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A Quaternary Approach to Manchu *side-* '≣ ' and its Connection with Tokharian *śtwar* 'four'[1]

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In my previous studies, starting from the assumption that the quaternary perception could have led people to associate square figures with the numerals for 'four', I have dealt with the cognitive significance of the numerals for 'four' and their etymological connections in central Eurasian languages (Wang 1998, 2000). The great extent of the quaternary resourcefulness to be found in Eurasia reflects its importance in early cultural and linguistic exchange. Yet the multiple tiers of semantic change deposited in the course of vocabulary diffusion necessarily make the task of etymologizing and explaining the related words in the various languages a complicated one. Accordingly, our research work would better proceed step by step. Relevant to the theme of quaternary perception I have recently found the Manchu words *sidehun* (*sidehen~šudehen*), *siden*, and *si*. From the phonetic point of view, the former two contain the root *side-*. In comparison with this root, Manchu *si* retains only its initial syllable by dropping the following one. These words have no clear etymological explanation. In this paper I shall extend the argument in my previous research to address the issue of this root and its connection with Tokharian *śtwar* (A) and *śtwer* (B) 'four' by organizing my discussions on five points.

1. DICTIONARY GLOSSES AND THEIR SEMANTIC ABSTRACTION. Norman (1978:239, 240) lists Manchu *sidehun*, *siden*, and *si* in three separate entries by glossing each with several meanings. I would like to organize them in Table 1 as follows:

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Table 1. The meanings of Manchu *sidehun*, *siden*, and *si*.

	SIDEHUN	SIDEN	SI
1	a horizontal wooden bar for a door	space, interval, interstice	
2	the horizontal pieces of window frames	a while	space (in writing), cf. *siden*
3	the horizontal supports on the bottom of wagons and sedan chairs	measure word for rooms	a file of five men
4	the steps on a ladder	witness	
5		official, public	

A similar lexicography is seen in Hu (1994:670-1, 668). He explains *sidehun* with two meanings: 'the horizontal wooden bars of the structures such as window frames, ladders, wagons and sedan chairs' and 'wooden bolt'. He arranges *siden* in three different entries each having a number of related meanings covering the senses shown in (1-2) and (4-5) in Table 1, with the meaning in (3) not being recorded. As for *si*, he interprets it in terms of 'space' and 'troops'.

How can we account for the set of related and distinct meanings of these three words? Is it possible to etymologize them with the Tokharian word for 'four'? The key to understanding the original semantic traits of the three words is through abstract approach to the passage from semiotic markings to numerical and geometric perceptions. Despite their specific denotations in semantics, all the four glosses of Manchu *sidehun* consistently pinpoint to an abstract array of the numerical marking(s) ≡ or −. And the meanings of 'space', 'measure word for rooms', and 'a file of five men' of Manchu *siden* and *si*, respectively, may also be perceived in terms of the geometric four-sided figure □. The gloss for Manchu *si* in the sense given in (3) is illustrated by a textual citation of the Manchu sentence *si sindame yabumbi*. For it Norman gives 'to walk in files of five', and Hu has 'to walk in rows'. In my opinion, the use of Manchu *si* in this context is reminiscent of the square formation in military drills.

In my previous work (Wang 1998) I traced the Manchu words *ᡝᡨᠠᠯᠠᠨ talan* 'measure word for walls and fences' and *deken* '*mu*—a traditional unit of area' back to Tajik *čal* 'forty' and Manchu *dehi* 'forty' (Orochun *d★ki* 'forty'), respectively. These two pairs of quaternary conceptualization supplement the parallel between Manchu *siden* in the sense of 'measure word for rooms' and Tokharian *śtwar* 'four'. The pattern of semantic shift had been pervasive in the form of quaternary undercurrents that could be present in historically connected words, creating corresponding meanings. I have connected Mongolian *čağarsun* 'paper' with Persian *čahār* 'four' (Wang 1998). Cognate to Mongolian *čağarsun* is Dagur *čās*. In addition to the meaning 'paper', Dagur *čās* also means 'generation, distance between blood relatives'. When I was a boy I often heard the Dagur speakers using the word *čās* in this sense, for example, occurring in the phrase *hoir čās hol* 'two generations afar'. If we look at Manchu *ᡝᡨᠠᠯᠠᠨ talan* in the senses of 'generation' and 'subdivision of a banner (as an administrative or military unit)', we can see there exhibiting a similar pattern of shift. I think, in history the word denoted a piece of territory in which a clan lived. With the growth of population, the clan split into several fraternal subclans, and then members of the clan began to realize that the territorial distance between them played a decisive role in determining the relationship among the subclans. As a result, the quaternary perception of a space applied also to the distance between blood relatives.

