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Mayan: A Sino-Tibetan Language? A Comparative Study

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MAYAN: A SINO-TIBETAN LANGUAGE? A COMPARATIVE STUDY.

Bede Fahey

INTRODUCTION

In 1995 I had the opportunity to visit the National Palace Museum in Taipei. I had already seen photographs of the old Chinese bronzes, which caused a second take based on the perception that a Mesoamerican fingerprint was readable in the various designs of these ancient Chinese artifacts. Looking at the real bronzes for the first time however, brought that experience into a new arena, where I felt that what I had been seeing more or less casually in the photographs, was too real to be coincidental. The problem however, was an aesthetic one with no rational explanation, and I had no idea of how this recognition could be brought into the realm of science.

Two years later when the issue surfaced again, it occurred to me that what might be required, if a solution were to be found, would be to research the origins of these fingerprints in their indigenous regions, to see if the existing knowledge in these areas could trigger ideas that might lead to a satisfactory resolution. The objective would be to discover if there was a plausible mechanism by which cultural transfer could have taken place across the Pacific. On searching the literature, I found that I was a relative latecomer to the intriguing problem of transpacific fingerprinting, and that it had already instigated a considerable body of published material (see Jett 1983; Sorenson and Raish, 1996). I next found many anomalies in the anthropological literature of the Pacific Basin, the archeology in particular, and some of the problems were stated in very clear terms by the scholars themselves. I began to wonder if the anomalies themselves might be suggesting an answer, and whether or not a solution might be found to these issues if they were to be approached from a macro-regional perspective. There were clearly associations between Neolithic Asia and Pre-Columbian America, and the problem was to find the best theoretical solution to explain them.

Finally I noticed the extreme relevance of the literature on the Southern Mongoloid dispersal in solving what began to appear as a circum-pacific issue. The theoretical basis developed to explain the Southern Mongoloid dispersal could conceivably apply to an ex-migratory episode affecting the whole macro-arena of the Pacific. It began to seem possible that a plausible mechanism of cultural transfer could have been colonization. The many noticeable indicators of apparent transpacific contacts could be indicators that much of the Americas may have been colonized well after the end of the Pleistocene. The Asiatic fingerprints in the Pre-Columbian Americas could be signatures of somewhat large scale migration out of Asia owing to adaptive changes and cultural developments there during the Neolithic. If the Austronesian maritime expansion into the Pacific could be attributed to the advance of agriculture on the East Asia mainland, it would seem plausible that such a mechanism could also have generated migration along the north Pacific rim. This would provide both an explanation and an investigative paradigm. A new investigative paradigm could perhaps address the problem at a more fundamental level, in terms of addressing what the full demographic impact of these early

Holocene adaptive transitions, especially the transition to farming in East Asia might be, and whether it might be appropriate to reapply the Southern Mongoloid dispersal model to the entire Pacific rim.

Though it may not be possible to fully know the processual aspects of the advent and advance of agriculture as a human adaptation, it could be possible to observe some of the effects of the adaptation in the available data. A successful adaptation could be defined as one that leads to an increased fertility rate and hence population increases resulting in colonization. Such processes would be observable in different data sets. Straightforward statements of hypotheses about these processes in early Neolithic agricultural core regions have been put forward by Peter Bellwood (1996a, 1996b, 1997) and Robert Blust (1993), for the Southern Mongoloid dispersal, and by Colin Renfrew (1987, 1988, 1992a, 1992b, 1996), for the Indo-European expansion. These hypotheses are expressed in terms that can be tested, and hence issues of long-distance fingerprinting and macro-regional anomalies can be brought into the scientific arena. Simply put, their hypotheses state that human populations expand outwards from indigenous early agricultural CORE REGIONS such as southwest Asia and the agricultural basins of the Yangtze and the Yellow Rivers. Agricultural *dependency* in these regions represented a fundamental shift of social practices which was not easily adopted by foragers and hence the agricultural populations have generally grown at a much more rapid rate than was the case with hunter-gatherers, and expanded out of core areas and colonized new niches at the expense of hunter-gatherers. The agricultural core regions tend to be regions of high linguistic diversity (Bellwood 1996a : 288-93). Languages spoken by these populations in the new regions reflect those initially spoken at the core, and hence population spreads are traceable to their initial core via linguistic (among other) evidence.

It is worthwhile to observe the constraints that apply to population behavior under the above model. In the time domain, human beings have only been involved in agriculture for a relatively short period; namely, agriculture coincides time-wise with the Holocene, and was probably Holocene-induced. Humans began to seek new ways of sustaining a livelihood in the wake of the climate changes brought on by the warming at the end of the Pleistocene. In the spatial domain, the constraint on population spread based on an adaptation is the available habitat, which in the case of Neolithic agriculture is confined to suitable regions within the global temperate belt. An adaptive population, human or otherwise, tends to expand to fill its available habitat, and it is possible to seek evidence of what has happened to human populations during the Holocene using that line of approach. A scientific approach would ask to what extent innovative human adaptations tended to fill the available habitat globally. It might be argued, this would imply a tendency for populations having acquired adaptive innovations to migrate latitudinally, i.e., to occupy the Earth's zones most climatically suited to their particular adaptations. To what extent humans have done this is a question one puts to the evidence. The evidence is beginning to suggest that more or less east-west migration of agricultural populations had occupied suitable niches in the temperate zone globally. Agriculturalists having occupied the most suitable zones in Eurasia, had then crossed the Pacific.

The investigative domain for assessing the effectiveness of the Neolithic farming revolution as an adaptation (now reconfigured as population science) is therefore the global data. The investigative domain for mainstream scholars in the tradition of anthropology regarding Pre-

Columbian America has been the Americas themselves. The *major* reason for this seems to come from the perception that people less modern than ourselves would have neither a reason nor the capabilities to cross the Pacific. On the one hand that assumption has to all intents and purposes already been shown to be wrong by the existing scholarship on the Austronesian dispersal, but in scientific terms, it involved placing a restriction on the investigative domain based on an untested assumption.

The tradition of anthropology may have also slowed progress in understanding historical processes in Pre-Columbian America by emphasizing the understanding and explaining of *cultural change* as a primary goal. This limited emphasis has perhaps amounted to an additional intellectual restriction, whereby the major anomalies such as the great and relatively sudden cultural onsets in the archeological record of Mesoamerica may not even be explainable in terms of cultural change at all, and need a broader framework of inquiry. Cultural change, as an interpretive paradigm, does not envelope all the present fields of knowledge in these areas. We know, for example that the Mayan cultural onset is associated with a specific language group. On the other hand, linguists have known for a long time that the genesis of a language group is never sudden, and certainly never as sudden as the onsets of the major cultural complexes in Mesoamerica. The inclusion of all relevant data sets, including the field of human genetics research (Guthrie 2001 : 90-163), already makes traditional historical views of the Americas untenable, and points not only to the use of an expanded model, but to the necessity to apply such a model objectively and globally. Understanding cultural change remains a desirable objective, although under a broader model, it tends to be viewed as something rather more fundamental, i.e., as *adaptation*.

I wrote a paper, published in *Pre-Columbiana* (2001), in which I argued that many of the languages of the Americas may reflect Neolithic migration from East Asian agricultural heartlands. These heartlands probably contained a multitude of language groups which have since been overridden in the heartlands themselves, but are nonetheless preserved in the colonized zones. Hence languages spoken in the Americas, particularly those known to be descended from Pre-Columbian agricultural societies, might be compared with dispersed languages of Southeast Asia and the Pacific Islands, because some of these languages might reflect a shared common origin among the theoretically displaced languages at the core. If this general hypothesis is true, much of the ethnicity and culture of indigenous America would reflect in a more or less intimate fashion those conditions from which the ancestral people departed in East Asia, and in particular, the regions associated with the Yangtze and Huang He river basins. These languages would be primarily non-Sinitic, reflecting earlier conditions in these major regions. However, in the process of checking transpacific languages for traces of common origin under the above model I found a tendency for a great many similarities to be found between the surviving language at the core, which was theoretically responsible for the displacement, i.e., Chinese (or Sinitic), and the Mayan languages of Central America. The ensuing comparison between the Sinitic and Mayan languages (henceforward usually referred to in the singular as 'Mayan') is the subject of this paper. It explores evidence of a genetic link between Mayan and Chinese, and ultimately its language family, Sino-Tibetan.

SINO-TIBETAN

While Sino-Tibetan includes such major languages as Chinese, Burmese, and Tibetan, most of the Sino-Tibetan languages are spoken only by small communities. The total number of Sino-Tibetan languages is estimated to be around 100-150 (Peiros 1998a : 169-217).

It is widely believed that the disintegration of Proto-Sino-Tibetan took place in China, possibly in Sichuan and Yunnan. This view is problematic, because only relatively few branches of the Sino-Tibetan family are represented there (Peiros 1998a : 169-217). Peiros has proposed that the most likely homeland of the Sino-Tibetan language family would be the region of highest diversity, which is in South Asia, indicating a possible location of the homeland in the territories south of the Himalayas. A very large diversity of Sino-Tibetan speakers still live on the plains flanking the lower Brahmaputra river in Northeastern India, which drains from the north side of the Himalayas (see David Bradley 1997 : 65-71). This river valley may have provided the pathway through which the early Sino-Tibetan people, ancestral to the major continental groups, may have spread across the Himalayas. Peiros suggests that Sino-Tibetan languages reached East and Southeast Asia in the mid-third millennium BC.

The Sino-Tibetan expansion is of the order of Indo-European, but it has received relatively little attention, and more interdisciplinary investigation is needed. The implications of Peiros' view are profound. The spread of this phylum indicates an incursion into China. Before the Proto-Sino-Tibetan language broke up, the entire geographical region of Asia north of the Himalayas was occupied by people of non-Sino-Tibetan origin. Peiros places the homeland close to the fluvial plains of the Ganges River, and hence it is strongly implied that the Sino-Tibetan expansion is an additional candidate for evaluation under the Bellwood-Blust and Renfrew model. The nature and distribution of the Sino-Tibetan language spread suggests that it may have been agricultural: generated in the early Holocene in another of the world's great river basins in the region of Bangladesh and Northern India. At present there is no interdisciplinary support for any possible cause. Reconstructed proto-language lexicon, however, could already provide information about the lifeways of proto-Sino-Tibetans. A substantial number of agricultural terms can be found in the proto-language.

THE MAYA

The Mayan language family has no known relatives in the Americas, except for a proposed relation to Mixe-Zoquean, and Totonacan, which is still in need of further investigation (Campbell 1997 : 165). The sudden appearance of Mayan iconography in the record puzzles archeologists, and the onset of this highly developed language-cultural complex in the Americas is unexplained. A genetic language link between Mayan and Chinese would support interpretation of this onset as a signature of long distance colonization from China. The Proto-Mayan homeland thought to be in the Chuchumatanes Mountains is possibly as near as we can get to a linguistic signature of the arrival of the Mayan people in Central America, suggesting a place of arrival close to the mountains, somewhere on the Guatemala coast.

The Mayans must have made opportunistic use of cultagens already domesticated in the Mesoamerican area. According to the language record, Proto-Mayan speakers were already highly successful agriculturalists, with a full range of Mesoamerican cultagens (beans, squash and maize), with the maize complex extremely well developed at the core of the culture. A general Mayan language family outline is given in Appendix I (for further detail see Kaufman 1976). In the most common view of Proto-Mayan diversification, after the early departure of Huastecan, other Mayan groups began to diversify and some expanded down the Usumacinta River into the Peten region around 1000 BCE, where Yucatecan and Cholan-Tzeltalan are found. Cholan, or Cholan-Tzeltalan are thought to be the principal bearers of classic Lowland Maya culture. Later, in about CE 200, the Tzeltalan branch migrated to the Chiapas highlands, formerly occupied by speakers of the Mixe-Zoquean languages (Campbell 1997 : 162-6). I believe this view is probably quite close to the truth, primarily because of its relatively close agreement with the archeological data, which puts the diagnostic Mayan cultural onset at around 900 BCE. This implies that the Huastec and Chicumultec Maya are not associated with the characteristic Mayan culture in the archeological horizons, and could be associated with earlier horizons, possibly even the Olmec.

PART I:

THE PHONOLOGY

The primary endeavor throughout this section is to explore the true phonemic relationship between Mayan and Chinese. Phonemic correspondence has been widely recognized as a criterion for showing genetic relationship throughout the history of linguistics. Evidence of recurring regular sound correspondences is considered to be the strongest evidence of remote genetic affinity. It should be kept in mind that it is correspondences among related languages, not mere similarities, which are deemed crucial, and that correspondences do not necessarily involve similar sounds (Campbell 1997 : 213). A large number of lexical similarities between Mayan and Chinese are assembled in this section, in sound correspondence sets, according to the root initials. While most of the correspondences are actually correspondences of similar sounds, a substantial number involve dissimilar sounds, which in most cases can be related to consistent evidence of phonemic conditioning. Similarities which clearly do not fit the sound correspondences are not considered to be cognate and have been discarded. The entire comparison is focused at the level of Proto-Mayan and Old Chinese. However I have admitted a somewhat larger database into the comparison, where the Old Chinese and Proto-Mayan lexemes are not available. It appeared that several Mayan word roots exist in Sino-Tibetan, but not in Chinese, and several Old Chinese words appear to have cognates in one or more of the Mayan branches, but not in Proto-Mayan. Such comparisons are made viable by the fact that the full system of sound correspondences for the Mayan dialects and five Sino-Tibetan languages including Chinese already exists, and dialectal comparisons are made only where their phonemes can be traceable via the sound charts to the appropriate corresponding phonemes in Proto-Mayan and Old Chinese. In other words the principle of sound correspondences applies throughout. The Mayan sound correspondence chart is given in Appendix I. The Sino-Tibetan

correspondences can be found in the Sino-Tibetan comparative vocabulary of Peiros and Starostin (1996). Sino-Tibetan roots given are keyed to the Mayan via the Chinese, i.e., I have given the root where it is already established by Peiros and Starostin as involving the particular Chinese lexeme under comparison. Such cases establish a Proto-Mayan to Proto-Sino-Tibetan phonemic correspondence category, where further comparisons may be made in the absence of a Chinese counterpart.

Three levels of comparison are made. The first level compares already reconstructed roots for both Proto-Mayan and Old Chinese. The second level involves reconstructed forms from the major branches of the Mayan group. The third level involves comparisons involving unreconstructed forms in Mayan dialects, and sometimes Middle Chinese is used when Old Chinese is not available. At the second and third level due care is taken to ensure that the entry is phonemically compatible with Old Chinese or Proto-Mayan, and this can be verified using the sound charts in the appendix. Comparisons at the second and third level have enabled a considerable extension of the data field, which has helped to support some sound correspondence categories that might have been difficult to solve otherwise. All roots given are proposed to have existed in a larger Proto-Mayan or Old Chinese lexical inventory, but only the first level can be attributed with relative certainty to the proto-language. The other levels nonetheless constitute reasonable, and sometimes compelling evidence that the lexeme must have existed at the level of a common proto-language. These levels are considered quite important as each lexeme involved could be a survival that the other languages have lost, thus helping to reconstitute a larger lexemic inventory for the proto-language.

OLD CHINESE RECONSTRUCTION

For the purpose of this paper, Old Chinese is defined as the language of the Early Zhou (the Western Zhou, ca. 1050-770 BCE), as reconstructed from bronze inscriptions and transmitted texts whose major portions seem to come from that period: the *Shijing* or Book of Songs, and the *Shujing* or Book of Documents, the *Yi Zhuo shu*, ch. 37, whose origin is apparently early Western Zhou (Shaughnessy 1981), and the oldest parts of the *Yijing* or Book of Changes (Schuessler 1987). The basic methodological principle of Old Chinese reconstruction makes use of a systematic relationship between the rhymes of the Book of Songs and the phonetic series which underlie Chinese script. Research on the phonology of Old Chinese was initiated by Chinese philologists in the 16th to the 19th centuries (Sagart 1999 : 1-7). A twentieth-century pioneer in Old Chinese reconstruction was Karlgren (1940, 1954, 1957), who provided the foundation for a system that has been much discussed and improved by scholars such as Pulleyblank (1962), Li Fang-Kuei (1971), Jakhontov (1959-60), Schuessler (1987), Starostin (1989b), and Baxter (1992). I use the reconstructed Old Chinese lexicon of Axel Schuessler as presented in the *Dictionary of Early Zhou*, and follow the practice of Schuessler of placing his reconstructions alongside Li's for comparison. All the above scholars have used a systematic approach in their work, even though their interpretations may vary. It is not difficult to cross-examine the different interpretations and see that each one reflects a system of approach that is to some extent common to all. Thus it is not the exact phonemic correctness of the particular phoneme that is deemed most crucial, but the fact that that any particular phoneme is consistently reflected as a phonemic category throughout the entire Old Chinese lexicon. Schuessler himself

has cautioned that individual (roman alphabet) letters in his reconstructions are more like cover symbols than phonetic renditions. Hence we are dealing with potentially inexact phonemic approximations given by the letters, but primarily the letters are seen to represent phonemic categories which are systematically derived from both the *Shijing* and the phonetic series within the Chinese script. The assumption of systematic regularity is here considered sufficient information from which to derive a correspondence system. Because the phonemic interpretation of a given category may vary from one scholar to another, it would not be considered fair practice to use reconstructions from different scholars, and I have stayed with Schuessler's system (alongside Li's as a secondary reference) throughout. Others, particularly Starostin's, are brought in only as a secondary comparison, when the phonemic category for the comparison is already established under Schuessler's system. For these reasons it can be seen that any attempt to standardize the orthography across the comparison would be premature and counter-productive, and I have stayed with the original authors' orthography throughout. A few advisory notes on how to approach the orthography are given in Appendix II.

I have chosen to use Schuessler's data as the primary source for several reasons. First of all, Schuessler has provided a sufficiently large database in the *Dictionary of Early Zhou (DEZ)*. A relatively large database has been crucial for sorting through the complexity of the correspondence sets. Secondly, Schuessler's entries in the *DEZ* represent an attempt to reestablish the oldest layer of Old Chinese, and therefore are to be thought of as more adequately representing the language of the period of the Western Zhou. Thirdly, Schuessler's presentation has included an abundance of information on precise meanings and usages of words, which is essential to making valid comparisons. It enables, in many cases, the comparison of many words which are not only similar in general semantic terms, but which are remarkably similarly nuanced. Fourthly, Schuessler has tentatively attempted to improve on Li Fang-kuei's reconstructions by providing more phonemic distinctions. Each OC entry in the comparison consists of Schuessler's reconstruction, which is sometimes preceded by Li Fang-kuei's reconstruction where I feel that Li may have provided additional information that is phonologically relevant. Where only a partial syllable is added, the additional partial portion is Li Fang-kuei's. This procedure is systematic and requires no further notation, besides the asterisk and italics.

