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ETYMA FOR 'CHICKEN', 'DUCK', AND 'GOOSE' AMONG LANGUAGE PHYLA IN CHINA AND SOUTHEAST ASIA

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Abstract
This paper considers the history of words for domesticated poultry, including 'chicken', 'goose', and 'duck', in China and mainland Southeast Asia to try to relate associated domestication events with specific language groups. Linguistic, archaeological and historical evidence supports Sinitic as one linguistic source, but in other cases, Tai and Austroasiatic[1] form additional centers of lexical forms which were borrowed by neighboring phyla. It is hypothesized that these geographic regions of etyma for domesticated birds may represent instances of bird domestication, or possibly advances in bird husbandry, by speech communities in the region in the Neolithic Era, followed by spread of both words and cultural practices.
Keywords: etymology, animal domestication, archaeology, Southeast Asia, China
ISO 639-3 codes: aav, hmx, map, mch, mkh, och, sit

1 On Etyma for Domestic Birds in the Region: Borrowing and Onomatopoeia
Cultural exchange often leads to lexical exchange, and it is thus probable that the borrowing of a word for a domesticated animal involves at least trade of the animal, and perhaps borrowing of related animal husbandry practices. Borrowing of words for domesticated animals can be measured numerically. In the online World Loanword Database (WOLD), borrowed rates for words for insects tend to be the lowest, followed by words for wild animals, and finally words for domesticated animals. These categories are shown in Table 1 with a generalized range (i.e., there are some exceptions) of relative borrowed rates and some examples. Note in particular numbers for the pairing of similar types of animals which are wild or domesticated: 'deer' versus 'horse', 'boar' versus 'pig', and 'eagle' versus 'duck'. The birds in this study are domesticated and thus in the database of languages of different continents also have relatively higher borrowed rates: 'chicken' (0.3), 'duck' (0.46), and 'goose' (0.47).

Table 1: *Relative Borrowed Rates of Types of Animals*

Category	Borrowed Rates	Examples
Insects	0.5-0.15	'flea' (0.7), 'worm' (0.12), 'ant' (0.12)
Wild animals	0.15-0.28	'deer' (0.12), 'boar' (0.23), 'eagle' (0.25)
Domestic animals	0.3-0.6	'horse' (0.57), 'pig' (0.3), 'duck' (0.46)

In recent research in the fields of historical linguistics, paleoanthropology, and archaeology in East and Southeast Asia, focus has been on the impact of agriculture on human sociocultural development, such

[1] Austroasiatic in mainland Southeast Asia has traditionally been referred to as 'Mon-Khmer'. However, following the hypothesis that Munda is one of various sub-branches of Austroasiatic, not a main sub-branch in contrast with the rest of Austroasiatic, 'Mon-Khmer' is not an accurate term. To capture that geographic sense, in this article, the term 'mainland Southeast Asian Austroasiatic' is sometimes used. Mon-Khmer is only used in this paper to refer to previously used names, such as Shorto's 2006 Proto-Mon-Khmer and the 'Mon-Khmer Etymological Dictionary'.

as the development of technology and the emergence of states. In such studies, reconstructed forms of words such as 'rice' and 'millet' dating back several thousand years have played a central role in trying to account for ethnolinguistic diversification (cf. Bellwood (2005, 2006, etc.), van Driem (2007 and 2011), Sagart (2008), Higham (e.g., 2013:33, 2014:128, etc.), inter alia).

Of smaller-scale sociocultural impact than agricultural production of grain, but still with significance in human sociocultural evolution, is the domestication of animals, which is related to human settlements, horticulture, trade, and belief systems. Carbon dating and archaeogenetic studies have increased understanding about possible locations and time depths of animal domestication, though the hypotheses can vary significantly. For instance, testing of ancient dog-like remains has pushed back canine domestication to perhaps as far back as 33,000 years ago (e.g., Druzhkova et.al. 2013). Timing of dog domestication is a significant matter in understanding human migration to the Americas over 10,000 years ago, which shows the impact such dating can have in understanding human sociocultural history. However, such extreme time depth makes it difficult, if not impossible, to connect any lexical form in modern languages or even Proto-languages to the original event.

In contrast, poultry, such as chickens, ducks, and geese, were domesticated in the past several thousand years, during the Neolithic Age, in southern China and mainland Southeast Asia, within a time frame that could be similar to timing of dispersal dates of language phyla in the region. Moreover, there are now reconstructions available for all major language phyla and numerous sub-branches in this region. This creates a situation in which zooarchaeology and historical linguistics may have valuable overlap in paleolinguistic and ethnohistorical inquiry.

This paper asks whether it is possible to link reconstructed words in language phyla to specific animal domestication events, focusing on chickens, ducks, and geese in this study. Can any of these etyma go back to the original time of domestication of these birds? The answer is that, for now, based on competing hypotheses and mixed amounts of available data, only working hypotheses can be presented of these words' origins. However, what emerges in the lexical data is a number of geographic centers of certain word forms across language families but generally with a language family or sub-group as the center from which other groups have borrowed the term. It is suggested in this study that these geographic centers of the word forms are locations of ancient domestication of those birds, though significant advances in bird husbandry practices could have also been the source of the regional uses of these words through trade and borrowing of both cultural practices. Such hypotheses and further questions for inquiry are raised in throughout the paper and the conclusion.

Another question that the data raises is the mechanism of lexical innovation. A recurring phenomenon seen in the data is imitative onomatopoeia in the coining of terms for several bird species in Asia, both wild and domesticated. All three bird species in this study have names clearly related to bird calls. This means of naming is a reasonably intuitive matter, such as in the case of 'cat', which is MAO (all caps indicate not a reconstruction but rather a regional shared form among language families, thereby maintaining a neutral position about the language group of origin) or a similar sounding word in Chinese languages, Tai languages, Vietnamese, and other languages in the region. Three examples of names of birds in the region of this birdcall-name association include the following.[2]

- 'crow', with the general form AK in reconstructions and many languages within Sino-Tibetan, Kra-Dai/Tai-Kadai, mainland Southeast Asian Austroasiatic, and Chamic[3]
- 'pigeon/dove', with the general form KU (cf. English 'coo' for the birdcall) in Old Chinese, Tai languages, Hmong-Mien, and Vietnamese
- 'owl', with an approximate sound of KU or KUK in Old Chinese, Tibeto-Burman, Tai languages, Vietnamese, and a handful of Austroasiatic languages (e.g., Nyah Kur and Stieng).

Such sound-symbolism adds uncertainty to claims of borrowing in a certain direction, especially at time depths of thousands of years, unless there is sufficient clarifying linguistic and extralinguistic evidence. Instances of onomatopoeia are noted in subsequent sections.

