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TONOGENESIS IN SOUTHEAST ASIA

BY

JAMES A. MATISOFF

DEPARTMENT OF LINGUISTICS
UNIVERSITY OF CALIFORNIA
BERKELEY, CALIFORNIA 94720

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In the Beginning was the Sino-Tibetan monosyllable, arrayed in its full consonantal and vocalic splendor. And the syllable was without tone and devoid of pitch. And monotony was on the face of the mora. And the Spirit of Change hovered over the segments flanking the syllabic nucleus.

And Change said, "Let the consonants guarding the vowel to the left and the right contribute some of their phonetic features to the vowel in the name of selfless intersegmental love, even if the consonants thereby be themselves diminished and lose some of their own substance. For their decay or loss will be the sacrifice through which Tone will be brought into the world, that linguists in some future time may rejoice."

And it was so. And the Language saw that it was good, and gradually began to exploit tonal differences for distinguishing utterances -- yea, even bending them to morphological ends. And the tones were fruitful and multiplied, and diffused from tongue to tongue in the Babel of Southeast Asia.

1.0. INTRODUCTION

The languages of Southeast Asia, some of which are fully tonal, others of which are only marginally or incipiently tonal, and some of which are not tonal at all, constitute an ideal terrain for the investigation of the mechanism of "tonogenesis".¹

This paper is organized as follows. First come some introductory remarks on the role of laryngeal final consonants and syllable-initial voicing vs. voicelessness in the generation of tonal phenomena (1.1); then a discussion of the interrelationship among monosyllabicity, intersegmental feature-sharing, and compensatory tone (1.2). In the next section we give a brief overview of the present state of our knowledge about the tonal situation at the Proto-Sino-Tibetan (PST) and Proto-Tibeto-Burman (PTB) levels (2.1), followed by some thoughts on the areal diffusion of tones in SE Asia and the utility of tone-systems for the establishment of genetic relationship among languages (2.2).

1.1. Laryngeal States and Tonal Effects

Twenty years ago the French botanist and Orientalist André Haudricourt wrote a classic article² which addressed itself to the problem of how standard Hanoi Vietnamese acquired its six tones. This question had a vital bearing on the genetic affiliation of Vietnamese--previous scholars had held that Vietnamese belonged in the Tai family rather than in the Mon-Khmer (M-K) group,³ largely because the Tai languages are tonal while the Mon-Khmer languages are not.⁴ Haudricourt succeeded in demonstrating that the tones of Vietnamese were secondary developments arising from a breakdown of the system of consonantal oppositions at the beginning and the end of the Mon-Khmer syllable. The proto-language had syllables with final segments of three significant types: those ending in an open vowel or nasal (i.e. with no laryngeal final segment); those ending in voiceless spirants, *s or *ʃ, which had reduced to -h by pre-Vietnamese times; and those ending in some sort of stops which had reduced to glottal stop by the pre-Vietnamese period. In addition the language had a voiced/voiceless distinction for its syllable-initial consonants. See Figure 1.

FIGURE 1. Vietnamese A (beginning of Christian era)

c o n t o u r					
↑ H C H E I A ↓					
pa		pas > pah		pax > paʔ	
ba		bas > bah		bax > baʔ	
NO TONES; C _i 's and C _f 's intact ⁵					

By the sixth century, final -h and -ʔ had disappeared, leaving in their wake a compensatory falling and rising effect (respectively) on the pitch of the preceding vowel. See Figure 2. At this point the language had a three-tone system, which apparently remained stable as long as the voiced/voiceless opposition for initial consonants remained in force. But by the 12th century, the old

FIGURE 2. Vietnamese B (sixth century)

MID	FALLING	RISING
pa	pà	pá
ba	bà	bá
THREE TONES: exeunt laryngeal C _f 's/enter "contours"		

voiced series had merged with the voiceless series. The language responded to this threat to its contrastive power by doubling the number of tones from three to six; the three tones descending from syllables with *voiced initials were then distinctively lower in pitch than the three which derived from syllables with *voiceless C_i's. See Figure 3.

FIGURE 3. Vietnamese C (twelfth century)

HIGHER	pa "ngang" ⁷	pǎ "hỏi"	pá "sắc"
LOWER	pà "huyền"	pă "ngã"	pạ "nặng"
SIX TONES: exeunt voiced C _i 's/enter "registers"			

This explanation--which has gone unchallenged by subsequent scholars--presupposes the existence of certain universal phonetic mechanisms which interrelate articulatory gestures of the larynx with the production of audible tonal effects. (a) Laryngeal C_f's affect the contour⁸ of the preceding vowel's pitch, with -h acting as a pitch depressor (i.e. leading to falling tones) and final -ʔ having the opposite effect (leading to rising tones). The exact physiological causes of these effects are being worked out in de-

tail by experimental phoneticians (see elsewhere in this volume), but Haudricourt's impressionistic explanation still seems generally valid: the pitch-drop before -h is due to a "relâchement brusque du larynx", while the pitch-rise before -ʔ is caused by an "augmentation de la tension des cordes vocales". (b) Syllable-initial consonants merely affect the register of the following vowel, with voiced C₁'s provoking lower pitch and voiceless C₁'s provoking higher pitch. Again the physiological explanation for this fact involves a complex interplay of aerodynamic and articulatory factors¹⁰, but one thing seems clear: this is a universal phenomenon which obtains even in languages like English¹¹ which would never dream of exploiting such redundant pitch-differences for contrastive purposes.