It may be asked why include Li's reconstruction at all, if Schuessler's represent an improved revision? The answer is that it is not always necessarily so, and there may be cases where Li has proposed something which is possibly more correct, and thus the pairing enables an immediate review. Of special interest are cases where Karlgren's and Li's final *-g are replaced in more recent systems by an open syllable. These cases more often than not correspond with a Mayan (voiceless) velar stop, and I have tentatively set them up accordingly. Cases also exist among the initials, particularly voiceless laterals (*hl~) in OC, where the Mayan appears to be in greater agreement with Li's OC and with Middle Chinese. This could point to an anomaly of reconstruction, rather than coincidental 'convergence'.

It has been generally assumed that the root syllable finals have been reconstructed with more reliability than the initials. This is because two data sources, that is, both the rhymes of the *Shijing* and the phonetic series in the script, have contributed to the reconstruction of the final, whereas only the phonetic series have been used in reconstructing the initial. However, for some

reason I have found somewhat more difficulty in establishing the correspondences on the finals, and I have made comparisons reflecting this margin of doubt, and therefore are in need of further clarification. Comparisons involving cases where the root final is in clear disagreement have been rejected, and entries are made which I feel may provide data towards narrowing the margin of doubt. Regarding the initials, although there is still unquestionably some refinement needed, and some doubts remain, there is a rather closer resolution of a full correspondence set. Vowel correspondences are not resolved. Although a general correspondence pattern appears to exist, there appear to be some complexities involved that require further refinement in order to be clarified.

All the Middle Chinese reconstructions in the following comparisons are from Pulleyblank's *Lexicon of Reconstructed Pronunciation in Early Middle Chinese, Late Middle Chinese, and Early Mandarin*. These are considerably more reliable than Old Chinese reconstructions and represent the sound system of 'Standard Chinese' as spoken as far back as A.D. 601 (Pulleyblank 1984, 1991) and are therefore included as a valuable comparative reference.

THE SYLLABLE

Proto-Mayan roots and Old Chinese (OC) lexemes are essentially, but not entirely, monosyllabic. Laurent Sagart (1999 : 20) has presented an explicit theory of root structure for Old Chinese, which will serve as a starting point for a comparison with Mayan root syllable structure. In his system, Old Chinese roots consist of four segmental positions: initial consonant, vowel, final consonant, and a final position which may be occupied by a glottal stop, the last two being optional:

$C_1V(C_2)(?)$

The glottal stop occurs only after resonants, whether vocalic (V) or consonantal (C₂). A root may be preceded by a prefix or prefixes, and followed by a suffix or suffixes. This proposed OC root structure transcribes into the Mayan in the following way: in the few cases where the final resonant/glottal stop combination occurs, this corresponds in Mayan to a simple stop. A further correspondence in root structure is obtained by observing that Mayan root syllables *always* carry a final consonant, but sometimes show the loss of the initial consonant. Therefore the proposed Proto-Mayan (PM) root structure is: (C₁)VC₂, and the proposed OC : PM structural correspondence is:

Old Chinese: $C_1V(C_2)(?)$: Proto-Mayan: (C₁)VC₂

I infer a simplified root structure for the proto-language: proto-Mayan-Chinese:

Proto-Mayan Chinese: C_1VC_2

This proposed proto-language root structure shows that by the stage of Old Chinese and Proto-Mayan, phonemic losses had occurred primarily in the root final position for Chinese, and

in the root initial position for Mayan. This would help to enable the reconstruction of both initial and final consonants for the proto-language.

The above simple root structure serves as a primary comparative model, but a few considerations must be kept in mind. It is not possible to deduce that either Old Chinese or Proto-Mayan were *entirely* monosyllabic in their root structure. Even though the Mayan languages are overwhelmingly monosyllabic in their root structure, a clear tolerance for the use of disyllables is evident, and the same could be said of Old Chinese (Victor Mair, personal communication). Some disyllables can be reconstructed at the level of Proto-Mayan: *aʔtz'aam, 'salt', *iSk'aq, 'claw' and *ihtz'iin 'younger sibling' (cognate with Tibetan ṽcuñ-po, 'younger brother'?). Some of these could possibly have monosyllabic cognates, for example, Chinese: 'salty' cuó 齎; Early Middle Chinese (EMC) dza, and Tibetan: tswa 'salt'; and the Sino-Tibetan etymology carrying the final '~m': *[c]um 'salt', is extensive, e.g., Jingpo: žum, and Lushai: tšhum. This is in keeping with what is believed to have been Proto-Sino-Tibetan word structure. The Proto-Sino-Tibetan word is believed to have had three parts: the presyllable, the root (major syllable) and the postsyllable. Only the roots, and to some extent the postsyllables have been reconstructed in Peiros and Starostin's *A Comparative Vocabulary of Five Sino-Tibetan Languages*. Thus it is almost entirely monosyllabic roots that are available for comparison, and these are compared to what appears to be the major root syllable in Mayan. Hence the C₁VC₂ root structure referred to above represents only the root or major syllable, and the present objective involves establishing cognacy between such root syllables. Nonetheless, a significant amount of root simplification is assumed to have taken place across the Sino-Tibetan spectrum. A certain amount of evidence can be gathered to show that this happened in Mayan, and the process must have affected Chinese as well. Therefore a degree of polysyllabicity is assumed to have existed in the proto-language, in keeping with the Sino-Tibetan model. These phonemic and syllabic losses must be taken into account when we reconstruct the lexical forms of the proto-language, if we are to arrive at forms which are as close as possible to the actual form of each lexeme at the time the proto-language was spoken. Hence the above polysyllabic forms are probably more compatible with the proto-language. The cognate roots for 'night', OC: *ljakh and PM: *ahq'ab' (possibly a compound) thus might suggest a proto-language pronunciation like *l(j)ahq'a(b)'. Though no direct evidence exists for a proto-language final *~b', the OC voiceless aspiration *~h could suggest a vestigial final syllable, in this case.

An additional consideration is that V in the root structure above refers to the vocalic segment and could refer to long vowels and short vowels, and a number of diphthongs which probably existed in the proto-language. Moreover, C is not restricted to a single consonant as in Sagart's system, but for comparative purposes can also optionally represent a consonant cluster. In particular, the issue of consonant clusters refers to reconstructed Old Chinese medial *-r- and *-j-, which can be seen in the following examples: gōng 宮 *kǰəwŋ (palace, mansion), and: bó 帛 *bərak (silk cloth). One of the reasons I have chosen to use Shuessler's data is that it includes the medial *-r- and *-j- in Old Chinese. These could thus be assessed for any role they may have played in conditioning sound change. There is some suggestion in the comparative evidence that these may have been already present in the proto-language, though in Mayan these were almost always lost. These medial *-r- and *-j- were lost without leaving any trace following many consonants, for example labial (b, p) and glottal (?) stop initial consonants, and in other cases

there is evidence of either retention, or phonemic conditioning, which produced different sounds entirely. This loss of these medials is one of the several aspects of the phonemic simplification in Mayan which is visible in the Chinese : Mayan correspondences. These OC medials (*-r- and *-j-) are reconstructed from distinctions existing in Middle Chinese. The actual phonetic correlate of the symbol *-r- in Old Chinese remains uncertain, and is simply a convention in OC reconstructions to represent possible options in Old Chinese that may have given rise to the Middle Chinese (MC) feature (Peiros 1998 : 187-88). It should therefore not be assumed necessarily that *-r- represents a rhotic, but it nonetheless could be interpreted as a sound capable of performing the conditioning role it has apparently played in the Mayan correspondences, where in many cases the Mayan forms are actually more similar to the Middle Chinese, for example: xué 學 MC: yœ:wk (to learn, study), is more like Mayan: xok (Itzaj) (read, study) than OC: *gərəwk. The medial *-j- on the other hand appears somewhat differently in the correspondences, and appears not to have played a major conditioning role but may have been retained following alveolar or retroflex stops (eg., t, tʃ), for example, OC: 'broil' *tjak corresponds to PM: 'cook' *tyaq', and has other possible associations as well.

The Sino-Tibetan roots given here are from *A Comparative Vocabulary of Five Sino-Tibetan Languages* by Peiros and Starostin (1996). All reconstructed Mayan entries are from Kaufman and Norman's: "An Outline of Proto-Cholan Phonology, Morphology and Vocabulary" (1984 : 77-148). Mayan entries are confined to one column. Proto-Mayan reconstructions are given in italics. Branch level reconstructions are in normal type but marked with an asterisk. No asterisk indicates an unreconstructed dialectal lexeme. The information is arranged according to Proto-Mayan initials. Branch and dialectal initials are traceable via the Mayan sound chart in Appendix I, to their parent (Proto-Mayan) initials. A large portion of entries in this paper are from the Itzaj Mayan dialect of the Yucatecan branch. Unlike Yucatec, its robust neighbor to the north, the dialect of Itzaj has been threatened with extinction. Partly in response to the Mayan revitalization movement, which began in Guatemala in the late 1980's, and involved the Itsaj in the 1990's, a large and reliable database was successfully compiled by Hofling and Tesucun: *An Itzaj Maya-Spanish-English Dictionary* (1997). This database has proved invaluable in extending the comparison, though it should be said that Itzaj occupies no special position as far as the comparison is concerned, and use of other Mayan branch dialects and reconstructed databases could further refine and extend the comparative work. All of the above sources provide easy look-up access for each entry and no further reference notation is required. Data drawn from other sources is appropriately referenced. Glosses are usually given in one column. Where the Mayan meanings are different, they are given on the right of the slash: /, or, if space does not permit, in the far right column. The Mayan and other abbreviations are given in Appendix I.

Proto-Mayan *p~ and *b~

Apparently no clear correspondence distinction can be drawn between *p~ and *b~, and possibly no contrast existed in this category in Proto-Mayan.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
wall / mud wall		bǐ 壁		pejk	*pahk *pähk'	Tze; Chol
to turn the back		běi 北	*pək	pək	*paq	bend face down
female pig, sow		bā 豕	*pəra	pai / pɛ:	p'ex	Itzaj
go out, start out	*P(r)öt	fā 發	*pjat *mpjat	puat	p'ät	Itzaj
to run away: 1	*pjā(H)	bū 逋	*pag *pa	pɔ	*pahs	leave, go out; Cholan.
to weed		biāo 廩	*pjagwx *pjaw	piaw	paak	Itzaj
split, break	*ph(j)ǎj	pò 破	*phajh	p ^h a ^h	pa'	Itzaj
stick to /stick: 2		fū 附	*bjugh *bju?(h)	buǎ ^h	*pāk'	Cholan
sow, broadcast: 3		bò 播	*parh *pajh	pa ^h	*pāk'	Cholan

1.) ST: *pjā(H) 'to run, hurry'; *P(r)öt 'remove'.

2.) GTz. & LL: *pak' 'smear, stick, paint'. Like the word 'to plant' below, this is possibly a member of a word family based on the 'spread' root. Itzaj: pāk' can have any of the following meanings: 'wall'; 'to plant'; 'to plaster'; 'to spread (disease)'. In the Shi 223, 6: 'If you plaster, the plaster sticks tight' (*DEZ* p.181).

3.) Cholan 'to plant, sow': *p~ *pāk'; LL: pak'; Itzaj: pak', pāk'.
ST: *bjārH; OC: Starostin: pār(s) 'throw, scatter'.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
walk / road, walk		bù 步	*mbah	bo ^h	*b'eeh	
fragrance		fū 馥		buwk	b'ok	smell, odor; Itzaj
dried meat / meat		fū 脯	*pja?	puǎ'	*b'aq'-eet	WM & Yuc
hew, cut / axe		fá 伐	*bjat	buat	baat	Yucatecan
one hundred		bó 百		pɛ:jk	*b'ahk'	four hundred; LL&Gtz
clothing	*Pǎk	fú 服	*bjək	buwk	*b'uhq	
wrap		bāo 包	*pragw *parəw	pɛ:w	*b'aq'	
thin	*pā	báo, bó 薄	*bak *mbak	bak	b'ak	Itzaj
tray, dish / spoon 1	*pan	pán 槃	*ban	ban	*paan	Cholan
food in the mouth 2		bǔ 哺		bo ^h	*b'ug'	PM: 'swallow'

1.) OC: 槃 *ban 'tray, dish, basin'; Mayan, Cholan branch 'large spoon, ladle': *paan *pan (LL & Gtz); pan (Kekchi).
ST: *pan (~ b-), 'tray, vessel'.

2.) Also 'eat': bū 餹 MC: bo. Starostin reconstructs 哺 as OC: *bās. The pair: bū 餹 'eat', and bǔ 哺 'food in the mouth', are Chinese cognates (Karlgren 1940 : 154).

ST: *wā 'chew, bite'.

In the following cases, it is most likely that the Mayan final ~ch goes back to a Proto-Mayan velar stop: ~k, or ~k' (see Appendix I (iii)).

	ST	Modern Ch.	Old Chinese	MC	Mayan	
back	*bhāk	bèi 背	*pəkh	pəj ^h	pach	Itzaj
turn the back		bèi 背	*bəkh	pəj ^h	pech	(lie down) Itzaj
to protect: 1		bǎo 保	*pəgwɣ *pəw?	paw'	b'ooch'	Itzaj

1.) Itzaj: b'ooch' 'protect against rain or snow'.

Also Karlgren (1940 : 357) gives: p'ai 稗 OC: *b'ěg 'fine rice', which is probably cognate with PM: *b'aq' 'seed' and *b'aqal' 'corn cob'.

Not in Chinese:

'uproot': ST: *bok : 'uproot': PM: *b'oq

'top, upper part': ST: *pə(w) : 'head': PM: *p~ pol

Tibetan: *dbu* 'head'; Burmese: *əpaw* 'top'; Jingpo: *bo* 'the head'; PK: *p[ú]-jV.

'nail': ST: *P(r)i (-e, -ej) : 'nail': PM: *b'aj~ b'ej (Itzaj)

Proto-Mayan *t(')~

Old Chinese: *t(h)~, *d~ : Mayan *t(')~

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to put up, build 1	*tjip	dā 搭		tap	*t'äb'	Chl; to rise, go up
anchor stone / stone		dǐng 碇		tejn ^h	*tooy	
sit down 2	*tún	dǐng 定	*dijh	dējn ^h	*teem	seat
to wrap 3	*[tjūp	da 搭		tāp	*tep'	Ch&LL
need 4		děi 得		tək	tak	Itzaj: want
forehead, face / chest 5	*tiāŋ	dǐng 定	*tiyh	tejn ^h	*tahn	Cholan branch
eagle 6	*fiwH	diāo 鷲	*tiəw	təw	*t'iiv	
bright / hot		dī 的	*tiawk *~kw	tejk	*tiqaw	
soil / shit		tǔ 土	*tha?	t ^h ɔ'	*ta?	Cholan br., LL: taa?
to turn over		dǎo 倒	*taw?(h)	taw'	*t'el	LL&Gtz
drop, fall		diào 掉		dew'	*t'ul	Greater Cholan
great words / word 7		dàn 誕		dan'	*t'an	Cholan; LL: *t'aan
fall down		tā 榻		t ^h ap	tab'	Itzaj: to fall into a trap
to go to, arrive / send		dào 到	*tagwh *tawh	taw ^h	*tag	

- 1.) ST: *tjip 'to mount'; OC: Starostin: *tāp.
- 2.) ST: *tūŋ 'sit, stay'; also: děng 凳 MC: təŋ^h 'bench, stool'. Comparison of both characters and phonetics suggests Chinese 'seat' and 'stone' are related.
- 3.) ST: *tūp 'wrap, bundle'; MC: tēp 'a girdle, wrapper' is from Pieros & Starostin, 1996: II: p.151.
- 4.) Cf. ST: *tōk 'obtain, get, gather'; dé 得 OC: 'find' *tək, MC: tək; PM: 'find' *tah.
- 5.) Itzaj: 'forehead': t'a'; 'front of body': taan
- 6.) diāo 鷗, not in the *DEZ* but identical with diāo 彫 *tiəw.
- 7.) Cf. ST: *dōn 'answer'. Tibetan: *than* 'answer'; Jingpo: *than* 'answer'; Lushai: *chon* 'to answer, speak to'; PK: *d(h)an* 'say, talk'. Pieros & Starostin do not include the following, but they could also belong to this etymology: PLB: *day* 'words, speech' (Matisoff 1988 : 653); Tibetan: *don* 'sense, meaning' (Jaschke 1998 : 258); Chinese: dǎn 亶 *tanx *tan? 'sincerity, truth'; MC: 'great words'.

Old Chinese: *th~, *d~, [*hl~]; Middle Chinese *t^(h)~, d~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to cut	1 *thrək	fī 剔	*thik *hlik	t ^h ejk	t'ok	Itzaj
when / until		dài 迨	*dagx *glə?	dəj ^h	tak	Itzaj
rabbit	2	tù 兔	*thagh *hlah	t ^h o ^h	*t'uʔl	LL&Gtz

- 1.) Itzaj: t'ok is used primarily in the sense 'to cut, harvest', cf. 苴 薙 MC: t^hej^h 'to mow, cut grass or weeds'.
- 2.) This root has widespread borrowings including into some non ST languages, for example in Tai (Tai Nuea) 'calendrical animal' *thu laa*; (Thai) *thə̀?*; cf. also Hani 'rabbit' (Gao 1995) *thù-hlɔ́*; Lolo-Burmese (Lahu) 'calendrical animal' *thô*, and 'year of the rabbit' *thô-lə̀ qhə̀?* (Matisoff 1988 : 692).

Not in Chinese;

- 'do, say, think': ST: *ti (-j) Cf. Lushai: *ti?* : 'think': *t~ *tuk (Yucatec)
- 'time, period': ST: *thūn : 'time': *t~ tun (Itzaj)
- 'break': ST: *tu (-k) : 'break': *t~ tuk' (Itzaj)

Proto-Mayan *tʰ(ʰ)~

No certain criterion is available in the OC reconstructions to establish a correspondence distinction between the distinct Mayan initials *t~ and *tʰ~. A sufficient number of these however are yodized in Chinese to suggest that proto-Mayan *tʰ~ is related to Chinese *~j~. This Chinese feature is far less prevalent in the proto-Mayan *t~ category.

Old Chinese *trj~ *drj~; Middle Chinese tr~, dr.

	ST	Modern Ch.	Old Chinese	MC	Mayan
tree trunk	*t(r)o	zhū 侏	*trju *~g	truă	*tyee?
(joint) wrist / knee	*t(r)ũH	zhǒu 肘	*trjəw?	truw'	*ty'ehk
string / cotton 1	*taŋ	zhāng 張	*trjaŋ	triaŋ	*tyiiŋ
beak / mouth		zhòu 喙	*trjuh *tuh	truw ^h	*tyii?
to sink / deep 2	*dh(r)um	chén 沉	*drjəm	drim	*tyaam
pour / douse	*[t]ǒ	zhù 注	*t(r)juh	təuă ^h	*tyup

1.) ST: *taŋ. The Chinese gloss in Pieros & Starostin is: 'give tension to a bow, stretch, extend'. Cf. 'leading thread': tǒng 統 MC: t^hawŋ^h. This root appears related to 'length': zhàng 長 MC: driaj^h. Mayan *tyiiŋ can refer to either cotton on the plant or spun cotton.