The foregoing analysis promises to lead Manchu *side-* to numerical conception in general and to quaternary perception in particular. The Manchu instance is by no means an isolated phenomenon. The Chinese characters for 'four' and 'forty' had the forms of four parallel markings ≡ and 𐂭𐂭𐂭𐂭, respectively, in their early existence. Likewise, the set of four markings 𐂭𐂭𐂭𐂭 converged in graphic presentation of the number four in many other early writing systems. The underlying agreement between the three Manchu words, when warranted by their phonetic shape, would suggest that they were historically derived from the common root **side-*. Thus, we are driven to compare it with Chinese *si* (< **sit*) 'four', Tokharian *śtwar* 'four', and Mongolian *sidün* 'tooth' (Wang 2000:294-5, 298).

2. PHONETIC PROBLEM. If we look at Tsintsius (1977), who and whose colleagues did comprehensive lexicography and historical comparison in Tungusic linguistics, we can have a rich picture of the Tungusic etymology concerning the Manchu root *side-*. Here the quaternary denominator has a chance of being a contributing factor in the formation of several semantic layers in Tungusic. Tsintsius (1977:76) has arranged Manchu *sidehun*, *siden*, and *si* under the headword represented by Evenki *sigdil* without making any attempt to reconstruct a Proto-Tungusic form and to explain how to reconcile the semantic differences in the provided etymology. Tsintsius' collection can be analyzed either synchronically or historically as containing two roots **sid-* and **sigd-* in a host of phonetic varieties depending on different languages and dialects. The initial sibilant of the words may present itself as *ś*, *š*, and *h*, and the postvocalic consonant *g* may change to the liquid *l*.

The major phonetic problem presented to the etymology I am proposing is the existence of the postvocalic velar stop in some languages: Evenki *sigdil* 'interval' and Solon *śigd* 'interval'. These words with the velar stop coexist with those without it: Ulcha *sidu* 'pole' and Nanai *sid* 'cross-beam'. Within Manchu we encounter the variant form *šukdun* in the sense of 'witness' only, which overlaps with that of *siden* in the same sense given in (4) in Table 1. We have to cope with this problem even though we may not provide a convincing solution. The question should be: was the postvocalic stop original, epenthetic, or metathetical?

In order to fit into the proposed etymology I shall adopt either epenthetic or metathetical approach. Under the epenthetic hypothesis, the archaic Tungusic root had the form of **sid-*. Certain Tungusic dialects came up with a glottal element in the postvocalic position yielding the secondary root **si d-*. Then the glottal sound further developed to what is the present-day velar stops *g~k*. In Turkic historical phonology, the Western Yugur and Tuva are known with this type of sound change. For example, Old Turkic *at* 'horse' and *et* 'flesh' are rendered as *aht* and *yeht* in the former and *aht* and *eht* in the latter. From the metathetical standpoint, the root **sid-* became presented as the secondary stem **sid+g(V)-* by taking on a suffix. The resultant stem **sidg(V)-*

subsequently changed to **sigd(V)-* through the switch from the two adjacent consonants **dg* to **gd*. In Tungusic, we are not short of the mechanism of metathesis. For example, Manchu *ᡩᡳᡴᡡᠨ dikūn* 'eight' is cognate to the following forms: Udehe *ᡩᡳᡴᡡᡥᡡ dikūhū(n-)*, Ulcha *ᡩᡳᡴᡡᡥᡡ dikūhū(n-)*, Oroki *ᡩᡳᡴᡡᡥᡝ dikūhē*, Nanai *ᡩᡳᡴᡡᡥᡳᠶᠠ dikūhia*, Evenki *ᡩᡳᡴᡡᡥᡡᠨ dikūhūn*, and Negidal *ᡩᡳᡴᡡᡥᡳ dikūhī*. The latter two forms show a metathesis from *kp* to *pk*. Also consider the similar change occurring in the following words: Manchu *sabka*, Orochun *sarpu* (< **sakpu*) 'chopstick'; Manchu *gabta-*, Orochun *garpa-* (< **gatpa-*) 'to shoot'; Manchu *saksaha*, Sibe *sask* 'magpie'.