In a 1968 talk¹² I roughly characterized the two basic contrasting "laryngeal attitudes" as shown in Figure 4.

FIGURE 4. Laryngeal Attitudes

TENSE-LARYNX SYNDROME	LAX-LARYNX SYNDROME
higher pitch/rising contour association with -ʔ voicelessness retracted tongue-root ¹³ "creaky" laryngeal turbulence larynx tense and/or raised= reduced supraglottal cavity	lower pitch/falling contour association with -h voicedness, breathiness advanced tongue root ¹³ "rasping" laryngeal turbulence larynx lax and/or lowered= distended supraglottal cavity

More recently La Raw Maran (1971) has persuasively proposed a small set of binary distinctive features which are intended to capture simultaneously not only the role of the larynx in the production of voiced obstruents, h, and glottal stop, but also the concomitant tonal effects on adjacent vowels. Similarly motivated features (spread vs. constricted glottis and slack vs. stiff cords) have been adopted by Halle and Stevens (1971), and are now being widely discussed by generative phonologists.

Despite the complexity of the simultaneous bundles of articulatory activities which go to make up the "tense" vs. "lax" syndromes, it seems clear that the syndromes as a whole do stand in a binary opposition to each other. Otherwise how are we to understand the oft-noted diachronic phenomenon of tonal "flip-flops"¹⁴ whereby a high tone and a low tone abruptly switch places, so that the *high becomes low, and the *low becomes high? Some sort of "alpha-reversal" of laryngeal gesture must be assumed.

Maran (1971) has noted that in Jinghpaw, a Tibeto-Burman language which he speaks natively, syllable-final stops (-p, -t, -k, -ʔ) are voiceless under the high-tone, but voiced (-b, -d, -g, -ʔ) under the low tone, inferring from this that it is the voicing contrast which is distinctive here, with the tonal difference being redundant. For several reasons¹⁵ I prefer to interpret the situation in the opposite sense. It seems to me that voicing/voicelessness has a causal effect on the tone of the adjacent vowel only in syllable-initial position. In syllable-final position the voicing or voicelessness of a consonant (at least in Tibeto-Burman) is rather the automatic, redundant consequence of a pre-existent tonal opposition, not its cause. For both -h and -ʔ are voiceless (though in rather different ways)--yet they have opposite tonal effects in syllable-final position.

1.2. Monosyllabicity, Intersegmental Feature-sharing, and Compensatory tone

If the laryngeal mechanisms we have been considering are really universal, why haven't all human languages been tonal at some point in their history, like Chinese, Burmese, or Jinghpaw? Some language families seem more hospitable to the development of tones than others, and the same goes for geographic areas of the world. It is as if the seeds of tone potential required a particularly fertile soil of a certain structural type in order to take root and flourish. In particular, it appears that to become truly tonal a language must have a basically monosyllabic structure (i.e. the morphemes must be only one syllable long). Polysyllabic languages like Japanese, Swedish, or Serbo-Croatian may develop "pitch-accent" systems, but these differ from true tone-systems in many important respects.^{16,17}

There is something about the tightly structured nature of the syllable in monosyllabic languages which favors the shift in contrastive function from one phonological feature of the syllable to another. The Tibeto-Burman (TB) languages have always been monosyllabic. The proto-monosyllable was quite complex in structure: the initial consonant could be preceded by a variety of prefixes (or even by a sequence of two prefixes) and followed by one of four glides (-w-, -y-, -r-, -l-). The vowel could be followed by any of a number of final nasals, stops, liquids, or -s, or even by a nasal or stop plus -s. Written Tibetan (WT) may be taken to preserve the proto-syllable canon faithfully, with maximally complex forms like brgyad 'eight', brnyabs 'diligence', bsnyags 'sediment'. Written Burmese (WB) syllables may have initial consonant clusters of up to three members, but no more than a single consonant in final position: mrwe 'snake', krwat 'leech', kiwak 'rat'. We may symbolize the proto-syllable canon as follows:

$$(P_1) (P_2) C_1 (G) V (') (C_f') (S),$$

where P = prefix, C_1 = initial consonant, G = glide, V = vowel, ' = vowel length, C_f = final consonant, and S = suffixial -s.

