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In the introduction to his *Word families in Chinese* (1934:1), B. Karlgren wrote: "it stands to reason that Chinese does not consist of so and so many thousands of independent monosyllables, none of them cognate to any others; in Chinese, as in all other languages, the words form families, groups of cognate words formed from one and the same primary stem". In the same text, Karlgren also articulated the notion that in comparing Chinese with related languages, word stems, not words per se, are the appropriate objects of comparison. Karlgren's *Word Families* assembled sets of words which resembled one another more or less closely in both Karlgren's reconstructed Old Chinese pronunciation and in meaning: for instance *xíng* 行, Karlgren's *g'ǎng 'to walk, to go'; *huáng* 徨, Karlgren's *g'wân 'to go to and fro'; *wáng* 往, Karlgren's *gi wang 'to walk, go'; *jiē* 街, Karlgren's *kěg 'street'; *xiàng* 巷, Karlgren's *g'ǔng 'street, lane' and *áo* 遨, Karlgren's *ngǒg 'to ramble, stroll', all of which begin and end in a velar and have meanings relating to the idea of walking. Naturally not all words of similar pronunciation and meaning can be referred to the same word family (*cí zú* 詞族): care must be taken to exclude accidental resemblances by restricting membership to well-attested words obeying well-attested and well-understood alternation patterns. Karlgren considered the words in each set as "possible cognate words", to be established more firmly, or discarded, when the morphological processes behind word families would be known. To be sure, progress in that direction has been accomplished since Karlgren; and while the resemblances between the forms listed above would strike many modern scholars as accidental, enough alternation patterns have been identified that word families can now begin to be successfully assembled.

Although no stable traditional designation exists for it, the notion of word-family has an interesting history in Chinese scholarship. Eastern Hàn commentators and exegetes were aware of cases of derivation by tone change and of other kinds of phonological alternations between related words, especially when written by the same character (Zhōu Zǔmó 周祖謨 1966). Later on, Gě Hóng 葛洪 (283-343) reported that *hǎo* 好 and *è*

惡 were pronounced differently according to whether they meant 'good' and bad', or 'to love' and 'to hate', respectively, thereby identifying an alternation affecting two words in parallel ways on the phonological and semantic levels. In his *Jīngdiǎn shìwén* 經典釋文 Lù Dé míng 陸德明 (556-627) used the *fǎnqiè* 反切 technique to record variant pronunciations for Chinese characters in their specific context of occurrence in the classics, based on their reading tradition in his own time. Lù's goal was to provide his contemporaries with a tool for correct recitation of the classics, but to us, considering that Old Chinese morphology died out during the first half of the first millennium CE, the *Jīngdiǎn shìwén* represents an irreplaceable source of information on Old Chinese morphological alternations in textual context. If we did not have it, our information on Old Chinese morphology would depend on minimal pairs occurring in Middle Chinese lexica with only rough indications of semantic difference, and no information on grammatical usage. The *Qúnjīng yīnbìàn* 群經音辯 by the northern Sòng 宋 scholar Jiǎ Chāngcháo 賈昌朝 (997/8-1065) collects variant readings, providing *fǎnqiè* 反切 and semantic glosses. *Juàn* 6 lists 210 minimal or nearly minimal pairs, most of them illustrating the derivation of *qùshēng* 去聲 words out of words in other tones, classified in terms of the semantics of the derivation. The *qùshēng* reading is always listed second, indicating a clear understanding of the direction of derivation. While Chinese characters built on the phonetic compound principle ("xíngshēngzì" 形聲字) had been held since the *Shuōwén jiězì* 說文解字 to consist of a semantic element, often located on the left of Chinese characters (hence "zuǒwén" 左文) and a phonetic element, often placed on the right ("yòuwén" 右文), another Sòng 宋 scholar Wáng Shèngměi 王聖美 argued that the left-side element only gave a broad semantic classification, while the right-side element gave both the character's pronunciation and its actual meaning. For instance he identified a right-side element *jiǎn* 淺 with the meaning 'small, little' in a set of four characters: *qiǎn* 淺 'shallow' ("little water"), *qián* 錢 'money' ("small amount of gold"), *cán* 殘 'fragment' ("small amount of matter") and *jiàn* 賤 'cheap' ("small in value"). This analysis is functionally not very different from positing a word-stem meaning 'small, little' with an Old Chinese pronunciation something like *TS(h)an, capable of evolving to Middle Chinese tshjenX, dzan, dzjen, dzjenH. This particular four-word set may not be considered a genuine word-family by many modern scholars, but Wáng's *yòuwén* 右文 theory did account for numerous instances of semantic contacts among characters having the same phonetic

