Chronological Implications in the Migration Behaviors of Sonorant-initial Characters in Peking Mandarin

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ABSTRACT

This paper submits evidence of the relative chronology deduced from the migration behaviors of sonorant-initial, i.e. Ci-Zhuo, characters in three types of tonal changes taking place between Middle Chinese of A.D. 601 (hereafter, MC) and Modern Peking (hereafter, MP). They are: (1) Ru-sheng transitions, (2) interflows between Yang-Ping, Shang and Qu, and (3) the convergent changes from these three tones into Yin-Ping. The manifested relative chronology reveals that Ci-Zhuo characters, largely speaking, began to (1) migrate out of the Ru-sheng category at a later time, (2) participate in the interflows at a later time and (3) move towards Yin-Ping at a later time. This explains the rare presence of Ci-Zhuo characters carrying the Yin-Ping tone in MP. These findings together exhibit an accord with my earlier claim (Chen 1992b-c) that Ru-sheng transitions in the language were chronologically determined rather than phonologically conditioned.

Key words: Phonology, Tones, Mandarin

Foreword.

Exceptions to sound laws are common knowledge. Yet, it is the magnitudes of the exceptions that sometimes escape our attention. In the case of the tonal

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* This paper was presented at the joint meeting of the Fourth International Conference on Chinese Linguistics (ICCL-4) and the Seventh North American Conference on Chinese Linguistics (NACCL-7) held in June 1995 at the University of Wisconsin at Madison.

evolution in Peking Mandarin, a vast amount of irregularities have been reported in my earlier works. And among them, certain patterns have surfaced; patterns distinct enough to pose as questions to the validity of certain universally accepted rules.

It has to be pointed out that the language of Zhongyuan Yinyun (hereafter, ZYYY) of AD 1324 is regarded as a legitimate link between MC and MP. This is because all the three systems represent the prestige language in northern China at different times. Whether ZYYY represents the language of Dadu (now, Beijing), Luoyang, Kaifeng, or Shangqiu, it was the standard pronunciation in northern China (Zhongyuan yayin). It is believed that the educated elite and hence the standard pronunciation always center around, or move along with, the political/cultural center of the time. Hence, the direct linkage between the three aforementioned systems of northern China. Similarly, the Guoyu (National Language) spoken in Taiwan is a direct descendant of the Biaozhun Guoyin (the Standard National Pronunciation) spoken in Peking before 1949. If ZYYY, the prestige pronunciation of Old Mandarin, is said to be incomparable with MP, then, on what basis is Qieyun, the language of Middle Chinese, comparable with MP?

Here, a brief summary of the linear relationship that runs through the three aforementioned types of tonal changes will be in order before going into the main discussion.

1. A linear relationship running through (1) Ru-sheng transitions, (2) interflows between Yang-Ping, Shang and Qu, and (3) convergent changes into Yin-Ping.

I started working on different types of tonal irregularities in Peking Mandarin, without anticipation of any inter-relationships between them. First was the convergent flows moving from Yang-Ping, Shang and Qu into Yin-Ping, and second, the three sets of interflows between those three tones. Half-way through my investigations, a prominent presence of the Qu-sheng caught my attention; that is, Qu appeared at much higher frequencies as (1) the source than as the goal in the changes studied and (2) a variant co-existing with Ru-sheng in MC doublets. That prompted me to look further into, and a little beyond, MC. As it turned out, I found linear relationships between Ru-sheng transitions, the three sets of interflows between Yang-Ping, Shang and Qu, and the convergent changes from the three tones into Yin-Ping. In other words, they are three successive tiers of changes. (Table 1 presents a number of examples showing such linear relationships.)