When we look at the phonological changes which these richly complex syllables have undergone through time (e.g. from WT to modern colloquial Lhasa Tibetan, or from WB to modern Rangoon Burmese, or from Proto-Lolo-Burmese to Lahu), we find that the different parts of the syllable have constantly been influencing each other: the prefixes affect the root-initial consonant, as do the glides; the glides also affect the vowel, as do the final consonants; the vowel itself affects the preceding and following consonants, etc. It thus makes little sense to ask questions like "What happens to the Proto-Tibeto-Burman (PTB) vowel *a in language X?" Rather we must specify the syllabic environment more precisely: "What is the PTB reflex of *-am, or *-ak, or *-wa, or *-ya, or *-yan in language X?" Thus, Proto-Lolo-Burmese (PLB) *-a develops into Lahu -a in syllables without a G or a C_f ; but *-ya becomes -e, and *-wa becomes -o. A nasal or stop following the PLB nuclear vowel *-a determined different Lahu reflexes for each point of articulation. Thus PTB *-am > lh. -o, but *-an > -e, and *ay > -o; *-ak > a',

but *-at > -e' and *-ap > -o'. It is for this reason that Sino-Tibetanists traditionally lump the vocalic nucleus together with any post-vocalic consonants the syllable may have, and refer to this complex, well-integrated entity as the "rhyme" of the syllable.

So tightly interdependent are these neighboring vowels and consonants, that certain phonetic features seem to have bounced back and forth from vowel to consonant and back again through the history of the TB languages. The fate of the PTB rhyme *-ik in Burmese is a good case in point. By the time Burmese was committed to writing in the 12th century, older *-ik had become -ac (e.g. PTB *tsik 'joint', WT tshigs, WB chac); that is, the palatality of the vowel had been transferred to the C_f , so that the latter changed from a velar stop to a palatal affricate, thereby depalatalizing the vowel from *i to a. What is remarkable is that this development was then completely reversed between the Old Burmese period and the modern standard Rangoon dialect, so that words written with -ac are now pronounced with the rhyme -i' (Mod.Bs. hsi 'joint'). That is, the palatality has been shifted back again from the C_f to its "original" vocalic home!

This leads us to the key question: did this complex proto-monosyllable already carry a lexically distinctive tone? The answer is far from clear at the moment.¹⁸ What does seem certain is that, given the intimate relationship between consonantal and vocalic features of the TB syllable, there must have been phonetic perturbations of the pitch of vowels due to the influence of neighboring consonants throughout the history of the family. However, as long as the consonants maintained themselves in a good state of preservation, such pitch-differences as existed were likely to have remained subphonemic--predictable, automatic, redundant. It was only when the old consonantal system had decayed through cluster simplification, losses, mergers that the daughter languages were forced to exploit those pitch-differences for contrastive purposes.

Initial consonants "decay" rather differently from final ones.¹⁹ At the beginning of the syllable, the prefixes generally found themselves in a weak position, sometimes fusing with the root-initial and often dropping entirely (see Matisoff 1972c). Before their departure, however, they were likely to have affected the

voicing or voicelessness of the root-initial consonant. Thus the glottal prefix *- or *-a- typically devoiced a following sonant, while the nasal prefix *-N- often voiced a following surd. Yet it is noteworthy that the basic TB *voiced/*voiceless opposition in root-initial position was everywhere preserved systematically, even though the phonetic nature of the contrast changed in many languages (like Burmese and Lahu) from voiced/voiceless to voiceless unaspirated/voiceless aspirated.

In syllable-final position there is a whole continuum of consonantal decay²⁰ for final nasals and stops. The three-way contrast among *-m, *-n, and *-ŋ was sometimes reduced to a two-way one, but without the remaining nasals losing their point of occlusion. (This is what happened in Mandarin Chinese, where *-m and *-n merged to -n.) At more advanced stages of decay, one or more of the nasals could lose their point of articulation, so that the feature of nasality shifted back onto the vowel, yielding a new type of oral/nasal contrast for vowels. At the ultimate stage, the nasal feature disappears altogether from the syllable; but in this case the vowel quality itself has usually already been altered differentially by the particular nasal which had followed it, so that the language does not necessarily suffer a loss of contrast.²¹

Final stops may undergo even more finely graded degrees of attrition than the nasals. The three-way proto-contrast among *-p, *-t, and *-k could be reduced to a two-way contrast without the remaining stops losing their buccal occlusion. More radically, one or more of the stops could be reduced to -ʔ--a glottal stop might be termed the "minimal stop" from this point of view. At more advanced stages the final consonant may disappear entirely, after transferring its occlusion back onto the vowel, so that the vowel has "laryngeal constriction" or "creakiness". At a still further stage even this constriction may disappear, and the only trace of the former C_f may be a tenseness in the vowel, or some other alteration in the vowel quality.²² The smile of the Cheshire cat, fading away imperceptibly.