Neither of the approaches I have suggested here, along with their supporting pieces, is thoroughly cogent for the time being, but either of them does appear to deserve attention that may prompt us to consider how to work out a proto-morpheme as a denominator for its different layers of historical distribution in the Tungusic etymology. If we go through the semantic extension and symbolism of the number words for 'four' on a cross-linguistic basis, we would be able to shed some light on the issue.

3. 'FOUR' IN ETHNONYMS AND TOPONYMS. In Mongolian the numeral *dörben* 'four' came up with a variety of designations including ethnonyms and toponyms, so was its derivative *dörbelᡩᡳᠨ dirin* 'square'. During the Yuan dynasty, according to the contemporary Chinese sources, the Mongolian emperor and empress habitually sit on the low bed with cushions in the imperial palace in what is now Beijing. Popular for sitting were the square cushions which were called *dörbeljin* in the Mongolian language. The hPhagspa alphabet of the Yuan dynasty was alternatively named *dörbeljin üsüg* 'the square script', which is a modification of the Tibetan alphabet. When doing archaeological work in northwestern China, Hedin (1943:120, 254, 1944:6) and his colleagues came across the well Durbeljin 'the square well', the village Durbeljin, and Durban-modo (Durben-motto). On his journey to Mongolia in the late nineteenth century Pozdneyev (1892) recorded a number of Mongolian expressions involving *dörben* and *dörbeljin* in vernacular pronunciations and morphological modifications: *Dörbet yurts*, *Dörbet ölöts~Dürbet-Öölöts*, *Dörbeljin ukhaa* (hill), *Dorbeljin uula* (mountain), *Döröljiin khütül* (peak), and *Dörbediin oboo* (heap).

In the history of Central Asia the number four formed part of tribal designations. For instance, the Sogdian Karabalgasun inscription recorded the ethnonym *ctβ'r twɣr'k* 'Four Twγry'. According to Henning (1938:559), 'Four *Twɣr(y)*' relates to the territory between Bišbalïq and Kučā, or a part of it. The designation of the Four-Twγr-country also occurs in a Manichaean hymn and in the Uyγur colophon of a Manichaean book (Henning 1938:551). In addition, Henning (1938:558) provided the alternative Turkic name *tört küsän* (placed in the parentheses) for Kučā as a country of importance for the propagation of Buddhism.

In Tungusic, the secondary stem **sigdV*- extended to cover some similar semantic layers. First, Evenki *sigd*★ means 'meat-fillet' presumably because the fillet is perceived to be in square or cubic shapes. Second, Negidal *sigd*★ denotes 'mountain range, ridge'. Third, Negidal *sigdan* is the ethnonym for the Negidal people, and Udehe *sigdi*◣★ is the ethnonym for the Udehe people. In Turkic, I have so far found the Salar word *sid*★ 'arris, edge, lozenge', which may have a connection with the Manchu root *side*-.

In the domain of nomenclature, perceptions matter; for many speakers, perception is reality. Existing research into the place of the square figure in human cognition is of great help for us to understand what I have provided above. Menninger (1969:180) argues that: 'People tend to think of the square not only as something with four corners, but also as something regular, something orderly'. Humez et al (1993:73, 74) points out that 'the square and the right angle are, after all, essential parts of our rational understanding of the world' and 'our fondness for the 90-degree angle is innate, a function of the profound extent to which we are characterized by lateral symmetry'. Ancient India is very rich with numerical symbolism. The quaternary symbolism is responsible for the fact that the value of four has often been attributed to the words for 'water' and 'ocean' (Ifrah 2000:473). The ancient Chinese also conceived the sea in quaternary terms creating the formulaic notion of *sihai* 'the four seas'. In ancient Greece, some earlier geographers, notably Ephorus, conceived the 'barbarian' world descriptively as divided into four, corresponding to the points of the compass, as seen