Table I. Assorted Examples of the Three Tiers of Changes

Type	Form	MC 601		ZYYY	Peking		Annotations
		Tone	Initial	1324	1932	1963/85	
1a.	辱	入	ńź	去-q	4 3:又讀	3	
	室	入	ś	上-q	3 4	4	
	髮	入	p	上-q	3	4	
	血	入	x	上-q	3:語音 4		xuè: xi ě（按，台北多讀 xu ě。）
	寂	入	dz	陽平-q	2	4	
1b	削	入	s	上-q	1:語音 4	1	xiāo: xuè。xiāo; xuē。
	骨	入	k	上-q	3,2,1		3: ～骼; 2: ～頭; 1: 節～眼。
	踏	入	t'	陽平-q	4	4 1*	1: ～實。　殺打
2a.	纛	入 去	d	去-q 陽平-ϕ	4 2:又讀	4	中古二讀皆左～。dú: dào。
2b.	鎩	入 去	ṣ	去-ϕ	1 4:又讀	1	shā:shài。中古二讀皆長矛也。
3a.	導	去	d	去	3:語音 4:	3	
	捕	去	b	陽平、去	3 4:又讀	3	
3b.	摟	平	l	陽平 上	2 3 1	3 1	2: ～其處子; 3: ～抱; 1: ～錢
	濤	平	d	陽平	2 1:又讀	1	
4.	正	去 平	ts	去 陰平	4 1		中古平: 正朔，本音政（去聲）。 4: ～式; 1: ～月。
	沽	去 上 平	k	上、陰平	1		去: 賣也; 上: 屠～; 平: 水名也。
	輕敲驅	去、平	k'	陰平	1		中古二讀同義。

Ru-sheng transitions had conceptually been understood or, at least, methodologically worked on, as changes between MC and the modern dialects in historical studies. But surely MC could not have been the cutting point for the very processes to begin taking place. Rather, such processes must have been going on long before the time of MC. I therefore made an attempt to trace the transitions between Ru to non-Ru occurring before MC by checking the tonal distributions within those word families in Guangyun, which contained both Ru and non-Ru characters. (The term 'word families' here refers to xiesheng xitong or Karlgren' s 'phonetic series'; that is, groups of characters sharing the same phonetic component and as arranged in Guangyun Shengxi.) I reckoned those to be the families caught in the transition; families that contained only Ru-sheng had not yet entered into the transition; those which contained all non-Ru-sheng were families with a 100% completion rate in MC of the transitions. In that sense, those families with both Ru and non-Ru characters not only constitute a corpus for the study of Ru-sheng transitions occurring before MC but also defines a time-frame on the stretch between OC and MC for my study.

That study (Chen 1992b) reveals two trends of Ru-sheng transitions in Peking Mandarin: Throughout the time-frame of my study, Ru changed predominantly into Qu, with possible subsequent progressions on to Ping or Shang, as evidenced by the multiple readings centering around Qu in Table 2a (taken from Chen 1992b; statistics revised in 1996). Hence, what I called a 'Qu-Centrality Theory for Ru-sheng transitions'. That was the Old Trend of transitions. Towards the end of MC, a new trend of transitions emerged in which Ru changed direct into Ping or Shang, and apparently more Ping than Shang, and also with possible progressions on to other tones. Table 3 (taken from Chen 1992c) presents cases in which clear division between the old and the new trends within the same families was visible.

Having examined all those types of tonal changes within Peking Mandarin since MC (Cf. References), I see the interflows between Yang-Ping, Shang and Qu as some kind of chain-reactions, or rippling effects of earlier Ru-sheng transitions. They were reshuffles of the members in the three tones for the maintenance of a certain equilibrium following the transitions of Ru into different tones at different times. As I have proven in my earlier works (Chen 1988 and to appear), after MC, Ru-sheng never changed into Yin-Ping direct; it was always via Yang-Ping, Shang, or Qu. In this light, the changes into Yin-Ping are downstream spin-offs following those reshuffles. Just like the crust of the earth has to constantly release the excessive energy trapped inside, Yang-Ping, Shang and Qu have been releasing excessive members into Yin-Ping to avoid saturation. Even