Looking at the TB family as a whole, we find that the details of consonantal decay differ considerably from subgroup to subgroup

and from language to language, but one important generalization holds: the better-preserved the consonantal system, the fewer the vowels and the fewer the tones; the more vestigial the consonant system, the more proliferation of vowels and tones.

2.1. Redundant and Contrastive Tone in PST and PTB

Paul K. Benedict (1972a, 1972b, 1973a) has argued persuasively that even back at the remote Proto-Sino-Tibetan period the proto-language had a "phonemic" two-way tone-contrast in non-stopped syllables (though syllables whose C_f was a stop had no distinctive tone). Benedict bases his argument mainly on evidence from Chinese on the one hand, and from certain subgroups of TB on the other: Lolo-Burmese, Karen, and Nungish. Karen is extremely aberrant from the other TB languages from the grammatical point of view (for one thing, the Karen object comes after the verb instead of before it); so much so that one is tempted to set up a higher-level taxonomic group "Tibeto-Karen" comprising Karen on the one hand and "Tibeto-Burman proper" on the other. Yet as Benedict has shown, the four tones of Karen correspond systematically to the two main non-stopped tones of Lolo-Burmese, in a simple, straightforward way. Two explanations are therefore possible: either the two-way tone-contrast must be placed at least as far back as the remote Tibeto-Karen period (and thus a fortiori at the PTB period), or else the tone-system of Lolo-Burmese somehow "diffused" into the Karen languages (see next section). Benedict rejects the diffusion hypothesis (see note 40), and goes on to show that the Lolo-Burmese/Karen/Nungish²³ two-tone system can be systematically related to the two principal non-stopped tones of Chinese, the level tone (p'ing sheng) and the rising tone (shang sheng).²⁴ He therefore projects the two-way tone-system back to the PST period itself.

A serious objection to Benedict's theory is the fact that the oldest attested TB language, Written Tibetan, shows no evidence of tonal distinctions at all. In fact some modern dialects of Tibetan, like Balti²⁵, don't have tone either, or at any rate do not have fully developed tone-systems like Lolo-Burmese. (Significantly it is those dialects, like Balti and Purik, which preserve the WT syllable-initial consonants the best that have non-existent

or rudimentary tones, while those dialects, like that of Lhasa, which have a degenerate consonantism, have developed relatively complex tone-systems that are of demonstrably recent origin.²⁶⁾ Are we then to suppose that the original PTB two-way tonal contrast was lost in Tibetan before the language was committed to writing (around the 7th century), so that the language got along without phonemic tones for centuries, only to reacquire it in certain dialects in quite recent times? Given the cyclical nature of TB phonological developments²⁷ this is not as far-fetched as it might sound.

Many other modern TB languages lack well-developed tonal systems, including most members of the huge and ramified Kuki-Chin-Naga family,²⁸ as well as the Barish or Bodo-Garo group. Significantly these languages are spoken at the Western extremity of the TB family, in Assam and Western Burma. Here Benedict is willing to use areal diffusion as an explanation, accounting for the lack of tones as being due to the influence of the non-tonal languages (Indo-European and other) with which these Westerners came in contact.

A particular problem is posed by the extremely important Jinghpaw language (Kachinic group of TB). Although Jinghpaw (Jg.) is quite close to Lolo-Burmese as far as the number of shared cognates is concerned, it is very hard to relate the Jg. tones systematically to those of LB--except, paradoxically, in stopped syllables.²⁹

From the foregoing it should be obvious that we are still far from being able to give a clearcut answer to the question "Did the PST or PTB proto-syllable carry a contrastive tone?" Indeed, I personally believe that the question is rather meaningless when posed in these terms. For I view the whole process of tone-birth and tone-decay as a cyclical one, that has no beginning and has no end. A language or language-family that has a predisposition (in the sense of 2.1 above) to develop tones will indulge this predisposition at certain points in its history, but not in others, depending on the total vowel-consonant dynamics of the syllable at a given point in time. Thus we may imagine a hypothetical language at Stage A: it is monosyllabic, but the number of possible syllables

is very large, since there is a rich system of syllable-initial and -final consonants. Grammatical information is carried by a number of non-syllabic affixes attached to both ends of the syllable. Different syllables have different pitches, but the language can afford to ignore this fact, since it is having no trouble keeping its utterances apart.

Time passes, and the language enters a new phase, Stage B: its initial- and final-consonantal systems are breaking down. Affixes are dropping or being absorbed into their root-morphemes. Homophony rears its ugly head. In desperation the language casts about for ways to protect its contrasts. Although each morpheme is still monosyllabic, the language now creates bisyllabic or even trisyllabic compounds in order to disambiguate homophones or near-homophones,³⁰ so that the word is no longer monosyllabic. At the same time, "analytical" ways of signalling grammatical relationships are found. Instead of, e.g., a causative prefix s-, the language might use a separate auxiliary verb meaning "make" or "send on an errand" to convey the concept of causation. Meanwhile the number of vowels has increased and lexically contrastive tones have arisen, exploiting the previously redundant pitch-differences among syllables.