element, of which every traditional Chinese scholar can cite any number. The *yòuwén* theory had a considerable influence in Chinese traditional lexicology: the works of Míng and Qīng scholars like Huáng Shēng 黃生 (1622-?), Dài Zhèn 戴震 (1724-1777), Duàn Yùcái 段玉裁 (1735-1815), Wáng Niànsūn 王念孫 (1744-1832) and Kǒng Guǎngsēn 孔廣森 (1752-1786) contain many references to it. Closer to us, Zhāng Bǐnglín 章炳麟 (1869-1936) in his *Wén shǐ* 文史 reaffirmed the phonetic nature of the Chinese script and sought etymological connections through the phonetic elements of Chinese characters. Following the research tradition of Dài Zhèn and Kǒng Guǎngsēn he required the rhymes of cognate words to conform to certain recurrent types of phonetic alternation called *zhuǎn* 轉, which can perhaps be translated as ‘transfer’.

Alternations between words ending in different classes of sounds were called *duìzhuǎn* 對轉 ‘opposite transfers’: for instance the alternation between the related words *é* 鵝, Middle Chinese nga ‘goose’ and *yàn* 鴈, Middle Chinese ngaenH ‘wild goose’ is a case of *yīnyáng duìzhuǎn* 陰陽對轉 ‘opposite transfer between vocalic and nasal endings’; while alternations between words ending in sounds of the same class were called *pángzhuǎn* 旁轉 ‘lateral transfers’: thus *nóng* 農, Middle Chinese nowng ‘farmer’ and *nán* 男, Middle Chinese nom ‘man, male’ were viewed as related words with nasal endings exhibiting ‘lateral transfer’ across different rhymes. Zhāng’s ‘transfers’ are defined purely as phonetic alternations: a specific semantic or grammatical alternation is not part of the notion’s description. For that reason the words related by these ‘transfers’ can be doublets originating in dialect stratification, rather than morphologically related forms. Zhāng’s typology of phonetic alternations is still influential among modern specialists of phonology and paleography in China: the *Tóngyuán Zìdiǎn* 同源字典 of Wáng Lì 王力 (1982) assembles a large number of putative Chinese word families on the basis of Zhāng Bǐnglín’s *zhuǎn* 轉, expanding the evidential basis of research on the subject. Addenda to Wáng’s dictionary are regularly published in the PRC (e.g. Liú 1999). Mèng (2001) is modern work in the same tradition. Other representative works are Zhāng Bó 張博 (2003), Zhāng Xīfēng 張希峰 (1999), Zhāng Jìtāo 章季濤 (2000). One also notes that the word family concept has been creatively applied to Chinese dialectology (Chá Zhōnglín 查中林 2002) and Tibeto-Burman linguistics (Zhāng Jìchuān 張濟川 2009).

Beginning in the late 19th century, modern linguistics of the western tradition renewed the traditional approach to word families by introducing the notion that affixes are behind morphological alternations (see lemma on OC morphology). A. Conrady (1864-1925), a Tibetanist and Sinologist trained in comparative Indo-European comparative linguistics, proposed that an *s- prefix with transitive-causative and denominative functions exerted a devoicing effect on a following voiced stop, resulting in alternations between intransitive verbs with voiced initials and transitive verbs with voiceless initials in Chinese, Burmese and Tibetan (Conrady 1896), a view still upheld by Gong (2002) and Mei (2012) in slightly different forms. Thus the *Guǎngyùn* 廣韻 gives two readings for *bài* 敗, in Baxter's notation (Baxter 1992): *baejH* 'defeated' (intransitive) and *paejH* 'to defeat' (transitive): Mei reconstructs *brads and *s-brads respectively. A causative *s- prefix is well accepted in Old Chinese but its role in devoicing is controversial: in the Baxter-Sagart system on the contrary, *s- assimilates in voicing on a voiced obstruent root initial that follows it: *shì* 視 *gijʔ > *dzyijX* 'look, see' vs. *shì* 示 *s-gijʔ-s > *z-gijʔ-s* > *z-ɬijʔ-s* > *zyijH* 'show (v.)' (Sagart and Baxter 2012). Sagart and Baxter explain the transitivity-related voicing alternation in *bài* 敗 by supposing a transitive verb root *pʳat, with secondary voicing due to a stative-intransitive nasal prefix: they reconstruct *pʳat-s 'to defeat' (v.t.), Middle Chinese *paejH* vs. *N-pʳat-s (v.i.) 'to suffer defeat', Middle Chinese *baejH*. Maspero (1930) posited Old Chinese prefixes like *k-, *χ-, *p- to account for pairs like *lǎn* 覽 *lám 'to look' vs. *jiàn* 鑑 *k-lám 'mirror', *hào* 耗 *máu 'exhausted' vs. *χ-máu 'to exhaust', *líng* 凌 *lǒng 'icy, ice' vs. *bīng* 冰 *p-lǒng 'to congeal' etc., but he did not succeed in identifying clear-cut functions for these putative affixes. Zhōu Zǔmó (1966) discussed departing-tone (*qùshēng* 去聲) derivations, identifying several morphological types, such as the derivation of deverbal nouns, for instance *cǎi* 采 (Rising tone) 'to pick' vs. (Departing tone, now written *cài* 菜) 'vegetables'. As part of his theory of the origin of Chinese tones (see lemma on tonogenesis) A.-G. Haudricourt (1954) —who was aware of Zhōu's study— explained alternations between departing-tone words and words in other tones by supposing an *s suffix evolving into *-h and eventually into the departing tone. This he illustrated with Gě Hóng's examples: *hǎo* 好 *xāu* (rising tone, *shǎngshēng* 上聲) 'good', *xāu* (departing tone) 'to love'; and *è* 惡 *âk* 'bad' (entering tone), *âks* (departing tone) 'to hate', where the suffix also affected the verb semantics. Zhōu's account of the functions associated with departing-tone derivations was