Table 2a. Tonal Distributions in the Word Families in *Guangyun* That Had Both Ru and Non-Ru Characters: Ru-sheng Transitions from OC to MC in Perspective

Types of Word Families		1		2		3	4		Total
Tonal Distributions	ping	+		+		−	+		
	shang	P+S≧5/Q+R		P+S<5/Q+R					
	Qu						−		
	Ru	+		+		+	+		
No. and % of Word Families		161	51.0%	43	13.6%	86	27.2%	26 8.2%	316 100%
No. and % of Characters		9376	70.8%	1303	9.8%	2107	15.9%	456 3.4%	13242 100%
Tonal Distribution	Ping	3787	40.4%	29	2.2%	−	87	19.1%	3903 29.50%
	Shang	1988	21.2%	49	3.8%	−	74	16.2%	2111 15.90%
	Qu	2030	21.6%	406	31.2%	569 27.0%	−		3005 22.70%
	Ru	1571	16.8%	819	62.8%	1538 73.0%	295	64.7%	4223 31.97%
Single Character Evolution: Route / Stage; Forms of Multiple Readings		83.2%		37.2%		27.0%	35.3%		Completion Rate / Whole Family Development
		Early		Late					Commencement
Old Trend	Early	R-Q	227		156		290		673
	Mid	R-Q- P	55	135	10	25			65
		R-Q-S	54		8				62 160 2187
		R-Q-S-P	26		7				33
	Late	Q- P	739	1315	6	39			745 85.6%
		Q-S	398		33				431 1354
		Q-S-P	178		—				178
		S-P	654		2			13	669
New Trend		R- P	147	282	8	25		26 60	181 367
		R- S	97		17		—	23	137
		R- S-P	38		—			11	49 14.4%

1676 215 — — 1676

Table 2b. Tonal Distributions in Reference to Syllable Initial Types in the Four Types of Word Families

Initials \ Family Types			1		2		3		4		Total	
*Vl	全清		3716	39.6%	591	45.4%	876	41.6%	153	33.6%	5336	40.3%
*Vl′	次清		1287	13.7%	247	19.0%	327	15.5%	87	19.1%	1948	14.7%
*Vd	全濁		2358	25.2%	304	23.3%	512	24.3%	58	12.7%	3232	24.4%
*N	次濁		2015	21.5%	161	12.3%	392	18.6%	158	34.7%	2726	20.6%
Vl 全清	P	平	1384	37.2%	19	3.2%	—		24	15.7%	1427	26.7%
	S	上	855	23.0%	20	3.4%	—		15	9.8%	890	16.7%
	Q	去	832	22.4%	183	31.0%	255	29.1%	—		1270	23.8%
	R	入	645	17.4%	369	62.4%	621	70.9%	114	74.5%	1749	32.8%
Vl′ 次清	P	平	526	40.8%	2	0.8%	—		17	19.5%	545	28.0%
	S	上	271	21.0%	11	4.5%	—		3	3.5%	285	14.6%
	Q	去	282	21.9%	86	34.8%	84	25.7%	—		452	23.2%
	R	入	208	16.2%	148	59.9%	243	74.3%	67	77.0%	666	34.2%
Vd 全濁	P	平	1108	47.0%	6	2.0%	—		8	13.8%	1122	34.7%
	S	上	476	20.2%	13	4.3%	—		4	6.9%	493	15.3%
	Q	去	449	19.0%	92	30.2%	128	25.0%	—		669	20.7%
	R	入	325	13.8%	193	63.5%	384	75.0%	46	79.3%	948	29.3%
Vl Vl′ Vd	Ru-T Rate**		$\frac{6183}{7361}$ = 84.0%		$\frac{432}{1142}$ = 37.8%		$\frac{467}{1715}$ = 27.2%		$\frac{71}{298}$ = 23.8%		**Ru-T Rate: completion rate of Ru-sheng transitions.	
N 次濁	P	平	769	38.2%	2	1.2%	—		38	24.1%	809	29.7%
	S	上	386	19.1%	5	3.1%	—		52	32.9%	443	16.3%
	Q	去	467	23.2%	45	28.0%	102	26.0%	—		614	22.5%
	R	入	393	19.5%	109	67.7%	290	74.0%	68	43.0%	860	31.5%
	Ru-T Rate		80.5%		32.3%		26.0%		57.0%			

* Vl - voiceless unaspirated obstruents; Vd - voiced obstruents;
Vl′ - voiceless aspirated obstruents; N - sonorants.