More time passes, and the language enters Stage C. Human laziness being what it is, some of the syllables in compounds are tending more and more to be pronounced laxly, slurred over. Vowels are losing their stress all over the place, and being reduced to shwa. These unstressed syllables also lose their tone, and tend increasingly to hitch themselves onto the adjacent syllable in the compound. The compounds are becoming "opaque", unanalyzable by the native speaker (cf. Eng. housewife > hussy). The same sort of thing is happening to grammatical morphemes like particles and auxiliary verbs; instead of maintaining their identity as separate words, they are fusing themselves with root-morphemes (cf. English gonna, wanna, oughta, etc.). The language is becoming synthetic again, and developing all kinds of new consonant clusters due to the fusion of once-separate syllables. Most of the old affixes left over from Stage A have long since disappeared, making way for a new crop, though enough of the old crop still remain to confuse

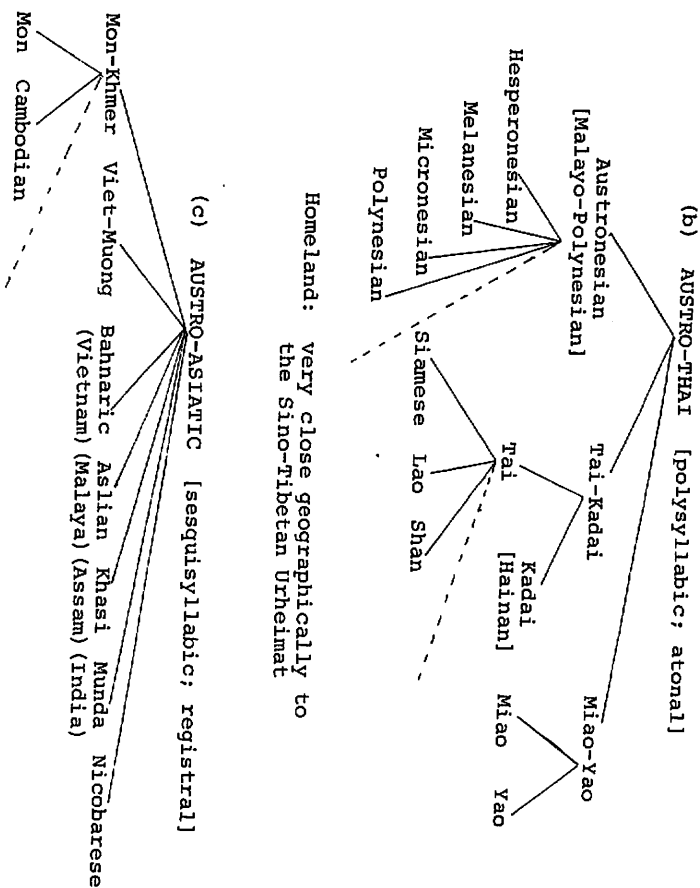
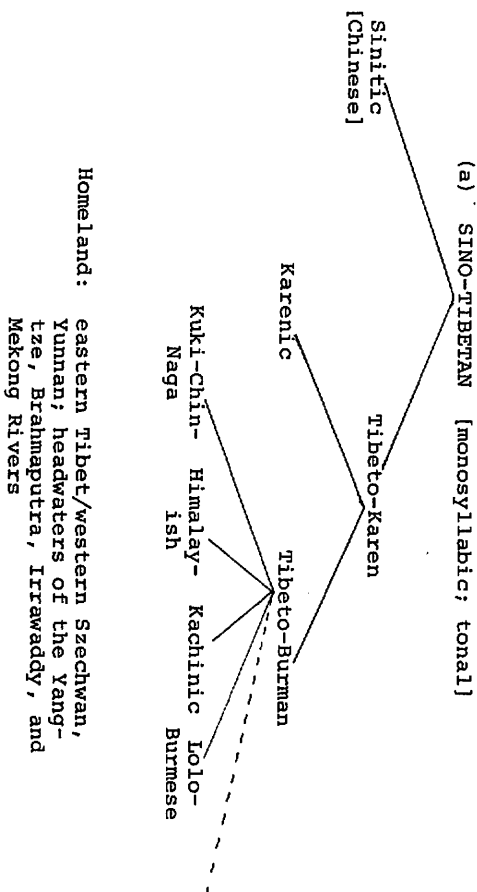
the picture. The nouveau riche consonantism of the syllable is making it less and less necessary to use the tones for contrastive purposes. Vowel-contrasts are weakening in certain areas. The language is becoming monosyllabic again.

And so it goes. Plus ça change, plus c'est la même chose.

