koto-*
 *mCtC 'base, origin' > *moto*

7.1.1.3 Distribution of primary vowels; 'Arisaka's Law'.

A restriction held on the shape of root morphemes: Co (= Co₂) did not occur in a root morpheme with Ca, Cwo, Cu. That is to say, there were (almost) no simple words of the structure CoCa, CoCwo, CoCu, CaCo, CwoCo, CuCo. This restriction is known as 'Arisaka's Law', after the linguist Arisaka Hideyo (1908-52) who first noticed it. Arisaka's law is summarized in (), for the direct reflexes of the pJ vowels. This has been taken to indicate that Japanese earlier had some form of 'vowel harmony', but it must be noted that such a restriction on the shape of root morphemes is different from the kind of vowel harmony which applies to the concatenation of stem and affix in 'vowel harmony languages' such as for example Turkish. Structurally the primary pJ vowels were organised as in (). Arisaka's law may be understood as ().

()	neutral	A	B
	-i		-u
	-ye	-o	-wo
			-a

()	*i	*V	*u
	*e	*C	*o
		*a	

()	neutral	central	back
	*i	*V	*u
	*e	*C	*o
			*a

7.1.2 Secondary vowels and diphthongs.

7.1.2.1 OJ -wi, -e.

All instances of OJ -e and -wi are the result of contractions of vowel sequences, as in the following examples.

()	*ui > wi	*waku- ir atukwo 'young-honoured.male' > wak wi ratukwo
	*Vi > wi	* ɸ vi isi 'big-stone' > op wi isi Proper name
	*Ci > e	*tCnC- iri 'palace-enter' > ton e ri 'palaceservant'
	*ai > e	*taka- iti 'high-market' > tak e ti Proper name

The vowel sequences which were contracted were either (a) simple juxtapositions with a vowel initial morpheme as the second part, as in the examples here; in such cases, the vowels were contracted where univertation took place. Or (b), sequences which arose through loss of an intervocalic

consonant; see below about consonant loss.

7.1.2.2 Apophonic nouns.

A number of nouns have alternating shapes with variation in the final syllable; these are often referred to as 'apophonic nouns'. One variant, the free form (known as *roshutsukei* (露出形) 'exposed form'), occurs in word final position, while the other, the compound form, (*hifukukei* (被覆形) 'covered form'), usually occurs in compounds or derived forms. Traditionally the compound form is thought to represent an older/more original shape of the word.

()		Exposed form		covered form
wi ~ u				
	'body'	<i>mwi</i>	~	<i>mu-kapari</i> ('substitute') 'hostage'
	'spirit'	<i>kamwi</i>	~	<i>kamu-kaze</i> ('wind') 'divine wind'
	'moon'	<i>tukwi</i>	~	<i>tuku-ywo</i> ('night') 'moonlit night'
	'stem'	<i>kukwi</i>	~	<i>kuku-tati</i> ('stand') 'flower stalk'
wi ~ o				
	'tree'	<i>kwi</i>	~	<i>ko-dati</i> ('stand') 'grove'
	'fire'	<i>pwi</i>	~	<i>po-no-po</i> ('Gen-grain.ear') 'flame'
	'Hades'	<i>yomwi</i>	~	<i>yomo-tu-kuni</i> ('Gen-land') 'id.'
e ~ o				
	'back'	<i>se</i>	~	<i>so-muku</i> 'turn'
e ~ a				
	'eye'	<i>me</i>	~	<i>ma-pye</i> ('side, direction') 'front'
	'saké'	<i>sake</i>	~	<i>saka-duki</i> ('cup') 'saké cup'

In such cases the free form ends in one of the derived vowels/diphthongs, thought to originate in vowel contractions like those in (above). As shown, the apophonic nouns are now generally thought to go back to consonant final shapes, with the final consonant being lost before *i. In some cases it is not possible to identify the consonant, hence the notation *sCC-i. The final consonant is also thought to have been deleted in composition before another consonant, thus *mum + kapari => mukapari.

'body'	<i>mwi</i>	< *mui (< *mum-i)
'tree'	<i>kwi</i>	< *kŪ (< *kŪ-i)
'back'	<i>se</i>	< *sCi (< *sCC-i)
'eye'	<i>me</i>	< *mai (< *mar-i)

7.1.2.3 Two sources for OJ o.

The reason we can recognize that OJ o in fact has two sources, *V and *C, is that what is reflected as the single vowel OJ o gives two outcomes when contracted with *-i (above) and that it takes part in two apophonic alternations, ultimately reflecting different outcomes when contracted with *-i

(above) .