Table 3. Internal Verification of a Qu/Yang-Ping Dichotomy around MC in Respect to Ru-sheng Transitions and Thus the Irrelevance of the Initials as a Determining Factor

革：14 字

	全清	次清
去	4	—
入	6	4

中古前
去：p—霸，灞，欛
中古後
陽平：k—革

孛：31 字

	全清	次清	全濁
去	—	1	3
入	1	4	22

注：中古 4 個去聲字皆又讀入聲

中古前
去：b—孛，悖，誖
p—誖
中古後
陽平：b—勃，渤，淳，脖，桲，鵓，鵪
p—鵪

伏：14 字

	全濁
去	3
入	11

注：3 去聲字皆又入聲

中古前
去：b—袱，軷，伏
中古後
陽平：b—茯，洑(水回流)，伏

中古音：
伏：去—鳥菢子；又音服。
入—匿藏也。

亟：7 字

	全清	次清	全濁
去	—	1	—
入	1	4	1

注：唯一去聲字又入聲

中古前
去：k'—亟
中古後
陽平：k—殛，亟（今 jí）
g—極

中古音
亟：去—數也，讇也，又紀力切
入—疾也，又音氣。

絕：8 字

	全清	次清	全濁
去	1	2	—
入	4	—	1

注：1 去聲字又入聲

中古前
去：ts'—脆
ts—蕝（今 zuì）
中古後
陽平：ts—蕝（今 jué，又讀 zuì）
dz—絕

中古音
蕝：去—束茅表位。
入—束茅表位。

发：47 字

	全清	次清	全濁
去	1	—	—
入	45		

注：2 去聲字皆又入聲

中古前
去：p—祓，
b—軷
中古後
陽平：p—敝，紱，皷
p'—祓
b—拔，跋，鈸，魃，茇
另有：上：p—髮（1932，上；1963，去）。

中古音：
祓：去—福也。
入—除災求福，又音廢。

翟：37字

	全清	次清	全濁
平	—	—	1
上	—	—	1
去	2	3	5
入	5	4	6

注：‘嬥’字平，上，去，入各一讀。
姻 3去聲字又入聲。

中古前
去：t'—糴
φ—耀，曜
d—糴藿
d—濯（浣衣，又入聲，今 zhuó）
中古後
早 去：t'—趯
φ—躍
晚 陽平：d—糴，翟
d̂—擢，翟，濯

乍：53字

	全清	次清	全濁
平	—	—	2
上	5	—	1
去	12	—	2
入	31		

注：5去聲字又入聲。

中古前
去：ts—作
ts̤—蚱，詐，榨，咋
dz—乍，祚，阼，胙，詐
中古後
早 去：ts—柞
dz—柞，怍，酢，岝
晚 陽平：ts̤—迮，笮（姓也），咋，舴（又，t—）
dz—昨，笮（～橋）

though the first-tier changes have all been completed, the admittance of the new members coming from Ru-sheng in Yang-Ping, Shang and Qu has a rippling effect that gives rise to the second and third tiers of changes. And in this connection, high-frequency colloquial forms have been the ones with high mobility to move out of Yang-Ping, Shang and Qu towards Yin-Ping.

The three tiers of changes are the three zones for the migrations to be discussed below. The discussions, illustrations, as well as the references cited in this section provide the necessary background information, including the materials and method, for this paper.