2.2. The Areal Diffusibility of Tones and the "Southeast Asian Tonbund".

Generations of scholars have puzzled over the genetic inter-relationships of the hundreds of languages spoken in mainland and insular Southeast Asia. This is not the place to attempt to recapitulate the various arguments that have been advanced to justify one or another classificatory scheme. Let us rather accept as a basis for discussion the classification worked out by Benedict during the thirty years he has been studying the languages of the area (see especially Benedict 1972a and 1973c). According to his scheme there are only three great linguistic superstocks in the area¹: Sino-Tibetan (ST), Austro-Thai (AT), and Austro-Asiatic (AA). See Figure 5.

FIGURE 5. The Three Superstocks



The indigenous inhabitants of mainland SEA are thought to have been the AA peoples. At a very early date the Austronesian branch of the AT peoples pushed southward, eventually leaving the mainland and settling on the island chains of the South Pacific.³² Later came the Tai peoples, whose southward invasion split the Mon-Khmer speech community in two. Some Tai communities remained behind in China, as have the Miao-Yao peoples until very recent times. The last intruders were the Tibeto-Karen peoples, who fanned out southward into Assam and Burma, and in very recent times as far as Thailand and Laos.

Of these three linguistic stocks, only Sino-Tibetan is thought to have been "intrinsically tonal" (with the qualifications expressed above in section 2.1). Proto-AT, as reconstructed by

Benedict (1973c) was devoid of tone, and had polysyllabic (often trisyllabic) root-morphemes. This polysyllabic structure is still characteristic of the Austronesian (AN) branch,³³ and AN has remained without true tones to the present day. The Tai and Miao-Yao (M-Y) branches, however, have become monosyllabic,³⁴ and have developed complex tonal systems of the Sino-Tibetan type. Proto-AA had what one might call a "sesquisyllabic" structure, with morphemes that were "a syllable and a half" in length. That is, the prevocalic consonant was often preceded by a "pre-initial" consonant, as in the modern Cambodian words psaa 'market', tkiam 'jaw', ckae 'dog', knaok 'peacock'. Unlike the ST prefixes, which tended to be unstable and easily lost, these pre-initials are well-preserved in Mon-Khmer. The Mon-Khmer languages have not quite developed true tone-systems in the ST sense, but rather an intermediate sort of two-way articulatory opposition in which pitch-difference plays a role but is not the only distinguishing factor. This phenomenon has been termed "register" (Henderson 1952). Syllables in the "high" or "head" register have a creaky pharyngealized quality, are pronounced with a tense larynx and retracted tongue-root, and are relatively high in pitch. Syllables in the "low" or "chest" register have a breathy laryngealized, "sepulchral" quality, are pronounced with a lax larynx and an advanced tongue-root, and are relatively low in pitch. See Figure 4 above. Other differences in vowel quality (i.e. tongue-higher vs. tongue-lower, tongue-fronter vs. -backer, or monophthongal vs. diphthongal) also accompany the register difference. In fact, the perturbations in vowel quality have been so great, and the number of distinct vocalic nuclei has multiplied to such an extent in these languages³⁵ that the simplest "phonemic solution" is to recognize these latter phonetic differences as the distinctive features distinguishing the high vs. low registers. The pitch difference is secondary--the languages are not truly tonal in the ST sense. Perhaps we could say that the Mon-Khmer languages escaped the fate of becoming tone languages by the expedient of multiplying their vocalic nuclei.³⁶ It is perhaps no accident that these "halfway tonal" languages also have a syllabic structure intermediate between the truly monosyllabic ST and the truly polysyllabic AA types.

If the genetic picture outlined above is at all accurate, we must still offer an explanation for the acquisition of true tonal systems by the Tai and Miao-Yao languages (which derive from the atonal Austro-Thai parent stock), as well as by Vietnamese (from the only semi-tonal Austro-Asiatic stock). (While we're at it, we should also account for the fact that many western Austronesian languages (like Javanese) have acquired register systems.) The only reasonable explanation, given our genetic framework, is to assume that the acquisition of true tone systems by these originally atonal languages was activated or catalyzed by intimate cultural contact with languages which already had true tone systems: the "areal diffusion" hypothesis.

Given the complicated migrations and meanderings of these many peoples crisscrossing back and forth across Southeast Asia, we may be sure that all three logically possible contact situations occurred abundantly over the centuries: (a) AA / AT; (b) AA / ST; (c) AT / ST.³⁷

As the language of the people who have been culturally dominant in East Asia for millennia, Chinese has exerted a powerful effect on the lexicon and phonology of the languages with which it has come in contact. Haudricourt (1954a), drawing on the work of earlier scholars like Henri Maspero, showed that in lexical items which Chinese has in common with Tai and Vietnamese (through borrowing in one direction or another), the tones systematically correspond: where Chinese has level tone (p'ing sheng), Vietnamese has tones ngang or huyền,³⁸ and Tai has tone "A" (unmarked in the writing system); where Chinese has departing (=falling) tone (ch'ü sheng), Vietnamese has tones hỏi or ngã, and Tai has tone "B" (marked with the first tonal marker in the writing system); where Chinese has rising tone (shang sheng), Vietnamese has tones sắc or ngang, and Tai has tone "C" (marked with the second tonal marker in the writing system). See Figure 6.