2.) ST: *dh(r)um 'deep place, pond'. Also 'deep': zhàn 湛 MC: dre:m', and 'submerge': diàn 墊 *tiəm^h *tiəms.

Old Chinese *tj~, *dj~; Middle Chinese dz~, tɕ~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
stone / obsidian 1	*ta(k)	shí 石	*djak	dziajk	*tyaah	
ripe		shú 熟	*djəwk *~kw	dzuwk	*tyaq	
broil / cook		zhǐ 炙	*tjak	tɕiajk	*tyaq'	
straight	*[dh]ǎiŋ	zhèng 正	*tjin ^h	tɕiajŋ ^h	*tyoj(m)	
tread / step on 2	*tjak	zhí 躋		tɕiajk	*tyeq	
attach, connect	*tok	shǔ 屬	*djuk	dzuawk	*tak'	LL&Gtz

1.) Cf. *tok 'flint' (Cholan branch); *took (LL). ST: *ta(k) 'stone'.

2.) Not in the *DEZ*; but 'foot': zhǐ 趾 *tjə?

Also:

'spit, saliva': tuò. Not in the *DEZ*; MC: t^hwa^h. PM: 'spit' (noun): *tyuhb'

ST: *thōj 'spit'. OC: Starostin: *thojs. Cf. tǔ 吐 *tha? (Schuessler) 'to spit out'.

'charcoal': tàn 炭; Not in the *DEZ*; MC: t^han^h. PM: 'ashes': *tya?ŋ.

ST: *thal; OC: Starostin: *thānh.

Proto-Mayan *tz(ʰ)~

Old Chinese *ts~, *dz~; Middle Chinese *ts^(h), *dz^(h).

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to suck	1	zā 啞		tsəp/tsap	*tz'ub'	
to hasten forward	2	zòu 奏	*tsukh	ts ^h uǒ	*tzak	to chase after
left	3	*cāj zuǒ 左	*tsaj?	tsa'	*tz'eh	left, leaning sideways
give		jī 齊	*tsiəj	tsej	tz'aj	Itzaj
sew up / spin thread		qī 緝	*tshjəp	ts ^h ip	tz'ip	Itzaj

1.) This Chinese etymon is not included by Peiros & Starostin in ST: *zhVp 'to suck', which is quite extensive. Tibetan (for example) is: aźib(s).

2.) Also 'to hasten, run': qū 趨 *tsrjuc *tshərju; MC ts^huǒ^h 'to hurry towards'.

3.) ST: *cāj zuǒ 左 can be either 'left', OC: *tsaj?, or 'help, assist', OC: *tsaj?h. Peiros and Starostin relate the two. Also 'going sideways, slanting': cè 側 *tsrjək; Cf. 'sideways': tzelek (Itzaj). ST: *ć(r)ǎk 'side, oblique, slanting'.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
take small steps		jī 躋	*tsjik	tsiəjk	tz'a'ak	Itzaj; have steps
to get wet, seep into	1	*ćām jiān 漸	*tsjam	tsiam	*tz'am	LL: bathe, get wet
sacrificial grain	2	*ćij zī 粢	*tsjəj	tsi	tz'ij	Itzaj; toasted ear of corn
arrow-head		zù 鏃		tsəwk	*tz'uq	Pointed
medicine		jī 劑		dzej ^h	*tz'aaq	
torch / kindle		jué 燭		dziak	*tz'a?	

1.) ST: *ćām 'moisten, soak'; jiān 漸 'bathe, get wet'; OC: Starostin: *ćam; Itzaj: 'sink' tz'ām.

2.) ST: *ćij 'grain, seed'.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
stone steps, lay bricks		qī 砌		ts ^h ej ^h	*tz'ahq	Masonry
do, make/ grasp	1	*ćok zuǒ 作	*tzak	tsak	tzak	Cholan
centre (of a wheel)		còu 輞		ts ^h əw ^h	tz'u'	Itzaj; centre, core, heart
small / a little		cí 仞	*tshji?		tz'eek	Itzaj

precipitous / precipice		qiào 峭		ts ^h iaw ^h	tz'ek	Itzaj
tinkle, clang, gong		qiāng 鏘		ts ^h iarj	*tzaan	LL&Gtz; sound of a bell
food	*žhan	càn 粢	*tshans	ts ^h an ^h	tzeen	Itzaj; food, sustenance
hair		cui 鬣	*tsh(r)juats	ts ^h wiaj ^h	*tzoʔtz	

1.) In Karlgren (1940 : 336) this is glossed as 'act, do, make, work; to perform, to sacrifice'. The Mayan entry is from Montgomery (2002 : 242) who gives *tzak* as 'to grasp, to grab, to appear, to conjure, to do blood sacrifice'. In Middle Chinese this appears as 'arise, create', (Pulleyblank 1991 : 425); Tibetan: 'to appear, to rise, to be begotten, originate' (Jaschke 1998 : 153)

Old Chinese *ts(h)r~; Middle Chinese *tʂ(h).

	ST	Modern Ch.	Old Chinese	MC	Mayan	
measure	1	cè 測	*tshrjak	tʂik	tz'aak	Itzaj; mecate (land measure)
insert / pierce		chā 插		tʂ ^h ɛ:p	*tz'äp	
recover from illness		chài 瘥		tʂ ^h ɛ:j ^h	tz'äk	Itzaj; heal
gather in/ stack	2	jí 戠	*tsrjəp	tʂip	tz'äp	Itzaj
break	*ćok	zhuó 斫		tʂœ:wk	*tz'ok	

1.) Cf. 'to count' *tzik (Chl, Chn, Acl, Chr, & LL)

2.) Possibly the same word in Chinese as: jí 楫 *tsjəp *tsrjəp 'to cluster together'; and comparable to ST: *chǔp 'gather'; and probably co-derivational with: jí 集 OC: *dzjəp 'to assemble, collect'.

In the following cases, proto-Mayan *tz~ would appear to correspond to OC: *dj~ and Middle Chinese tʂ~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
clay		zhí 埴	*djək	dʒik	*tz'ihk	Chr
wade/ splashing	1	shè 涉	*djəp	dʒiap	*tz'op	WM & Yucatecan

Proto-Mayan *ch~

	ST	Modern Ch.	Old Chinese	MC	Mayan	
mat; MC bed mat		zé 贗	*tsrik	tʂɛ:jk	*ch'aaq	(bed)
sharp cutting /cut		cè 戩	*tshrjak		ch'äk	Itzaj
firewood / wood	1	chái 柴		dʒɛ:j	che'	Itzaj
sheaf, bundle		jǐ 稯	*tsiəjh	tʂɛ:j ^h	chej	Itzaj (bunch)
to file, polish		cuō 磋	*tshaj	ts ^h a	cha'aj	Itzaj (scratchy)
affairs, tasks, works		cǎi 采	*tshəʔ		*chaʔ	Ch-Tze (suffix -le)
pluck/ peck	2	cǎi 采	*tshəʔ	ts ^h əj'	ch'ej	Itzaj

bite, eat / chew	*CǎH	jǔ 咀		dziǝ'	*chaʔ	Chln; chewy
elder sister	*čǎjH	jiě 姊		tsi'	*chiich	

- 1.) Possibly the same phonetically in OC as 'burnt offering': cháí 柴 *dzri (Schuessler)
- 2.) Also 'seize, grab': chāo 抄; Not in the *DEZ*; MC: tʂʰɛ:w. In Mayan also 'grab, catch, fetch': *chuk (Chol branch & LL & Gtz); Itzaj 'grab': ch'a'.

Not in Chinese:

'breasts, milk': ST: *[ʒh]u(-k) : 'woman's breast': *chuʔ (Chl, Chn, Chr; Cht 'milk'; LL & Gtz). Cf. Jingpo: čuʔ 'the breasts, milk'.

Proto-Mayan *k~

An Old Chinese: Proto-Mayan *k~ : *k~ correspondence is very clear.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
high, overbearing 1		kàng 亢		kʰaŋʰ	*kaʔŋ	
palace, mansion 2	*qǐm	gōng 宮	*kjəwŋ	kuwŋ	*kyum	LL
aunt		gū 姑	*ka *~g	kɔ	*kiik	
be bent, hook 3	*kjōw	gōu 句	*ku *~g	kəw	kuuk	Itzaj; elbow
injure		kè 刻	*khək	kʰək	*k'aq	
bitter 4	*ghāH	kǔ 苦	*khaʔ	kʰɔ'	*k'ah	
street		jiē 街		kɛ:j	kaayej	Itzaj
be able to bear 5	*khām	kān 堪	*khəm		*k'am	Take
kill 6	*ghuam	kān 戡	*khəm		*kam	Die
hollow, empty	*qhōŋ	kōng 空	*khuŋ	kʰəwŋ	*k'eʔn	Cave

- 1.) An apparently related morpheme is found in the *DEZ*: kàng 抗 *khaŋh, a transitive verbal form: 'to lift up'.
- 2.) 'Seated, dwelling': *chum (Cholan), *kyum (LL). This category goes back to proto-Mayan *k~. A very extensive ST etymology exists here under ST: *qǐm. Several of these reflect the diphthong, for instance Tibetan: *khjim* 'house'; Bahing: *khyim*; Lepcha: *khyum*. Chinese is the only one with final -ŋ and hence the -m > -ŋ sound change is a Chinese peculiarity.
- 3.) ST: 'bend': *kuk (P&S use different Chinese etymon here).
- 4.) ST: *ghāH 'bitter' has an extensive ST etymology: Tibetan: *kha*; Burmese: *khah*; Jingpo: *kha*; Lushai: *kha*.

- 4.) ST: *ghāH 'bitter' has an extensive ST etymology: Tibetan: *kha*; Burmese: *khah*; Jingpo: *kha*; Lushai: *kha*.
- 5.) Also ST: *Kam 'take, accept' (not in Chinese). In Itzaj *k'am* means 'accept'.
- 6.) ST: *ghuam 'to die, pine away'. Tibetan forms: *khum(s)* and *agoms* to 'kill', are probably directly cognate with the proto-Mayan form: **kam-isa* 'to kill'.

Several Mayan finals such as ~x below, have no clear counterparts in OC.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
change		gǎi 改	*kəgx *kə?	kəj'	*k'ex	exchange
mouth	*kh ^w ə(H)	kǒu 口	*khugh *khu?	k ^h əw'	*k'ux	bight, eat

The following two are also in phonological agreement, showing similar transitions from velar stop to affricate initials:

	Modern Ch.	Old Chinese	MC	Mayan	
red	chǐ 赤	*khrjak *khljak	tɕ ^h iajk	*kaq	> *chäk Chln
cooked sacrificial millet, food / ground parched corn	chǐ 饘	*khrjagh *khljah	tɕ ^h i ^h /tɕ ^h i ^h	*k'aj	> *ch'äj Chln

A number of proto-Mayan words with initial *k~ appear to correspond with an affricate initial in Old Chinese: it can be observed from the sound chart in Appendix A that these also go to an affricate initial in many Mayan languages, for example, 'grindstone': **kaa?* > **cha?* (Cholan); 'claw': **isk`aq* > *ich`ak* (Itzaj); and 'flea': **k`aq* > **ch`äk* (Cholan).

	ST	Modern Ch.	Old Chinese	MC	Mayan	
whetstone		cuò 錯	*tshak	ts ^h ak	*kaa?	grindstone
claw		zhǎo 爪	*tsrew?	tɕɛ:w'	*isk'aq	
flea		zǎo 蚤		tsaw'	*k'aq	

Not in Chinese:

- 'barking deer': ST: *khij : 'deer': PM: *kehj
- 'leopard, tiger': ST: *k(h)ej : 'cougar': PM: *koj
- 'shoot, sprout': ST: *kuk : 'sprout': *k~ > k'uuk' (Itzaj)

Proto-Mayan *q~

A significant number of examples suggest that an Old Chinese velar or glottal consonant followed by a glide: ~w~ or ~j~ corresponds to proto-Mayan *q~.

Old Chinese: *kw, gw, ʔw : Proto-Mayan: *q(ʔ)~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
grain	1	hé 禾	*gwaj	ɣwa	*q'aj	harvest
yellow	2	*qhwa(ŋ) huáng 黃	*gwaŋ	ɣwaŋ	*q'an	
name of a bird	3	jiū 鳩	*kwjəgw? *kwjəw	kuw	*q'uʔq	quetzal
mild, warm		wēn 溫	*ʔwən *ʔuən	ʔwən	*q'uun	soft, mild
the light	4	jiòng 頌	*kwijʔ		*q'iiŋ	sun, day
nest		wō 窩; kē 窠		ʔwa; k ^h wa	*q'uuʔ	
bend, deflect		yū 迂	*ʔwjag *ʔwja	ʔuǎ	*q'och	bent
encourage		yuān 援	*gwjan *wjjan	wuan	*qoʔŋ	let's go
wing, feather	5	*q ^w (r)aH yǔ 羽	*gwjagx *wjaʔ	wuǎ	*q'uʔq	quetzal feather
pass, traverse	6	*q ^w at yuè 越	*gwjat *rwjat	wuat	*q'at	
pass	7	guò 過	*kwarh *kuajh	kwa ^h	*q'ahx	

1.) That the word: hé 禾 *gwaj could apply to harvested grain in Old Chinese is clearly evident from Schuessler's glosses in the *DEZ*: -Menzies 2455 IV 'We will receive grain' (i.e., a harvest); -679 Xiao-Yi 'Ten zi-measures of grain'. The transitive verbal form for this in Chinese is: huò 穫 *gwak 'to harvest'.

2.) Piers and Starostin: OC: 黃 *qhway (whaŋ); Burmese: wa, wayh, Lushai: eŋ, PK: we, where the proto-Sino-Tibetan is: *qh^wa

3.) An apparently closely related morpheme to Chinese: jiū 鳩 *kwjəgw? *kwjəw (name of a bird) is: xiāo 鴞 *gwjagw *wjaw. This possibly goes back to a Sino-Tibetan root: *q(h)wa (a kind of bird). Proto-Mayan 'blackbird' *q'aʔ(a)w (PM) is also possible here. [The Mayan name for the Mesoamerican 'feathered serpent' deity Quetzalcoatl is: K'uk'ulkan. Mayan historical sources associate the name with a man who led the Toltec armies into the Yucatan in the tenth century (Coe 1999 : 167)].

4.) Where proto-Mayan: 'sun, day' *q'iiŋ corresponds to Chinese: jiòng 頌 *kwijʔ 'the light'; 'ten days, a decade' in Chinese is: xún 旬 *sgwjín *swjín.

5.) *q'uʔq' probably had the more generalized usage as 'feather' in the Proto-Mayan, based on the occurrence of *k'uk'um (feather) in the Cholan branch of Mayan, which occurs in the Yucatecan dialect of Itzaj as 'feather' as well.

6.) OC: (Starostin): *wat

The following Mayan words have no proto-Mayan reconstructions, but if they existed in proto-Mayan, the derivation would be **q~ > *k~*. (The Itzaj derivations could optionally derive from proto-Mayan **k~*).

	ST	Modern Ch.	Old Chinese	MC	Mayan	
watch, observe 1		guān 觀	<i>*kwan *kuan</i>	kwan	<i>*kan [>q ?]</i>	
turtle		guī 龜	<i>*kwjəg *kwjə</i>	kwi	<i>*kok</i>	Chl, Tze
wilderness / forest		qiú 茆	<i>*gwjəg *gwəw</i>	guw	k'aax	Itzaj
village / town 2	<i>*g(h)wa</i>	qiū 丘	<i>*khwjə</i>	k ^h uw	kaj	Itzaj
bind, tie up		guǒ 裹	<i>*kwarx *kuaj?</i>	kwa	<i>*kach'</i>	Chl

1.) 'Watch, observe': guān 觀 **kwan *kuan*; 'learn': **kan (~*qan(?))*; Itzaj: kan. 'learn, watch'. Also see guàn 觀 **kwan *kuan* 'a sight'. Probably these belong to a word family based on ST: **khan (~*gh-)* 'see, look, know', where the Chinese members are: kǎn 看 OC: **khān(s)* (Starostin) 'see, look, regard' (not in the *DEZ*); and kàn 看 MC: k^han^h 'to look at; read, look upon, regard'. The Mayan extension of this root is in Lowland and Greater Tzeltalan: **känän* 'to watch over'. Other extensions are discussed further on.

2.) Sino-Tibetan root 'village, street': **g(h)wa* (also 'village' **qhwa*). In Lushai, 'town' is *khua*. The gloss 'village' is from Starostin. Schuessler's is a little different (hill) but apparently can mean 'place'. Cf. also ST: **q- *ka*, 'to sit, dwell', and Itzaj: kajäl 'to live'.

Old Chinese: **kj~, gj~* : Proto-Mayan: **q~*.

As above, a **k~* initial in the Cholan branch would assure that the word belongs under proto-Mayan **q~* (whereas the placement is optional in the case of Itzaj). The only apparent distinguishing feature is yodization in the Chinese or Sino-Tibetan. It will be noticed below, that 'sing' does not have the glide in Chinese, but it is attested in the Sino-Tibetan.

	ST	Modern Ch.	Old Chinese	MC	Mayan < <i>*q~</i>	
begin		jǔ 舉	<i>*kja?</i>	kiö	<i>*kaaj</i>	LL
sing	<i>*K(j)ār</i>	gē 歌	<i>*kaj</i>	ka	<i>*k'aay</i>	LL&Gtz
beg, ask for		qǐ 乞	<i>*khjət</i>	k ^h it	<i>*k'aht</i>	LL
to question		jié 詰		k ^h jit	k'aat	Itzaj
good fortune		qí 棋	<i>*gjə</i>	gi	ki'	Itzaj: good
walk lame	<i>*Gh(j)äl</i>	jiǎn 蹇	<i>*kərjan?</i>	kian	<i>*k'on</i>	Cholan: gimpy

Not in Chinese:

word: ST: **k(h)a* : name: **q'~ *k'ab'a?* (Cholan)
**k'aab'aa?* (LL)

Old Chinese: **hm~* : Proto-Mayan: **q~*

It can be seen from the following example that a phonemic change had occurred in the Chinese branch of some Sino-Tibetan etymologies with initial **m~*. This change appears as a Chinese innovation and is distinguished by a quite divergent phonemic trend in the later development of the word in Chinese. The etymology I use to illustrate this is the 'fire' etymology in Sino-Tibetan:

'Fire': huǒ 火 **hmərx *hmaj?* MC: xwa', L: xua', Y: xwǒ.
 ST: **mējH* 'fire'; Starostin reconstructs such cases as OC: **sm~* (OC: 'fire' **sm[e]j?*);
 Tibetan: *me* 'fire'; Burmese: *mih*, **m[e]jh* 'fire'; Jingpo: *mji* 'fire' (in compounds); Lushai: *mei* 'fire'. PG: **m[e]*; Kanauri: *mě*; Kham: *mē*; Rgyarung: *timi*; PK: **mī*.

