THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

中文及雙語學系
Department of Chinese & Bilingual Studies

Language, Cognition, and Neuroscience

DIVERSITY & UNITY IN EAST ASIA

Languages & Peoples

Eleventh East Asia Forum on Humanities,
Hanyang University, Seoul, 2019.10.18-9.

William S-Y. Wang, 王士元.

At this Forum on the Humanities, I would like to offer some global remarks on the defining feature of humans, our language, which enabled us to migrate out of Africa and diversify across our entire planet.

In East Asia, there has been innumerable contacts among its populations across 50 ky, resulting in extensive mixing in DNA and in languages. Over the past several millennia, written language in the form of sinograms, 汉字 has played a very special role in promoting the cultural unity of East Asia, creating what has been called the Sinosphere.

The advances in science and technology have greatly increased the human lifespan, but at the same time new urgent challenges have arisen from degenerative diseases associated with ageing.

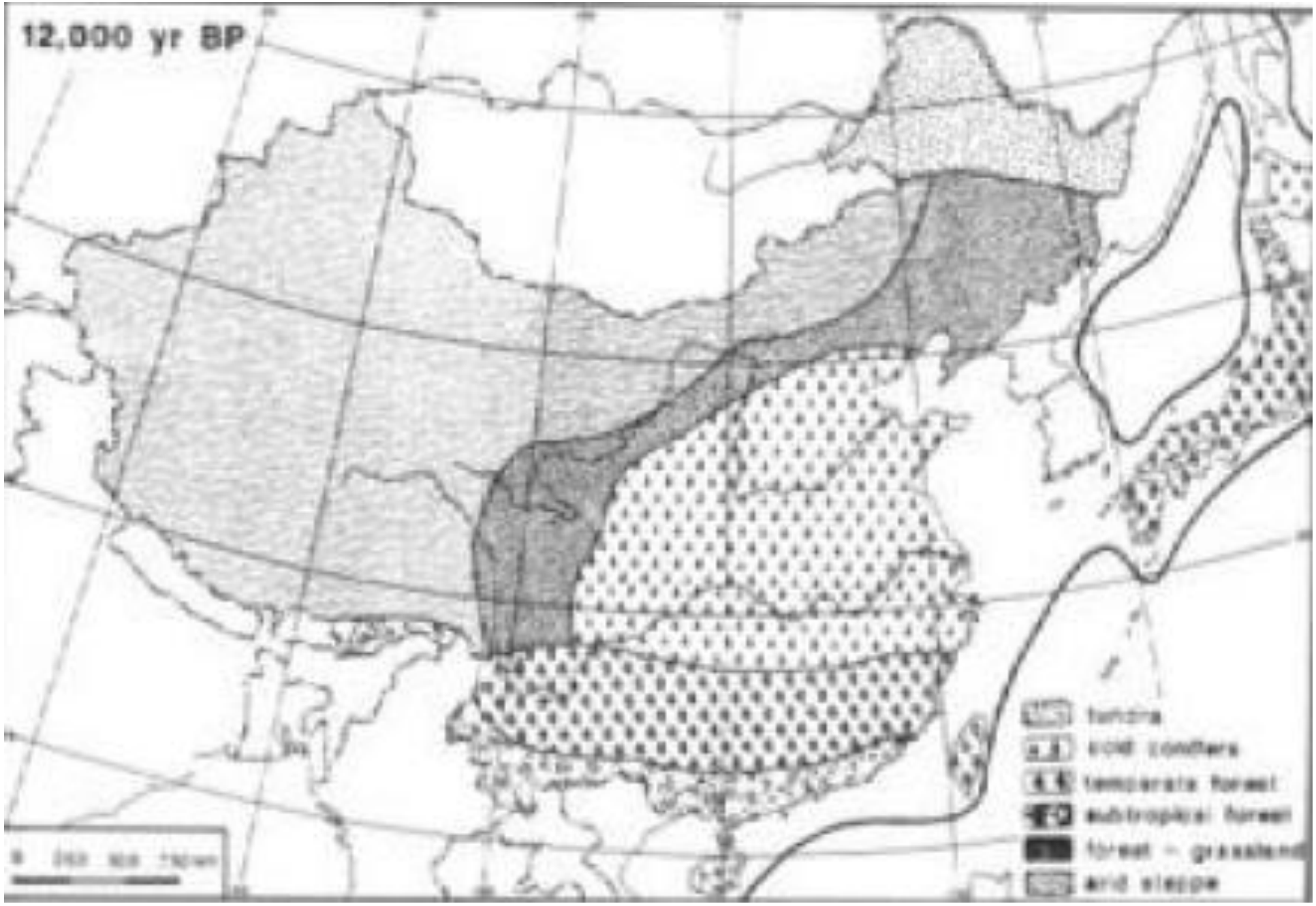
- Anatomically Modern Humans started emigrating from Africa some **100 kya**. Their movement patterns & population growth were conditioned by climate & geological changes.
- Ancient DNA from Tianyuan (田园) fossil of **40 kya** shows early lineage of modern East Asians. During the Last Glacial Maximum (LGM) of **21 kya, sea level was 125 m lower** than present; Japan & Taiwan were connected by land to the Asian mainland, with land bridge across Beringia.
- Archeological data show isolated sites @ **9kya**, expanding @ **7kya**, & networking together to form an **'Initial China' by 6kya**. Various linguistic studies also converge around 6 kya for the date of the last Sino-Tibetan unity.
- Survey published in Chang, K.C. (张光直) et al 2005 includes a selected list of 122 sites. Among these was Jiahu (贾湖) of **8kya**, with findings of playable flutes and **primitive sinograms**.
- Over many millennia, East Asia has always been inhabited by a great diversity of peoples, who spoke languages classified as Sino-Tibetan, Altaic, Austric, & Indo-European. Starting with the Xia (夏) dynastic rule persisted 4 ky until the 20th century. History was marked by repeated cycles of a strong centralized unity collapsing into diverse contending polities, only to be united again. These cycles resulted in **high degrees of mixture in the genetics of peoples as well as in the languages they speak**.