In order for Tai, Miao-Yao, and Vietnamese to have become susceptible to tonal influence from Chinese, something must have happened to their internal structure to make them more "tone-prone".³⁹ We must assume that phonological interinfluencing on the "segmental"

FIGURE 6. Sino-Xenic Tone Correspondences

CHINESE	平 p'ing [level]	去 ch'ü [falling]	上 shang [rising]
VIETNAMESE	ngang/huyền	hỏi/ngã	sắc/nặng
TAI	A (unmarked)	B ⁽¹⁾ 𑜀𑜂𑜆𑜐 𑜀𑜂𑜆𑜐	C ⁽²⁾ 𑜀𑜂𑜆𑜐 𑜀𑜂𑜆𑜐

level (i.e. involving consonants and vowels) must have preceded the tonal influence. First of all, these non-ST languages had to become truly monosyllabic (through the loss of affixes, reduction of unstressed syllables in compounds, etc.). Then, they had to suffer disastrous mergers in their consonantal systems in order to motivate their recourse to tones to maintain lexical contrastiveness. Haudricourt (1946a, 1961) has shown how widespread disruptions of the voiced/voiceless opposition in syllable-initial position must have swept through all the language families of SEA in the early centuries of the present millennium. Two main tendencies were at work: the devoicing of previously voiced stop initials, and the voicing of previously voiceless nasals and other sonorants. Standard Thai is a typical example, with the old *voiced series becoming voiceless aspirated (merging with the old *voiceless aspirated series) and the old *voiceless sonorants becoming voiced (merging with the old *voiced sonorants).

It seems likely that the development of true tones in Vietnamese was precipitated not only by influence from Chinese, but also from Siamese as well. This indicates that Tai (and Miao-Yao) acquired their tone systems from Chinese before Vietnamese did; that is, the ST > AT influence preceded the ST-cum-AT > AA influence.

The development of register systems in some Austronesian languages may be viewed as due to AA > AT substratal influence (the "Austro-linkage") at the geographical fringes of the true-tone diffusional area.

It should by now be apparent that tonal similarities--even

regular tonal correspondences--are not to be taken uncritically as evidence for genetic relationship among languages.⁴⁰ Indeed, tonal criteria are not even sufficient to establish genetic subgroupings for languages which are already known to be genetically related. A striking proof of this is the fact that some modern dialects of Tibetan are truly tonal while others are not. Yet these are dialects of one and the same language, more closely related to each other than to any other language. Not only may tones be readily acquired by diffusion (provided that the acquiring language has been made sensitized or "tone-prone"); they may also be lost through contact with non-tonal languages (as in the case of some western subgroups of TB [cf. 2.1 above]).⁴¹

For truly is it said, "The Language gave, and the Language hath taken away--blessed be the name of the Language" [Job 1.21].

FOOTNOTES

¹This paper may be viewed as an introduction to the several articles and reviews on Tibeto-Burman tones that I have written over the past five years (see References). Despite the fact that this material is easily accessible, non-specialists might find it useful to have the main motivations of this line of research presented here in one place in relatively non-technical fashion.

The term "tonogenesis" was first used, to my knowledge, in my 1970 article "Glottal dissimilation and the Lahu high-rising tone: a tonogenetic case-study".

²"De l'origine des tons en vietnamien", *Journal Asiatique* 242. 69-82 (1954).

³See 2.2 below.

⁴Most M-K languages have "register" systems rather than "true" tonal distinctions. See below, loc. cit.

⁵Haudricourt does not commit himself as to the exact nature of these stops, symbolizing them by *-X.

⁶Throughout the rest of this paper we use the symbols "C_i" and "C_f" for "syllable-initial consonants" and "syllable-final consonants", respectively.

⁷The diacritics over the vowels are those used to indicate the six tones in modern Vietnamese orthography. The words ngang, huyền, etc. are the native names for the tones.

⁸Haudricourt's term is "inflexion".

⁹Haudricourt uses the words "hauteur" or "registre" for this concept. The word "register" has a different, technical sense when used to describe the two-way tonality opposition characteristic of Cambodian and the other Mon-Khmer languages. See 2.2 below.

¹⁰Which my colleague John Ohala has tried to make me understand on several occasions.

¹¹William Ewan has carried out experiments which confirm this for English (personal communication); see also Lea (1973).

¹²Implications of Tibeto-Burman phonological developments for distinctive feature theory", Yale University Linguistics Club, Dec. 1968.

¹³For a fascinating treatment of the relationship of the tongue-root to laryngeal activity in the production of tonal effects see Gregerson (1973).

¹⁴See Matisoff (1972b).