2. Migration behaviors of the Ci-Zhuo (sonorant) characters.

The author has worked on various types of tonal changes, namely, the convergent change towards Yin-Ping and the three respective interflows between Qu, Yang-Ping and Shang (Chen 1988b, 1992a, 1994b, 1995; all statistics revised in 1996). Table 4 presents the percentages of the Ci-Zhuo characters in the various types of changes as well as in the relevant MC multiple readings which have become obsolete; an extraction of the figures are given below for easy reference.

% of Ci-zhuo Characters	Readings in the Changes	MC Multiple-Now Obsolete
Others/Yin-Ping	9.1% (72.5/799)	4.9% (17/345)
Qu/Shang	15.8% (65.5/414)	21.1% (42/199)
Qu/Yang-Ping	43.8% (141/322)	34.1% (53.5/157)
Shang/Yang-Ping	65.3% (77/118)	64.2% (52/81)

Table 4. Contents of Sonorant-Initial Characters in Various Types of Tonal Changes

Type	MC 601 →1985		Volume - No. of Characters				Sonorant-Initial Characters No.	%	Total	MC Multiple-Readings: Now Obsolete
1.	Others→Yin-P		196+184(Ru)=380	88.4%	624	78.1%	58	15.3%	$\frac{72.5}{799}$= 9.1%	$\frac{17}{345}$= 4.9%
	Others & Yin-P	Yin-P	242+2(Ru)=244	66.1%			9.5	0.4%		
		Others	124+1(Ru)=125	33.9%	175		6	4.8%		
	Yin-P→Others		50	11.6%		21.9%	0	—		
2.	Qu→Shang		97+x+(52)=153	74.6%	285	68.8%	13	8.5%	$\frac{65.5}{414}$= 15.8%	$\frac{42}{199}$= 21.1%
	Qu & Shang	→shang	113+y=153	63.2%			28	21.2%		
		→Qu	68+y=77	36.8%	129		14.5	19.6%		
	Shang→Qu		52	25.4%		31.2%	10	19.2%		
	Qu→Yang-P		48	55.8%	209	64.5%	20	41.7%	$\frac{141}{322}$= 43.8%	$\frac{53.5}{157}$= 34.1%
	Qu & Yang-P	→Yang-P	147+(14)=161	68.2%			69.5	43.2%		
		→Qu	70+(5)=75	31.8%	115		33	44.0%		
	Yang-P→Qu		38	44.2%		35.5%	18.5	48.7%		
	Shang→Yang-P		29	53.7%	68	57.6%	17	58.6%	$\frac{77}{118}$= 65.3%	$\frac{52}{81}$= 64.2%
	Shang & Yang-P	→Yang-P	39	60.9%			30	76.9%		
		→Shang	25	39.1%	50		17	68.0%		
	Yang-P→Shang		25	46.3%		42.4%	13	52.0%		

x: voiced obstruent in both Shang and Qu;

(x): voiced obstruent in Shang;

x: voiced and voicedless obstruent in Shang.

Characters of MC Ru origin and characters that have gone through Yang-Ping, Shang and Qu are not included in the figures of Type-2 changes. Characters that retain the original multiple tonal readings from MC are totally excluded.

2.1. The contents of Ci-Zhuo characters in the three interflows.

In my study of the Shang/Yang-Ping interflow (Chen 1994b), a dominant presence of Ci-Zhuo characters arrested my attention. A comparison of the three sets of interflows on the proportions of characters with Ci-Zhuo initials, as presented in Table 4, reveals amazing consistencies both within and between the interflows: the Qu/Shang interflow has the lowest percentages and the Shang/Yang-Ping interflow, the highest. Such consistencies could not have been a matter of pure coincidence.

It is particularly significant, that the percentages of Ci-Zhuo characters in the various types of changes tally perfectly with those in the respective MC multiple readings that have since become obsolete.

