

中國字調跟語調

趙元任

TONE AND INTONATION IN CHINESE¹

by

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In this brief paper, I wish to discuss some problems of methodology I have met with in the study of word-tone and sentence-intonation in Chinese.

The most obvious fact we have to recognize is that the actual melody or pitch movement of a tonal language is a different affair from the mere succession of the few fixed tonal patterns which are supposed to make up the tones of that language. It is in fact a resultant of three elements, the characteristic tones of the individual syllable-words, their influence on each other in connected speech, and the movement of pitch, which indicates the mood or attitude of the speaker. The first is usually called *tone*, or *etymological tone*, the second I shall call *neutral intonation*, and the third *expressive intonation*, the latter two together forming sentence intonation. We shall consider these in turn.

I. WORD-TONE

1. *Preliminary Survey of Tones*.—The usual method of investigating the tones of a dialect under study is to ask the informant, the speaker of the dialect, to pronounce separately a list of isolated words, and we either note down the tone by ear or let the speaker speak to a kymograph or an oscillograph for subsequent plotting into a curve. In the course of this procedure, the following problems will have to be taken into consideration.

First, in order to make sure that we have included all classes of tones there exist in the dialect studied, the word list must be made representative enough. This can be largely taken care of by making use of known facts of the tones in the dialects in relation to the tones or *sheng* in ancient Chinese. From these we can anticipate the possible ramifications of tones in the modern dialects with a fair degree of inclusiveness, as shown by the following table:

1. Read before the 145th Meeting of the American Oriental Society, April 20, 1933.

Modern		Peiping	Nan- king	Han- kow	Changsha	Soochow	Foo- chow	Canton	Yao ²
Ancient	Initial Consonant								
Tone Class									
平	Voiceless	I	I	I	I	I	I	I	I
	Voiced	II	II	II	II	II	II	II	
上	Voiceless	III	III	III	III	III		III	II
	Soft ¹					Coll. V	Lit. I	IV	
	V'd				Coll. V	Lit. IV	V	V	IV, VI
	Hard ¹								
去	Unasp.	IV	IV	IV	IV	IV	IV	V	III
	Asp. & Fricative								IV
	Voiced				V	V	V	VI	V
入	Voiceless	Majority IV	V	II	VI	VI	VI	short long vowels vowels VII VIII	I
	Voiced	Majority II				VII	VII	IX	V

It will be noted that besides the original tonal categories, what influenced the modern tones most are the *manners* of articulation of the initials, such as voicing, aspiration, plosive and nasal, etc. and that the *places* of articulation of the original initials have had little influence with changes in modern tones. It should be borne in mind, however, that the use of the so-called ancient Chinese or the language of 切韻 is only an account of the special accessibility of our knowledge concerning it, and not on account of this period being any more influential on modern Chinese than that of any other period. For instance, while we know that the sonority and aspiration are relevant factors in tonal change, we cannot decide without proof that the present tonal scheme of a given dialect depends on the sonority or aspiration of that period rather than some other period. Thus in the tone scheme of the folk-songs of the

1. *Soft* (次濁) stands for nasals, liquids and semivowels. *Hard* (全濁) stands for plosives, affricates and fricatives.

2. Y. R. Chao, *Phonetics of the Yao Folk-Songs* (搖歌記音), Peiping, 1930, pp. 164-167.

Kwangsi Yao's¹ the 陰去 subdivides into high level or high rising according as the initial is an unaspirate or an aspirate-or-fricative. But 借 is high level although it is fricative in Yao [θ'ia], because it came from an Ancient Chinese [tsia], an unaspirate. On the other hand, 到 [t'au] is high rising on account of its being an aspirate in Yao pronunciation, although Ancient Chinese had an unaspirate [tau]. Consequently, the use of this scheme for the study of tone-classes is only to be regarded as suggestive as to the classes there will be, and not to be definitive for any single case, which will have to be decided as questions of isolated fact.