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[2] Similar phenomena for other animals can be exemplified. Schuessler (2007), in his etymological dictionary of Old Chinese, notes about ten instances of apparent onomatopoeia. While four include birds, namely, 'chicken', 'owl', 'pigeon', and 'crow/raven', two others are animals based on their calls, including 'cat' and 'frog'.

[3] The AK form appears not to be widespread in other Austronesian groups, suggesting that it is a mainland Southeast Asian areal term.

The remainder of this article provides the following: (1) a brief review of archaeological studies of birds domesticated in Asia; (2) a statement on previous research of the timing of language family dispersals in the region; (3) descriptions of the various word forms for each of the three domesticated bird species along with generalized maps of their distribution; and (4) a summary of conclusions, hypotheses, and questions based on the data.

2 Archaeological Studies on Chickens, Ducks, and Geese in Asia

Zooarchaeological studies of chickens, ducks, and geese vary in number and depth. There are numerous studies of the genetic variety of each species, but the claims of time depth and region of original domestication are much more numerous for chickens than for either ducks or geese. Overall, archaeological and genetic evidence suggests that instances of domestication of all three birds have occurred in regions of the Yellow and Yangtze rivers several thousand years ago, while domestication in mainland Southeast Asia appears to be later, and such claims are not as strongly supported in the literature. Scanes and Willham (2004:279-280) provide a summary: (a) chicken domestication in northeastern China c. 7500 BP, Iran in 5900-5800 BP, and in India in 4000-3000 BP; (b) duck domestication in East Asia and the Fertile Crescent (unspecified timing); (c) goose domestication in East Asia and the Fertile Crescent and/or Egypt by 5000 BP. Other studies and hypotheses are summarized below.

A connection between domestic chickens and Southeast Asian jungle fowl was made by Darwin (1859:13, referencing a "Mr. Blythe"). Many genetic studies confirm that chickens around the world have roots in Asia (West and Zhou 1989, Eriksson et. al. 2009, Sawai et. al. 2010, Storey et. al. 2012, Miao 2013, inter alia), including not only genes of the red jungle fowl of mainland and insular Southeast Asia, as Darwin had assumed, but also the grey and green jungle fowl of South Asia. This ultimately provides evidence of multiple instances of domestication in Southwest China, Southeast Asia, and South Asia. However, the earliest evidence of domesticated chicken bones have been found in China, rather than Southeast Asia, in the Cishan site in Hebei Province, northern China, with a timing of about 6000 BCE. Most recently, possible domesticated chicken bones—though possibly still wild jungle fowl—were found at the Nanzhuangtou site, also in Hebei, back to 8000 BCE (Xiang et.al. 2014). It has been shown that the likely reason for this northern location is that in the mid-Holocene, temperatures were warmer, allowing a variety of warm-climate animals to reside much farther north in China than is possible today (Ibid.). Archaeological evidence of domestic chickens comes much later in Southeast Asia, such as the Ban Chiang site in Thailand, which has evidence of human cultural activity only from fourth to third millennium BCE (e.g., UNESCO). Still, referring to Underhill (1997), Storey et. al. (2012) support the claim that intentional chicken domestication in Southeast Asia may go back to the mid-third century BCE.

Unlike essentially flightless chickens, ducks and geese have most likely been domesticated in different sections of the world. There is evidence, for example, of full-fledged goose husbandry in Egypt in the middle of the third millennium BCE, as shown by replicas of goose pens (Houlihan and Goodman 1986:54, as noted in Blench and MacDonald 2000). In a similar period and similar way, in China, evidence of poultry husbandry comes in the form of clay figures of geese made during the Long Shan culture in Hubei province (2,400 to 2,000 BCE) along the Middle Yangtze River (Watson 1969:394). Whether these represent wild or domestic ducks and geese is argued in the literature (e.g., Albarella 2005:252), but considering that domesticated sheep were made into figurines in this region (Barnes 1999), it is certainly possible that these statuettes of ducks and geese represent domesticated versions approximately 6,000 years ago in the Yangtze River region. In contrast, early archaeological evidence of domesticated ducks and geese in Southeast Asia is very limited.

Overall, archaeological evidence points to chicken domestication in the northern region of the Yellow River during the Nanzhuangtou culture of the early Holocene period (Xiang et.al. 2014). In contrast, duck and goose domestication may have occurred in the middle Yangtze River region during the mid- to late-Holocene period. Evidence of domesticated chickens in Southeast Asia comes much later, possibly in the 3rd to second millennium in the Khorat Plateau (UNESCO), but it is difficult to find in archaeological studies evidence of timing of domesticated ducks and geese in mainland Southeast Asia. Indeed, there is a well-known dearth of available archaeological evidence from the Holocene era (White 2011:32, Blench 2011:127), and whether earlier archaeological evidence of the practice of raising poultry can be found in mainland Southeast remains to be seen. In considering the relationship between southern China and mainland Southeast Asia, one hypothesis holds that, somewhere near the beginning of the 2nd millennium BCE, rice-

production was brought south from the Yangtze region, along with domestic livestock (e.g., Higham and Higham 2009:138). Thus, whether bird domestication occurred independently in mainland Southeast Asia, was brought south by groups, or was perhaps a mixture of both, is a question requiring more data.

This archaeological information makes it worth considering closely the lexical data and its geographic distribution. Before exploring lexical evidence, a summary of the timing of language phyla is needed to compare with archaeological dates.

3 Language Phyla in China and Southeast Asia

To consider whether reconstructions of words for poultry can be connected to archaeological evidence, it is necessary to review proposed dates of proto-language reconstructions of the language groups.[4] Researchers have posited approximate times of major dispersals of the five major established language phyla in the region based on a variety of different methods (e.g., glottochronology, historical events, archaeological data, genetics, etc.). Table 1 provides ranges of periods for each language group.

***Table 1**: Posited Dates of Language Phyla Dispersal in Central China and Southeast Asia*

Phyla	Dates Range
Sino-Tibetan	• **4000 to 6000 BCE** • 4000 BCE (STEDT); 5000-6000 BCE (Sagart 2008)
Austroasiatic	• **2000 to 6000 BCE** • 2000 BCE[5] (Sidwell 2010 and Sidwell and Blench 2011); 5000 BCE (Sagart 2008); 5000 BCE (Diffloth 2005:79); 6000 BCE (Peiros 1998:108)
Austronesian	• **4000 to 3500 BCE** (but with archaeological evidence connecting it to Hemudu culture 5000-3400 BCE (Bellwood 2006:104) and possible genetic connections with Daxi culture 6400 to 5300 BCE (Li et.al. 2007)) • 4000-3500 BCE (Bellwood 2006:113); 3500 BCE (Sagart 2008:133); at least 3500 BCE on Taiwan (Blust 2013:27)
Tai-Kadai[6]	• **1000 to 2000 BCE** (but with possible genetic connections to Liangzhu culture 4th to 2nd mill. BCE (Li et.al. 2007)) • 1000 to 2000 BCE (Sagart 2008); 1800 BCE (Peiros 1998:15)
Hmong-Mien[7]	• **500 to 800 BCE** (but with possible genetic connections with Liangzhu culture 4th to 2nd mill. BCE (Li et.al. 2007)) • 500 BCE (Sagart 2008); 800 BCE (Peiros 1998:116)