¹⁵See my review of Maran (1971) (Matisoff 1973c).

¹⁶The number of contrasts in a pitch-accent system is minimal (usually simply high-pitch vs. low-pitch), with no more than one syllable of each morpheme being specified for high pitch in the underlying structure. The pitches of the other syllables are typically predictable from their position in the word, or indeed from the whole grammatical construction that the word participates in. That is, the pitch contrast has a "low functional load" in distinguishing individual syllables paradigmatically.

¹⁷This seems to hold for African languages as well. Those languages which have developed the most elaborate tone systems (e.g. Bamileke) are also monosyllabic (personal communications, March 1973).

¹⁸Benedict wants to set up a two-way tone contrast in non-stopped syllables way back at the Proto-Sino-Tibetan period. For a brief discussion and some references, see 2.1 below.

¹⁹I cannot resist observing that dental decay is no more prevalent than velar or labial decay in our family.

²⁰What Maran (1971) calls "depletion of final consonants".

²¹This is what happened in Lahu, as we indicated above. (*am > o, *an > e, *aŋ > ɔ).

²²All of these stages are attested in one or another Loloish language. See Matisoff (1972b).

²³Nungish is a minor TB group that shows special affinities both for LB and for Kachinic.

²⁴The third Chinese non-stopped tone, the "going tone" (ch'ü-sheng) has been demonstrated to be of relatively recent origin. See Haudricourt (1954b) and Downer (1959).

²⁵See Sprigg (1966).

²⁶See Sedláček (1960).

²⁷See the discussion of the Burmese reflexes of the PTB *-ik rhyme, 1.2 above, and the remarks on the "tonal cycle" later in this section.

²⁸It is possible that more Kuki-Chin languages will be found to have real tone systems once they have been better recorded by modern linguists. Those Kuki-Chin languages which do have several tones (see e.g. Henderson 1968) exploit them extensively in productive morphological processes, which makes them look suspiciously recent in origin.

²⁹See Matisoff (1973d).

³⁰Instances of this process abound in the world's languages. In some American English dialects where *pin* and *pen* are homophonous, the words are replaced by the compound forms "stick-pin" /strɪkpɪn/ and "ink-pen" /ɪŋkprɪn/, respectively.

As a more exotic example, we may take the Galitsianer dialect of Yiddish, where the vowels *u* and *i* have merged, along with the spirants *s* and *š*. The words for *foot* and *fish* (standard Yiddish *fus* and *fiš*) are both pronounced /fis/. Speakers of this dialect responded by creating jocular compounds whose second members were the Russian words for 'foot' and 'fish': *fis-noge* (< Russ. *noǵá* 'foot') vs. *fis-ribe* (< Russ. *ryba*)!

³¹Leaving out the fantastically complex and archaic linguistic area of New Guinea, which is now under intensive investigation by Professor Stephan Wurm and his associates at Australian National University.

³²An interesting Austronesian people are the Chams, who remigrated back to the mainland (Vietnam) after having lived for centuries in the islands near Malaya.

³³Though AN morphemes now typically have only two syllables, not three.

³⁴The reduction of the trisyllabic proto-root occurred differently in Tai and M-Y. Tai usually dropped the beginning of the root (cf. Siamese *taa*, Malay *mata* 'eye'), while M-Y dropped the end.

³⁵According to Huffman (1970), standard Cambodian has no fewer than 31 vocalic nuclei.

³⁶Not unlike those physically weak animal species, like gerbils, whose chosen evolutionary defense against extinction is the ability to proliferate their kind rapidly.

³⁷Benedict has discussed the AA/AT contact relationship, which he calls the "Austro-linkage", in Benedict (1973b). In the AA/ST area, Shorto (1973) has assembled an impressive number of Mon-Khmer etymologies for widespread ST roots. In Matisoff (1973a) I discussed the probable M-K source for the velar "animal prefix" in Lolo-Burmese. The AT/ST interaction has been intensively studied by Benedict (1967, part 3; 1972a; 1973). Many ST words for items of material culture and technology (including objects related to writing and the calendrical signs of the zodiac) can now be shown to have an AT source. Recent archaeological findings (Chang 1963, Gorman 1971) confirm a high level of material culture in the non-Chinese neolithic denizens of northern Southeast Asia.

³⁸See 1.1 above.

³⁹It is noteworthy that Japanese, despite centuries of massive lexical borrowing from Chinese, has never shown any signs of preserving lexical tone contrasts in these borrowed items. The intrinsic polysyllabicity of Japanese has resisted any such development. (Also the geographic isolation of the Japanese islands from the mainland must have been an inhibitory factor.)

⁴⁰Benedict's rejection of the diffusional explanation for the close correspondence between the tones of the distantly related Karenic and Lolo-Burmese languages (2.1 above) is therefore open to debate.

⁴¹We might refer to this process as "tonexodus" (Lea 1973).

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