2. *Nomenclature of tone-classes.*—Since by far the greatest number of known dialects follow in rough outline the four main divisions of the ancient 聲 and subdivide if they do into two classes according to the sonority of the ancient initials, the only sensible thing to do for a nomenclature of the classes of tones is to name them by their origin, 平, 上, 去, or 入, irrespective of their actual tones. For the subdivision, Western sinologists usually use the terms *upper* and *lower* for the ancient voiceless and voiced series respectively. But Chinese writers prefer the term 陰 and 陽, and I shall recommend them as preferable class names, as they are non-committal as to the actual nature of tones, for which we need a separate series of descriptive terms which should have none in common with the classificatory terms (see 3, below). This would prevent such confusions as made by at least one writer² who says that the Hakka's upper 入 is pronounced lower 入 and *vice versa*, whereas what was meant was that that class of words which have a high tone in Cantonese have a low tone in Hakka and that class of words which have a low tone in Cantonese have a high tone in Hakka. In our terminology, 陰入 is 陰入 and 陽入 is 陽入. They happen to have such and such values in such and such places, just as x may be equal to 1 and y equal to 2 in one connection, and x may be equal to 2 and y equal to 1 in another, but we should not confuse our discussions by saying that x is equal to y .

In cases where modern classes correspond to the ancient with a small proportion of exceptions, the choice of name is simple. If a whole class is redistributed among other classes, such as 入聲 in Peiping, only the names of the surviving classes will be retained, in this case, 陰平 陽平, 上, and 去, although each of these contains a minority from the original 入 class. If, however, two whole classes of subdivisions combine, then the nomenclature may need some deciding. Thus in the dialect of Wuchang, the whole of the ancient 入 combines with 陽平. Should we call this combined class 陽平 or 入? From the point of view of this one

1. *Phonetics of the Yao Folk-songs*, p. 116

2. Ch. Rey, *Dictionnaire Chinois-Français Dialecte Hac-ka*, Hongkong, 1901, p. X and throughout the book.

dialect, there is not much room for choice. But if we take a neighboring dialect, that of Changsha, we find that its 陰平 and 陽平 are closely similar in sound to the 陰平 and the class in question of Wuchang, respectively, while in addition Changsha has a 入 class distinct from all other classes. It is therefore more convenient for us to call this questionable class of Wuchang 陽平 rather than 入. It should be noted here that the comparison in actual sound here is not a concession of classification yielding to descriptions, as it was used only for the collocation of classes between neighboring dialects and consideration was only given as what kind of tone should be called by what kind of name. Another instance of ambiguity in classification is the voiced subdivisions of the 上 and 去 tones of Soochow (see above table), which combine to form one tone. From the point of view of Soochow alone, it could just as well be called 陽上去, but as it is a more common phenomenon among the dialects for a portion of 上 to combine with the whole of 去 (see first three dialects in table) as one undivided class, and would thus be considered as 上 becoming 去 the same may conveniently be applied to the case of Soochow, and we shall call the resulting class 陽去 rather than 陽上.

An interesting case of ambiguous classification touches the question of definition of a tone-class. In the city of Changchow, which is the writer's home town, there are two systems of tones, called the "gentry's speech" and the "speech of the street." In the gentry's system, if the method of pronouncing single words is used, one would discover seven classes, corresponding in the main with the four ancient tones with the voiceless and voiced subdivisions, except that ancient voiced 上 goes partly to 陽平, partly to 陰上 and partly to 去, instead of forming a separate class to complete the total number of eight. But if we observe the combinational behavior of the first of these small classes, namely those which go into 陽平, they do not behave in the same way as the 陽平 proper. Thus the character 勞 (陽平 proper) and 老 (of the class of characters in question) are both pronounced [lɑ̃] with a low-rising tone, which is that of 陽平 in this dialect. But when followed by 先生 ("Mr."), the former changes into a low level, which is what the 陽平 normally does in this tonal environment, but the latter changes into a rising tone, which in turn sounds just like the isolated pronunciation of a 陽去 in this dialect. The upshot of all this is: Without there being an additional eighth kind of tone in actual sound, there is a definable class of characters whose tonal *behavior* differs from that of all the seven classes, and if we conceive of tones from a classificatory point of view, we can properly say that this dialect does have a 陽上 which has type of behavior peculiar to itself. From a historical point of view, this condition is not likely to be a very stable one, and the class will probably not be able to maintain itself against influences of analogy.