from Greece (Renfrew 1987:219). Much the same can be said about the Chinese way of treating the non-Chinese ethnic groups in the quaternary perspective from the central plain where the ethnic Chinese were situated. Even the earth and the world are perceived to be quaternary. St. John the Divine, an octogenarian in exile on the mountainous island of Patmos, surrounded by miles and miles of the wine-dark Aegean Sea, wrote: 'And after all these things, I saw four angels standing on the four corners of the earth, holding onto the four winds so that no wind should blow on the earth or on the sea or on any tree' (Humez 1993:66). In ancient Mesopotamia, to match the dignity of his imperial position Naram-Sin, King of Agade, called himself king of the Four Quarters of the World. A Middle Hittite hymn to the Sun reads: 'and the four (horses) which you, Sun, harnessed… O Sun God! Great king! You constantly ride [in a chariot] around the four corners of the world' (Gamkrelidze and Ivanov 1995:629).

In their daily experience people acquire quadrilateral perceptions and foster the consequent habits to carry them over to their linguistic expressions with the number words for 'four', thus promoting quadrilateral cognition. Menninger's (1969:148) discussion of the Latin case has also generated evidence for a habitual use of 'square' in the place of 'peak'. Latin *tri-quetrus* means 'three-cornered', the idea of 'peak' or 'corner' being embodied in the *quetrum* and derived ultimately from the Indo-European *q◆et◆or* 'four'. From *quetrum* came the Latin word *quadra* 'square, cross'; in this word the old meaning again comes to the surface.

As we know, hill, heap, peak, mountain, range, ridge, and the earth are not necessarily in square shapes. Yet they are perceived and named so. Given this cognitive endowment, how quadrilateral perceptions work cross-linguistically is an important aspect of our linguistic study of the number four. Because of this, we should be aware of the human cognitive trend that geometric perception was a dynamic visual and mental process. We cannot properly undertake to analyze any semantic expansions without an awareness of the multiple tiers of meanings of the number four.

4. TALLY STICKS AND MARKINGS AS WITNESSES. Once upon a time, a favorite mode of record keeping was to use tally sticks. What was inscribed or written down on them would be used as a witness. The cardinal numbers must have had high frequency in usage in daily life, being able to carry with the great ease its symbolic meanings over to other denotations or connotations. When we speak of Manchu *siden* in the sense of 'witness', we are unwittingly turning to the similar semantic problem with the Hittite words *kutrus* 'witness' and *kutruwan-* 'witness'. Carruthers (1933:152) derived Hittite *kutrus* from Indo-European **kʷtru-*, a variant stem-form of the numeral for 'four'. This etymology has been accepted by some researchers, the recent reference to the subject being in Eichner's work (1992:80-82) on the Anatolian numerals. According to Carruthers, the Hittite *kutrus* is represented also in the secondary formations *kutruwatar* 'the giving of evidence', *kutruwā(i)-* 'to cause witnesses to testify' (?), and the preterite form *kutruwahhun* 'made (one) a witness'. It is a remarkable fact, that Hittite *kutrus* is cognate to the Indo-European numeral for 'four', but it lost this numerical meaning. How did this semantic shift happen? The contemporary socio-cultural practice contributed to the proposed shift. Carruthers (1933:152) argues that:

> If the judge is considered as a major party in the case, he will normally be the *third* person present, and the witness, when called, will obviously be the *fourth*. Or, if the judge is excluded from the reckoning, the supporters or witnesses for plaintiff and defendant will be the third *and* fourth parties concerned.

This analysis points to the path for the semantic shift from 'fourth' to 'witness'. I consider it symptomatic of the semantic equivalency between Manchu *siden* 'witness' and Tokharian *śtwar* 'four'. It is however not possible for me at the moment to prove that the similar practice had once existed in the early Manchu society when the meaning of 'witness' emerged in the Manchu speech. But I should like to give an alternative explanation that the notched tally had once served as a witness for record-keeping and economic transaction, as the concerned parties were afraid of forgetting or recanting what had been done. In the

preliterate societies there would be no way of witnessing a transaction if no notched tallies or similar methods were used.

Early people who experienced a need for having access to counting efficiency undertook to develop a necessary stage of using sticks and notches. The mnemonic counting devices of this type were the precedent of the orthographic designation for numerals. This practice was found in many cultures. For instance, the ancient Chinese employed wooden and bamboo sticks of various lengths as tools for counting and calculation. This method readily resulted in the parallel display of wooden sticks in the form of □ or □□□□. In an abstract sense, this arrangement may be cognitively identical to what is meant by Manchu *sidehun*[2].