Beyond timing, mapping of the possible locations of language phyla homelands can be a useful point of reference. In a computational study of possible language phyla dispersal points, based on degree of

[4] Historical linguistic research in Southeast Asia is complicated by long-term mixing of speech communities. Moreover, theories at the level of megalocomparison (cf., Matisoff 1990 for discussion), including hypotheses of Austric (Schmidt 1906, Reid 1991 and 2007), Austro-Tai (Benedict 1942 and 1975), Sino-Tai (Li 1976, Luo 1998, 2000, etc.), and Sino-Austronesian (Sagart 2005, etc.) make the matter of time depth even more uncertain. For this paper, the most widely recognized language families are used for hypotheses considered in this paper.

[5] Researchers have assumed that Proto-Austroasiatic groups resided in mainland Southeast Asia for thousands of years prior to 2000 BCE, but archaeological evidence (e.g., the Phùng Nguyên culture, the Ban Chiang site, etc.) to clarify the timing and geographic spread of the proto-Austroasiatic speech community has yet to be worked out.

[6] The position taken in this article is that Tai-Kadai is related to Austronesian, as per Sagart 2004 and Ostapirat 2013. Moreover, the genetic study of Li et.al. (2007) on Liangzhu culture based on historical DNA studies also supports an Austronesian-Tai-Kadai genetic connection. If so, Tai-Kadai is a completely restructured Austronesian language likely due partly to intense, long-term contact with Sinitic groups (see DeLancey 2010 for a summary) which also restructured Sinitic itself along with Hmong-Mien and the Vietic branch of Austroasiatic.

[7] Haudricourt (1966) and Peiros (1998:155-160), with provocative lexical data of proto-forms, have hypothesized linguistic connections between Austroasiatic and Hmong-Mien. This position has recently been supported by a study done by a team of geneticists (Cai et. al. 2011) who note high frequencies of a number of haplogroups shared by these two speech communities. The team further hypothesizes northward migration of the Hmong-Mien groups. This would complicate matters significantly. The position in this study is that more supporting data is needed to prove shared origins and separate it from ancient sociolinguistic contact, which results in shared genetic material.

diversity, Wichman et. al. (2010:259) put the Sino-Tibetan homeland in Sichuan, Hmong-Mien just south of the western part of the Yangtze, Tai-Kadai southeast of Hmong-Mien, and Austroasiatic in Central Thailand. The following are assumptions based on the hypothesized timing and location of the language phyla in light of archaeological studies of possible timing of bird domestication discussed in the previous section.

- Sino-Tibetan: There is substantial disagreement about the subgrouping and direction of dispersal of Sino-Tibetan. However, there is archaeological evidence to suggest that early Sino-Tibetan groups, or at least Sinitic groups, were in the region at the time of duck and goose domestication. Regarding chicken domestication, the time and location of that makes it possible to connect that event with Cishan-Peiligang culture (8000-5500 BCE), but at upwards of 10,000 BP, it may not be possible to make a meaningful connection between that event and early Sinitic groups.
- Austroasiatic: Considering the assumption that Austroasiatic has had a presence in mainland Southeast Asia for at least several thousand years, archaeological studies provide surprisingly little information (as noted in §1) to make claims about bird domestication in relation to Austroasiatic groups. However, linguistic data presented below, combined with the time depths in Table 2, suggest that some instances of bird domestication may have occurred in Austroasiatic territory, though much later than in northern and central China.
- Austronesian: Despite the presumed mainland origins of Austronesian groups and studies of the relation between the Austronesian dispersal and the spread of chickens in the Pacific, proto-Austronesian reconstructions for the domesticated birds in this study are mostly not related, or not proven absolutely in the case of *qayam 'bird', to reconstructed words in mainland Southeast Asian language phyla. Horridge (2006:143-144), in describing the spread of Austronesian groups throughout the Pacific, notes how early Austronesian groups brought key elements for food production, including chicken, tubers, and seeds. Words for both 'duck' and 'geese' both have listed loan forms in Blust and Trussel 2010 and appear to have spread later than the dates considered in this study. Words for 'chicken', on the other hand, do have a more complex history in Austronesian, as discussed in that section.
- Tai-Kadai: Claims of the linguistic timing of Tai-Kadai dispersal makes it impossible to connect the group with the domestication events, while genetic evidence makes it at least possible to relate the groups with the domestication of ducks and geese in the Yangtze River region.
- Hmong-Mien: Like Tai-Kadai, the posited timing of the dispersal of Hmong-Mien is too recent to be connected with the ancient timing of these domestication events. However, archaeogenetic studies of Hmong-Mien groups (Li et.al. 2007) and the possibility that Hmong-Mien had a more northerly position at some point prior to Chinese southward expansion[8] does make Hmong-Mien a viable group to consider for ducks and geese.

Overall, while none of the language phyla date back to the potential 10,000-year-old domestication event of chickens, all language families in the region have time depths that allow the possibility that the proto-language communities were in Asia at the time of at least some of the poultry domestication events. However, the timing and location of archaeological studies do not align neatly with the time and location of language group dispersals, making only tentative hypotheses possible. These matters are dealt with in subsequent sections.

4. Words for Domesticated Birds in China and Southeast Asia

This section discusses possible etymological origins and regional spread of the words in the region for domesticated birds. The lexical data comes from several major searchable databases and electronic texts, including the Mon-Khmer Etymological Dictionary, the Sino-Tibetan Etymological Dictionary and Thesaurus, Schuessler's 'ABC Etymological Dictionary of Old Chinese', Proto-Tai-o-Matic, Blust's Austronesian Comparative Dictionary, among other sources. In addition, various proto-language reconstructions were used, many published in the past several years (Shorto 2006 for Mon-Khmer, Norquest

[8] That Hmong-Mien peoples are the survivors of a larger language family has been suggested to me by Martha Ratliff. That would account for a larger area of distribution in the past, though it goes against the genetic historical study noted in footnote 8, which suggests a northward expansion from Southeast Asia. Again, there is insufficient data to make claims either way.

2008 and 2015 for Proto-Hlai, Pittayaporn 2009 for Proto-Tai, Ratliff 2010 for Proto-Hmong-Mien, Baxter and Sagart 2014 for Old and Middle Chinese, etc.) and thus also in electronic searchable format. Thus, the data presented is largely historical linguistic data, with lists of proto-language forms and maps of regions of word forms for each bird. Discussion of possible donor and recipient languages are noted, but discussion of the sociocultural implications and timing of the emergence of these words is in the concluding thoughts in section 5.