3. *Determination of Values of Tones.*—To borrow a figure so aptly used by Bernhard Karlgren in explaining the relations between sound-classes and sound-values,¹ we can regard tone-classes as *x*'s and *y*'s in algebra and the actual movement of pitch as the numerical values of these classes.

Even here, we have to make several abstractions. Obviously, we do not concern ourselves with the absolute pitch of the tone, and consider only the pitch relative to the speaker's range of voice, so that what would be a low tone for a soprano is actually higher in pitch than the high tone of a tenor or even of a contralto.

Again, the range of pitch between different tones and within the limits of moving tones is also a variable quantity depending on force of articulation and force of vocalization. Moreover, when the range is modified by these changes, we have as yet no proof that the inflexion will change *proportionally*, somewhat as a graph drawn on an elastic band would be magnified when stretched. As our first inquiry is the most colorless average pronunciation of individual tones, our aim will be to get an average curve and range of the tone as spoken in a most colorless way.

No satisfactory method has yet been devised to obtain quickly and accurately a large number of tone-curves from which averages for class-values can be quickly obtained. The Kymographic method, such as used by Fu Liu² is extremely laborious and does not allow of statistical application. What is needed and has not been found is a device which draws automatically, not the time-displacement curves, as with the kymographs, oscillographs, etc., which have to be measured and computed and redrawn, but time-pitch curves in direct response to the sound. For lack of something better, the writer has been in the habit of using one of three things, a sliding pitch pipe, a swanee whistle, and a beat-frequency vacuum-tube oscillator with continuous pitch control over the range of human voice. In each case, the informant speaks the tone and the experimenter imitates the tone on the instrument while noting the pitches of the starting and ending positions and turning points if the tone is circumflex. This is of course far from being satisfactory, and all questions of the form of the curvature would have to be judged quite subjectively, but it serves most purposes of classification if the following points about systematic errors are attended to.

The dangers of systematic errors, or errors of interpretation, and errors of uncontrolled conditions in the study of tones are so great that all the refinements of experimental study are useless unless these are pro-

1. B. Karlgren, *Phonologie Chinoise*, Vol. I, pp. 9-10.

2. Fu Liu, *Etude Expérimentale Sur les Tons du Chinois*, Paris. 1925.

perly guarded against. In the first place, the speaker must be placed in the mood of a matter of fact information. He should not be led to feel as a pupil reciting his lessons, in which case all his tones become flattened or narrowed in range, nor feel as a language teacher impressing the distinction of the tones on the ignorant learner, in which case the tones would be exaggerated. The list of typical characters should be in random order, and should be spaced far enough in time to avoid influencing each other. It goes without saying that no two adjacent words should form possible phrases. In the writer's experience, it is also a good practice to disregard the first and last few words in a list, as the speaker has not yet decided which key he is going to speak at when starting, and he always tends to drop his voice a little at the last word, feeling that "this is the end of the list." It is usually very dangerous to ask the speaker to repeat a word, for then he would give the tone plus some kind of expressive intonation, "now I am repeating this, do you get it now?" Rather than actual repetition, the writer has found it very convenient to have the reading recorded phonographically and then analyze it by ear at leisure. The reason for having the whole list said together is to insure that the tones should be said in the same key and thus be comparable. Some speakers change their keys more readily than others, and the recorder should be constantly on the lookout. In no case should parts of one list be compared with each other if the list has been interrupted by intervening conversation. Different readings of the whole list on different occasions may of course be used together for purposes of getting an average. The standard is to space the words far enough to be out of influence of sentence intonation and yet near enough to keep a unity of key in the memory of the speaker, and this condition is not always easy to fulfil.