It would appear from a number of cases that the change had already been affected at the stage of proto-Mayan-Chinese and is reflected in the proto-Mayan as **q~*. Hence in the case of the above etymology, OC: **hmaj?* corresponds to PM: **q'ahq'* 'fire'. Other cases are:

	ST	Modern Ch.	Old Chinese	MC	Mayan	
black	<i>*mek</i> (dark)	hēi 黑	<i>*hmək</i>	xək	<i>*q'eq</i>	
sea		hǎi 海	<i>*hmə?</i>	xəj'	<i>*q'aq'</i>	

Sagart (1999 : 153) has made a case for assigning an OC initial **hm~* to 'blood', which would place it in this category, although it is not quite regular: xuè 血 **hmik* > **hmit*; MC: xwet; PM: **kik'*. An explanation for the irregularity could be that the consonants could have assimilated from: **qik'*. (Further assimilation took place later when both consonants were glottalized: **ch'ich'* (Cholan; Kaufman & Norman 1984 : 119). Cf. Schuessler's OC: **hwit* < **hwik*.

 Proto-Mayan **~* (zero initial)

It can be seen from the following examples that zero initials in Mayan could be the result of a lost **l~* in the proto-language.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
give	1 <i>*lǎH</i>	yǔ 予	<i>*lja?</i>	jiǎ	<i>*aq'</i>	
weeds	<i>*lǔH</i>	yòu 莠	<i>*ljəw?</i>	juw'	<i>*aq'in</i>	
wet		yè 液		jiǎk	<i>*ak'</i>	
night	2 <i>*jǎH</i>	yè 夜	<i>*ljakh</i>	jiǎ ^h	<i>*ahq'ab'</i>	
to chant		yáo 謠	<i>*ljaw</i>	jiaw	<i>*aw</i>	cry out

1.) ST: **lǎH*; OC: yǔ 予 **la?* (Starostin); Jingpo: *la* 'take accept'; Lushai: *la* (*lak*), 'take'; PK: **lè(s)*; Bodo: *lá*; Banpara: *la*; Newari: *lā*; Magari: *la*.

2.) ST: *rjak '24 hours; a day, night'. OC: *lhiak (Starostin) 'evening, night'; Tibetan: žag day; Burmese: rak '24 hours', *rjakx 'night'; Jingpo: jaʔ 'a day'; Lushai: riak 'to stay the night'. Chinese 'night': yè 夜 *ragh *ljakh; MC: jia^h, also belongs in this word family; also: yǐ 翌 *rek *lje, 'next day, tomorrow'. The forms of this etymon in Aguacatec and Uspantec, two somewhat separate dialects of the Eastern Mayan branch provide possible contributory evidence of a lost *l~ initial in the proto-language: Aguacatec: laq'bal ; Uspantec: laaq'ab, (Dienhart 1989 : 462). The final syllable here is possibly a temporal particle; such as exists in Itzaj: b'a-; hence PM: *ahq'ab' is possibly a compound. The broader context of this Sino-Tibetan gloss suggests that the etymology might also involve other Mayan compounds using the same root. In the Yucatecan branch, for example, 'today' is made up from a simple reversal of order of the temporal particle and the root, where a recorded form is bejelak; (modern forms are like Itzaj: b'a'la' 'now, today'); and 'tomorrow', in some dialects is similar to 'night', for example in Tzotzil: ok'ob, and in Cholan: *ak'b'-i is 'yesterday'.

'words, speech': ST: *lă : 'to say': PM: *(h)al (?)
Chinese is Starostin's *lhe

Not found in Chinese:

'moon': ST: *lăH : 'moon': *uuh (WM & Yucatec)

'lower, down': ST: *[lj] ŋ : 'go/ come down': *ehm (Cholan & LL)

A possibility that Chinese 'go down': jiàng 降 MC: kœ:wŋ could be a prefixed reflex of this root is discussed further on.

'testicles, male': ST: *laH : 'male': PM: *aj~

'leg, foot': ST: *la : 'thigh': PM: *aa? (?)

A significant number of words in OC with initial *k~ appear to correspond to words with zero initial in proto-Mayan. While the (Yucatecan) dialectical a form for thigh: chak- appears to correspond with Chinese 'thigh': gǔ 股 *kagx *kaʔ and ST: *k^wāH 'thigh, leg', the proto-Mayan form is *aa?. Notwithstanding the apparent existence of a Chinese : Mayan *k~ : *zero correspondence, it appears likely that many of these cases developed from roots with an *l~ initial with a *k~ prefix in the proto-language. This conjecture is indicated by the presence of *l~ roots in Sino-Tibetan and of *k~ prefixation of such roots in Chinese.

'Tongue' in Chinese is: shé 舌 *djat *mljat, MC: ziat ST: lǎjH. It therefore seems more likely that unless 'tongue' is irregular in Chinese, proto-Mayan *aaq is cognate with Chinese: jué 臄 'tongue', which Pieros and Starostin have included under an ST etymology where the Mayan is more consistent: *χiak 'tongue, lick':

'tongue': jué 臄 *gjak *gjak : 'tongue': *aaq
Starostin: *g[l]ak

Tibetan: *l̥zags* 'tongue', *ldag* 'to lick'; Burmese: *ljak* 'to lick'; Jingpo: *meta?* Lushai: *liak, lia?* 'to lick, lap up', KC: *m-liak*. Proto-Mayan has a companion etymon: **leq'* 'to lick'. Recorded forms for the word 'tongue' in the Huastecan branch: *lecab* suggest retention of an earlier lost **l~* initial (Dienhart 1998 : 663).

A number of glottal initials in Old and Middle Chinese appear to correspond to zero initial in PM; for example:

	ST	Modern Ch.	Old Chinese	MC	Mayan	
breast 1	*ʔrǎŋ	yīng 膺		ʔiŋ	im	Itzaj
be satiated / drink 2		yù 饕	*ʔjuh *~ugh		*uk'	
dark		yōu 幽	*ʔjiəw *~agw	ʔjiw	'eek'	Itzaj
a kind of grass		yāo 蓼	*ʔjiaw *~agw	ʔjiaw	*aaq	grass
fragrant / smell		yù 鬱	*ʔjuət	ʔut	*utz'	
inside / go in	*yūk	ào 奧	*ʔjəwk	ʔaw ^h	*ook	

1.) ST: *ʔrǎŋ; Starostin has not included the above etymon, but: Tibetan: *bray*; Burmese: *raŋ*; Lushai: *eŋ*.

2.) 'Drink your fill of wine'. Shi 146,6 Gl. 414.

Not in Chinese:

'below': ST: *ʔuk : 'foot': PM: *ooq

This could have a Chinese counterpart in: ào 奧 *ʔjəkw *ʔjəwk which in Middle Chinese means 'deep, profound', whereas in the *DEZ* it is glossed as 'bay, cove'.

Proto-Mayan **l~*

Old Chinese **l~* : Proto-Mayan **l~*

There is no obvious reason why in some cases lateral initials were dropped, as above, and in other cases retained. One assumes some environmental distinction was involved.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to cease, end finish 1		yǐ 已	*ljəʔ	ji'	*laaj	finish; completely, all
bird of pray 2	*lǎk	yǐ 弋	*ljək	jik	*lik-lik	Chn; hawk
be easy, at ease/ good 3	*l[é]k	yǐ 易	*ljikh	ji ^h	lek	Tz, Tzot, Toj
shining, sunshine 4	*ʔxian	yáng 陽	*ljəŋ	jiəŋ	*lem	shiny, flashing

1.) In Chinese **ljəʔ* is an 'already' marker for completed action (*DEZ* p.735), and its Mayan counterpart serves a similar function of 'completive affix'.

- 2.) yǐ 弋. This word appears in the *DEZ* as *ljək 'shoot with stringed arrow'; Starostin reconstructs it as *lek, and says it appears as 'bird of prey' in Chinese since the Han, however it must have been carried over (in that sense) since earlier times as it is widely represented in Sino-Tibetan.
- 3.) ST: *l[ě]k 'good, easy'; OC: Starostin: *ləks.
- 4.) 'shining, sunshine': yáng 陽 OC: Starostin: *Ləŋ. In Chinese, this is the expression for the positive principle in the yin-yang.

The following two cases involving voiceless laterals in OC may suggest that voiceless and voiced 'l~' may have merged in Mayan.

		ST	Modern Ch.	Old Chinese	MC	Mayan	
explain, excuse	1	*ʎōt	shuō 說	*hljuat	ɸwiat	*lot	Chn; lie
let go, release		*ʎǎH	shě 舍	*hljaʔ	ɸia'	lāk	Itzaj; unfasten
go away/ go out	2		tāo 慆	*hləw *~gw	t ^h aw	lok'	Cholan .

- 1.) ST: *ʎōt 'speak, say'; OC: Starostin: 說 lət 'speak, explain'.
- 2.) WM & Yuc: *looq'

The following category involves ST laterals and OC 'gl~' initials, appearing to show a unique Chinese transition.

		ST	Modern Ch.	Old Chinese	MC	Mayan	
come	1	*ʎā(H)	dài 迨	*gləʔ	dej'	*laʔ	come! (imperative)
field / earth	2	*liŋ	tián 田	*glin	den	*luʔm	WM & Yuc
calm, quiet	3	*lēm	tiān 恬	*gliam	dem	lem	Itzaj; calm
abortion	4	*lōk	dú 殯		dewk	luk'	Itzaj; remove

- 1.) 'come': dài 迨 OC: Starostin: *Ləʔ.
- 2.) ST: *liŋ 'field'; OC: Starostin: *lhīn. Cf. Lepcha: lyǎŋ 'land, field'.
- 3.) 'calm': tiān 恬 OC: Starostin: *lēm.
- 4.) 'abortion': dú 殯; Not in the *DEZ*; OC: Starostin: *lōk.

		ST	Modern Ch.	Old Chinese	MC	Mayan	
eat, swallow	1	*lōk	shí 食	*mljək	zɪk	luk'	Itzaj; swallow
lick	2		shǐ 舐	*lajʔ -? (Starostin)	zɪ'	*leq	

- 1.) 'eat, swallow': shí 食 OC: Starostin: *lək. Cf. yǐ 食 MC: ji^h 'proper name'.

2.) 'lick': shǐ 舐; Not in the *DEZ*; placed by Peiros & Starostin under ST: *lāj(H) 'tongue, lick'; OC: Starostin: *laj? -e? 'to lick'; but could these be two separate etyma at the ST level?

Not in Chinese:

'pierce, penetrate': ST: *lěŋ : 'poke a hole in': *l~ *lom In Choltil this means specifically 'poke a hole in'; in LL: 'break a pot or box'. In Itzaj, *lom* means 'stab'.

'boil, cook': ST: *χāk : 'boiling, froth': PM: *loq

'leaf': ST: *χāk : 'leaf': le' (Yucatec; Dienhart 1989 : 376).

'mud': ST: *χōk : 'mud': luk' (Itzaj)

'bend': ST: *χěp : 'curve': lop (Itzaj)

'fall': ST: *IVw : 'fall': lub' (Itzaj).

Proto-Mayan *m~

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to cover, hat 1	*mūk	mào 冒	*mægwh *rməwkh	maw ^h	*maq	cover
someone / person		mǒu 某	*mǎ? *~gw	məw'	maak	Itzaj
be busy		máng 忙	*maŋ	maŋ	meen	Itzaj; making
to make efforts 2		mòu 懋	*məwh *~gwh		muk'	Itzaj; strength
grave		mù 墓	*makh	mɔ ^h	*muq	bury
people, MC: vagrants	*m(r)aŋ	méng 氓	*mrəŋ *mərəŋ	mɛ:ŋ	*muun	slavery
to wash		mù 沐	*muk	məwk	muwik	Usp; make wet
unenlightened 3	*mūŋ	méng 夢	*mjəŋ	muwŋ	*meem	dumb
be loving 4		mù 慕	*makh	mɔ ^h	*meq'	WM & Yu; embrace
obscure, bewildered		mèi 昧	*məts	məj ^h	*mutz'	close eyes
cloth cover / net, bag		mǐ 穉	*miak	mɛ:jk	*muku(h)k	Chn & Kek
parrot 5	*mǎH	wǔ 武鳥		muə'	*mo?	LL/GTz; parrot, macaw
there is no, have no 6	*mǎH	wú 無	*mja *~g	muə	*ma..	not

1.) ST: *mūk 'hat'; Starostin has reconstructed OC: 冒 *mūk(s) hat; cf. māk 'cap': Itzaj.

2.) Also 'vigorous': ST: *mǎH; mài 勳 OC: Starostin: 勳 *mar?; EMC is: mɛ:j^h; Also: ST: *mǎjH, 'healthy, vigorous'.

3.) ST: *mūŋ 'dark, blind'. Cf. méng 朦 MC: məwŋ 'blind, drowsy, half asleep'; and méng 蒙 MC: məwŋ 'ignorant'; and měng 瞢 MC: məwŋ 'muddled, ignorant'.

4.) Also 'stroke, touch': mó 模 EMC: mak. ST: *māk 'want, love'.

5.) 'parrot': wǔ 武鳥 ST: *mǎH 'a kind of bird: parrot, peacock'; Starostin: OC: *ma? 'parrot'.

6.) ST: *mǎH. The *ma..* negative is extremely widespread throughout the Sino-Tibetan languages.

Some other possible cases:

'haze': mái 霾 EMC: mɛ:j : 'cloud': *m~ muyal (Itzaj)

'fog': wù 霧 EMC: muǎ^h : 'drizzle': *mus
ST: *m(r)o(w); Starostin: OC: 霧 *mh(r)o(k)s; Tibetan: *rmu* 'fog'; Burmese: *mru*. Chinese 'drizzle' is: mò *mərík-muk or màì 霰 *mərík-muk.

'work': wù 務 EMC: muǎ^h : 'work': *m~ meyaj (Yuc & Itzaj)

ST: *mǒ; Starostin: 務 *mhoʔs; Burmese: əhmuʔ 'work, affair'; Jingpo: *mu* 'work, labour'.

Not in Chinese:

'son in law': ST: *māk : 'sibling in law of the opposite sex': *muʔ (PM)

Proto-Mayan *n~

There are only a few comparisons available from which to draw possible correspondence distinctions between proto-Mayan *ŋ~ and *n.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
to reside		yù 寓		ŋuǎ ^h	naj	Itzaj: house
wife and children		nú 孥	*na	no	*naʔ	LL
go upstream 1		nǐ 逆	*ŋjak	ŋiajk	nak'	Itzaj: ascend
I, me	*ŋā-	wǒ 我	*ŋajʔ	ŋa'	*nu-	
high 2	*ŋǒj	wéi 崑		ŋwəj	*nohj	full
outside / far 3		wài 外	*ŋuats *~dh	ŋwaj ^h	*najt	
make a mistake		wù 誤	*ŋwah	ŋo ^h	*naaj	forget
awake; understand 4		wù 悟	ŋah	ŋo ^h	*naʔ	understand

- 1.) This Chinese word could also mean 'go against; contrary', and compares to Itzaj: nak 'to bump against'.
- 2.) In the Cholan branch of Mayan, this etymon (*noj) is used in the sense of 'big'.
- 3.) *DEZ*: wài 外 OC: **ɣuats* Shi 304,1 'The great outer states'; Shu 5,17 'Outside [of China] I pushed on to the four seas.'
- 4.) ST: *nǎ 'to think, be aware'; Chinese 'to scrutinize': rú 茹 OC: **njah*, MC: *jiǎ*.

 Proto-Mayan **ɣ*~

	ST	Modern Ch.	Old Chinese	MC	Mayan	
breasts, milk 1	*nǒH	rǔ 乳		juǎ'	*ɣul	WM: to suck
cut off the nose		yǐ 剃		ɣi ^h	*ɣii?	nose

- 1.) It appears as if this might be related by this context to rú 濡 OC: **nju*, MC: *juǎ* 'moisten, soak', and rú 孺 MC: *juǎ*^h, 'baby, child' (ST: *nǒwH).

Not in Chinese:

'back': ST: *nǔk : 'neck': WM: *nuuq'

'bow, bend': ST: *ɣǔk : 'face down': LL: *nuk

 Proto-Mayan **s*~

Old Chinese: **s*~ : Mayan **s*~

	ST	Modern Ch.	Old Chinese	MC	Mayan	
white		sù 素	* <i>sah</i> *~ <i>gh</i>	so ^h	* <i>saq</i>	
to lop off (tree) 1		sī 斯	* <i>sji</i> *~ <i>g</i>		* <i>sii?</i>	firewood
search	*sǒk -ǎk	suǒ 索	* <i>sak</i>	sak 2	* <i>säk</i>	Chr; seek
grasshopper		shā-jī 莎雞	* <i>srar-kig</i> * <i>Gsaj-ki</i>		* <i>sahk'</i>	
scratch / itchy		sāo 搔	* <i>səw</i> *~ <i>gw</i>		* <i>sak' / *saak</i>	Chln / LL & Gtz
to break		sǔi 碎	* <i>sədh</i> * <i>suats</i>		* <i>set'</i>	cut, tear
cold 3		xiāo 瀟	* <i>siəw</i> *~ <i>gw</i>		* <i>si?k</i>	
thread, string	*chēm	xiān	* <i>sjiam</i> * <i>ʔsjəm</i>	siam	sum	Itzaj; rope
sunrise / earlier today		xiān 暹		siam	* <i>sahm-i</i>	Chln
strained liquor 4	*chǎH	xǔ 漚	* <i>sa?</i> (Starostin)	siǎ'	* <i>sa?</i>	LL; atole
grain in husk / grass		sù 粟	* <i>sjuk</i>	suawk	su'uk	Itzaj

vegetable / plant		sù 筍	* <i>suk</i>	səwk	siik'	Itzaj
snot		si 泗	* <i>sjəs(?)</i>	si ^h	* <i>sihm</i>	
split	* <i>ziŋ (?)</i>	sī 斯	* <i>sjī</i>	siə/si	* <i>sil</i>	
to be given		cǐ 賜 / sǐ 賜	* <i>seljikh</i>	si ^h	* <i>siih</i>	gift
wash rice	5	xī 浙		sejk	* <i>saq'</i>	WM: wash grain
to rest		xí 息	* <i>sjək</i>	sik	sakan	Itzaj: lazy
afraid		xǐ 蕙		si'/si'	saak	Itzaj

1.) Cf. 'firewood': xī 新 **sjin*; si' 'firewood', and si'in 'plant (tree)' belong to the same root in Itzaj.

ST: **šij* 'firewood, tree'.

2.) MC: suǒ 索 sak 'to seek'.

3.) Cf. ST: **chīk* (š~, -ěk) 'cold'. Lushai: *sik* 'cold'.

4.) 'strained liquor': xǔ 漚; Not in the *DEZ*; ST: **chǎH*; OC: Starostin: **sa?* 'to strain spirits'; Jingpo: *ca* 'malted or fermented rice'; Lushai: **sa* 'to brew' (as beer).