4.1 Chicken

Reconstructions for the word for 'chicken' are available for all language phyla of East, South, and Southeast Asia, as shown in Table 2. Four categories stand out in the data: (1) a KAJ form in the Sinosphere region of Southern China, (2) the ʔIAR form in mainland Southeast Asia and sub-groups among bordering Tibeto-Burman groups; (3) onomatopoetic forms likely derived from the sound of roosters crowing in Dravidian, Sanskrit, Formosan, and Sino-Tibetan (with the most reduced form), and (4) words related to and perhaps derived from 'bird' on opposite geographic peripheries (Munda versus Austronesian). Rather than supporting a common origin, onomatopoetic forms highlight the problem with determining etymological origins when sound-symbolism is involved and independent innovation can be a likely source.

Based on data in Table 2, three phonological forms for 'chicken' are prominent throughout China and mainland Southeast Asia: KAJ, ʔIAR, and KRAK/KAK, as shown in Map 1. They form three geographic regions across multiple language families. Hypotheses about the origins and spread of each form are presented below.

The KAJ form is seen throughout the Sinosphere and goes beyond the circled central portion in Map 1. It occurs in all varieties of Chinese, Hmong-Mien, and Tai-Kadai down through Thailand, though surprisingly not in Vietic with a reconstruction of *r-ka. It is generally assumed that Sinitic was the donor of this form into Tai-Kadai and Hmong-Mien. Sagart (2008:136-137) and Blench (2011:131) both discuss the Cishan-Peiligang culture's spread of agriculture, connecting these to early Sino-Tibetan-Austronesian (in Sagart's hypothesis) or at least Sino-Tibetan groups (Blench's position). However, it is not impossible that very early proto-Hmong-Mien groups, if they were in central China at that time, were the innovators (cf., Blench (2011:131) notes this possibility in regards to agricultural developments), and early Sino-Tibetan groups were the borrowers. It seems unlikely, however, that Tai-Kadai originated this term based on its very southerly location.

The ʔIAR form appears in only five sub-branches of Austroasiatic,[9] but they stretch across from Northeast India, Burma, and Thailand into central Vietnam, though not in Khmer or regions to the south. [10] It also appears in Kuki-Chin-Naga languages in Northeast India to Burma. ʔIAR is here claimed to be an Austroasiatic loan in those Tibeto-Burman languages since it is more widespread in Austroasiatic than it is in Sino-Tibetan, especially in comparison to the Sino-Tibetan KRAK form. One could even speculate that Khasic was the donor considering its proximity with those Tibeto-Burman groups and its reconstruction of *sʔiar, which is a close match with Matisoff's (2003) Proto-Tibeto-Burman reconstructions. As a presumed Austroasiatic etymon, the question remains as to how to account for this northern belt of distribution in Austroasiatic and the lack of the forms to the south or even in Vietic, Katuic, or Munda. One possibility is a

[9] Blench (2011:137) lists the number of sub-branches containing the Austroasiatic etyma for 'chicken', 'duck', and 'goose' in this study, but the list suggests that they are in six, nine, and nine sub-branches respectively without indicating which groups, while in this study, the numbers are four, seven, and six with all sub-branches indicated. The statements in this study are based on the Mon-Khmer Etymological Dictionary, which contains large numbers of both individual languages and proto-language reconstructions. According to the data in that source, only four sub-branches have this etymon. If additional data changes the numbers of sub-branches, the relative number in both this study and Blench's remain the same, and the overall general claims remain the same.

[10] Regarding the Vietic form, I previously assumed it was related somehow to the Sinitic KAJ form. Schuessler (2007:292) lists it a related word, considering it an example of vowel alternation /e/ and /a/ (2007:103). However, as Ferlus (2007) provides a reconstruction of *r-ka: in Vietic, it is clearly a completely distinct form with a presyllable. Ferlus (2013:3-4) also notes the apparent borrowing of the Viet-Muong words of the 12-year calendar in Khmer, with the result that Khmer retained the *r-ka: form for the calendar. In contrast, the proto-Katuic form *ʔndruuj (Sidwell 2005), Proto-Pearic *hlɛːk (Headley 1985), Khmer *moan* (Headley 1997), and Proto-Monic *tjaaŋ (Diffloth 1984) also appear to be unrelated to other language groups in the region. Such lexical variety in a small geographic region where jungle fowl are native is noteworthy.

preservation that spread, but it does not appear that these sub-branches form a sub-group. One reason for the borrowing is developments in the practice of raising chickens, which could account for the sharing of the cultural practice and the lexical item to neighboring Tibeto-Burman groups.

Table 2: *Reconstructions for 'Chicken/Fowl' in China and Southeast Asia*

Type	**Proto-Language**	**Form (Source)**
KAJ	Old Chinese	*kˤe (Baxter and Sagart 2014)
	Middle Chinese	*kej (Baxter and Sagart 2014)
	Proto-Hmong-Mien[11]	*Kəi (Ratliff 2010)
	Proto-Tai	*kajB (Pittayaporn 2009)
	Proto-Kra	*ki A (Ostirapat 1999)
	Proto-Hlai	*k^{h}əj (Norquest 2015)
	Proto-Austronesian	*qayam 'bird' (Blust and Trussel 2010)[12]
ʔIAR	Proto-Austroasiatic	*ʔiər (Shorto 2007) Proto-Khasic: *sʔiar 'chicken' (Sidwell 2012) Proto-Palaungic: *ʔiər 'fowl' (Sidwell 2010) Proto-Khmuic:*(s)ʔiər 'chicken' (Sidwell 2010) Proto-Bahnaric: *ʔiər 'chicken' (Sidwell 2011)
	Proto-Tibeto-Burman	*ʔa:r or *ha:r (Matisoff 2003) (141 reflexes)
	Proto-Kuki-Chin	*ʔaar (VanBik 2009)
	Proto-Tangkhulic	*ar (Mortensen 2012)
Onom.	Proto-Sino-Tibetan	*k-rak/kak (Matisoff 2003)[13] (578+44 reflexes)
	PAN-Formosan	*tuRukuk (Blust and Trussel 2010)
	Dravidian	*kaṟu, kaṟuku (Burrow and Emeneau 1984)
	Sanskrit	kukkuṭá (Turner 1962-6:164)
"bird"	Proto-Austronesian	*manuk 'chicken' (Blust and Trussel 2010)[14]
	Proto-Munda	*si(X)m 'chicken' (Zide and Zide 1976)[15]

[11] Martha Ratliff (personal communication) notes that Hmong-Mien has both the KAJ form for 'chicken' from Sinitic and the MANUK form for 'bird' possibly related to Austronesian, which has apparently replaced MANUK with *qayam 'bird', which in turn may be related to KAJ. See footnote 10.