4. *Notation and Nomenclature for Tone-values.*—Between the extremes of class-name and class-notation in the form of diacritical or other normalized rudimentary tone-marks on the one hand, and the very detailed experimental curves of single occurrences of tones on the other, it would be rather useful to have an intermediate kind of notation to indicate the general nature of tone-values. As early as in 1857, Edkins¹ gave a list of twenty-four natural tones (our tone-values), which is sound in principle, but somewhat inconvenient in its method of division; for such an ordinary tone-value as the Cantonese 陰去, which is a middle level tone, would find no place in the scheme. The writer proposed in *Le Maître Phonétique*² a system as follows:

1. Joseph Edkins, *A Grammar of the Chinese Colloquial Language Commonly Called the Mandarin*, Shanghai, 1857.
2. "A System of Tone-Letters", *Le Maître Phonétique*, 1930, p. 24.

"Each tone-letter consists of a vertical reference line, of the height of an *n*, to which a simplified time-pitch curve of the tone represented is attached. The total range is divided into four equal parts, thus making five points, numbered 1, 2, 3, 4, 5, corresponding to low, half-low, medium, half-high, high, respectively."

In this way, there will also result a simple way of naming the tones by the figures, "11:" will be low level, "15:" will be low rising to high, "315:" will be middle-low-high circumflex. Short tones can be indicated by narrower signs (in abscissa) and extra-long tones can be indicated by wider signs, though there is usually no need of marking them in Chinese.

As the scale is relative, we cannot say how large the interval 1-5 is, or how high the pitch is. But in practice, the average is between an augmented fifth and an octave (each step being between a whole tone and a tone and half), and the pitch of 1 is about the lowest limit of the speakers voice.

II. NEUTRAL INTONATION

5. *Tonal Environment*.—Even in plain matter of fact statements, where there is no question of special expressive intonation, the tones of

Second word First word	陰平 44: ㄣ	陰上 22: ㄥ	陰去 12: ㄨ	陰入 13: ㄨ	陽平 52: ㄨ	陽去 242: ㄨ	陽入 ¹ 4: ㄨ
陰平 44: ㄣ	春天 ㄣㄣ	思想 ㄨㄣ	恭敬 ㄨㄣ	公爵 ㄨㄣ	天文 ㄣㄨ	軍隊 ㄨㄨ	驅逐 ㄣㄣ
陰上 22: ㄥ	祖宗 ㄣㄣ	水彩 ㄣㄣ	寶貝 ㄣㄣ	禮節 ㄣㄣ	野蠻 ㄣㄨ	隱士 ㄣㄨ	好食 ㄣㄣ
陰去 12: ㄨ	退婚 ㄣㄣ	信仰 ㄨㄣ	告退 ㄨㄣ	氣壓 ㄨㄣ	透明 ㄣㄨ	怨恨 ㄨㄨ	鞭葉 ㄣㄣ
陰入 13: ㄨ	雪花 ㄣㄣ or 借書 ㄣㄣ	七巧 ㄣㄣ or 借手 ㄨㄣ	窄布 ㄣㄣ or 尺寸 ㄨㄣ	竹節 ㄣㄣ or 拍劫 ㄨㄣ	惡名 ㄣㄨ or 拍球 ㄣㄨ	得道 ㄣㄨ or 僻地 ㄨㄨ	出力 ㄣㄣ or 燭盒 ㄣㄣ
陽平 52: ㄨ	檀香 ㄣㄣ	蘋果 ㄣㄣ	裁判 ㄣㄣ	洋鐵 ㄣㄣ	彈琴 ㄣㄨ	仁義 ㄣㄨ	涼藥 ㄣㄣ
陽去 242: ㄨ	護兵 ㄣㄣ	項羽 ㄨㄣ	懶做 ㄨㄣ	用筆 ㄨㄣ	閏年 ㄣㄨ	杏樹 ㄨㄨ	事業 ㄣㄣ
陽入 4: ㄨ	伏羲 ㄣㄣ	日本 ㄣㄣ	習慣 ㄣㄣ	十一 ㄣㄣ	石頭 ㄣㄨ	學問 ㄣㄨ	六月 ㄣㄣ