later refined by Downer (1959), Chou (1962), Mei (1980), Schuessler (1985) and Sūn (1999).

In the past decades, increased attention to word-family alternations has led to more proposals for Old Chinese affixes being presented in the works of e.g. Pulleyblank (1973), Schuessler (1976), Geilich (1994), Baxter and Sagart (1998), Sagart (1999), Jīn (2006) and Schuessler (2007), although proposals can differ widely (see lemma on morphology). This in turn has brought the notion of root—the invariant element in all the members of a word-family—more into focus, an approach illustrated *inter alia* by Schuessler (1976) and Sagart (1999). Under a root-based approach, word families can be defined strictly as sets of words sharing the same root and having different affixes (non-affixal derivational processes such as vowel alternation, or ablaut, have been proposed for Old Chinese by Pulleyblank (1963, 1989) but the functions of ablaut, if it ever existed as a derivational process, have not been established). Two examples of roots in the Baxter-Sagart system are given below. A root *pʰək 'turn the back' occurs bare in *běi* 北, Old Chinese *pʰək > Middle Chinese pok 'turn the back', out of which the term 'north' arose, either through semantic shift or through zero-nominalization; nominalized by *-s in *bèi* 背 *pʰək-s > pojH 'the back'; out of this noun the *m- prefix in turn derived a volitional verb: *bèi* 背 *m-pʰək-s > bojH 'turn the back on, cheat'. Another root: *kʰep 'to grasp, clasp' occurs zero-nominalized and infixed with <r>, a marker of distributed actions and paired objects (Sagart 1993) in *jiá* 夾 *kʰ<r>ep > kaep 'chopsticks'; stativized by *N- in *xiá* 狹 *N-kʰ<r>ep > heap 'narrow'; and as an *m- prefixed volitional verb in *xí* 挾 *m-kʰep > hep 'to grasp'. The nasal prefixes in 'narrow' and 'to grasp' are supported by the prenasalized initials in the Chinese loans to Hmong-Mien *ɲteap 'to pick food with chopsticks' and *ŋge:p 'narrow' (reconstructions of Wang and Mao 1995).

Cognate relationships in the Chinese lexicon may also be due to derivational processes that were productive before the Old Chinese period: thus the words *mò* 墨 *C.mʰək > mok 'ink' and *hēi* 黑 *mʰək > xok 'black' are most likely related somehow, but whether or not a productive derivational process of the corresponding description existed in Old Chinese is questionable. If there was no such process, then the relatedness of these two words must depend on morphological process that were already frozen in the Old Chinese period.

The above examples illustrate how, in agreement with Wáng Shèngmǐ's early observations, the members of a word-family are often —though not always, or necessarily—written with characters sharing the same phonetic element. In such cases the *Shuōwén* often says that the character includes a signific which is also phonetic ("從X, X 亦聲"). This has suggested to some authors that creators of new characters in early China intended their choice of a phonetic element to express the semantics of characters (Vandermeersch 1994). This is not necessary, however: a tendency to write words of the same word family with the same phonetic element would mechanically follow from the fact that —by definition— they share the same word stem.

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