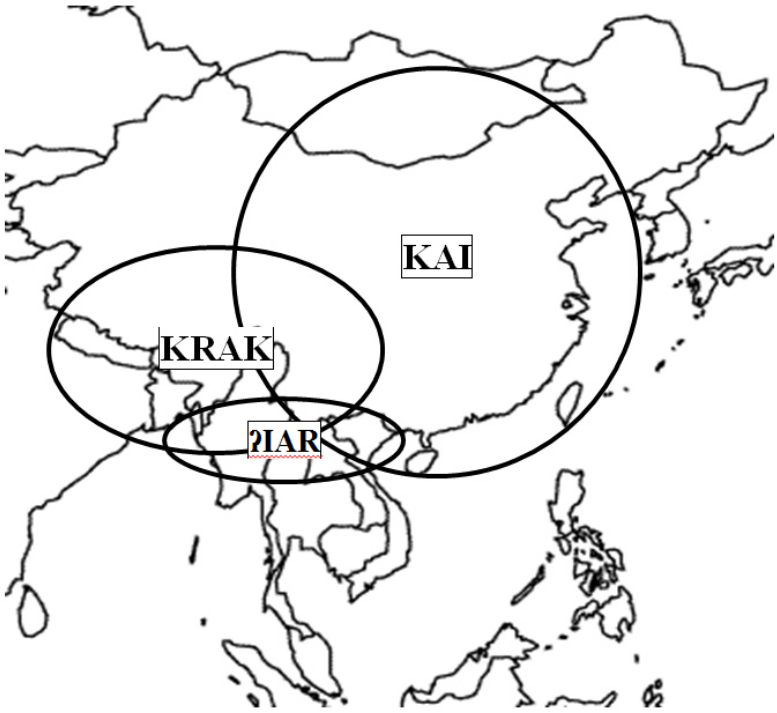
[12] This item is tentatively listed here despite the only partial semantic similarity (*manuk and *qayam alternate between 'bird' and 'chicken' in various Austronesian language groups) and no clear explanation for the second syllable, if it were related to KAJ. Bellwood (2006:104) notes archaeological evidence of the Zhejiang province site of Hemudu culture and evidence of various domesticated livestock, including chickens, pigs, and likely others. If Hemudu culture turns out to be related to the source of proto-Austronesian groups, it might therefore connect the KAJ form with Proto-Austronesian *qayam 'bird'. Sagart (2004:167) also identifies the Formosan form *kuka, but notes (personal communication) that there is no existing archaeological evidence to support such a connection, leaving onomatopoeia a possible explanation for that form. Still, Blust (2013:747) asserts that PAN *qayam meant 'bird' and *manuk meant 'chicken' and then suggests that Formosan languages innovated via onomatopoeia, which weakens the notion that *qayam is somehow related to KAJ.

[13] STEDT also has the reconstruction *kak, with a note that this may be related to *k-rak. Considering that *kak has only 44 reflexes in Sino-Tibetan versus *k-rak with 578 reflexes (STEDT as of December 2014), it may indeed be a reduced variant. Thus, it is not listed separately in Map 1.

[14] See footnote 10.

[15] This is clearly related to widely attested Proto-Austroasiatic *sim 'bird'.

Map 1: *Words for 'Chicken' in China and Mainland Southeast Asia*



Finally, the origin of the Sino-Tibetan (but non-Sinitic) KRAK form is uncertain. It is hypothesized here that this is a form reduced from a full onomatopoetic form. Fuller forms appear in unrelated language groups, such as Sanskrit and Dravidian. Other words for birds have been similarly derived from onomatopoeia, as noted in section, so considering this an onomatopoetic form is not unreasonable. KRAK is not widespread in northeast China, where chicken domestication probably first took place, so it most likely has a later date of creation. The debate over the Sino-Tibetan homeland and dispersal (i.e., whether Sinitic forms a main sub-branch separate from the rest of Tibeto-Burman or is merely one of many sub-branches) is one that has major implications for the history of these forms. Nevertheless, the notion that Sinitic KAJ could be older than Tibeto-Burman KRAK is supported by the zooarchaeological data.

4.2 Duck

The three most widespread phonological forms for 'duck' in the region are (a) PIT[16], a Proto-Tai etymon, (b) DAʔ, an etymon in mainland Austroasiatic, and (c) an AP form widespread in the Sinosphere but ultimately of uncertain origins.

The situation is complicated by the spread of all northern forms throughout Austroasiatic sub-branches, potentially representing the effect of southward expansion of Tai groups. Table 4 shows the Austroasiatic sub-branches in which *da[ʔ] (a) has been reconstructed to the proto-sub-branch level (three sub-branches) or (b) is widespread in those sub-branches when reconstructions are lacking (noted as 'widespread'). However, Tai PIT was apparently borrowed into Proto-Vietic (likely prior to contact with Sinitic), is widespread in Palaungic, and has entered some individual mainland Austroasiatic languages as well. Moreover, AP is in both Proto-Khmuic and the Mang language. Also notable is the use in Khasic of HAAN 'goose' to refer to 'duck', an apparent semantic merging of the term for 'waterfowl'.

[16] This form has some complications. Benedict (1975:276) claimed this to be an Austro-Tai cognate *bets and the source of Lolo-Burmese *bay1/2. While this author assumes Tai-Kadai as a sub-branch of Austronesian, the language families are considered separately due to their distinct histories and distinct lexical forms of all three birds in this study. In addition, on the western periphery, Indo-Aryan *battakh (also noted as a likely borrowing from Arabic battax) was borrowed by Kuki-Chin groups, as noted in the STEDT section "Fowl (i.e., domestic birds)". The partial similarity of the first syllable with the proto-Tai form may be chance similarity, though it may again be due to onomatopoeia as part of the creation of the word.