1. T'ao Yü-Min, "Phonetics of the Foochow Dialect", in this *Bulletin*, I, 4, 1930, pp. 163-165.

words undergo marked or even radical changes in connected speech. The influence of tones on each other, usually the second on a preceding one, is remarkably regular. Where the dialect has no marked tonic stress, such as exists in that of Peiping, one can cover practically all combinations by a systematic permutation between the tones. To illustrate we shall take the tones of Foochow, as given on p. 7.

It will be noticed that the tones changed in combination are sometimes like the old tones and sometimes have a new sound entirely. The usual way of describing this is to say that tone A when followed closely by tone B becomes a tone C. But it should be remembered that this only means that tone A closely followed by tone B only sounds as C would sound if C stood alone. If a real tone C were followed by a tone B it would not always remain having the isolated pronunciation of C but would again sound like tone D (if standing alone). And so we have 試探 [sɔ̃y₁ t'ɑ̃p₁] sounding like 徐 + 探 [sy₁ t'ɑ̃p₁]¹, 徐探 like 始 + 探 [sy₁ t'ɑ̃p₁], and 始探 pronounced [sy₁ t'ɑ̃p₁], for which there is no isolated word pronounced [sy₁].

Since tones in combination give rise to new and yet typical tones, it is necessary in our recording of typical tone values to take into account all of these. Thus, from a more concrete setting of tones in connected speech, we get a more representative idea of what a certain tone-class is. It is not an adequate description of the Foochow 上 and the Canton 陽去 as both being half-low level, or "22:." For the former is a "22:." which does such and such things when followed by such and such tones (see second row of Table) whereas the latter does nothing of the kind. There are several advantages in thus conceiving the tone-classes as a pattern of collection² of tones. In the first place, it is nearer to fact. For instance, if we consider the Peiping 上 primarily a "214:." concave-circumflex tone, we should be puzzled by the fact that not once in a long paragraph do we actually hear a 上聲 actually pronounced that way. The reason is that 上聲 is a tone which is "21:." or "11:.", low-falling or level most of the time, except when followed by another 上聲 in which case it becomes "35:." or middle-rising-to-high, and only when it is final does it have the "214:." tone. Secondly, it enables us to recognize the existence of a tone-class of which the isolated tone value cannot be distinguished from that of another class, such as the 陽上 of Changchow referred to above (section 2). Thirdly, when a value in combination is entirely new

1. The change of vowels in combination is a peculiarity of the Foochow dialect.
2. We could, if we chose, speak of *tonemes* instead of *collections*. But as we may have to consider the tone-values as tonemes when compared with the total resultant tone, neutral intonation, and expressive intonation, which resultant would then be the real tones, it is better not to commit ourselves now as to which stage of abstraction would be called the toneme-stage.

to the list of isolated tones, such as the truncated 上聲 of Peiping or that form of Foochow 上聲 which has the "35:" value, it will not be necessary to treat it as a heterogeneous addition to the list, but simply consider it as one member of the group that forms that class in question, a member which does not happen to belong to any of the other groups or classes, nor is the value of this class when pronounced in isolation.