5.) Karlgren's OC reconstruction for 'wash rice', xī 浙 is **siek* under GSR #857, the same as 'white': xī 皙 OC: **siek*. Another word for 'wash grains' is: shì 釋 OC: **sthjiak* **hljak* (*DEZ*), which Karlgren has reconstructed as OC: **šiǎk* (GSR #790).

Not in Chinese:

'tomorrow': ST: **saŋ* : 'tomorrow': samal (Itzaj); sam: temporal particle.

Proto-Mayan **x~*

Old Chinese: **sr~* : Mayan **x~*

This corresponds to Middle Chinese retroflex fricative: ʂ, which is identical to the reflex of **x~* occurring in Kanjobalan and Mamean.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
tip, thin end of a twig		shāo 梢		ʂɛ:w	xu'ul	Itzaj; digging stick
end of a bow		shāo 梢		ʂɛ:w	xul	Itzaj; end
foot		shū 足		ʂiǎ	xaj	Itzaj; bird foot
wide apart		shū 疏	* <i>srja</i>	ʂiǎ	xaach	Itzaj; wide spacing
gravel, sand	* <i>3aj</i>	shā 砂	* <i>srar</i> * <i>Gsaj</i>	ʂai/ʂɛ:	xej	Itzaj; gritty
sound of the wind	1	sōu 颼		ʂuw	xul	Ixil, Pmam, Pchi

- 1.) 'wind' is xul in some Mayan dialects (Dienhart 1998 : 719).

Proto-Mayan *x~ could also correspond to Middle Chinese alveolo-palatal fricative ç. These could have merged with the above, as they eventually did for the most part in Chinese.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
wing 1		chǐ 翅		çi ^h	*xiik	
thatch		shān 苫		çiam	xa'an	Itzaj
strong smell/ foul 2		shān 顛		çian	*xihin	Chl; Chr. Tze: *xihn
tie in a bundle/ basket		shù 束	*?-juk	çuawk	xuxak	Itzaj

- 1.) 'wing' could alternately belong in the category below.
 2.) 'foul smelling' in Itzaj is: xeam

A conditioned correspondence exists between OC velar stop, followed by *~r~ and PM: *x~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
spread wings 1	*krāk	hé	*grāk *garāk		*xiik	wing
walk, go, travel	*krV(H) (-ŋ)	xíng 行	*grāŋ *mgarāŋ	ɣe:jŋ	*xaŋ	
horn 2	*k- rua -k	jiaó 角	*kruk *karuk	kœ:wk	*xuk	
learn, study	*Kruā	xué 學	*grāk ^w *garāk ^w	ɣœ:wk	xok	Itzaj, Yuk
end up / extend		jiè 屆	*krādh *kārāts	kœ:j ^h	xit'	Itzaj
breach / cut	*k ^w āt		Starostin: *k ^w rāts		*xet	

- 1.) ST: *krāk 'wing'.
 2.) ST: *k- rua -k 'horn, corner'; MC: 'horn, corner' kœ:wk; PM: *xuk 'horn'; *xukub 'corner'.

Proto-Mayan *j~

Only a small number of comparables could be found for Proto-Mayan *j~ and these are not distinct from Proto-Mayan *h~. It could be that there are as yet undiscovered correspondences in this category, or that the Chinese reflexes have merged.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
crow	*ya	wū 烏	*?a	?o	*jooj	
choke	*?ik	yē 噎	*?i[k] > *?it	?it	*jiq	

Proto-Mayan *h~

Old Chinese *g~ : Proto-Mayan *h~

A number of examples suggest a possible link between OC *g~ and PM *h~:

	ST	Modern Ch.	Old Chinese	MC	Mayan	
lake / water	1	hú 湖	*ga	ɣɔ	*haʔ	
later / late		hòu 後	*guʔ	ɣəw'	*hal	
come across/ arrive here	2	hòu 逅	*guʔh	ɣəw ^h	*hul	
join / tighten		hé 合	*gəp	ɣəp	jep'	Itzaj

1.) 'river' hé 河 OC: *gal > gaj MC: ɣa is probably also cognate. Also 'lake' is ha' in the Mayan dialect Pmam (Dienhart 1999 : 373).

2.) In some Mayan dialects this root is used with the meaning 'guest'. In Chinese: xièhòu 邂逅 'carefree and happy'. Shi 94,1 'We meet carefree and happy.'

The Mayan *aajaaw 'lord' could possibly fit into this category. The PM *aajaaw consists of prefix (masculine classifier: *aaj~) plus root, and a number of cases occur which might suggest that the unprefix root could be *haaw, e.g., Chuj: ahal, and Kan: aHau (Deinhart, 1989: 397). Chinese cognates would be 'ruler': hóu 后 OC: *guʔ(h) MC: ɣəw', and 'feudal lord': hóu 後 MC: ɣəw.

Chinese *ʔ : Proto-Mayan *h~

Note: Itzaj 'j' from the Hofling-Tesecun dictionary is identical to PM *h~, but is used here in keeping with the practice of using the original authors' orthography throughout. It has two possible PM derivations: *j~ and *h~ (see Appendix I, (iii)). The Chinese reflex *ʔ~ is identical to the Mamean reflex *ʔ~ in this category.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
take one's leisure	*ʔel	ān 安	*ʔan	ʔan	jen	Itzaj
lose one's breath		ài 僂	*ʔəs		jes	Itzaj; to pant
to feast	1	yàn 饌	*ʔians	ʔen ^h	jan	Itzaj; to eat
shade, conceal	2	yīn 陰	*ʔjam	ʔim	jum	Itzaj; covered
sound		yīn 音	*ʔjam	ʔim	jum	Itzaj
beautiful		yǐ 懿	*ʔjits	ʔi ^h	jatz'utz	Itzaj; pretty
sigh of affirmation	3	āi 欸		ʔəj	jaj	Itzaj; yes
cavity	4	āo 凹		ʔɛ:w	jol	Itzaj; hole

1.) 'feast': OC: Starostin: *ʔēns.

- 2.) 'shade, conceal': yīn 陰. Negative principle in yin-yang; OC: Starostin: *ʔəm.
- 3.) 'sound indicating agreement': ST: *ʔēw 'yes'; this does not include the above Chinese etymon.
- 4.) 'hole': jol (Huas, Yuc, Itzaj); and: jul (Tec, Mam, Ixl, Cak, Tzu, Qui, Usp, Pmam, Pchi).

Not found in Chinese:

'to split': ST: *ʔǎk : 'to split': *h~ jek (Itzaj)
 Lushai: *ek* 'to cleave or split, as wood'

Proto-Mayan *r~ and *y~

Old Chinese *r~ : Proto-Mayan *r~ / *y~

In the following cases, an agreement between Old Chinese *r~ and Proto-Mayan *r~ is clear. Proto-Mayan *raʔh 'painful/ desire, love' is identified as a single etymon (Kaufman & Norman 1984 : 137) but according to the following comparisons, it could best be split into two.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
pain, suffering		lǐ 里	*rǎʔ		*raʔh	painful
think of, ponder		lǜ 慮	*rǎh	liǒ ^h	*raʔh	desire, love
green		lǜ 綠	*rǎk	luawk	*raʔx	

In the following few possible cases of correspondence it is not clear whether these go back to Proto-Mayan *r~ or *y~.

	ST	Modern Ch.	Old Chinese	MC	Mayan	
flow, flow away		liú 流	*rǎw	luw	yal	Itzaj; spread, of liquids
sika deer; deer	*rǎk	lù 鹿	*ruk	lǎwk	yuk	Itzaj; brocket deer
display / show		lǚ	*rǎʔ		*yeʔ	Chn
burn, shine	*rew(H)	liào 燎	*riawh	liaw ^h	yuul	Itzaj; shining
to remain, tarry		liú 留	*Crǎw	luw ^h	ya'la'	Itzaj; leftovers

Also (?): 'rub the palm along something, stroke': luō 捋 MC: lwat 'massage; press on belly'; PM: *yot'.

Proto-Mayan *w~

Too few comparisons can be found to produce any secure OC correspondence with Proto Mayan *w~. A couple of the finals suggest a direct *~w : *~w correspondence, e.g., 'eagle' OC: *tiəw PM: *t'iiw; 'ruler' MC: γəw' PM: *aajaaw. Peiros and Starostin have set up an ST : OC *w~ : *p~/*b~ correspondence, but it is doubtful whether PM: *w~ would make a viable comparison with OC: *p~/*b~.

The correspondences are summarized in the following table:

OC		p-Mayan
	p(h)	p(')
	b(h)	b'
d(h)	t(h)	t(')
dj	tj	
dr(h)(j)	tr(h)(j)	ty(')
dz(h)	ts(h)	
[dʒr(h)]	tsr(h)	tz(')
	ts(h)(r)	ch(')
[g(h)]	k(h)	k(')
	lm	
g(h)w g(h)j	k(h)w k(h)j	q(')
	hl	
z	s	s
	l	l
	sr	
g(h)r	k(h)r	x
	[ʔ]	j
g(h)	ʔ	h
	ŋ	
	m	m
	n	n
	ŋ	ŋ
	[w]	w
	r	r
	[y]	y
	l	
	ʔ	ʔ

TOWARDS A PHONOLOGY OF THE PROTO-LANGUAGE.

Phonemic developments evidently happened in parallel between the two languages after they broke up. The main phonological developments that affected Mayan consonants also eventually occurred in Chinese. A primary feature in the phonological comparison of Proto-Mayan and Old Chinese is the apparent Mayan loss of voicing contrasts among the obstruent (or stop) consonants found in Old Chinese. This invites the question of whether the sound inventory of the proto-language (i.e., the Sinitic source language from which both Mayan and Chinese derived) was more like the Mayan or more like the Chinese. In other words do the sound differences arise primarily from phonemic losses on the Mayan side, or from an innovation of voiced contrasts in Chinese? I adopt the former alternative, although it is by no means clearly established.

Far removed from Proto-Mayan, the reconstructed set of initials of the Early Mandarin of the Yuan period taken from the *Zhongyuan yinyun* (Pulleyblank 1984 : 238) bears a remarkable resemblance to the (consonantal) sound inventory of Proto-Mayan. This resemblance is particularly instructive because it shows a strongly parallel historical case of devoicing of obstruent contrasts such as may have happened in Mayan at a much earlier time. The sounds found in Early Mandarin initials occur after a momentous shift through the Middle Chinese period, from Early Middle Chinese voiced stops to Late Middle Chinese partially voiced aspirates "leading to a register split in the Middle Chinese tones and the eventual loss of voicing in obstruents in the majority of Chinese dialects," (Pulleyblank 1984 : 163). It is thus entirely plausible that Mayan may have undergone a similar change from a proto-language sound inventory containing the voiced contrasts found in reconstructed OC. Increasingly accentuated glottalization could be the primary instrument of devoicing in Mayan. This can be compared to a visible process in Chinese in a number of examples, e.g., 'arrow': hóu 鏃 EMC: ɣəw > LMC: xfiəw > Y: xəw; and 'bull': tǎ 特 EMC: dək > LMC: tʃəǎk > Y: təj'.

In contrast to what happened among the Mayan obstruents, an opposite trend occurred among the liquids and nasals, where voicing contrasts were lost, but the surviving member became voiced (we see complex evolution in this category in both Mayan and Chinese). This had happened by the stage of Early Middle Chinese, hence both types of shift had occurred by the stage of Early Mandarin, resulting in the very Proto-Mayan looking set of initial consonants.

Notwithstanding the voicing aspect, a clear phonological consistency can be seen throughout the history of both languages. Furthermore it is sufficiently clear that the Mayan sound system follows a pattern that is typical of Sino-Tibetan at large. This can be seen in the somewhat more extensive Proto-Sino-Tibetan phonemic inventory (Peiros & Starostin 1996).

The following table compares the initial Old Chinese and Proto-Mayan consonantal sound inventories, with that of Pumi (Matisoff 1997 : 173), a Tibeto-Burman language of the Qiangic family. The chart uses only the simple consonants of Pumi, which has a proliferation of consonantal onsets around a simple consonant core. The pattern in Pumi resembles those in Mayan and Chinese. The OC initials in the table are based on those given by Sagart (1999 : 28), which in turn are based on those given by Karlgren. I have fleshed out the OC column somewhat by reverting to the use of Karlgren's where their reinsertion is in concurrence with the

comparative pattern and provides needed links towards determination of the proto-language phonemic inventory. All renditions in the table have been transcribed (to a reasonable approximation) into the standardized International Phonetic Alphabet (IPA).

Voiced	EMC	Voiced	OC	Core Pumi	p-Mayan
b	p p ^h	b ^h	p p ^h	b	p p ^h b' p'
d	t t ^h	d	t t ^h	d	t t ^h
dr	tr tr ^h	[d]	[t] [t ^h]	d	t t ^h
dz	ts ts ^h	dz	ts ts ^h	dz	ts ts ^h
dz _l	tʂ tʂ ^h	dz _l ^h	tʂ tʂ ^h	dz _l	tʂ tʂ ^h
dz _l	tʂ tʂ ^h			dʒ	tʃ tʃ ^h
g	k k ^h	g(w)	k(w) k(w) ^h	g	k k ^h q q ^h
z	s	z	s	v z	ϕ s
z _l	ʂ		[ʂ]	z _l	ʂ
z	ʂ		[ʂ]		ʃ
ɣ	x		x	ɣ	x
m		m	m̥	m	m̥
n		n	n̥	n	n
ɲ		[ɲ]		ɲ	
ŋ		ŋ(w)	ŋ(w)	ŋ	ŋ
l		l	l̥	l	l̥
		r	r̥		r
	j				j
	w	w	w̥		w
	[ʔ(w)]		ʔ(w)		

The parallels across the spectrum are easily observable. The patterning in the table enables one to make significant observations regarding Old Chinese, as well as providing a framework for a reconstructed phonemic inventory of Proto-Mayan-Chinese.

Proto-Mayan is a single column because of the loss of voicing contrasts, where one first of all observes that the only surviving voiced contrast in Mayan is: b' p', mirroring that found in OC (utilizing Karlgren's).

One notices significant gaps or apparent omissions in the OC columns. One of these gaps occurs alongside the Pumi and Middle Chinese affricate pairs: tɕ, tɕ^h. This gap also exists in Mayan and if it had existed in the proto-language, it has subsequently merged with another phoneme. Further down the column another OC phonemic gap can be seen alongside the Mayan and Pumi uvular stops (q, q'). Still further down one notices an absence of voiced velar and glottal fricatives in OC. Only velar fricatives are attested in EMC, and only one fricative, x (or χ, a voiceless uvular fricative), in OC. These gaps appear to show that the Chinese abandoned the use of the rear point of articulation in some categories. The uvular stop appears to have been forward shifted in Chinese (*q > *kw). Peiros and Starostin's treatment also reflects this phenomenon (e.g., ST: *qw > OC: *kw).

A parallel shift also occurred in Mayan among the velar and uvular stops, but *after* the stage of Proto-Mayan. The uvular stop forward shifted to become a velar stop (i.e., q > k) in many Mayan dialects, and the velar stop tended to affricatize (e.g., k > tʃ). For example one sees the transition in PM: 'red' *kaq > Cholan: *tʃək. In Chinese, however, where the loss of the uvular stops must have occurred (according to the reconstructions) before the stage of OC, the equivalent type of shift among some velar stops (those occurring before high front vowels) is mirrored from the stage of OC on, for example OC: 'red' *khljak > MC: tɕ^hiajk. Cognacy is firmly established here on phonological grounds based on a proto-language reconstruction *khljak, given that 'l' as well as diphthongs were often dropped in Mayan. The proto-language diphthong survives in Eastern Mayan dialects (see Dienhart 1989 : 518-521).

The absence of the voiced velar and glottal fricatives in OC (ɣ and fi respectively), is conspicuous and instructive, since the voiced contrasts manifest themselves at the stage of EMC. A number of examples, e.g., 'lake' hú 湖 MC: ɣɔ, OC: *ga and Proto-Mayan: *Ha? 'water' suggest that *g~ might be a voiced fricative in OC, in cases where these have become MC ɣ. A forward transition did not affect the Mayan fricative gutturals at any time, whereas the transition in OC in some cases to the glottal stop ʔ is in keeping with the abandonment of the rear point of articulation for the fricatives. It is thus reasonable to assume the presence of both the uvular stops and the glottal fricatives in the proto-language.

Completing our review of the OC columns, the presence of OC alveolar-palatal fricative ɕ is corroborated in the other columns and probably merged with ʃ for the Mayan palatal fricative ʃ, where the Mayans only slightly forward-shifted the original sounds. Under this proposal Chinese 'wing' chǐ 翅 MC: ɕi^h would be the direct cognate of Proto-Mayan 'feather' *ʃii?. If Mayan ʃ is generally the result of slight forward shifting, the true Proto-Mayan was probably ɕ, as still spoken in some dialects. This sound in Mayan was also the focus of mergers of consonant clusters, again paralleling what happened in Chinese.

Unvoiced liquid and nasal ʈ and ɱ completely disappeared in both Mayan and Chinese. Proto-language ɱ followed an unusual pathway, becoming velar fricative x in Chinese and uvular stop q in Mayan (for instance OC: 'black' *ɱək > MC: xək, vs. a Mayan transition of proto-language: *ɱək > PM: *q'eq).

The Proto-Mayan-Chinese phonemic inventory set up below as a provisional model is slightly larger than that proposed for Old Chinese. It involves some theoretical placements aimed at providing consistency and completeness. Square brackets indicate those whose existence is somewhat doubtful though theoretically possible.

Proto-Mayan-Chinese	
Voiced	Unvoiced
	p
b ^h	p ^h
d	t
	t ^h
ɖ	ʈ
	ʈ ^h
dz	ts
	ts ^h
dz̥	tɕ
	tɕ ^h
dz̥	tɕ̥
	tɕ̥ ^h
g ^(w)	k ^(w)
	k ^{(w)h}
[g]	q
	q ^h
z	s
z̥	ɕ
z̥	ɕ̥
ʎ	x
fi	h
m	ɱ
n	[ɱ]
ɳ	[ɳ]
ŋ ^(w)	[ŋ ^(w)]
l	ʈ
r	[ʈ]
(j)	
w	[w]
ʔ ^(w)	ʔ

PART II:

GRAMMATICAL AND OTHER FEATURES.

THE SINO-TIBETAN SIGNATURE OF MAYAN GRAMMAR.