- The power of language was greatly enhanced by the invention of **writing**. While Galileo praised the alphabet, **sinograms** are unique in presenting semantic information in parallel with phonetic information. Oracle bone inscriptions were used extensively 3 kya during the Shang (商) dynasty, they were rediscovered only at beginning of 20th century.
- Sinograms are **hierarchically** structured, and typically involve speech recoding, as demonstrated by experiments. Because sinograms depend less on the phonetics of speech, they have been used to write many different languages of East Asia, enhancing cultural unity across time and space. Sinograms evolve through modifying old ones and introducing new ones. They have even been explored for dyslexic American children because they involve different eye movements.

========

- Science and technology have become a major force in evolution, surpassing natural selection. It has greatly extended human longevity, though the effects of the added decades have been mostly negative so far. Humans urgently need deeper understanding of language & cognition to help elders have **healthy & productive sunset years**.

During the Last Glacial Maximum, the sea may be 125 meters below current level.

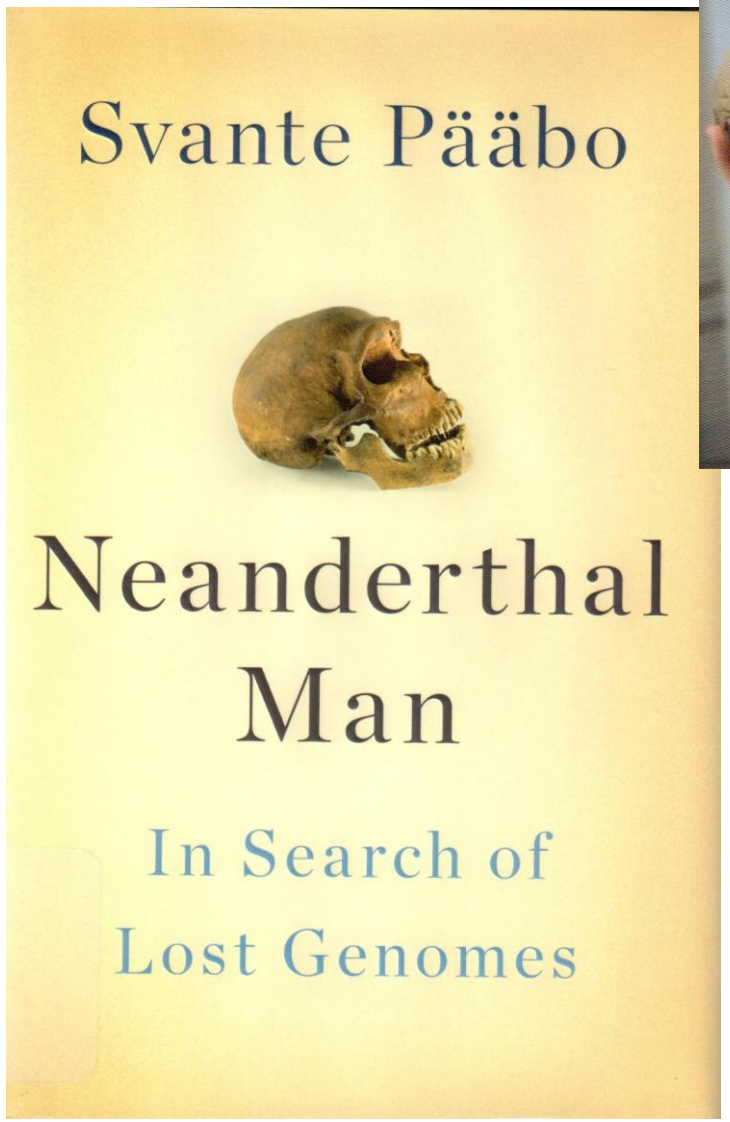


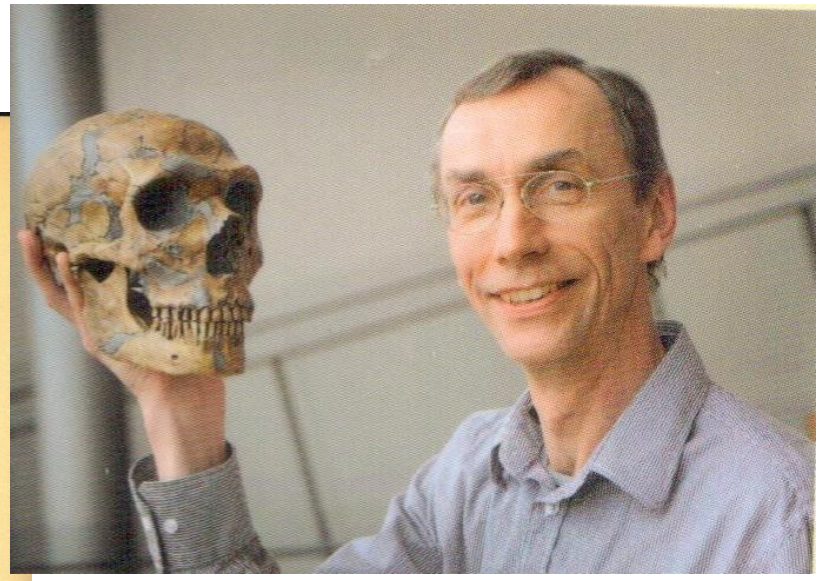
Winkler, M.G. & P. K. Wang. 1994.

The late quaternary vegetation & climate of China.

221-64 in Global Climates: Since the Last Glacial Maximum, ed. by H.E. Wright, Jr., J.E. Kutzbach & T. Webb, University of Minnesota Press.

从化石中萃取DNA!





Pääbo, Svante. 2014. *Neanderthal Man: In Search of Lost Genomes*. Basic Books.