In my earlier papers on tonal evolution, I have repeatedly argued that Rusheng transitions in the language were not phonologically conditioned but rather chronologically determined. As proven by the large amounts of irregularities presented in my earlier papers, the syllable initials were irrelevant to the patterns of the tonal changes. Yet the highly consistent gradations in the figures in Table 4, on the other hand, suggests undeniable correlations between the initials and the tones. How do we reconcile this apparent disparity?

To adhere to my chronological argument, I shall start by looking at what I called the pace profiles of the three interflows, which refer to the numbers of movements within the various time spans (Table 5).

The ratios for movements taking place before versus after 1932 (the Biaozhun Guoyin; Standard National Pronunciation) in the three interflows are: 1:4.8 for Qu/Shang, 1:6.8 for Qu/Yang-Ping, 1:9.8 for Shang/Yang-Ping. It seems that the Shang/Yang-Ping interflow became active at a later time than did the other two interflows.

Moreover, the gradations in the three ratios are amazingly consistent with those for the Ci-Zhuo contents. The Qu/Shang interflow, which has the lowest Ci-Zhuo content, was the first one to become active. Thus, a positive correlation between the Ci-Zhuo content and late movements is visible. Hence, a tentative assumption is proposed here: Ci-Zhuo characters, generally speaking, started to participate in the interflows later than characters with other types of initials.

Table 5. Simplified Pace Profiles of the Three Interflows: Numbers of Moves* in Various Time Spans

set of Leterflow \ Time Span		MC → ZYYY (723 yrs)	ZYYY → 1932 (590 ysr)	1932-1963 (31 yrs)	1963-1985 (22 yrs)	Total
A.	Qu → (Qu, Shang) → Shang	123+52 52.6%	92+9 30.3%	43 12.9%	14 4.2%	333 100%
	Shang → (Shang, Qu) → Qu	69+7 35.5%	104+2 49.5%	29 13.6%	3 1.4%	214 100%
	Combined moves Before/after 1932	458 83.7%		89 16.3%		547 100%
	Moves/Year	0.3488		1.6792		
	Before:After 1932	1 : 4.8				
B.	Qu → (Qu, Yang-P) → Yang-P	143 48.5%	90 30.5%	57 19.3%	5 1.7%	295 100%
	Yang-P → (Yang-P, Qu) → Qu	67+ 38.1%	71 40.3%	35 19.9%	3 1.7%	176 100%
	Combined moves Before/after 1932	371 78.8%		100 21.2%		471 100%
	Moves/Year	0.2826		1.8868		
	Before:After 1932	1 : 6.8				
C.	Shang → (Shang, Yang-P) → Yang-P	32.5 32.8%	42.5 43.4%	15 15.2%	8 8.2%	98 100%
	Yang-P → (Yang-P, Shang) → Shang	30.5 38.6%	21.5 27.2%	16 20.3%	11 13.9%	79 100%
	Combined moves Before/after 1932	127 71.8%		50 28.2%		177 100%
	Moves/Year	0.0967		0.9434		
	Before:After 1932	1 : 9.8				

* Some characters have more than one move registered e.g. A → A/B → B(→ A, etc).

x: Underlined figures represent Zhuo-Shang Characters, Which are taken as Qu.

Here, it ought to be pointed out that the validity of the figures in the pace profiles for inter-comparisons between the interflows should be indubitable, as they were deduced from the same corpus and by the same method. Nevertheless, they are not highly significant for intra-comparisons within each of the interflows, because there may have been large amounts of unrecorded changes in the earlier periods.

As stated earlier, a linear relationship has been perceived in the three types of changes. If Ci-Zhuo characters entered into the interflows late, they should have behaved the same in both the earlier and later tiers of changes as well. Let us examine changes in the other tiers for verification as well as explanation.

2.2. Ci-Zhuo characters in the first-tier changes of Ru-sheng transitions.

In my study of the Ru-sheng transitions occurring before MC (Chen 1992b), I reported that the Type-4 word families contained a very high proportion of characters with Ci-Zhuo initials; 34.7% (158 out of 456 characters). And this is also the group of families whose Ru-sheng members had changed into only Ping and Shang, but not Qu, before the time of MC.