The Xianbei tribal confederation, which was a dominant power in Inner Asia in the second century, has often been mentioned as the ethnogenesis of the Tungusic and Mongolic peoples. The Xianbei group, along with the other Altaic groups, practiced tally notches for keeping record of things and marking off numbers. This reflects the rudimentary state of Altaic record keeping and counting. The notches and markings carved on tally sticks could be effectively used as witnesses in the future references.

During his archaeological expedition in the northwestern part of China Stein spotted many wooden strips and tablets bearing Chinese, Tibetan, and Kharoshthi characters. Stein (1968:284) observed that the fact that the majority of these tablets bore in the sunk socket of their covers or envelopes the impressions of two, or in a few cases even three, seals strongly supported the assumption of their containing agreements or bonds executed before witnesses. Stein (1968:289) continues to argue: 'If such tablets were used ordinarily for agreements, contracts, bonds, or other official records intended eventually to serve as legal evidence, we can understand the care and ingenuity bestowed upon their make and method of fastening'.

[2] The Hittite word *kutris-* means 'reckoning, count, tally, number'. Phonetically, this word is pretty similar to Hittite *kutrus* and *kutruwan-* 'witness'. I am not certain if they are connected.

Early people spontaneously employed an iconic way of representing the cardinal numbers. Representational convergence when the graphemes (notched or written) for one, two, three, and four reflected the consistency of value contained in the numbers can be seen as cognitive tendency of the human beings and as a visual accommodation to their eyes. Lower cardinal numbers are easy to score and easy to be identified. To know how to add one to the existing number was to know how to conceive it with the eyes. Higher cardinal numbers, on the other hand, contains more and more strokes if the iconographic method used for the lower ones was applied to them. It would inevitably cause the difficulty for people to conceive. That was why, as Ifrah (2000:9) explains, the method was abandoned as early people were able to rearrange the signs for higher cardinal numbers hierarchically, which were conceived with relative ease. Often the relation between the value of a number and its iconic representation may be one-to-many. Thus, there were many ways to represent the number four such as □, ᠺᠺᠺᠺ, ····, and ::, but usually one of them remained conventional in tally representation. The set of notches ᠺᠺᠺᠺ was visually good and remarkable, also was easy to score with a tool. Since tally sticks with a set of notches were often used as a witness, the new meaning of 'witness' emerged in Manchu *siden* in the course of semantic development.

5. SQUARE AND PUBLIC SPACE. To seek the threads of evidence for the quaternary interpretation of Manchu *siden* 'official, public', I assume that there might be three possibilities for the meaning to have taken place. First, the meaning 'space' was understood as 'public space' and then shortened as 'public', which in turn extended to 'official'. Throughout history we are not short of square places, large or small, for public or official functions such as markets, gatherings, worships, and military drills and inspections.

Second, quadrilateral figures represent a symbol for house, group of houses forming a settlement and village, and further a city. In ancient Sumerian and Egyptian graphemes the quadrilateral figure was used to mean 'house'. In Central Asian archaeology people often come across ancient remains of square buildings. Frumkin (1970:145) reported

that: "A huge building with many columns was discovered in the northern sector of Staraya (Old) Nisa situated near Ashkhabad. Its 'Square Hall', the oldest part of which dated roughly from the 2nd century BC, was reconstructed in the 1st or 2nd century AD and apparently served as a religious shrine, possibly for dynastic worship" (further references therein). In Chinese, the Buddhist abbot and abbot's room share the same linguistic designation of *fangzhang* 'square *zhang* (= 11 1/9 square meters)' because the abbot lived and conducted his teachings in a square place.