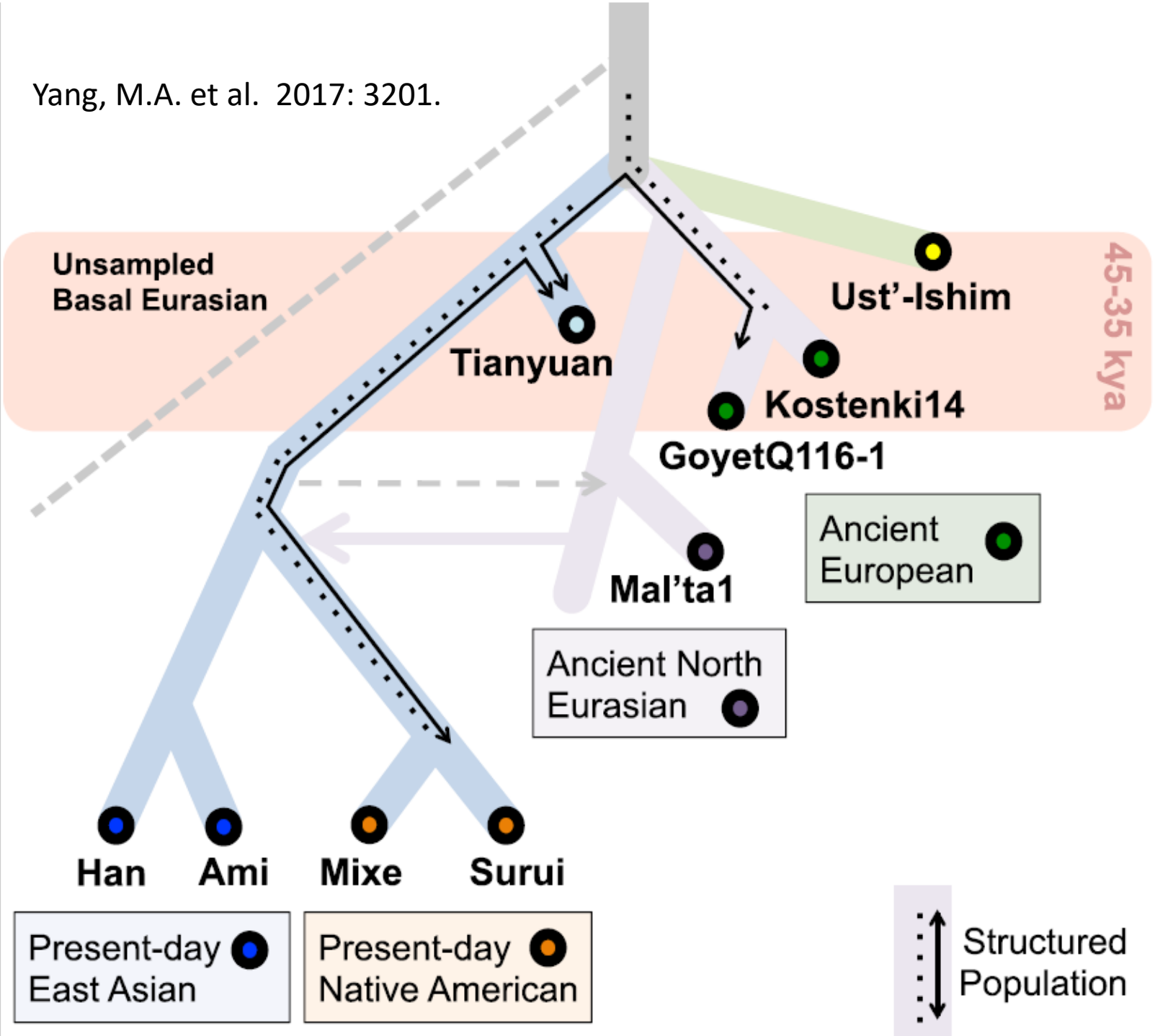
Pääbo is a pioneer in research on ancient DNA. He leads a team at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

Reich, David. 2018. *Who We Are and How We Got Here: Ancient DNA and the New Science of the Human Past*. Pantheon.

David Reich is a Professor of Genetics at Harvard University. In 2017 he was awarded the Dan David Prize for the computational discovery of intermixing of Neanderthals and modern humans.