It is suspected here that Type-4 families are the last group of families to enter into Ru-sheng transition, due to a two-fold consideration: (1) This group is very small in size, containing only 26 families (8.2% of the total 316 families) and 456 characters (3.4% of the total 13242 characters); (2) They are the only families that do not contain any Qu-sheng characters, yet Ru-Qu transitions are statistically proven the predominant route.

The completion rates of Ru-sheng transitions reflect the advancements of the macro-transitions, that is, how far the families as a whole had entered into the process of Ru-sheng transitions. (In contrast, micro-transitions refer to transitions of individual members in a family.) A clear division in respect to time can be seen between Type-1 and Types 2, 3 and 4 (Table 2a) in regard to their completion rates of Ru-sheng transitions. Obviously the Type-1 families, with an Completion rate of 83.3%, had started the processes of transition much earlier than did the other three types of families, whose completion rates are 37.2%, 27.0% and 35.3%, respectively.

Such an array of rates, nevertheless, fall short of proving that Type-4 families are the latest to enter into the transition. However, as stated above, this group contains an unusually high proportion of Ci-Zhuo characters. After a subtraction of the Ci-Zhuo characters in the four types of families, perfect gradations emerge in their completion rates of Ru-sheng transitions: 84.0%, 37.8%,

27.2% and 23.8% (Table 2b).

Apparently, the Ci-Zhuo characters suddenly became hyper-active at a rather late stage. In the Type-4 families, the Ci-Zhuo characters occupied 34.7% of the total volume, as compared to 12.3% to 21.5% in the other three types of families; and their Ru-sheng transition rate was as high as 57.0%, as compared to a 23.8% average for syllables of other types of initials.

Now, there is solid statistical evidence that Type-4 families were the last group to enter into Ru-sheng transition and that Ci-Zhuo characters became active in a rather late stage. In fact, it is very probable that the Ci-Zhuo characters in the other three types of families also became active later than characters of other types of initials.

A correlation between high Ci-Zhuo content and slow movements is thus visible in this first-tier changes as well.

2.3. Ci-Zhuo characters in the third-tier changes, the convergent changes into Yin-Ping.

I have gathered a total of 624 characters that have been changing towards Yin-Ping either from other tones or from MC doublets containing a Ping-sheng reading with voiceless initials (Chen 1988b; statistics revised in 1996).

A comparison between characters with Quan-Zhuo (voiced obstruent) and Ci-Zhuo initials that have migrated into the Yin-Ping tone after MC yields the statistics in Table 6.

Table 6. A comparison of Characters from MC Voiced Obstruent and Sonorant Origins on Migration into the Yin-Ping Tone after MC

MC of categories	Non-Ru		Ru	
Time of inception	Voiced Obstruent	Sonorant	Voiced Obstruent	Sonorant
Middle Chinese (doublets)	46	6.6	0.3	1
ZYYY (1324)	7.5	1	0	0
1932	38.5	38	0.5	7
1963	1.5	12	10.3	4
Total	98.5	57.6	11.1	12

Among the MC non-Ru-sheng characters, a total of 53.5 (46+7.5) Quan-Zhuo characters had started to change towards Yin-Ping by the time of ZYYY, while only 7.6 (6.6+1) Ci-Zhuo characters had done so. In 1932, almost equal numbers of Quan-Zhuo and Ci-Zhuo characters, 38.5 vs 38, had started to change. In 1963, 1.5 Quan-Zhuo characters versus 12 Ci-Zhuo ones started the migration.

Such is a positive indication that Ci-Zhuo characters became active in the third-tier changes at a later time than did the Quan-Zhuo ones. And this is precisely because they started out late in the first two tiers of changes.