- () 'big' * pV > *opo-* ~ *opwisi* < * pV-isi
 'palace' **tCnC* > *tono* ~ *toneri* < **tCnC-iri*
- () 'tree' **kV* > *ko-* ~ *kwi* < **kV*
 'back' **sC* > *so-* ~ *se* < **sCi*

7.1.2.4 Secondary -wo, -ye.

In addition to reflecting directly pJ *o and *e, some instances of OJ -wo and -ye are secondary in the sense that they derive from contraction of sequences of vowels, similar to those above. There are few good examples of this, but the following may be cited:

- ***ia** > **ye** **saki-ari* 'bloom-is' > *sakyeri* 'is blooming'
***ic** > **ye** **pi-Cki* 'sun-put' > *pyeki* Proper name
- ***uC** > **wo** **situ-ori* 'native.weaving-weave'~*sitwori* 'type of cloth'
***ua** > **wo** **kazu-ap-* 'number-join' > *kazwope-* 'count'

7.1.2.5 Lexical distribution of Cwo, Cye, Ce, and Cwi.

Reflecting their prehistory, the syllables *Cwo*, *Cye*, *Ce*, and *Cwi* are restricted in the OJ lexicon. This is shown by the following result of a count of the text occurrence of different syllable types in the Man'yooshuu (Ohno 1980:151ff), maintaining the orthographic three way distinction between *koo*, *otsu*, and neutral syllables.

()	<i>Ci₁</i>	<i>Ci</i>	<i>Ci₂</i>
	3,160	6,103	370
	<i>Ce₁</i>	<i>Ce</i>	<i>Ce₂</i>
	686	2,299	853
	<i>Co₁</i>	<i>Co</i>	<i>Co₂</i>
	1,030	3,631	5,280
	<i>Ca</i>	<i>Cu</i>	
	12,120	6,415	

A frequency count in running text gives no real picture of lexical distribution, but these figures do indicate that *Cwi* (= *Ci₂*), *Cye* (= *Ce₁*), *Ce*, and *Cwo* (= *Co₁*) were relatively infrequent compared to *Ci* (= *Ci₁*), *Ca*, *Co* (= *Co₂*), and *Cu*. It should furthermore be noted that whereas simple morphemes of the structure *CiCi*, *CaCa*, *CoCo*, *CuCu* all are well represented in the lexicon, there are no simple morphemes of the type *CwoCwo*, *CyeCye*, *CeCe*, *CwiCwi*.

In terms of lexical distribution, *Cwi* is infrequent in the OJ lexicon. It is almost exclusively found in morpheme final position; the only exceptions among simple forms being: *mwina* 'all', *pwiwe-* 'to scrape, slice thin', *kwisi* 'shore', *kwiri*

'fog'.⁴ *Cye* and *Ce* are also lexically rather infrequent. By far the most occurrences are in morpheme final position, but while simple words with nonfinal *Cye* and *Ce* are rare, they are not exceptional. *Cwo* is not lexically infrequent, making up approximately 25% of occurrences of *Co*₁ and *Co*₂ in the words listed in *ZdB* (Matsumoto 1984), but most occurrences of *Cwo* are in morpheme final position (see Martin 1987:60-62 for a list of words with *Cwo*).

These distributional facts reflect (a) that all OJ *Cwi*, *Ce*, and some *Cye* and *Cwo*, are etymologically secondary, and (b) that **o* and **e*, the ancestors of nonsecondary *wo* and *ye*, merged with *u* and *i* in nonfinal position.

7.2 Vowel length and syllable structure.

Vowel length is reconstructed for pJ, based mainly on interpreting low pitch in EMJ as reflecting pJ long vowels, supplemented with Ryuukyuan evidence in the form of what seem to be primary long vowels. Vovin 1993 offers additional external evidence. All of the primary pJ vowels are thought to have had long and short members. The precise role of this feature in changes between pJ and OJ is far from clear. It has been proposed that vowel raising (below) only applied to short vowels. Vowel length has also been identified as the conditioning environment in changes involving consonant loss (below).

Note further that the syllable structure of pre-OJ, which allowed syllable final nasals, see below, was less simple than OJ. There are, however, no indications that the pJ vowel length or syllable final nasal(s) contributed to syllable length. On the whole, there is nothing to suggest that pJ prosodically was quantity sensitive (mora counting). There is little evidence, too, for other consonants than nasals having been allowed in syllable final position in pJ. Final consonants which may be reconstructed on comparative grounds may have been lost by the stage reconstructed as pJ.

7.3 Consonants.

The chart above shows only regular, main developments of the pJ consonants. See below about some conditioned changes.