6. *Tonic Stress*.—Stress-accent does not play any important part in most Chinese dialects. But in a few dialects, including that of Peiping, tonic stress plays such an important part that unstressed syllables not only tend to have their vowels obscured, but also lose their proper tones, and acquire a level, usually short tone, the pitch being determined by the preceding syllable. In Peiping, this neutral tone has a half-low pitch ("2:" ˩) when preceded by one of the two *p'ing*'s, half-high ("4:" ˥) when preceded by a 上聲 (thus forming together with the truncated 上聲 a complete 上聲), and low ("1:" ˩) when preceded by a 去聲. To the Peiping ear, the values "˩" and "˥" sound like a 去聲, and the "˩" sounds like a 陰平. If unstressed syllables occur in succession, then the pitch of each will depend upon what the preceding one *sounds like* according to the above rules. Thus,

打 ˩ 扮 ˩
打 ˩ 扮 ˩ 了 ˩
打 ˩ 扮 ˩ 了 ˩ 沒 ˩ 有 ˩

But

看 ˩ 見 ˩
看 ˩ 見 ˩ 了 ˩
看 ˩ 見 ˩ 了 ˩ 沒 ˩ 有 ˩

7. *Special Changes in Tones*.—While the study of the permutations and of stress will cover most of what one needs to know in order to render a fairly adequate account of the neutral intonation, or the total resultant intonation of colorless connected speech, there always remains the possibility of special kinds of intonation for which one should be on the lookout. Thus, in Cantonese, there are many words which take on special tones, known as 變音, or modified tones, when used in colloquial speech, e. g. 錢 read as [tɕ'i:n˩] in the literary pronunciation, but [tɕ'i:n˥] in the spoken language.¹

In Peiping, when words are reduplicated to form adjectives or adverbs of manner, the second syllable always takes a high level tone, as 慢慢(兒)的 [man˩ man˥ dɛ˩] Again, the words 一 and 不 have many peculiar behaviors according to the succeeding syllable, not following the

1. The 變音's are all marked by an asterisk in the transcriptions in J. D. Ball's *Cantonese Made Easy*, 3rd Ed., 1904.

general rules for tonal succession.¹ Where rules cannot cover such cases, we practically have to fall back on a purely lexical point of view and record the facts for further systematization and historical explanation.

III. EXPRESSIVE INTONATION²

8. *Existence of Expressive Intonation in Chinese*.—Owing to the fact that Western learners of Chinese tend to use intonation in a purely expressive role, writers on and teachers of Chinese have gone to the other extreme of regarding Chinese intonation as entirely fixed by word-tones. It is true that many of the functions of intonation in other languages are fulfilled in Chinese by other devices than intonation, such as the use of particles. But there still remains a good deal of pitch movement in Chinese speech which expresses moods and attitudes of the speaker in addition to the modulation of pitch due to the etymological word-tones and the more or less regular forms of neutral speech intonation when tones are joined together. So little work has been done along this line that we can only indicate briefly some of the factors that have to be considered.

9. *Logical Intonation and Emotional Intonation*.—In their work on English intonation, Klinghardt and Klemm,³ divide the expressions of speech into logical and emotional expressions, the former depending on stress and intonation, while the latter on the quality of the voice, unusual degrees of stress (or weakness), the general pitch of the whole phrase, and the tempo of the speech. Very significant is their further remark that while all these elements in the method of expression are universal for human speech, the manner of their actual application is universal only for emotional expression and would vary from language to language as to their application to logical expression. We shall see that except for the abundant use of grammatical particles in place of intonational changes, the preceding observation apply largely also to expressive intonation in Chinese.

10. *Addition of Tone and Intonation*.—We have to consider now how it is possible for speech intonation to exist simultaneously with the etymological tones. In the matter of neutral intonation, it is fairly

1. See, for instance, C. Goodrich, *A Pocket Dictionary and Pekingese Syllabary*, Shanghai, 1899, under these characters *I* and *PU*.