Manchu *siden*, in the sense of 'measure word for rooms', implies the existence of rooms or houses. An easy way to approach the etymological connection between the dwelling house and the house as an official agency is to examine how English *house* comes to denote the House of Representatives as a government body. Together, towns and their surrounding walls combined to yield the impression of the official place. For instance, it is suggested that the word *Kremlin* 'the government of Russia' had a connection with Mongolian *kerem* 'wall, city'. In Altaic, Dagur *k★ɐɾɪn* means 'wall'; its source word in Manchu is *hečen* which means 'city wall, city', and Manchu vernacular *h★č★n* turns out to denote 'capital city', getting close to the sense of 'official'. Vocabulary diffusion took place in repeated waves of lexicalization in the adjacent languages. The Tungusic secondary root **sigd★-* penetrated into some Mongolic languages through the change of lambdacism in the V__C position: Dagur *śild★~śill★~hild★~hill★* 'floor (of a room, often four-sided)', Mongolian *siltegen* 'village, inhabited place', and Middle Mongolian *šinden~šindeyen* 'village'. The lambdacized form is also found within Tungusic: Negidal *sill★* (< **sild★*) 'interval, space'.

Third, in ancient Greece the Pythagoreans identified justice with the number four. This idea, along with some other pieces of Pythagorean numerical symbolism, has been viewed as mysticism (Jones 1952:56). However, we should be aware of the possibility whereby the Pythagoreans had not got this idea out of thin air simply for the sake of mysticism. It was instead likely that they had drawn this symbolism from the contemporary quaternary praxis in their society. The Pythagoreans creatively arranged numbers in square and oblong forms. Given its aesthetic beauty and geometric uprightness, the square figure associated

with number four may yield the perception of justice in both symbolic and linguistic terms. In this connection, consider the following two instances. Firstly, early Chinese thinkers often defined the nature of social norms in geometric terms. For example, Confucius endeavored to set up patterned social rules for people to follow, admiring the symbolic power and aesthetic beauty of the square shape in streamlining social behavior. Secondly, the English word *square* in the list of its polysemic denotations means 'just, fair, honest'. Accordingly, there is nothing mysterious about the quaternary symbolism. The quadrilateral feature had a deep cultural value for people and thinkers to catch in developing native concepts of 'justice' and 'official, public'.

In this paper I have aimed to take up the theme that has been recurrent throughout my numerical studies from a Tungusic angle. The Manchu root morpheme **side*- represented a chain in the diffusion of the words for 'four' in Central Eurasia. It would suggest that the early Tungusic speakers had acquired the morpheme and continued to use it by adding certain semantic nuances. The resultant semantic distributions demonstrate that these words are all related with one another. By analyzing the different phonetic forms, into which the root **side*- evolved to present itself in Tungusic, and its derived meanings, as well as the underlying perception people had of it, we can broaden our knowledge of how the proto-morpheme for 'four' diffused from language to language arithmetically and geometrically. In the course of vocabulary diffusion, the speakers of different languages may have altered the meaning of words beyond intuitive recognition, without affecting their basic phonetic shape. That is why we have Manchu *side*-, Mongolian *sidün* 'tooth', Tokharian *śtwar* 'four', and Chinese *si* 'four'.

The semantic traits contained in the Tungusic words have in common two important abstractions: □and □. The former reflects a set of iconographically quantifiable markings, and the latter represents a four-sided geometric figure. As their underlying similarity was accessible to people, they each could eventually have been used to derive new meanings. Today we are sensitive about the semantic differences between several meanings presented by Manchu *sidehun*, *siden* and *si* as shown in Table 1. Upon a close examination, there is little particularly

incompatible about those meanings. We can postulate two mutually exclusive scenarios of the subsequent fate of this semantic abstraction. It might be either that the set had not developed into a number word for 'four' because such a development was not needed for Tungusic in that direction when it had already acquired the number out of the other chronologically available lexeme, or that the set once meant 'four' in history and was later superseded by what is now used as *duin* (Manchu) 'four'.

Although certain insights, especially insights into the phonetic organization of the number words for 'four' and their reflections in sister languages, have been gained through the comparative method, their basic transcontinental linkage was not a focus in research. The linkage pertains to the cognitive process underlying the pattern of linguistic distribution across languages in Eurasia. Given the primacy of the Indo-European membership of the Tokharian language, the satem feature of Tokharian *śtwar* and *śtwer* 'four' had once become an important concern among historical linguists. After all, our comparison shows the status of the initial sibilant of the Tokharian word having more phonetic connection with the east than with the west. No analysis of the etymological connection of the numerals for four can be complete without a thorough study of their proto-morphemes and distribution in Eurasia.

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