Table 3: *Reconstructions for 'Duck' in China and Southeast Asia*

Type	Proto-Language	Form (Source)
PIT	Proto-Tai	*pit^{D} (Pittayaporn 2009)
	Proto-Hlai	*ɓit (Norquest 2008)
	Proto-Vietic	*vi:t (Ferlus 2007)
	Lolo-Burmese	bay 1/2 (STEDT)
AP	Old / Middle Chinese	NONE (but widespread AP forms in varieties of southern Chinese)
	Proto-Hmong-Mien	*ʔap (Ratliff 2010)
	Proto-Kra	*kap D (Ostiraspat 1999)
	Tani (Tibeto-Burman)	*ǰap (Sun 1993)
DAʔ	Proto-Austroasiatic	*da[ʔ] (Shorto 2007)
	Proto-Chamic	*ʔada (Thurgood 1999)
Others	Proto-Hmong	*ɕu̯aC (Ratliff 2010)
	Proto-Hlai	*C-ŋa:nɦ 'land duck/goose' (Norquest 2008)
	Proto-Western-Malayo-Polynesian[17]	*itik (Blust and Trussel 2010)

Table 4: *Forms for 'duck' among Austroasiatic sub-branches*

Forms	Branches
*da[ʔ]	Proto-Bahnaric, Proto-Katuic, Proto-Monic, Pearic (widespread), Vietic (Thavung), Aslian (widespread), Khmer
PIT	Bahnaric (Cheng, Sapuan), Mangic (Bolyu), Palaungic (widespread), Proto-Vietic
Others	Proto-Khasic *haan; Proto-Khmuic *ka:p; Mangic (Mang AP *ciəj^{6}ʔa:p^{3}*)

The three major forms—AP, PIT, and DAʔ—form three general geographic regions, as shown in Map 2. As with 'chicken', there is a northern Sinosphere form with AP. To the south, there are two dominant forms: Tai PIT and Austroasiatic DAʔ. All three forms can plausibly be considered to be derived from sound-symbolism related to a duck's call. However, DAʔ and PIT have more clearly established language group sources, while the origin of AP is less certain and could come from Sinitic or Hmong-Mien as its domestication may have occurred south of the Yellow River. These three forms are summarized below.

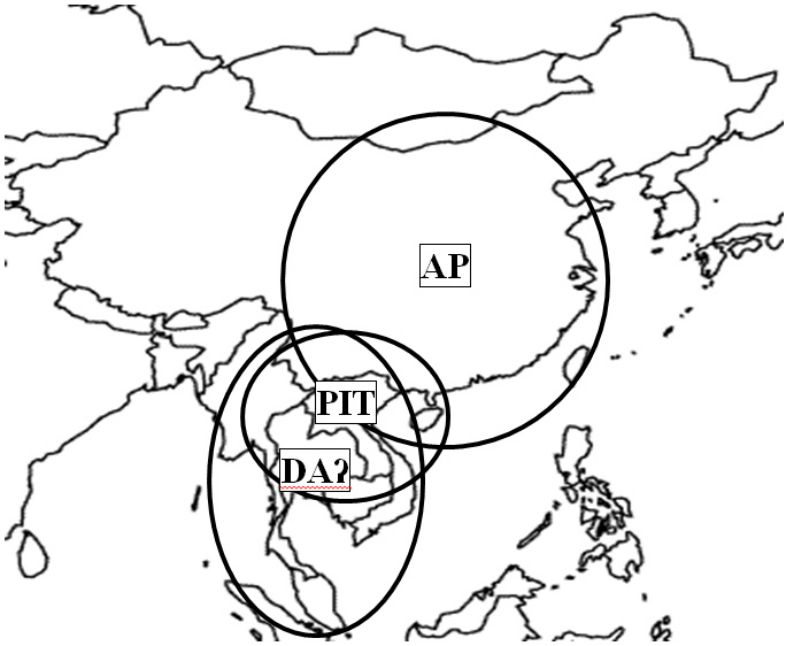
The AP form is the dominant one in the Sinosphere, like KAJ 'chicken'. Thus, one hypothesis is that this is a Sinitic word which spread to Hmong-Mien and the Kra sub-branch of Kra-Dai (and possibly Khmuic). However, it is not impossible for ancestors of Hmong-Mien or even Tai-Kadai groups to have been in the region at the time of domestication. Finally, however, as it is a possible instance of onomatopoeia, it becomes even harder to assign a source language group.

The Austroasiatic etymon[18] DAʔ occurs in seven mainland Southeast Asian sub-branches of Austroasiatic, excluding Khasic, but including Aslian, making it the most widespread Austroasiatic word for a domesticated bird. Paul Sidwell (personal communication) has suggested that DAʔ stems from an Old Khmer word that spread throughout the region, perhaps at the time of the Funan Empire (68 to 550 CE). If so, while the form is geographically widespread in the language family, this scenario would make it much less ancient in the other sub-branches. The form also entered Chamic at the proto-language level (Thurgood 1999:309). Considering this situation, it is possible to hypothesize that the emergence of the Khmer empire led to the spread of ducks via trading in the first millennium CE.

[17] Blust (2010 under the section 'Loans') claims that Malay *bebek* 'duck', an onomatopoetic form, spread throughout Western and Central Malayo-Polynesian languages (with *bibi* as a variant in some languages). Again, due to the sound-symbolism, it is difficult to trace the origins of such words.

[18] Two common phonological realizations of the etymon are with /a/ but also /ia/ in some languages, the latter perhaps the result of Austroasiatic register, of which one effect is vocalic mutation, such as diphthongization.

Map 2: *Words for 'Duck' in China and Mainland Southeast Asia*



The PIT form is a likely etymon from the Tai branch of Tai-Kadai as it is most widespread in that language group, down through Thailand, but sporadic in other language groups. It has spread into a number of Austroasiatic languages, and in Vietnamese at the Proto-Vietic stage, making that loanword possibly a Dong Son era borrowing. A comparable Chinese character 鴄 'wild duck' (Mandarin pī and Cantonese pat1) exists (noted by Manomaivibool 1975:124 and 331), but it is archaic in Chinese and extremely rare.[19] While 鴄 is listed in the Kangxi Dictionary, defined as having the meaning of the standard Chinese 鴨 'duck', the AP form, and it is mentioned in the Liji 'Book of Rites', appearing in the homophonous reduced form 匹 only once, it appears in writings mainly from the much later Ming Dynasty.[20] It thus seems likely to be a Tai word that has had minimal presence in Chinese.

Overall, the matter of the spread of the term for 'duck' in the region is more complex in the north. Table 3 shows that Hmong-Mien and Tai-Kadai both have competing lexical forms for 'duck'. Both language families have AP and one other term unrelated to Sinitic. The more apparently onomatopoetic form AP is more widespread. While the forms not in Sinitic appear to be innovations within each group, it is not clear whether they predate or antedate the AP form and how they could relate to duck domestication in those regions.

4.3 Goose

Among language phyla in the region, there are two widespread phonological forms for words for 'geese': (a) a NGAN/NGA form, which is has a large geographic range largely to the north, and (b) a HAAN form, seen in both Tai and mainland Southeast Asian Austroasiatic. Moreover, there are distinct words for domesticated versus wild geese, a phenomenon not seen for 'chicken' or 'duck'.

It is here proposed that (a) HAAN and NGAN are likely related, (b) NGA and NGAN would appear related, though whether morphologically related (i.e., an /-n/ suffix discussed below) is less clear, and (c) onomatopoeia overlaps all the forms and potentially obfuscates their origins and histories. The following points summarize key issues of the virtual allofam (as these forms do appear to come from the same lexical source) in the region.