7.3.1. Secondary origin of OJ mediae (/b, d, g, z/).

The OJ mediae reflect contractions of a nasal with a following obstruent. Where recoverable, such sequences arose through

⁴ Of these, *mwina* may be thought to be a compound: *mwi-na* 'body-person'; about *pwiwe-*, see Whitman 1985:133; *wi* in *kwisi* and *kwiri* may be rare examples of sporadic umlaut under influence of *i* in the following syllable, going back to **kusi/kosi/k]si*, **kuri/kori/ k]ri*.

vowel weakening and loss, often where *univerbation* of a complex form took place; cf. also the origin of *rendaku* (above). It should be noted that the vowel loss involved appears to be sporadic, that is, not regular sound changes.

- () **ami-piki* 'net-pull' > *abiki* [ã^mb_jig_ji] 'trawling'
 **yama-miti* 'mountain-path' > *yamadi* [jãmäⁿd_ji] 'id.'
 **mura-nusi* 'village-master' > *murazi* [murãⁿʔi] proper name
 **yama-nV-tCri* 'mountain-Gen-bird' > *yamadori* [jãmäⁿdori]

Distribution of OJ mediae and liquid. The mediae and the liquid (/r/) did not occur *word* initially. There were, however, *suffixes* with initial media or liquid, for example, *be-* (verb extension; Necessitive), *dani* (adverbial particle; 'at least; even'), *ga* (case particle; Genitive), *ra* (noun suffix; Plural). For the mediae, this does not reflect a true phonotactic restriction, but the etymologically secondary nature of the mediae. It is on the other hand a feature shared with the so-called Altaic languages not to allow word initial liquids. In the Man'yooshu we find three words with initial media: one mimetic, *bisibisi* 'sniffing', and two Sino-Japanese words, *gak(w)i* 'glutton, hungry ghost' and *baramon* 'Brahman' (Okumura 1999:110ff). Note, thus, that this restriction did not apply to mimetics or to Sino-Japanese vocabulary which was integrated into the common vocabulary, nor to the outcome of sporadic sound changes in later periods. Likewise, Sino-Japanese vocabulary with initial liquid was readily accepted into Japanese with no change, but it is significant that no sound changes produced words with initial *r*.

Word medial syllable final nasals. For many OJ forms with a media it is not possible to recover a source OJ with a vowel between nasal and tenuis. Some such forms may reflect contraction of a tenuis with a directly preceding syllable final nasal.

- () **tunpu* 'grain' > *tubu*
 **kanti* 'rudder' > *kadi*
 **pinsa* 'knee' > *piza*

It is not possible to recover internally the nature of these nasals. For the forms above, *-*n* is posited, but there is no reason to suppose that pre-OJ did not have *-*m*, *-*ŋ* in addition to *-*n*. There is nothing to say that *piza* is not from **pimsa* or **pinsa*.⁵

⁵ Positing syllable final *-*ŋ* in pJ raises the question of whether it was allowed before vowel within a word, and if so whether **ŋ* between vowels went to OJ /g/ or with pJ **g* to zero.

Proto-Japanese mediae. The general view on the development of pJ *b, *d, *g, *z is, as shown above, that they were weakened and are reflected as OJ glides and zero: w, y, Ø, Ø. Conversely, pJ is usually not thought to have had glides. There is good evidence, some of it comparative, for b > w, e.g. *ba 'I' > wa, some for *d > y, e.g. *do 'four' > yo, but little direct evidence for *g, *z > Ø. Some indirect evidence in the form of vowel contractions which are best understood as motivated by the loss of some intervocalic consonant may be offered. However, for *d, *g, *z the competing view exists (Whitman 1985) that they merged with the secondary prenasalised mediae when these arose, i.e. pJ *d, *g, *z > OJ d, g, z. A question usually not addressed in connection with the pJ mediae is what became of pJ nasal + media, i.e. *nb, *nd, *ng, *nz etc. (whether original sequences or weakened from *nVb, *nVd, *nVg, *nVz). It seems likely that such sequences gave OJ mediae.

Summary of sources of OJ mediae. While it is generally agreed that the OJ mediae are secondary, they are usually regarded simply as reflecting contraction of a pJ tenuis with a preceding nasal, as in the examples in (). Indeed, such cases provide the clearest internal evidence for the origin of the OJ mediae, but it will be seen that in fact probably the following sources should be reckoned with:

()	
OJ	pJ
b <	*mVp, *nVp, *ŋVp; *mp, *np, *ŋp; *mVb, *nVb, *ŋVb; *mb, *nb, *ŋb
d <	*mVt, *nVt, *ŋVt; *mt, *nt, *ŋt; *mVd, *nVd, *ŋVd; *md, *nd, *ŋd
g <	*mVk, *nVk, *ŋVk; *mk, *nk, *ŋk; *mVg, *nVg, *ŋVg; *mg, *ng, *ŋg
z <	*mVs, *nVs, *ŋVs; *ms, *ns, *ŋs; *mVz, *nVz, *ŋVz; *mz, *nz, *ŋz