2. A more detailed account of this topic has been published under the title of "A preliminary Study of English Intonation (with American Variants) and Its Chinese Equivalents", *The Ts'ai Yüan P'ei Anniversary Volume* (Supplementary volume I of this *Bulletin*, 1932)

3. H. Klinghardt and G. Klemm, *Uebungen im Englischen Tonfall*, 2nd ed., Leipsic, 1926, p. 1.

simple. Each word-tone simply acquires a more or less regular modification because of its tonal environment, or, if we take the point of view of a tone-class consisting of a group of its sound-values, we can say that it takes on such and such a value when joined to such and such a tone. If, however, a falling tone should occur at a place where a rising expressive intonation is called for, then we meet with the problem of tonal addition. When an occidental student of Chinese says correctly.

這個東西 ↗好, 那個東西 ↘壞…………… I

(This thing is ↗good, that thing is ↘bad) and then goes on to say wrongly,

那個東西 ↗壞, 這個東西 ↘好…………… II

(That thing is ↗bad, this thing is ↘good)

he is simply using sentence intonation to the exclusion of word-tone. As a first approximation towards correcting his intonation, he will be told to stick to the falling tone of 壞 even though it ends a suspense-clause and to the rising tone of 好 even though it ends a conclusion. But if we observe more closely the intonation of such a succession of clauses, we shall notice even without any instrumental aid, that the falling tone in the suspense-clause does not fall quite so low, and the rising tone in the conclusion does not rise quite so high. These tones are in fact the algebraic sums or resultants of two factors, the original word-tone and the sentence intonation proper, in this case a purely logical intonation.¹

If, however, we have an example like the following,

(Do you say) this is ↗bad? It is (decidedly) ↘good!

這個 壞? 這個 好!

this first clause will also have a rising intonation and the second a falling intonation in Chinese, but the fall and rise will not be added simultaneously to the last syllables, but will be joined on successively, *after* the word-tones are completed, thus:

這個 ↗↘ 壞? 這個 ↘↗ 好!

Thus we see there are at least two types of tonal additions, simultaneous addition and successive addition, and in our consideration of the forms of intonation, we have not only to ascertain what they are, but also how they are applied to the tonal systems of the language.

11. *Some Forms of Intonation.*—In a preliminary comparative study of English and Chinese intonation,² the writer undertook to work

1. It should be borne in mind that this method of distinguishing suspense and conclusion, which is like that of English, is only *one* of the ways in which such logical import is expressed. Other methods such as prolonging the last syllable on the suspense, are also possible.

2. "A preliminary Study of English Intonation (with American Variants) and its Chinese Equivalents," *The Ts'ai Yuan P'ei Anniversary Volume*.

out some of the forms and functions of Chinese intonation as are found in Mandarin. I shall give here some illustrations of how these forms are combined with tones to form resultant speech melodies.

The forms which add simultaneously are:

- (a) ↑ General raised level of pitch,
- (b) ↓ General lowered level of pitch,
- (c) ↕ Widening of range,
- (d) * Narrowing of range,

all of which may affect either the whole or a part of the intonation group. These modifications, however, do not all apply in a simple manner to the resultant intonation. For intonation (a), there is usually, though not always, an accompanying (d), due probably to the greater effort in raising the upper limit of a normal tone than the lower limit, resulting in what may be compared to be the flattened sun on the horizon caused by differential refraction. More remarkable is the fact that when unstressed syllables following 陰平 and 陽平 normally have lower pitch (cf. 6 above), now have a high pitch, resulting in a changed pattern. Thus, a question asked for the first time.

你說什末來看？ ↘↗↗↘↘↘

(What did you say?)

will on repetition

你說什末來看？ ↑↘↗↗↗↗

(What did you say?)