[19] To highlight the rarity of the character, a Google search for 鴄 pī results in only 100,000 hits, but for the typical Chinese word for duck 鴨 yā, there are 25 million hits.

[20] The online databases of ancient Chinese texts (from the West Zhou Dynasty to the Qing Dynasty) of the Chinese Text Project and the Sheffield Corpus of Chinese were both searched to determine the approximate age of the word in Chinese.

- Proto-Indo-European *ghansōr (cf. Germanic *gans) is similar to Proto-Sino-Tibetan *ŋa-n and very similar to Old Chinese *C.ŋˤrar-s and some proto-forms in sub-branches of Tai-Kadai. As noted in section 2, goose domestication was developed in Egypt by the third millennium BCE, a similar time to that in China. However, there is no concrete evidence to suggest transmission of goose husbandry across Central Asia at such an early time.
- Li (1977:46) claimed that the Chinese form entered proto-Tai, positing a relationship between the Sinitic NGAN form and the Tai HAAN form, as noted in Schuessler's Old Chinese etymological dictionary (2007:556). However, both Proto-Hlai and Proto-Kam-Sui both have the NGAN form, and the only other Sino-Tai loanword with the OC initial *ŋ and Proto-Tai initial *h is 'five'.
- It has been hypothesized that there was a Sino-Tibetan final /-n/ (Coblin 1986), and the STEDT website similarly posits a tentative *nga-n form. However, problems with this claim have been noted (Schuessler 2007:556). It is also questionable to posit that the word for domestic goose preceded the word for wild goose.

Table 5: *Reconstructions for 'Goose' in China and Southeast Asia*

Type	**Proto-Language**	**Form (Source)**
HAAN	Proto-Austroasiatic	*haan (Shorto 2006)
	Proto-Tai	*ha:nB (Pittayaporn 2009)
NGAN	Proto-Sino-Tibetan	*ŋa-n (STEDT)
	Old Chinese	*C.ŋˤrar-s (雁 Mandarin *yàn*; Cantonese *ngaan6*) wild goose' (Baxter and Sagart 2014)
	Proto-Kam-Sui	*ŋrāns (Peiros 2008)[21]
	Proto-Hlai	*C-ŋa:nɦ (also 'land duck') (Norquest 2008:465); *ɓunɦ (Norquest 2015)
	Proto-Hmong-Mien	NONE (but a likely NGAN form)[22]
	Vietnamese	ngan 'goose (wild)'
		ngỗng 'goose (domesticated)'
	Proto-Indo-European	*ghansōr (López-Menchero 2009);
		*ĝhan-s- (Pokorny 1959)
NGA	Old Chinese	*ŋˤar 'domestic goose' (鵝 Mandarin *é*;
		Cantonese *ngo4*) (Baxter and Sagart 2014)
	Proto-Hlai	*C-ŋe: (Norquest 2008:465)

Finally, there is the issue of the widespread appearance of Tai HAAN through Mainland Southeast Asian Austroasiatic languages extending westward to Khasic. It would make sense if the word for 'goose' spread in a similar time as the Old Khmer word for 'duck', though it would have been due primarily to Tai groups' southward migration. As with words for duck, the geographic spread of words for 'goose' among Austroasiatic languages shows a complex range of language contact. The HAAN form of 'goose' is reconstructed for two groups or widespread in four more Austroasiatic sub-branches (though in Proto-Khasic it means 'duck'). However, the NGAN form is also widespread in Austroasiatic, even in regions without large Tibeto-Burman speech communities, such as Bahnaric, Katuic, and Khmeric. In the region of Northern Vietnam, the Vietnamese word *ngỗng* 'goose' appears in Vietic, Katuic (Pacoh), and several languages of Bahnaric. Finally, some Aslian languages (Temiar and Semai) have loans from Malay *angsa*, originally Sankskrit (Blust and Trussel 2010), and hence an Indo-European etymon).

[21] While Peiros' method is to refer to the Chinese language reconstruction as it is the donor language, all five of the Kam-Sui languages have the same phonological form /ŋa:n6/.

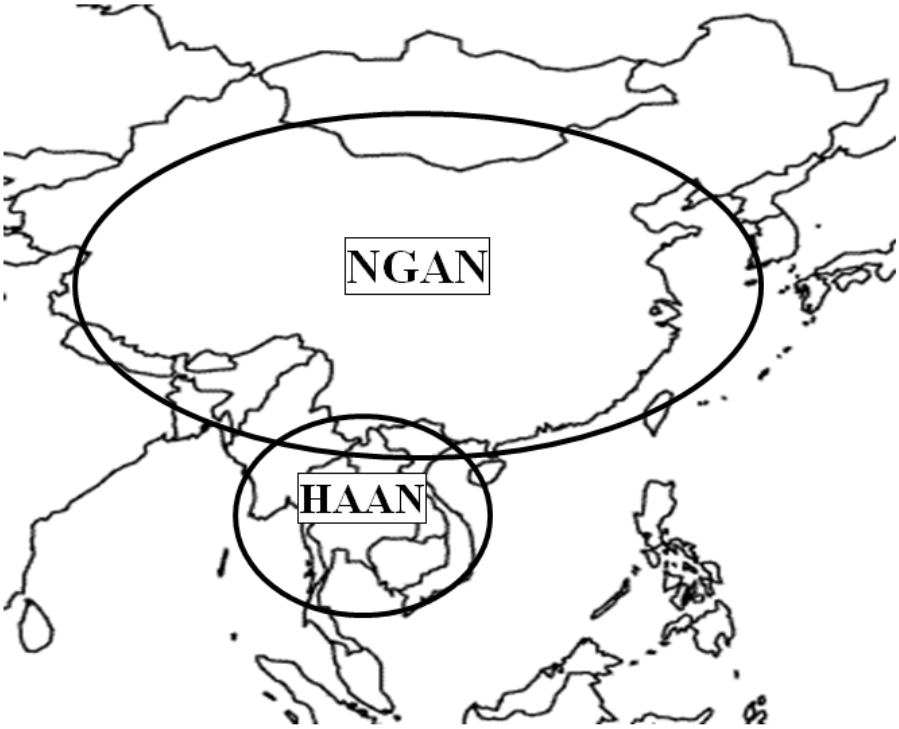
[22] In Chen's 2014 study of Hmong-Mien, as noted by Martha Ratliff (personal communication), in the list for 'goose' of the 26 varieties of Hmong-Mien, two have the Tai HAAN forms, while the rest have the NGAN form. The form in Hmong-Mien is most likely a Sinitic loan. Ratliff (2010:225) notes how initial velar nasals in Hmong-Mien tend to appear primarily in loanwords. Moreover, Ratliff sees this as an instance of a broader cultural borrowing of the Sinitic home lifestyle.