7.3.2 Consonant loss

Medial consonant loss between pJ and OJ is generally recognized because of the presence of one of the secondary vowels or diphthongs in a form. Since such consonants are lost with no trace of their identity, the identification of lost consonants has largely been based on comparative Korean-Japanese evidence, in particular in the work of John Whitman. Interestingly, allomorphy or lexeme variation within Japanese holds few clues to the reconstruction of consonant loss. In addition to the unconditioned loss of pJ *g, *z which was noted above and sporadic loss of medial consonants, the following regular conditioned changes may be mentioned.

*Palatalization before *i, *y*. Whitman proposes changes of consonants before *i as follows:

- () a. *t > s / _ *i, *y
 b. *d, *z, *n, *r > Ø / _ *i, *y

Note that this change is based on a different view on the development of pJ *d, *z than the standard view, but that it gives the same outcome before *i, viz. Ø. More significantly, this means that (morphologically simple) OJ *ti, ni, ri* are secondary, i.e. < *Cwi < *Cui, *C*ŵ*i, and that OJ *te, ne, re, .ye* < *Cai, CCi (other sources for .ye are possible). Whitman shows convincingly that where internally etymologizable occurrences of these syllables exhibit the alternations typical of Cwi and Ce (= Ce₂), for example *te* 'hand' ~ *ta-*, *ni* 'load' ~ *no-* (*nor-* 'to carry', *nose-* 'to carry'), *ti* 'miscanthus' ~ *tu-* (*tubana* 'miscanthus flower'). Furthermore, there are no consonant base verbs in final -d, -z, -y, -n (there are three irregular n-base verbs, see below), although verb roots exist which would have given such forms. This may be understood as base final *-d, *-z, *-n being lost before the Infinitive formant *-i and that the resulting sequence *Vi contracted to give a secondary vowel or diphthong. The Infinitive is the main derived stem of consonant base verbs and a change in that form may well have resulted in the base being restructured. Note, however, that the implications for the palatalization hypothesis of the lack of -d, -z, -y, -n base verbs in OJ are unclear, for OJ has -t and -r bases, going back to pJ *-t and *-r bases. Furthermore, at least some OJ -d, -z < pJ *-nt, *-ns; thus, *-nt-i, *-ns-i should give OJ -z-i and the absence of -z base verbs cannot be explained by palatalization.

In addition to the evidence which Whitman offers, it may be noted that whereas there are approximately 35 OJ bisyllabic words of the shape *siCV*, there are at most seven *tiCV*.⁶ This skewed distribution supports the proposed change **tiCV* > *siCV*. Further, another consequence of this palatalization is that some instances of OJ #*i-* may be from #**ni-*. Note that of the four OJ nouns of the shape *i*, two have synonyms in *nV*: *i* 'sleep' ~ *ne-~na-* 'to sleep', *i* 'you' ~ *na* 'id.', suggesting that the *i* in those two words in fact goes back to **ni*.

Medial -m-, -r-; Whitman's law.

Whitman has identified loss of -m-, -r- as follows (these regularities are known as 'Whitman's law'):

*m > Ø / V₁V₂, where V₁ is short *u, *o
 *r > Ø / V₁V₂, where V₁ is a short vowel

The following are examples of loss of consonant.

⁶ They are: *tika-* 'close' (adj.), *tini/tinu* 'black sea bream', *tiri* 'dust', *tisa* 'lettuce' (< **tiisa*); and the following complex forms: *tigwi* 'ornamental crossbeams' (< *ti* (?) '1.000' + *kwi* 'tree'), *titi* 'breast, milk' (< *ti* 'milk'), *titi* 'father' (< *ti* 'esteemed male').

'body'	<i>mwi</i>	<	<i>*mui</i>	<	<i>*mumi</i>	<=	<i>*mum + i</i>
'tree'	<i>kwi</i>	<	<i>*kʷ</i>	<	<i>*kʷri</i>	<=	<i>*kʷ + i</i>
'eye'	<i>me</i>	<	<i>*mai</i>	<	<i>*mari</i>	<=	<i>*mar + i</i>

Loss of word final -m. Finally, it might be mentioned that comparative evidence shows that proto-Korean-Japanese had word final *-m*, cf. OJ *asa* 'morning' :: MK *achom* 'id.'. Such nasals were lost before *pJ*, but reflected in the EMJ accentual class, 2.5, of the noun (see below about accent).

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