Old Chinese is a language in which each word is isolated and uninflected, and almost every word has the appearance of a root. In modern Chinese, grammar depends largely on position. It is, however, indispensable in proposing a close relationship between Mayan and Chinese to propose as well that this lack of morphologically overt grammar was not always the state of affairs, as Mayan languages have a rather complex inflectional grammar. It is central to this proposal that Chinese grew out of a language that had a much more active grammar, and that it must have undergone somewhat radical change. Recent scholarship, especially by Laurent Sagart, following Henri Maspero, (1930) and several others, has increasingly suggested the likelihood of an ancient Chinese that was much less monomorphemic, based on internal Chinese evidence. Analysis of word families within Chinese and comparative work with geographically remote dialects has shown that morphological alternations must have been somewhat typical of Old Chinese, based primarily on a large number of affixes which have since become fused (Sagart 1999). According to Sagart, Old Chinese was not strictly monosyllabic, and had a largely derivational morphology which made use of affixes. A cascade of changes caused the language to move away from this model by the time of Middle Chinese. This current comparison argues that such a cascade of changes had already affected Old Chinese, and that the language had already moved away from one that had had an earlier considerably more complex inflectional base.

This idea is already somewhat implicit in the Chinese relationship to the Tibeto-Burman language family, and its position in the overall classification: Sino-Tibetan. The initial difficulty with making a grammatical comparison between Mayan and Chinese has been the lack of Chinese grammar with which to make the comparison. So inevitably one turns to the other Sino-Tibetan group viz., the Tibeto-Burman languages. There has been some discussion concerning the verb agreement systems in Tibeto-Burman as to whether they developed through innovation or outside influence or whether they point towards a reconstructable verb agreement system for PTB. Bauman (1975) and DeLancey (1989) have argued in favor of a reconstructable verb agreement pattern for PTB based on an identifiable paradigm, with corresponding morphological form in at least one member of almost every branch of the family (DeLancey, 1989: 317). It is only possible to assume the degree of complexity in any proto-language that is compatible with the available evidence among the daughter languages. However, if languages that are located remotely from each other in the sphere of a language family can be shown to have paradigmatic and morphological commonality in their grammar, that can be taken as evidence that such features were present at least at some earlier level, even though in most cases they may have been lost. I conjectured that features in common with the Mayan grammatical model might be found among the Tibeto-Burman languages and, in particular, that some of the more peripheral languages of the Sino-Tibetan sphere might have undergone somewhat more conservative change. If so, they may have retained some common paradigmatic elements that

could be reflective of features that had been present in the earlier development of the language family, or in the proto-language itself.

The following tables make a brief test for such paradigmatic commonality between a Mayan language and Kulung, a member of the Tibeto-Burman Kiranti language family in eastern Nepal, ultimately a member of the Himalayish (or Western) branch of Tibeto-Burman. Both Kiranti and Mayan languages are characterized by an elaborate system of verbal affixes involving the incorporation of personal pronouns in the verb system. The verb stem in Kulung has affixes attached, which express person and number agreement with one or two actants. I have transcribed the terms: NON-PRETERITE and PRETERITE in the Kulung source material to INCOMPLETEIVE and COMPLETIVE respectively in order to have common terminology for the comparison. The grammatical features referred to throughout this section are usually made with reference to the Itzaj dialect of Mayan, however, cognate features can generally be found throughout the spectrum of Mayan languages, and equivalent comparisons could just as well be made using other Mayan dialects. The two tables show commonality of verbal morphology at a fundamental level between the two languages: i) person markers are attached to verb stems; ii) these person markers may be differentiated according to the status of the verb, i.e., they may mark transitivity vs. intransitivity; iii) they are further differentiated (only in the case of the intransitive in Itzaj), according to the aspect of the verb, i.e., their forms are also inflected to serve as markers for the incompleteive and the completeive aspects:

STATUS	INTRANSITIVE			
	KULUNG		ITZA	
ASPECT	INCOMPLETEIVE	COMPLETIVE	INCOMPLETEIVE	COMPLETIVE
1SG	koŋ ims -o: I sleep -1SG	koŋ ims -o I slept -1SG	k -in -wenel INC- I -sleep	wenel -een I slept
2SG	an ims -e you sleep -N1SG	an ims -a -ø you slept-COMP-N1SG	k -a -wenel INC- you -sleep	wenel -eech you slept
3	ŋ- ke ims -e he/she sleeps -N1SG	ŋ- ke ims -a -ø s/he slept-COMP-N1SG	k -u -wenel INC- s/he sleeps	wenel -ij s/he slept

STATUS	TRANSITIVE			
	KULUNG		ITZA	
ASPECT	INCOMPLETEIVE	COMPLETIVE	INCOMPLETEIVE	COMPLETIVE
1SG	koŋ ker -o: I hit -1SG	koŋ ker -ø -u I hit -COMP -3PAT	kin -wilik -ø I see him	kin -wilik -ø I saw him
2SG	an ker -e you hit -2SG>3	an ker -ø -u you hit -COMP-3PAT	kaw -ilik -ø you see him	kaw -ilik -ø you saw him
3	ŋ- ke ker -e he/she hits -3SG>3	ŋ- ke ker -ø -u he/she hit-COMP-PAT	kuy -ilik -ø he/she sees him	kuy -ilik -ø he/she saw him

The person markers indicating the subject of a transitive verb, i.e., Mayan: kin-, ka-, and ku-, and the subject person markers in Kulung: -o:, -e, -e in the transitive status, are repeated in the intransitive, but only in the incomplete. Possibly the so called 'split ergative' type of agreement system peculiar to Mayan, is in reality an archaic feature of Sino-Tibetan grammar.

I have made a further brief Mayan comparison between partial conjugations using data from another Kiranti language of eastern Nepal: Limbu. In the following table, the symbol Σ represents the verb stem.

STATUS	INTRANSITIVE			
	LIMBU		ITZA	
ASPECT	INCOMPLETE	COMPLETIVE	INCOMPLETE	COMPLETIVE
1SG	Σ -ʔε	Σ -aŋ	k -in - Σ	Σ -e'en
1 DUAL	a- Σ -si	a- Σ -etchi		
1PL	a- Σ	a- Σ -ε	ki - Σ	Σ -o'on -e'ex
2SG	ke- Σ	ke- Σ -ε	k- a- Σ	Σ -eech
2 DUAL	ke- Σ -si	ke- Σ -etchi		
2PL	ke- Σ -i	ke- Σ -i	k- a- Σ -e'ex	Σ -e'ex
3SG	Σ	Σ -ε	k- u- Σ	Σ -ij
3 DUAL	Σ -si	Σ -etchi		
3PL	Σ	Σ -ε	k- u- Σ -oo'	Σ -oo'

Several notable similarities of form occur in the above table, and further evidence can be seen of close similarities among the verb agreement systems. The Tibetan verbal system (see Jaschke 2004 : 40-78) also appears to exhibit features similar to the Mayan.

CHINESE BEFORE 11TH CENTURY BCE.

Let us now examine evidence of how an active verbally inflected language such as Mayan may have been at the root of formation of a language that has the fused monomorphemic character of Chinese. These examples relating to verbal morphologies show that not only affixes, but also the inflections as well, are probably reflected in Chinese as fused forms. Each Mayan verbal root may be marked by a transitive vs. intransitive status suffix that encodes whether a verb has a direct object or not. In the cases below, each stand-alone root with no suffix attached implies an activity of some sort with no direct object, e.g., 'to scrub': ja', whereas a direct object may be implied with the addition of a transitive suffix: -ik, e.g., 'to scrub it': ja'ik. It can be seen that in most of the following cases the addition of the Chinese suffix: ^h to the natural root appears to have the same function; i.e., the suffixes could be cognate.

	Modern Chinese	Middle Chinese		Itzaj Mayan
to burn, cook	shāo 燒	ɕiaw	to burn	chuj
to burn wasteland	shào 燒	ɕiaw ^h	to burn (an object)	chujik

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj
to rain	yǔ 雨	(Sch.) *rwjaʔ	wuǎ'	rain, water	ja'
to rain upon	yù 雨	*wjaʔh	wuǎ ^h	to wash	ja'tik

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj
pool	wū 滷		ʔo	to scrub	ja'
wash, cleanse	wù 汙		ʔo ^h	to scrub it	ja'ik

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
froth, foam	oū 漚		ʔəw	watery, swampy	juj
to soak	òu 漚	(Sch) *ʔuh	ʔəw ^h	to stir, to keep from settling	juytik

	Modern Chinese	Middle Chinese		Itzaj Mayan
seize, grab	chāo 抄	tʂ ^h ɛ:w	grab	ch'a'
rob, plunder	chāo 鈔	tʂ ^h ɛ:w ^h	grab (with an object)	ch'a'ik

In the examples above, the ~ik suffix is used when the aspect of the verb is incompletive, i.e., it implies ongoing action. However, if one compares the completive aspect (completed action) transitive marker: -aj to the Chinese ^h suffix, e.g., ɕiaw^h : chej-aj the cognacy may become more readily apparent. In some cases the final ^h may alternate with a velar stop ~k, and these alternations could demonstrate Chinese parallels with Mayan completive vs. incompletive alternations. Note that the Chinese meanings here are transitive:

	Modern Chinese	Middle Chinese		Itzaj Mayan
gather together	còu 湊	tʂ ^h əw ^h	bunched : COMP	chejaj
to pile up, bunch	cù 簇	tʂ ^h əwk	form a bunch : INC	chejik

Cf. collect, accumulate, pile up: jǐ 積 MC: tsiǎ^h; tsiajk.

	Modern Chinese	Middle Chinese		Itzaj Mayan
to prick	cǐ 刺	tʂ ^h i ^h	pecked : COMP	ch'ejaj
pierce	qǐ 刺	tʂ ^h iajk	pierce : INC	ch'ejik

And in the following case there is an alternation between the natural root and an apparently transitive incompletive ending:

	Modern Chinese	Middle Chinese		Itzaj Mayan
to slap	pī 批	p ^h ɛj	chop	p'uy
to beat, clap	pāi 拍	p ^h ɛ:jk	to chop (it) up	p'uyik

In addition to the above, the next comparison introduces comparison of another Chinese morphological variation to another Mayan suffixal inflection; a general participle suffix: -a'an:

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
to hasten, run to	qū 趨	*tshərju	ts ^h uǒ	to follow	tzäy
to hasten (to an object)	qù 趨	*tshjuh	ts ^h uǒ ^h	to follow (it)	tzäyik
hurried	cōng		ts ^h əwŋ	followed	tzäya`an

The comparisons made thus far have been made using roots with final consonants other than stops. The following tables examine how inflections like the Mayan may have been used in Chinese in word formation in some roots with velar stop (~k) finals showing how such finals suffered gradual elimination. Chinese does not allow the use of intervocalic stops, therefore word formation involving the generation of bisyllables with intervening stops was accompanied by syllabic reduction involving the loss of the stop:

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
cap, (cover) / mat	mǐ 幕 / mù 幕	*miak (?) / *mak	mɛjk / mak		māk
to cover (it), hat	mào 冒	*mægwh *rməwkh	maw ^h	TR; COMP	mākaj
troubled eyesight	mào 瞽		maw ^h		
blind	máng 盲	*mraŋ *məraŋ	mɛ:ŋ	covered: PART	māka`an

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
tranquil	mò 莫	*mak	mak	hide, bury	muk
grave, tomb	mù 墓	*magh *makh	mɔ ^h	buried it	mukaj
dark	míng 冥	*miŋ	mɛjŋ	hidden	muka`an
close the eyes	míng 瞑		mɛjŋ		

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
fire	huǒ 火	*hmaj?	xwa'		k`aak`
dry or warm by the fire	hōng 烘	*huŋ	xəwŋ	roasted over a fire	k`aak`a`an

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
learn, understand	xué 學	*gərəwk	γɛ:wk	count, read, study	xok
teach, instruct	xiào 學	*gərəwkh	γɛ:w ^h	read, read to	xokaj
school	hóng 龔		γwe:jŋ	counted, read	xoka`an

There are other functions for the suffix *~h in Chinese. There appears to have been a kind of morphological convergence that has happened in a process of grammatical simplification where several functional distinctions may be implied by the same morphological device, which helps make the exploration of OC morphology a difficult task. The OC *~h has been identified as a 'direction of flow' suffix which could easily be seen to overlap its use as a transitive suffix, but the two functions are probably distinct. There are occasional similar examples of direction of flow suffixal morphology in Mayan which has become, like Chinese, embedded in the roots, for example: 'leave' *jok*; 'pull out' *jok*; 'stick' *jek* 'split' *jek*; 'fold' *päk* 'plant' (spread) *päk*.

Another OC suffix: *~s is the causative function, also cognate with the Mayan causative suffix:

	Old Chinese	Middle Chinese	Tibetan	Itzaj Mayan
causative	Schuessler: *-s	-- ^h	--s	-es, --esä
	Starostin: *-s			

There exists in Chinese a stand alone reflex of this suffix, 'send, employ, cause': shǐ 使 OC: (Schuessler) *sɾjəʔ; MC ʃi'. The use of this suffix in Chinese and Mayan can be seen in the following example based on the Sino-Tibetan root 'lower, down': *[lj] ŋ; and the Mayan root: *ehm (Cholan & LL) 'go/ come down'; and *ehm-esa 'to lower' i.e., 'to cause to go down'.

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
submit, surrender	xiàng 降	*gəwŋ	ɣœ:wŋ	descend	em
fall, drop, descend	jiàng 降	*kəwŋh	kœ:wŋ ^h	lower, causative	emsaj

An alternate causative suffix: -kun with identical meaning may also occur in Itzaj without any apparent distinction in Chinese, i.e., Chinese continues to use the 's' suffix:

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
take one's leisure	ān 安	*ʔan	ʔan	recline	jen
repress, press down	àn 按	*ʔans	ʔan ^h	make lean against	jenkuntik

The following word family is based on the Sino-Tibetan root: *khan, 'to see, look, know'. The root is somewhat internally varied in Mayan and this, as well as the inflections are remarkably paralleled in Chinese.

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
see, call on, meet	jiàn 見		ken ^h	learned, trans	känaj
spy on, watch	jiàn 間		kɛ:n ^h	watched, trans	känäntaj
look at, watch	kān 看		k ^h an	learn	ka'an-
look upon; read	kàn 看	*khan(s)	k ^h an ^h	teach	ka'ansaj

The next comparison shows a large word family based not on affixes but the repeated reapplication of the root. An extensive word family with apparent Mayan-Chinese connections is based on the Sino-Tibetan root: *bā(H) / phā(H) 'to spread, extend; wide, vast'. This table compares the use of a simple Mayan root: pāk with Chinese words with an underlying 'spread' semantic and the common graphic elements: 布 or 甫, and generally common phonetic elements as well in Old Chinese. The graphs have common features, though different origin. The graph 甫 (fǔ, MC: puǒ, 'to begin'), in the oracle bone inscriptions had the form of a seedling growing in a field and was the original form of 圃, 'garden' (Li 1993 : 92).

Sino-Tibetan roots	
spread, extend	*bā(H) / phā(H)
wide, ample	*pāk
patch, mend	*[ph]āH

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
wide	bó 博	*pak	pak		
spread	bù 佈		pɔ ^h	to spread	pāk'; pak'
patch, mend	bǔ 補	*pagx *mpa?	pɔ ^h	to patch, mend	pāk' -äl
garden, orchard	pǔ 圃	*pagh *pa?(h)	pɔ'	garden	pāk' -aalil
widen, to spread	pǔ 溥	*phagx *pha?	p ^h ɔ'	to spread (disease) /plaster wall	pāk'; pak'
propagate	fù 敷	*phjag *phja	p ^h uǒ	to spread (disease)	pāk'

The next is possibly connected to the above, though with the specific underlying semantic: 'to scatter' in Chinese and Sino-Tibetan, and containing the 'field' graphic element: 田, probably a common element of 甫. The ST 'scatter' root is: *bjärH.

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
sow, broadcast	bò 播	*parh *pajh	pa ^h	to plant, sow	pak'; pāk'

And sharing common graphic: 番; and phonetic elements with the above is a Chinese and Mayan pair bases on the ST root: *phär, 'time, one time':

	Modern Chinese	Old Chinese	Middle Chinese		Itzaj Mayan
time	fān 番	*phar (Starostin)	p ^h uan	time	pak

It is an intriguing possibility that Chinese morphology could perhaps involve Mayan-type inflectional patterns in an even more complex way, freezing as well such things as prefixal aspect markers and even attached pronouns into single morphemes. The following comparison explores the use of the Mayan 'em' root: 'to go down', showing the parallel relationship between the 'frozen' morpheme in Chinese, and its inflected usage in Itzaj. The Itzaj portion shows an incompletive marker: k~, followed by a pronoun: uy-, followed by the root: em 'to go down', followed by the causative marker s-, followed by a (derived transitive verb) transitive status marker -aj: i.e., 'he/she lowers (something)'.

	Modern Chinese	Middle Chinese	Itzaj Mayan
fall, drop, descend	jiàng 降	kœ:ŋ ^h	k- uy- em -s -aj

Alternations in the OC reconstructions involving the presence or absence of the initial *k~ could possibly be attributable to the presence or absence of an incompletive aspect marker *k~. Let us make the reasonable assumption that yú 食於 *?jagh *?jah, 'to satiate, nourish'; and yù 餵 *?jugh *?juh 'to be satiated'; and yù 餵 *khjug *?khju 'to be satiated', are morphemic variations based on the same root. The variations, including the vowel change could result from affixes such as we have seen above, (in this comparison I have used Li's reconstructions):

	Modern Chinese	Old Chinese		Itzaj Mayan
satiate, nourish	yú 食於	*?jagh	drink (it) COMP	uk' -aj
to be satiated / drink	yù 餵	*?jugh	he drank (it)	uy- uk' -aj
to be satiated / drink	yù 餵	*khjug	he is drinking AP	k- -uy- uk'

In both languages an affix indicates momentary, transient or attempted action. The OC prefix **k~* indicates transient or attempted action (see Sagart 1999 : 100), and the Mayan suffix *~k`V* is the celeritive suffix with a similar function (Hofling and Tesucun 1997 : 16). For an example of the usage in Mayan observe the root 'limp': *chen* (Itzaj), which occurs only with this affix: *chenk`aJal*, 'limp'; *chenk`etak*, 'lame, limping, lamely'. For an illustration of this affix across the Sino-Tibetan, I explore below its usage with the Sino-Tibetan root 'to fall'. Although it is inconclusive, the broad spectrum of data suggests that the two Sino-Tibetan roots meaning 'fall' could ultimately be prefixed and unprefixed variants of the single root: **IVw*:

Sino-Tibetan: <i>*klaH</i> (fall)		Sino-Tibetan: <i>*IVw</i> (fall)		Prefixed forms in Chinese		Itzaj Mayan	
Burmese: LB	<i>khla?</i>	Chinese	<i>lak</i>	Mandarin	<i>ke-lak</i>	fall on side	<i>la`kaJal</i>
PG	<i>*khlaC</i>	Tibetan	<i>lugs</i>	Xiamen	<i>ka-lauh</i>	fall into a trap	<i>lejk`aJal</i>

It can be seen from the above that a high degree of compatibility exists between Chinese fused forms and forms of verbal inflection still actively used in modern Mayan. Fused word families exist in Chinese where the modern day counterparts in Mayan are still active inflectional variations of the same root. Further compatibility can be observed among the affixes and other idiosyncratic derivational features of Chinese. It appears that embedded in Chinese morphology is something of a 'memory' of a lost inflectional grammar. At the root of the derivational morphology characteristic of Old Chinese, as observed by Sagart, we may find in addition to a system of affixes, a language spoken in the second millennium BCE whose verbal system formerly had a complex inflectional base, on the Mayan model.