Intonation (b) is nearly always accompanied by (d), because the lowest tone in a dialect being usually near the lower limit of voice, any general lowering of pitch must result in a narrowing of the range as well. A peculiar effect that often results from the effect to lower the pitch is the loss of voice at the lowest point, resulting in a sort of a grunt or sometimes a glottal stop. In such a low intonation, the *shang-sheng* of Peiping which is the lowest tone, often breaks into two syllables, as 好 [↓xɑ̃ ʔu̯], 你 [↓ni ʔi].¹

The effects of (c) widening and (d) narrowing the range of pitch are probably evenly applied to the neutral intonation without special features, so far as Mandarin is concerned, except that a magnified *shang-sheng*, which normally ends at half high, does not end quite as high as proportionally.

Two forms of successive addition deserve special attention, the rising ending and the following ending. If we use the signs ↗ and ↘ to

1. Some dialects have regular tones always pronounced this way, e. g. the 陽上 of Huang Yen in Chekiang.

represent these endings, we can best represent their effects on tones by the following formulae:

↗ 55:= 56: ↗

↗ 35:= 36: ↗

214:=216: ↗

↗ 51:=513: ↘

where 6 is to represent extra high pitch. The most interesting effect is that on the *ch'ü-sheng*, resulting in a circumflex tone. When the syllable to which the rising ending applies is an unstressed and therefore toneless syllable, it is changed into a rising tone, the general pitch depending upon whether it was originally half high (after *shang-sheng*), half low (after one of the *p'ings*) or low (after *ch'ü-sheng*).

The falling endings have the following effect:

↘ 55:= 551: ↘

↘ 35:= 351: ↘

↘ 214:=2141: ↘

↘ 51:=5121: ↘

When it applies to an unstressed syllable, it rises through one step and falls to the original level, forming a circumflex tone, except that the unstressed tone following a *shang-sheng*, which is high, falls directly downwards.

12. *Form and Function in Intonation*.—It is a well known fact that the relations between grammatical forms and functions is not that of one-to-one correspondence, but that of many--to-many correspondence. While there is in the matter of expressive intonation a greater degree of universality, as already noted by Klinghardt, the relation is still by no means quite simple. For an initial effort in gathering data in this field, we must be prepared to find the same intonation used for different functions and the same function expressed by different intonations, and also by non-intonational elements of speech. Thus the same falling ending expresses in Chinese the following functions:

(1) Enumeration:

說你多有錢↘, 說他多好看↘, 說你們多快活↘

(2) Protesting statement:

不是你↘, 是他↘

(3) Satisfaction over new situation:

乚↘, 這樣好↘

(4) Affected exclamation:

真可憐↘

On the other hand, enumeration is not only expressed by the falling ending in Chinese, but also by such devices as lengthening of last syllable, addition of such particles as 阿, [a], 咧 [lɛ]. With such cases of many-to-many correspondence, there are two directions in which further analysis can be pursued. We can try to differentiate further the forms into varieties which have so far escaped notice, such as different lengths in the falling ending. On the other hand, we can try to differentiate the functions further, such as simple enumeration, with neutral intonation and simple pauses, and impressive enumeration, which would have the falling ending. If expressive intonation were determined purely by physiological and psychological factors, the ultimate results of such analysis would be the one-to-one correlation of each function with each form, or more likely each functional element with each formal element. But even in this matter of expressive intonation, which, as Klinghardt already noted, is much more universal than that of lexical elements (phonetic elements and etymological tone), there will still probably remain a large amount of arbitrary usage, which have to be regarded as historical facts to be explained only in terms of antecedent historical conditions. Thus we see that after we have disentangled the two historical factors of (1) Etymological intonation and (2) neutral intonation from the total resultant intonation of actual spoken Chinese, the remaining factor of (3) expressive intonation will form a subject to be treated by the methods both of historical linguistics and of general linguistics.

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- (1) Enumeration:
我們家有三個小孩。我們家有三個小孩。
- (2) Prefatory statement:
不長得。是地。
- (3) Satisfaction over new situation:
廿。這。
- (4) Affected exclamation:
真可憐。