Table 6: *Words for "Goose" in Austroasiatic*

FORMS	BRANCHES
HAAN	Proto-Palaungic; Proto-Khmuic; Bahnaric (widespread); Katuic (widespread); Monic (widespread); Pearic (in Pear)
NGAN	Proto-Khmuic; Bahnaric (Brao); Katuic (Kui); Khmeric (widespread; with /k/ prefix); Vietic
NGONG	Vietic; Bahnaric; Katuic (Pacoh)
OTHER	Khasic (cf. Proto Khasic 'duck' *haan); Aslian (Malay loans); Nicobaric

Map 3 shows the general regions of the northern NGAN form and the southern HAAN form. Considering the occurrence of overlapping phonetic shapes, however, it is probable that they share origins and are not merely the result of onomatopoeia. Based on both linguistic and archaeological evidence, it is reasonable to suggest that Sinitic helped to spread the word into neighboring language groups, including other Sino-Tibetan groups. Tai-Kadai groups borrowed the term, and then Tai HAAN was subsequently borrowed into Austroasiatic languages. However, whether the origins of the form lie in the Fertile Cresent or East Asia is currently an unanswerable question.

Map 3: *Words for 'Goose' in China and Mainland Southeast Asia*



4. Final Hypotheses and Questions

The goal of this study has been to use linguistic and archaeological data and studies to explore the etymological origins and spread of words for poultry, namely, 'chicken,' 'duck,' and 'goose', in China and mainland Southeast Asia. This has touched on issues of sociocultural history in the region. It thus provides a case study in testing the limits of what can be said about the linguistic history of words in speech communities several thousand years in the past. It also involves grappling with the matter of language phyla classification and timing as well as interphyla borrowing in a region with tremendous complexity and uncertainty. Finally, the lexical data show how onomatopoeia was a recurring word-formation strategy to name birds in this region, which, while interesting, inserts some uncertainty in all claims of origins and borrowing. Some of the primary conclusions include those in Table 7.

Table 7: *Summary of word forms and possible language group sources*

Bird	Form	Likely Source	Notes
chicken	KAJ	Sinitic	spread into Kra-Dai and Hmong-Mien
	KRAK	Sino-Tibetan	onomatopoeia (likely reduced form)
	ʔIAR	Austroasiatic	spread into Kuki-Chin-Naga
duck	AP	uncertain source	onomatopoeia
	PIT	Tai	spread into Vietic and other Austroasiatic
	DAʔ	Austroasiatic	most widespread poultry word in Austroasiatic
goose	NGAN / NGA	Sinitic	spread into Hmong-Mien and Kra-Dai; possible shared origins with Proto-Indo-European
	HAAN	Kra-Dai via Sinitic	loanword in Austroasiatic in Mainland Southeast Asia

To return to the original question posed in section 1, could any of these etyma be connected to the earliest instances of poultry domestication? The archaeological studies provide hypothetical areas and times of poultry domestication, but these are still subject to debate and further zooarchaeological inquiry. To a good extent, while the major language phyla in the region are agreed upon (i.e., Austroasiatic, Austronesian, Hmong-Mien, Sino-Tibetan, and Tai-Kadai/Kra-Dai), the relationships among them, the timing of language group dispersals, and the urheimat are still being explored. Increasingly, attempts have been made to connect modern language groups with archaeological traditions and with ancient historical groups (e.g., Sinitic with Cishan-Peiligang culture, Tai and Vietic with Baiyue, etc.), but while this area gains ground, these hypotheses are regarded as tentative in the research community. Altogether, this situation presents considerable challenges in trying to link sociocultural historical events with linguistic history.

Nevertheless, in this study of poultry, broad geographic regions of word forms have emerged across language phyla. One hypothesis is that these geographic lexical centers could represent domestication events which subsequently spread to other speech communities. It is generally assumed that basic vocabulary (i.e., words common to the human experience) tend to be replaced at slower rates than culturally specific words. Thus, words that are the result of innovation within a speech community, especially items or activities that are sociologically attractive or highly functional, are more readily transmitted. And insofar as there is archaeological evidence of prehistoric trade of pottery, jade, and bronze, and the transmission of rice-growing and other agricultural practices, there has almost undoubtedly been transmission of animal husbandry.

A final point that could clarify direction of borrowing of terms for domesticated poultry is a term for 'cage'. Throughout mainland Southeast Asian Austroasiatic, Tai, and Sino-Tibetan, there is the approximate form KRUNG meaning 'cage' or some kind of holding place for animals (e.g., 'pen', 'sty', etc.). Such a device is essential for animal husbandry, and it is possible, if not likely, that the spread of poultry or at least some bird husbandry practices occurred simultaneously with the spread of devices to hold them. The geography region of KRUNG parallels the region for NGAN and HAAN shown in Map 3. Can this additional lexical item provide support for HAAN in both Tai and mainland Southeast Asian Austroasiatic, thereby providing a general time from for this spread of these words and husbandry practices? More archaeological evidence would be needed to answer this question.

Table 8: *KRUNG for 'cage' in China and Mainland Southeast Asia*

Proto-Language	Reconstruction
Austroasiatic	*[t]ruŋ 'stable, sty, cage' cf. *kruŋ 'to confine' (Shorto 2006)
Old Chinese	*k.rˤoŋ (Baxter and Sagart 2014)
Sino-Tibetan	*kruːŋ (STEDT)
Tai-Kadai	*krụ̊oŋ (Li 1977)

How can linguistic evidence provide clarifying evidence in this realm? Data does support in various ways the centrality of Sinitic within the Sinosphere and the southward expansion of groups from south China into Southeast Asia, a period which has few corroborating written historical documents. It also supports the hypothesis of expansion of Tai groups into mainland Southeast Asia. It shows exchange among

Austroasiatic, Tibeto-Burman, and Tai groups, an aspect which has no explicit historical documentation. The degree to which a word form is spread within a language family has been considered useful in determining the age of such words, and thus also the relative age of the groups. In Austroasiatic, words for 'chicken' are less widespread than words for 'duck' and 'goose', as noted by Blench (2011:137). This could be interpreted as meaning that geese and especially ducks were domesticated by Austroasiatic groups significantly earlier than chickens were, and yet the geographically widespread form for 'chicken' suggests the possibility of a domestication event very early in the prehistoric period. Does diversity of lexical forms in language groups indicate a later time of developing or adopting the practice of chicken or duck husbandry, or does it mean that there was more time depth to allow the increased lexical variety?

Finally, the data can provide points of reference for other broader historical anthropological inquiry. For instance, how does lexical evidence of poultry domestication correspond to understanding of the emergence of agriculture in north China, central China, and mainland Southeast Asia? Hopefully, the mapping of these word forms and the relevant historical and archaeological data will have use to those engaged in research of human sociocultural history.

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