THE SINO-TIBETAN ROOTS OF MAYAN NUMERALS.

What is most striking about the broad-spectrum comparison of numerals is the lack of any apparent congruency of any kind between Sino-Tibetan and Mayan (Tibeto-Burman and Chinese data: Matisoff 1997 : 11; Proto-Mayan: Kaufman & Norman 1984 : 137; Itzaj: Hofling & Tesucun 1997 : 26):

	Prot. Tibeto-Burman	Old Chinese	Proto-Mayan	Itzaj
one	<i>*it *kat *g-t(y)ik</i>	<i>*ʔjət *tʃjək</i>	<i>*juun</i>	Jun
two	<i>*g-ni-s</i>	<i>*njer</i>	<i>*kaʔ-ib`</i>	<i>ka`-</i>
three	<i>*g-sum</i>	<i>*ts`əm ~*səm</i>	<i>*oox-ib`</i>	<i>`ox-</i>
four	<i>*b-ley</i>	<i>*sjəd</i>	<i>*kaaŋ-ib`</i>	<i>kan- kām-</i>
five	<i>*l-/b-ŋa</i>	<i>*ngo</i>	<i>*hoʔ-oob`</i>	<i>job`- jo`</i>
six	<i>*d-ruk</i>	<i>*ljok</i>	<i>*waaq-iib`</i>	<i>waak-</i>
seven	<i>*s-nis</i>	<i>*ts`jət</i>	<i>*huuq-uub`</i>	<i>Uuk-</i>
eight	<i>*b-g-ryat / *b-r-gyat</i>	<i>*pwät</i>	<i>*waaq-iib`</i>	<i>waxak-</i>
nine	<i>*d-kew / *d-gaw</i>	<i>*kjug > *kiəw</i>	<i>*b`eleŋ-eeb`</i>	<i>b`olon-</i>
ten	<i>*g(y)ip</i>	<i>*djəp</i>	<i>*laajuŋ</i>	<i>lajun-</i>
twenty	<i>*m-kul</i>		<i>*k`aal</i>	<i>k`al-</i>
one hundred	<i>*r-gya WT *brgya</i>	<i>*pāk</i>	<i>*hoʔ-k`aal</i>	
four hundred			<i>(LL&Gtz) *b`ahk`</i>	

I have included the above chart because I think the lack of congruency is interesting. It has been somewhat of a problem to reconcile this lack of correspondence in the Mayan numeral system with the Chinese, vis-à-vis the origins of Mayan numeracy. The Maya used what appears as a highly idiosyncratic counting system. The Mayan number system is vigesimal; that is, it uses the number twenty rather than ten as its counting base. Base twenty numbers are organized according to the following orders of magnitude: 1, 20, 400, 8000, 160,000, 3,200,000 etcetera, and the numeral names reflect the number base. The Chinese number system, by contrast is decimal, or base ten. With the lack of any apparent cognacy among the numerals, or congruency between the counting systems, one might be tempted to think that the numerical systems used by the Mayan and Chinese were developed independently of each other. I do not think that is the case, however; and on closer inspection, some of the Mayan numerals do appear to have Sino-Tibetan roots, and it appears that the clues to the roots of Mayan numeracy may lie much deeper among the Tibeto-Burman languages. We find such clues on the opposite periphery of the range of the Sino-Tibetan expansion, in the Southern Himalayas, and the region around the lower reaches of Ganges River.

Vigesimality is a feature of the Himalayish languages, spoken in isolated regions of Nepal; Bodo-Garo, a language group spoken around the upper reaches of the Ganges delta in Northeastern India; and Kuki-Naga, a group distributed just east of the upper reaches of the Ganges delta, and east of the lower reaches, in eastern Bangladesh and Western Burma. Some of these languages have both kinds of systems in more or less free variation, with the vigesimal one apparently older (Matisoff 1997 : 39). In Garo conservative speakers still use a vigesimal system throughout.

To observe some remarkable numerical congruency between Mayan and the languages of these regions, I first examine Proto-Mayan: **waaq-iib`* 'six' which does not appear to have an extremely close relationship with the Chinese liù 六 OC: L **ljəkw* S **Crjəwk*, under the system of sound correspondences outlined in this paper. For this numeral, let us examine occurrences in the Central Tibeto-Burman group, among the Adi-Mising-Nishi group (Bradley, 1997 : 31-35), in Northeastern India and Western Burma (Matisoff 1997 : 6-7):

ST:	Adi-Mising	Gallong	Minyong	Tagin	Padam	Nishi	Yano Nishi
six	a-ke`	akke	akeng	ake	akke	Akple	akke

Mayan:	Huastecan	Yucatec	Tojo	Moto	Teco	Agua	Tzut
six	akak	wak`	wake`	wajaqe	waaq	Uqaq	waq-i

Chinese 'three': sān 三 **səm* and proto-Mayan: **oox-ib`* do not at first appear to be cognate, although they probably ultimately are, via a probable longer form in some Mayan dialects, e.g., Tzotzil: *oxim*; in other words, the common form is a depleted form where only the presyllable generally survived. Even so, there is not a lot of support for a Mayan : Chinese x : s correspondence.

The numeral 'three' is perhaps the most stable of all the TB numerals (Matisoff, 1997: 70), and if Tzotzil *oxim* is seen to be representative of a fuller Proto-Mayan form, its cognacy is

easily recognizable. A velar prefix of long standing with this etymon is the velar, *g-/*k-*, present in the PTB reconstruction: **g-sum*. As in the case of 'six', Mayan finds its best comparables among the languages of Northeastern India with forms having no consonantal prefix. Here again one finds remarkable congruency with the languages of Northeastern India, in this case I draw a comparison from Kuki-Naga.

	Wancho	Ao	Mongsen	Kimsing	Sangtam	Tzot (Maya)	Pmam (Maya)
three	a-zam	asem	asam	acam	asang	oxim	oxim

Vocalic prefixes are also present among the AMN group for the numeral 'three'. These forms have involved the loss of the root initial **s-*.

	Adi-Mising	Gallong	Tagin	Lhopa	Nishi
three	a-um	aum	aum	a(h)um	a:-a:m

There is no single general root for 'one' and 'ten' in Tibeto-Burman (Matisoff 1997 : 17). A root closely resembling PM **juun*, 'one' occurs in a very few places in North Eastern India: **han* or **hanj* occurs in Serdukpen, Zeme, Nocte and Maram (Matisoff 1997 : 22). The best candidate for a Sino-Tibetan cognate for the Mayan 'ten': **laajuuj* arises again among the Adi-Mising-Nishi and Naga groups, in the same area. It is reasonable here to suppose that Mayan 'ten' is a compound consisting of **juun* 'one' and **laa-* 'a multiple of ten'; cf. Itzaj 'one' *jun-*, 'ten' *lajun*, and 'twenty' *junk`aal*. Hence I set **laaj-* up separately as having the meaning 'ten' or 'multiple of ten', possibly the same etymon as PM 'finish, all': **laaj*.

	Sema Naga	Angami (Khonoma)	Apatani: ten	proto-Mayan
combining multiples of ten	lho-	lhi-	lya	*laaj-

	proto-AMN	Proto-North Assam	Apatani	proto-Mayan
(one multiple of) ten	*s-r/ lyanj	*lhyanj	*lya-ŋ	*laajuuj

The most important signature in the comparison of the Himalayish and AMN with Mayan numbers is that of the number base 'twenty' and the way it is used to form other numbers:

	p-Hymalayish / AMN	p-Mayan
twenty	*-kal	*k`aal

Himalayish and AMN forms deriving from **kal* (unlike the Kuki-Chin-Naga forms deriving from **m-kul*), are used in the multiplicative formations for the higher twenties 40, 60, 80, in the same way as Mayan **k`aal*:

	Tamang (Himalayish)	Yucatecan	Huastecan
twenty	kha:l -ki:h	jun k`al	jun -inik
forty	kha:l -nyih	k`a -k`al	chab -inik
sixty	ha:l -som	ox -k`al	ox -inik
eighty	kha:l -pli	kan -k`al	tze -inik
hundred	kha:l -nga:h	ho -k`al	bo` -inik

When it comes to the intervening tens, Huastecan follows exactly the same system as Tamang, i.e., 'thirty' is 'twenty + ten', although *kal* is replaced by *inik*, except in the case of 90 *kal* makes a reappearance. Yucatecan 30, 50 etc are formed a little differently: i.e., 'thirty' is 'forty – ten':

	Tamang	Yucatecan	Huastecan
thirty	kha:l –ki:h –syi –ci	lajun –ka –k`aal	jun inik laajuj
fifty	kha:l –nyi:h –syi –ci	lajun –yox –k`aal	chab inik laajuj
ninety	kha:l –pli –syi –ci	lahun –jo –k`aal	tze –inik kal laju

A semantic key involving double meanings for this etymon also suggests a close relationship for Mayan **k`aal* with Himalayish **-kal*, and possibly ultimately PTB **m-kul*. The Written Tibetan cognate *khal* is glossed as 'burden, load', or 'bushel' a dry measure equal to 20 *bre`* (Mazaudon 1985 : 136). In several Mayan dialects, the root has similar double meanings. The identical root in Itzaj: *k`al* also means 'to close, a closed in place' and in other dialects the meaning 'twenty' is interchangeable with the meaning 'to tie'. I take these Mayan meanings to imply something like 'a completed bundle'; similar to Matisoff's suggestion of a possible gloss 'complete load' for PTB, if one is to infer an ultimate identity for the two TB etyma.

The significance of these similarities is potentially very great. If they are indeed genuine indicators of common roots, then they must also be of great antiquity. They furthermore suggest a possible locus of origin in South Asia for the Mayan numerical system, and hence raise additional questions about the early numeral systems used by the Chinese.

BODY PARTS.

It appears likely that several Sino-Tibetan etyma involving limbs are based on a root like ST *la* (leg, foot) or *lāk* (hand, arm) with an added prefix such as is found in ST: *kV-liH* (armpit). In the case of 'armpit' both the fused prefix: *gē* 絡 *k-lak* > MC: *kak*, and the unprefix: *yi* 亦 *lak* > MC: *yak* form persisted in Chinese (Sagart 1999 : 14), and it appears that the prefixed form may have prevailed in the Mayan in the Itzaj form of *xik`* < **x~* 'armpit' (under a *kl : x* correspondence?). By extension it is possible that Proto-Mayan 'wing': **xiik`* (identical to 'armpit' in Itzaj: *xik`*), could derive from a prefixed form like Chinese: *yì* 翼 **lek`* 'wing', which is the Chinese morpheme that Peiros and Starostin have placed under Sino-Tibetan: **lāk* (hand, arm). An unfused prefix form for 'leg' with a similar root is attested in the Yucatecan branch of Mayan: *tze-lek`*. Mayan 'hand, arm': **q`ab`* appears to have had a different (though possibly related) derivation but it is possible to recover the usage of the same root for 'arm' in Cholan, where it appears as: *lak`-ub* (Dienhart 1989 : 17); likewise 'foot': *lak-ok`* (Dienhart 1989 : 64).

Sino-Tibetan		Cholan	
hand, arm	below / lower	limb prefix	foot
*lāk	*?uk	lak-	ok

A number of forms like the Middle Chinese: jué 腳 *kiak* appear in Mayan dialects: Cholan: *k`ok*; Chujean: *k-ok*; and Kekchican: *qoq*; as well, occurrences of glottal onsets for this etymon are fairly typical, as, for example in Lacandon: *`ok*; Yucatecan: *`ook*; Jacalteco: *`oq*, and so on. Also 'hind leg, haunch' gé 膈 **k-lak* (EMC: *ke:jk*) had this prefixed form in Chinese, (Sagart 1999 : 236). A close comparison with the Cholan: *k`ok* and *lak`-ok`*; and Chujean: *k-ok* suggests that in Mayan, a practice of loose prefixation had continued. Affixation such as we see in Mayan languages for limbs is very widespread among the Sino-Tibetan languages:

Sino-Tibetan			Mayan		
Jingpo	back of ankle	lek -hre	Cholan	foot	lak` -ok`
Jingpo	foot, leg	lago	Cholan	leg	lak` -ok`
Jingpo	thigh	meg -ji	Itza	thigh	muk` ok
Garó	shin	dza-rikiŋ	Yucatecan	leg	tze -lek`
Jingpo	limb, branch	lekuŋ	Huastecan	thigh	kuekuen -lek
Rgyarung	hand, arm	teyäk	Huastecan	heel	tutub -lek
Jingpo	cramp in the legs	lek -hren	Huastecan	finger	kubak -lek

Let us examine whether the Itzaj words *ok* 'foot' and *ok* 'enter' are etymologically related. In proto-Mayan, these roots are: **ooq* 'foot', and **ook* 'enter'. As suggested, Mayan *ok* 'foot' could derive from proto-Sino-Tibetan: **ʔuk* 'below'. Tibetan *aok* 'below', and Burmese *auk* 'the under part' are close approximants to PM **ooq* 'foot'. Not surprisingly, Itzaj uses the root to mean 'lower part' as well, for instance: *ok witz*, 'the foot of a hill'. A link may be provided by the Chinese. It is possible that Chinese: ào 奧 **ʔəkʷ* **ʔəwk* MC: 'profound' belongs under the ST etymology: **ʔuk* 'below'. Both graphic and phonetic evidence suggests an early interchangeability of the general meanings: 'inside', and 'below' in Chinese. Compare: ào 奧 (profound, deep) to: ào 澳 **ʔəgwʰ* **ʔəwkh*, (the inside area). In the table below, which shows Mayan, Chinese and Sino-Tibetan parallels, it can be seen that in Itzaj, *ok*, when used as a verb can also mean: 'set' i.e., 'go down'.

	Sino-Tibetan		Old Chinese		Itza Mayan
inside	<i>*yūk</i>	interior	<i>*ʔjəwk</i>	enter	<i>ok</i>
below	<i>*ʔük</i>	profound, deep	<i>*ʔjəwk</i>	go down (sun)	<i>okol</i>
		make inhabited	<i>*ʔəwkh</i>	caused to enter	<i>oksaj</i>

Concerning the derivation of **q`ab`*, 'hand', both Mayan and Chinese (as well as some Sino-Tibetan) evidence suggests that this could be a reduced composite of two morphemes. It could be observed that since 'arm': gēbei 胳膊, and 'armpit' (gē 腋 **k-lak*) contain identical roots, 'arm' must also have derived from a composite form. It appears to be related to visible composites for 'arm' in Chinese: gēbei 胳膊 and gēbo 胳膊 MC: *kak-p^hak*. The latter has a remarkable resemblance to 'thigh' in Yucatecan: *chak-bak* (which would be phonologically consistent with a reconstruction of **kak-bak* in proto-Mayan). (In this case Yucatecan: *-bak* is probably directly cognate with Chinese: bǐ 髀 MC: *bej* 'thigh').

Sino-Tibetan		Middle Chinese	Mayan
leg, thigh	hip; femur	arm	Yucatecan : thigh
*k ^w ā(H)	*bējH	kak- p ^h ak	chak-bak
leg, foot (limb?)	arm	arm	Huastecan: hand, arm
*kāk	*Piak	kak-pji ^h	ku-bak

Chinese gēbei 胳膊 MC: kak-pji^h on the other hand could be compared to some of the *q`ab`* forms in Eastern Mayan: Mamean: *nq`abe*; Cakchiquel: *q`abaaaj*; and Tzutujil: *q`abaaaj*. Similarly, Huastecan 'hand' is: *kubak*. In these cases the final portion is probably directly cognate with Chinese bèi 臂 pji^h, 'arm'; ST: *Piak; OC: (Starostin) *peks. Both a composite *k`ab`* (hand, arm) and a stand alone *q`a`* (hand, arm) root are present in Itzaj. A comparable Sino-Tibetan form comes from Lepcha: *a-ka pek*, 'forearm' (Peiros 1998 : 213).

THE PRONOUNS

	Sino-Tibetan	Chinese	Itzaj
I, we	*ŋa-	wú 吾 *ŋa	I: im- in- -en -een
	*ka (Sagart 1999 : 145)		we: ki- kiw-
possessive: our	*k(j)ǎ- ~g-	qí 其 *gǐə	ki-, ki-
he, she, they		yī 伊 *ʔjəjʔ *ʔjiʔ (Sch.)	u- uy- -i -ij
this, that	*k(j)ǎ	jī 其 *kjəh	that: ka' ke kej

WRITING

The Mayan root for 'to read, study': *xok* (the Itzaj form), appears to be directly cognate with Chinese: *xiáo* 學 which Sagart has given in OC as: *gruk; *gruk-s. This root exists in the Yucatec, Itzaj, and Mopan dialects. A likely cognate exists in Tibetan: 'read' *s-grog-pa*, and possibly derivative 'school' *grwa* and *čos-gra*. The root that applies to 'write', 'writing', or 'writer', is *tz`ihb`, a root which is virtually universal, which appears to be directly cognate with *zǐ* 字 (in Sagart's system: *tsiʔ). This root in Chinese is said to have acquired the meaning associated with writing: 'Chinese character' only in early Han. According to Xu Shen, the author of the *Shuo Wen Jie Zi*, the word at first only designated characters consisting of a phonetic exponent and a semantic exponent (Sagart 1999 : 210). He believed that the term *zǐ* 字 derived from the homophone *zǐ* 孳 *N-tsiʔ-s 'to copulate, breed', because the coupling of character types could generate a large number of new characters (Sagart 1999 : 210). According to Sagart the character 字 which has been reapplied to 'write' originally meant 'to nourish, love, treat as one's own child'. This coupling of meaning is repeated in some Tibeto-Burman cognates, shown in a chart which I have reproduced below. The same coupling of meaning is remarkably found in Mayan, and I have illustrated this by adding these into Sagart's chart. [The 'love' meaning I extract for the 'tz`iib' root is written in the Hofling-Tesucun dictionary as 'desire, want, desire one another']. This argues for a much greater antiquity of the dual usage of the root than

had been believed by Xu Shen. I have also made the corresponding entries for the ST roots and Tibetan from Peiros & Starostin. The Tibetan cognate under the 'write' gloss means 'picture'.

	ST	Tibetan	Chinese	Tujia	Written Burmese	PTB (Benedict 1972)	Itza Mayan
child			zi 子 *tsi? > tsiX			*tsa	
to love	*Că	m3a	zi 字 N-tsi?-s > dziH	tshi	ca	*m-dza	tz`iib
writing	*Că	zo	zi 字 *N-tsi?-s > dzih	tshi tshi	ca		tz`iib

In Lacandon we find *tz`iba`an*, in Cholan: *tziba*; Tzeltalan: *tzibahel*; Tojo: *tz`ijp`an*; Uspanteco: *tz`ibanik*. A very small number of occurrences of a similar word for 'baby' are recorded, Itzaj (1867): *tz`u* (Dienhart 1989 : 27); and Mopan (1977): *tz`itz`i`tz`ub* (Dienhart 1989 : 27); and 'little': *tz`it (Cholan).