2.4. Ci-Zhuo characters in Modern Peking in general.

The above discussions provide statistical evidence to show that Ci-Zhuo characters generally started to enter into the three tiers of changes later than did characters of other initials. Let us take a look at the proportions of Yin-Ping readings for characters of MC Ci-Zhuo origin in MP, as compared with those of MC Quan-Zhuo and Qing (voiceless) origins. Here, I utilized the lists of homophones in the Chines-English Dictionary (1978, Beijing) as the corpus and calculated the proportions of Yin-Ping readings in the total readings under certain initials. As a comprehensive comparison will be unattainable and also unnecessary, I shall just display the figures for two sets of initials in MP; those for l-, m-, n-versus those for j-, q- x- (Table 7).

Table 7. Proportions of Yin-Ping Readings Under Two Types of Initials in Modern Peking:

Type 1: l-, m-, n-, MC Sonorants Type 2: j-, q-, x-, MC Obstruents			
l-	20/455	= 4.4%	45/888 = 5.1%
m-	16/267	= 6.0%	
n-	9/166	= 5.4%	
j-	168/496	=33.9%	404/1144 = 35.3%
q-	88/290	=30.3%	
x-	148/358	=41.3%	

* Source of data: the homophone lists in the *Chinese-English Dictionary* (1979, The Commercial Press, Beijing).

The three sonorant initials chosen here show an average of 5.1% (45/888) of Yin-Ping readings; where as the three obstruents show an average of 35.3% (404/1144) of Yin-Ping readings; both with small internal variations. The wide gap between the two figures is a strong confirmation that characters of a MC Ci-Zhuo origin entered the third-tier changes late and hence completion rates are

low. The ultimate reason for this was that they started to enter into the first-tier changes late.

3. Concluding remarks.

To sum up, it is common knowledge that Ci-Zhuo initials and the Yin-Ping tone are rare combinations in Modern Peking. This paper submits an explanation in chronological terms for the phenomenon. That is: (1) Ci-Zhuo characters entered into the first tier of changes (i.e. the Ru-sheng transitions) late. (2) Hence, the Qu/Shang interflow, which was the earliest to occur, exhibits the lowest proportion of Ci-Zhuo characters; the Shang/Yang-Ping interflow, which was the last one to occur, exhibits the highest proportion of Ci-Zhuo characters. (3) Therefore, there are very few Ci-Zhuo characters in the third-tier of changes (i.e. the convergent changes from Yang-Ping, Shang and Qu into Yin-Ping). This explanation is found to be in full accord with my claim that Ru-sheng transitions in the language have been chronologically determined; that is, at different times, there were different dominant patterns for Ru to change into different tones.

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（編輯部按：本文實際出版日期爲 1997 年 6 月）

北京音系次濁字聲調變化的時序

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摘　要

本文探討次濁字在三種梯次的聲調變化裡與其他聲母字的相對時序。這三種梯次的聲調變化是：一、入聲的初步舒化；二、舒化之後，去、陽平之間的對流變化；三、陽平上去三聲的陰平化。

確切的統計數字顯示次濁字在入聲的初步舒化中起步較晚。在三類對流變化裡，上去對流發生的時序最先，而次濁字的比例最低；陽平與上對流發生的時序最後，而次濁字的比例最高。在最後一個梯次的變化，即陰平化的例子裡，次濁字的比例亦是最低。因此，北京音系裡，陰平調的次濁字少見的原因就是次濁字在第一梯次的變化裡起步較晚，而後在第二個梯次的變化裡次濁字也相應的少。

本文的資料亦可證明筆者先前的看法，即入聲舒化的形式基本上並非取決於聲母的類型，而是不同的時間有不同的趨勢；其間只是數字多寡的差別，而非類型與規則上的限制。確切的統計數字顯示，次濁入聲字的舒化確是起步較晚；結果是在第三梯次的陰平化裡，次濁字的比例也特別低。

關鍵詞：歷史音韻、聲調、北京音系