CULTURAL TERMS

There are a couple of cases of words with important symbolic and abstract meanings which also have a known literal and banal meaning in Mayan, where the Sino-Tibetan counterparts appear to exist only in the abstract. Mayan: *tun*, Proto-Mayan: **tooy* is the word for the both the crucial unit of time, a period of 360 days, and 'stone'. Long calendrical cycles are measured in groupings of *tun*: a *katun* is 20 *tun*; a *baktun* is 20 *katun*. Sino-Tibetan has an extensive etymology where PST: **thun* refers to time, or a unit of time; Tibetan: *thun* 'a regular amount, a fixed quantity of time'; Burmese: *tunh* 'a period, time'; Jingpo: *tan, eten* 'time'; Lushai: *tun* 'the present, at the present time'. Sino-Tibetan has a probably related word: **thoŋ*, 'a short time', Tibetan: *thay* 'a very short space of time'; Jingpo: *toy* 'a short period of time'. The Chinese counterpart could be 'regulate': *dǒng* 董 **tuyx *tuy?*. I have tentatively set up anchor stone: *dǐng* 碇 MC: *tejn^h* as corresponding to PM: **tooy* 'stone', which would probably be **tiyh* in OC, the same as *dǐng* 碇, the constellation Pegasus; cf. ST: **Tuŋ* 'thousand'; also PK: **thò(ŋ)* 'year' (P&S 1996; II :178).

Another somewhat similar case is proto-Mayan: **pohp* 'mat', a very important word in classical Mayan ideology where it took on the meaning: 'rule of law, govern'. The Chinese counterpart in the abstract meaning could be: *fǎ* 法 **pjap* 'law, model'.

The important Mayan word PM: **aajaaw* 'lord, king', which frequently appears in king names, probably has a cognate in *hòu* 后 **guʔ(h)* MC: *yəw* 'sovereign, a major lord'. The first syllable **aaj* is a masculine classifier.

For interest's sake I examined the names of two Mayan rulers for signs of possible Chinese or Sino-Tibetan roots. I chose the names of both the first and last major rulers of Copan: Mah K`ina Yax K`uk` Mo`, who founded the Copan dynasty early in the fifth century CE, whose name means 'Great Sun Lord Quetzal Macaw'; and Yax Pac, who took office in Copan on July 2, 763, and died in the winter of 820, who sit facing one another on Altar Q, a

block of green andesite set at the base of the ruined staircase to Structure 16 of the Acropolis at Copan (*National Geographic*, October, 1989 : 488-504), and obtained the following results:

Mah K`ina Yax K`uk` Mo`: Copan: 5th century CE.

Great	Sun	Lord: Lit: '1 st , centre'	Quetzal	Macaw
Mah	K`ina	Yax	K`uk	Mo`
*ma?	*kwiŋ?	*raks (?)	*kwjegw ~gw	*mo?
wǔ 武	jiòng 穎	lù 路	jiū 鳩	wǔ 武鳥
(martial, military)	(the light)	(great)	(bird)	(parrot)

Yax Pac: Copan: 763-820 CE.

Yax	Pac
*raks (?)	*prak
lù 路	bó 伯
great, grand	lord, clan head

An alternate rendition of Yax Pac's name has appeared more recently: Yax Pasaj (first dawn) Chan Yoaat (Coe & Stone 2001 : 83). This rendition would be more compatible with Chinese bà 霸 MC: pai^h/pe:^h 'overlord', the graph of which also means 'phase of the moon'. The city Palenque was often represented by the word: *baak* 'bone' and the 'bone' emblem glyph (Coe & Stone 2001 : 70-72). This name is reminiscent of, and could possibly be co-derivational with the name of the first Shang capital: bò 亳 MC: bak (Chang 1980 : 7).

CONCLUSION

The principle requirement of any proposal of genetic relatedness between languages is the existence of an observable system of phonemic correspondence between them. All languages undergo change over time, which in general is regular and systematic. Hence a proposal of relatedness involves assembling the data in a manner that enables the assessment of a regularity of correspondence between the two languages. If the lexical data yields an observable system of phonemic correspondence, that can be taken as evidence that the two languages are related. It should be kept in mind that the disposition of the work is hypothetical, based on the fact that the data itself is hypothetical. One seeks an orderly system of phonemic relationship between the two sets of hypothetical data and if such a system can be found in the comparative material, the systemic relationship thus discovered constitutes the evidence. This has been the objective of Part I of this paper. The system of correspondences observable in the data points to instances of phonetically conditioned sound change and general devoicing of consonants resulting in a much simplified Mayan sound inventory. The number of lexemes involved seems to reveal a high degree of cognacy and a somewhat closer relationship between the languages than what might have been expected.

Ideally, a proposal of relatedness should be accompanied by some examples of some embedded features, or common features of language that are peculiar to both of the languages under consideration which are highly unlikely to be coincidental. Such features are the subject

of Part II. These features reveal a common language type and a plausibility of language relationship between Mayan and Chinese and ultimately, the language family, Sino-Tibetan. Taken together, the evidence speaks for an early presence in Mesoamerica of a people whose language was fully Sinitic.

The people living in Central America today called the Maya, are associated with a specific archeological cultural complex which has its earliest manifestation in the region at around 900 BCE. This signature places the Mayan onset in Mesoamerica in a very precise historical context in China. It coincides (within less than two centuries) with a major political upheaval in China, associated with the demise of the Shang. The dates of these events place them in a broad historical context that points to a time that is already quite late in the period of agriculturally induced population spread out of Asia, and points to a secondary and probably related phenomenon resulting from intensification of processes at the core, namely, displacement. The possibility that the Maya are in fact displaced Shang is one that I do not take lightly, and I believe it is one of the more plausible explanations of the facts. Whatever the cause of the Mayan migration out of Asia, the archeological dating tells us that if the Mayan language thesis is correct, that is, if the Mayans speak a language that is closely related to Chinese, their speech reflects the language spoken by the Chinese who lived during the second millennium BCE, i.e., the language of the Shang.

Until now, the research on Old Chinese reconstruction has followed a unique method in the discipline of linguistics, which consists of determining Old Chinese rhymes and consonantal onsets, and fleshing them out with phonetic values based on their evolution into (reconstructed) Middle Chinese (Sagart 1999 : 10). I quote Sagart: 'There is no serious alternative to this method to gain information about the pronunciation of Chinese in Zhou times: it is doubtful if the comparative method can help us see much beyond Han Chinese, since most of the diversity among modern dialects results from migrations which took place no earlier than the second century BCE' (Sagart 1999 : 10). The Mayan material now enables a return of the research into the comparative arena for retrieving information about the language of the Chinese at a much greater antiquity than has thus far been possible, reaching into the latter part of the second millennium BCE. An even earlier reach is possibly to be gained if the Huastecan branch represents a split from the common language that happened much earlier than 1000 BCE. This earlier split appears to have happened and may be associated with earlier Sinitic migration into Mesoamerica.

At the theoretical level this research has highlighted the importance of the Sino-Tibetan expansion. The historical importance of this phenomenon is, as I see it, not yet well understood. The Bellwood-Blust and Renfrew model of agricultural spread derived from the Indo-European and Austronesian data appears to apply equally as well to the Sino-Tibetan expansion. The high concentration of Sino-Tibetan languages through the southern area of the Himalayas spreading out to the plains across the lower reaches of the Brahmaputra River suggests that this is another early agricultural CORE REGION.

AFTERWORD

A potentially great significance for the geographical range of this language group has become apparent during the latter stages of this research. Both the Pacific reach as well as the theoretical significance of the southwest periphery give this expansion a vital geographic status with respect to the population movements of human beings globally, throughout the Holocene. A conjecture that has come to mind is that Shang culture itself may have had its roots in Northeastern India. This question arises particularly from the above data on numeracy found near the region. The notion is given some extra support from an idea that was first suggested by Peiros, that Sino-Tibetan speakers, i.e., the Chinese themselves, were only relatively recent arrivals on the North China Plain. His observation raises new questions about what was happening in the whole of Asia during the Neolithic, and points to a need for a new look at the question of Chinese cultural origins.

A further question, suggested by the global data, is raised by the relative proximity of loci of origin of the world's two major agricultural expansions to each other: i.e., the Indo-European and the Sino-Tibetan expansions, in the Fertile Crescent and the Ganges and Brahmaputra Plains respectively. Did the two expansions originally spring from nodes in which agriculture was invented independently, or had these two core regions from the very earliest times been functionally and causally related, having arisen from a continuity of early expansion across northern India?

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APPENDIX I

i) MAYAN LANGUAGE CLASSIFICATION FOLLOWING KAUFMAN (1976)

Proto-Mayan:				Abbreviation:
	Huastecan:		Huastec Chicomuceltec	Hua Chi
	<hr/>			
	Yucatecan:		Yucatec Lacandon Itzaj Mopan	Yuc Lac Itz Mop
	<hr/>			
Western Mayan:	Greater Cholan:	Cholan:	Chol Chontal	Chl Chn
			Cholti Chorti	Cht Chr
		Tzeltalan:	Tzeltal Tzotzil	Tze Tzo
	Greater Kanjobalan:	Chujean:	Tojolabal Chuj	Toj Chu
		Kanjobalan:	Kanjobal Acatec Jacaltec	Kan Aca Jac
			Motozintlec-Tuzantec	Mot / Tuz
	<hr/>			
Eastern Mayan:		Mamean:	Teco Mam	Tec Mam
			Aguatec Ixil	Agu Ixil
	Quichean:		Kekchi Uspantec Pocomchi Pocomam	Kek Usp Poc
		Core Quichean:	Quiche Sipacapa Sacapultec Cakchiquel Tzutujil	Qui Sip Sac Cak Tzu
	<hr/>			

ii)

ABBREVIATIONS

Mayan:

PM: Proto-Mayan.

Chln: Cholan (branch).

LL: Lowland: A geographical area, not a genetic grouping, which shows borrowing, specifically Yucatecan and Cholan.

GTz: Greater Tzeltalan.

WM: Western Mayan; a grouping including Cholan-Tzeltalan, Greater Kanjobalan.

EM: Eastern Mayan: Mamean and Quichean.

Other abbreviations:

AMN	Adi-Mising-Nishi
EM	Early Mandarin
EMC	Early Middle Chinese
EZ	Early Zhou
GSR	Karlgren 1957, <i>Grammata Serica Recensa</i>
KC	Proto-Kuki-Chin
LMC	Late Middle Chinese
MC	Middle Chinese
OC	Old Chinese
P&S	Peiros & Starostin
PG	Proto-Garo
PK	Proto-Kiranti
PST	Proto-Sino-Tibetan
PTB	Proto-Tibeto-Burman
Shi	Shijing
ST	Sino-Tibetan

iii.) MAYAN SOUND CORRESPONDENCE SETS (CAMPBELL 1984)

pM	Hua	Chl	Yuc	Lac	Mop	Itz	Chl	Chn	Chr	Tze	Tzo	Toj	Chu	Kan	Aca	Jac	Mot	Tec	Mam	Agu	Ixl	Qui	Cak	Tzu	Poc	Usp	Kek
*p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
*b'	b	w	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'	b'
			p'	p'	p'	p'	p'	p'	p'	p'	p'							ch	ch	ch	ch	t	t	t	t	t	
*t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
	ty		ch	ch	ch	ch						ch															
*t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'	t'
*ty	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	tz	tz	tz	tz	ch	ch	ch	ch	ch
	ty		ch	ch	ch	ch																					
*ty'	t'	t'	t'	t'	t'	t'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'
*tz	t	t	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	tz	s	tz	s
													tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx
*tz'	t'	t'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'	tz'
													tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'
*ch	tz	ch	ch	ch	ch	ch	ch	ch	ch	ch	ch	ch	ch	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	tx	ch	ch	ch
*ch'	tz'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	tx'	ch'	ch'	ch'
*k	tz	ch	k	k	k	k	ch	ch	ch	ch	ch	ch	ch	k	k	k	k	k	k	k	k	k	k	k	k	k	k
			ch	ch	ch	ch							ch	ch	ch			ky	ky	ch	ch						
*k'	tz'	ch'	k'	k'	k'	k'	ch'	ch'	ch'	ch'	ch'	ch'	ch'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'
			ch'	ch'	ch'	ch'							ch'	ch'	ch'			ky'	ky'	ch'	ch'						
*q	k	k	k	k	k	k	k	k	k	k	k	k	k	q	q	j	q	q	q	q	q	q	q	q	q	q	q
													j	j													
*q'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	k'	q'	q'	q'	q'	q'	q'	q'	q'	q'	q'	q'	q'	q'	q'
													?	?													
*l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l	l
					r																						
*r	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	ch	t	t	t	t	r	r	r	r	r
*m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
*n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n
*ŋ	w	w	n	n	n	n	n	n	n	n	n	n	ŋ	n	n	n	ŋ	j	j	j	j	j	j	j	j	j	h
	h	h																								vj	
	ø	ø																									
*s	th	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
*x	x	x	x	x	x	x	x	x	x	x	x	x	x	xh	xh	xh	x	xh	xh	xh	xh	xh	x	x	x	x	x
*j	h	h	jb	h	h	h	h	h	h	j	j	h	j	j	h	h	h	j	j	j	j	j	j	j	j	j	j
*b	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	h	?	?	?	?	h	w	w	h	b	b
																		y	ø	ø	ø	w	y	y			
																					y	y	h	h			
*w	ø	ø	w	w	w	w	w	w	w	v	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w	w
	w	w																									
	b																										
*y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y

APPENDIX II

NOTES ON THE ORTHOGRAPHY

i.) MAYAN.

The Mayan orthography used in this paper which is taken from Kaufman and Norman consists of a practical orthography commonly used Mayan linguistics based on that of Spanish, cited by Campbell (1984:371) as PLFM or Proyecto Linguistico Francisco Marroquin. It is listed below alongside its phonetic equivalences, followed by its description.

IPA	PLFM	
p	p	Voiceless bilabial plosive
p'	p'	Voiceless bilabial plosive ejective
b'	b'	Glottalized voiced bilabial (implosive) stop
t	t	Voiceless alveolar stop
t'	t'	Glottalized voiceless alveolar stop
ts	tz	Voiceless alveolar affricate
ts'	tz'	Glottalized voiceless alveolar affricate.
tʃ	ch	Voiceless palatal affricate
tʃ'	ch'	Glottalized voiceless palatal affricate
tʂ	tx	Voiceless retroflex affricate
tʂ'	tx'	Glottalized voiceless retroflex affricate
k	k	Voiceless velar stop
k'	k'	Glottalized voiceless velar stop
q	q	Voiceless uvular stop
q'	q'	Glottalized voiceless uvular stop
s	s	Voiceless alveolar fricative
ʃ	x	Voiceless palato-alveolar fricative
ʂ	xh	Voiceless retroflex fricative
h	j	Voiceless glottal (or) velar fricative
m	m	Nasal labial

ii.) CHINESE.

(1) The Old Chinese reconstructions from Schuessler's *DEZ*, which are quoted directly in the comparisons are written in letters which "are more like cover symbols than phonetic renditions" (Schuessler 1987 : xi).

(2) The Middle Chinese reconstructions taken from Pulleyblank's *Lexicon of Reconstructed Pronunciation in Early Middle Chinese, Late Middle Chinese, and Early Mandarin*, are given in the International Phonetic Alphabet (IPA) and are intended to express the phonological structure as closely as possible (Pulleyblank 1991 : 4). A few of the special symbols are explained by Pulleyblank as follows:

ǎ stands for a nonsyllabic form of the vowel [a]. Pharyngeal glide, such as the second element in diphthongs in words like *fair* [fɛə] in the 'r-less' dialects of English.

a: Standard IPA for long vowel.

ç is the palatal fricative as in Mandarin *xī* 西 [çi] 'west'. A typographical alternative often used, for example by Karlgren, is ś.

ʒ Voiced counterpart of ç.

ɛ Lower mid-front vowel, e.g., Mandarin *tiān* 天 [tʰjɛn] 'heaven'.

ə Schwa: stands for the central vowel. [This is seen in the Mayan orthography as ä.]

ǎ An off glide similar to ǎ.

ɣ Voiced velar fricative.

x Voiceless velar fricative as in Mandarin *hǎo* 好 [xaw'] good.

ʰ Voiceless aspiration. This marks departing tone in EMC.

fi is reconstructed as a component of the 'muddy' initials of LMC such as kfi- etc. Voiced glottal fricative in IPA.

i̇ Barred i stands for high central unrounded vowel.

j IPA for a high front glide like consonantal y- in English, (not to be confused with j in the Mayan orthography which is a voiceless glottal or velar fricative).

ɔ A lower mid back rounded vowel like that in English *long*.

œ: A lower mid front rounded vowel.

r In LMC and EM r corresponds to the retroflex r of Modern Mandarin. It may have had slightly more friction than the retroflex [ɹ] of American English, since it is represented by ʒ in the Tibetan transcriptions but it was phonologically a sonorant, not an obstruent.

ʂ Retroflex fricative as in Mandarin *shān* 山 [ʂan] 'mountain'.

ʐ Voiced retroflex fricative.

? Glottal stop.

' Sign of glottalization used to mark Rising Tone in EMC.

iii) SINO-TIBETAN.

I received the following advice on the orthography used in *A Comparative Vocabulary of five Sino-Tibetan Languages* from author Peiros (2000):

"The symbols are used in the dictionary in several ways:

(1) Tibetan and Burmese are used in the dictionary in transliteration. It means that the letters represent symbols used in the traditional orthographies of these languages, and not as phonetic symbols. The idea here is to avoid scripts other than Latin. The choice of Latin symbols somehow reflects our views about the phonological nature of the local letters, but not of their phonetic values.

(2) Lushai symbols represent the information given in the Dictionary of the language, which is also not the phonetic one.

(3) Jingphaw we simply follow the orthography of the dictionary, which is, presumably, phonological.

(4) Old Chinese and Proto-ST are given in phonological reconstruction, and the symbols used correspond to the phonemes and not the sounds....Each symbol in the Dictionary may correspond to several phonetic symbols, but only one phoneme."

The symbol \mathcal{L} , frequently used by Peiros and Starostin in their section of laterals, is described by Pullum and Ladusaw in the *Phonetic Symbol Guide* (1996 : 110) as a voiceless alveolar laterally released affricate [IPA: tʃ]. The other lateral symbol \mathcal{L} could be intended to imply a voiceless distinction from *l* in OC but this is not clear.

A transcription guide for the Tibetan is given by Jaschke (1998 : iix). The symbol Υ used, for example in *ɣcũn-po* 'younger brother' is not a phonetic but stands for a prefix.

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