David Reich
PHOTO CREDIT: Bizu Tesfaye (Howard Hughes Medical Institute)

Yang, M.A. et al. 2017: 3201.



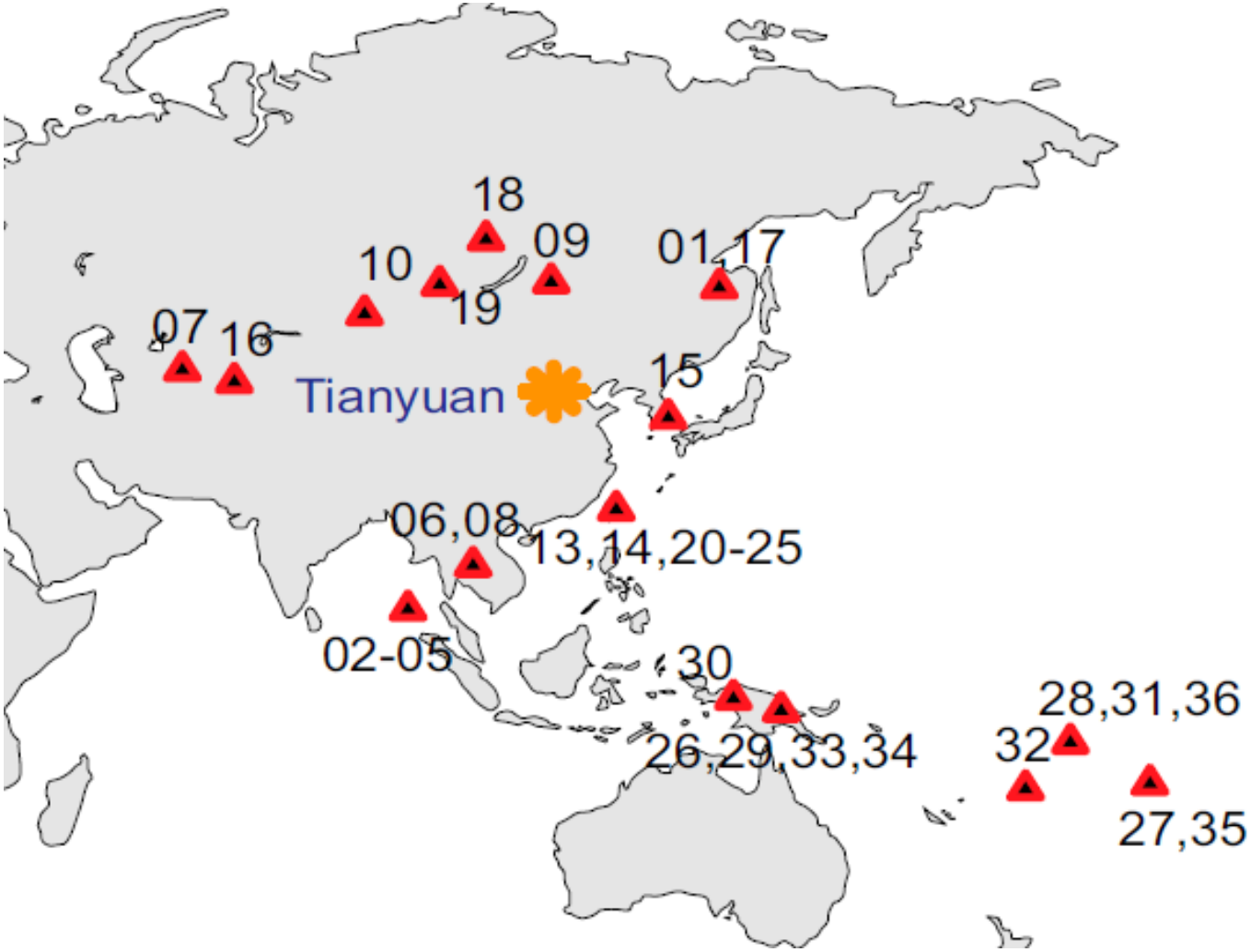
460 | NATURE | VOL 534 | 23 JUNE 2016

付巧妹

中国科学院
IVPP 古脊椎动物与古人类研究所

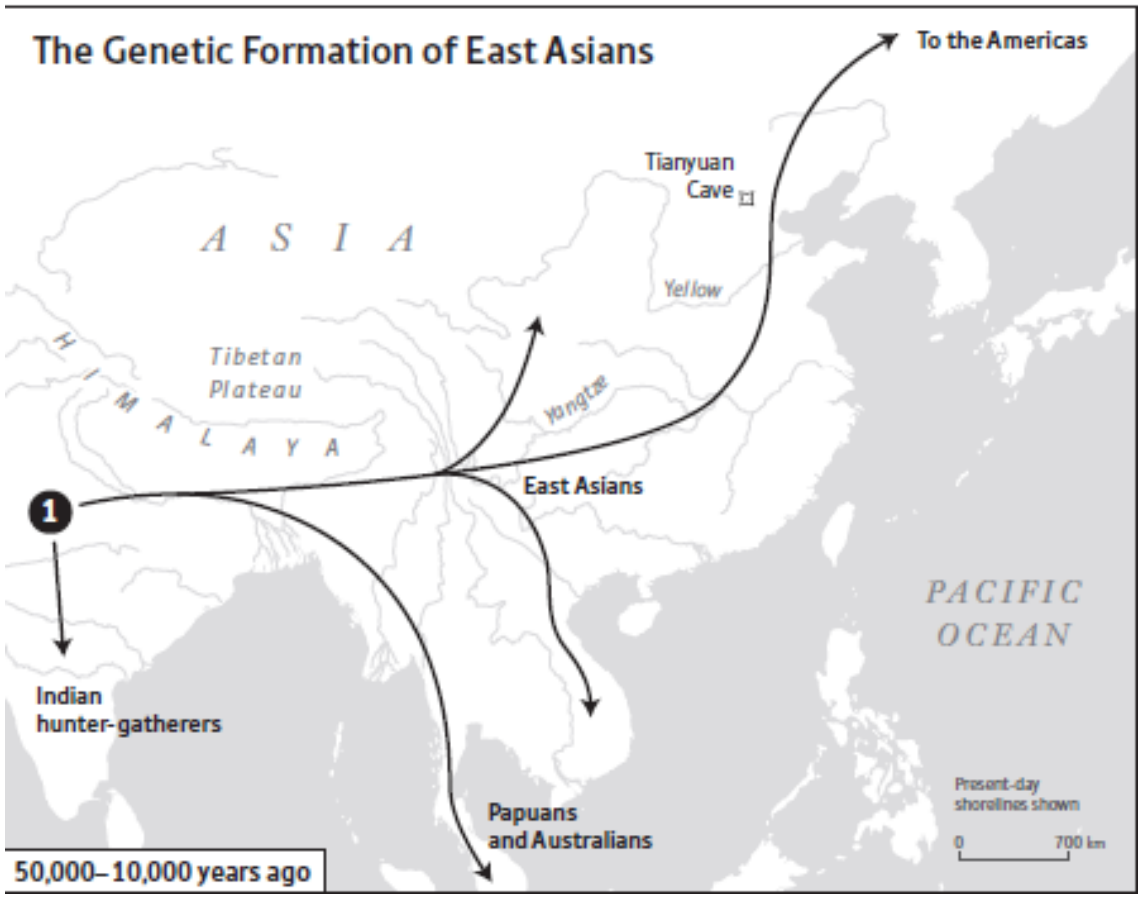
- Fu, Q., et al (2013). "DNA analysis of an early modern human from Tianyuan Cave, China." PNAS **110**(6): 2223-2227.
- Yang, M. A., et al. (2017). "40,000-Year-Old Individual from Asia Provides Insight into Early Population Structure in Eurasia." Current Biology **27**: 3202-3208.
- Yang, M. A. and Q. Fu (2018). "Insights into Modern Human Prehistory Using Ancient Genomes." Trends in Genetics **34.**

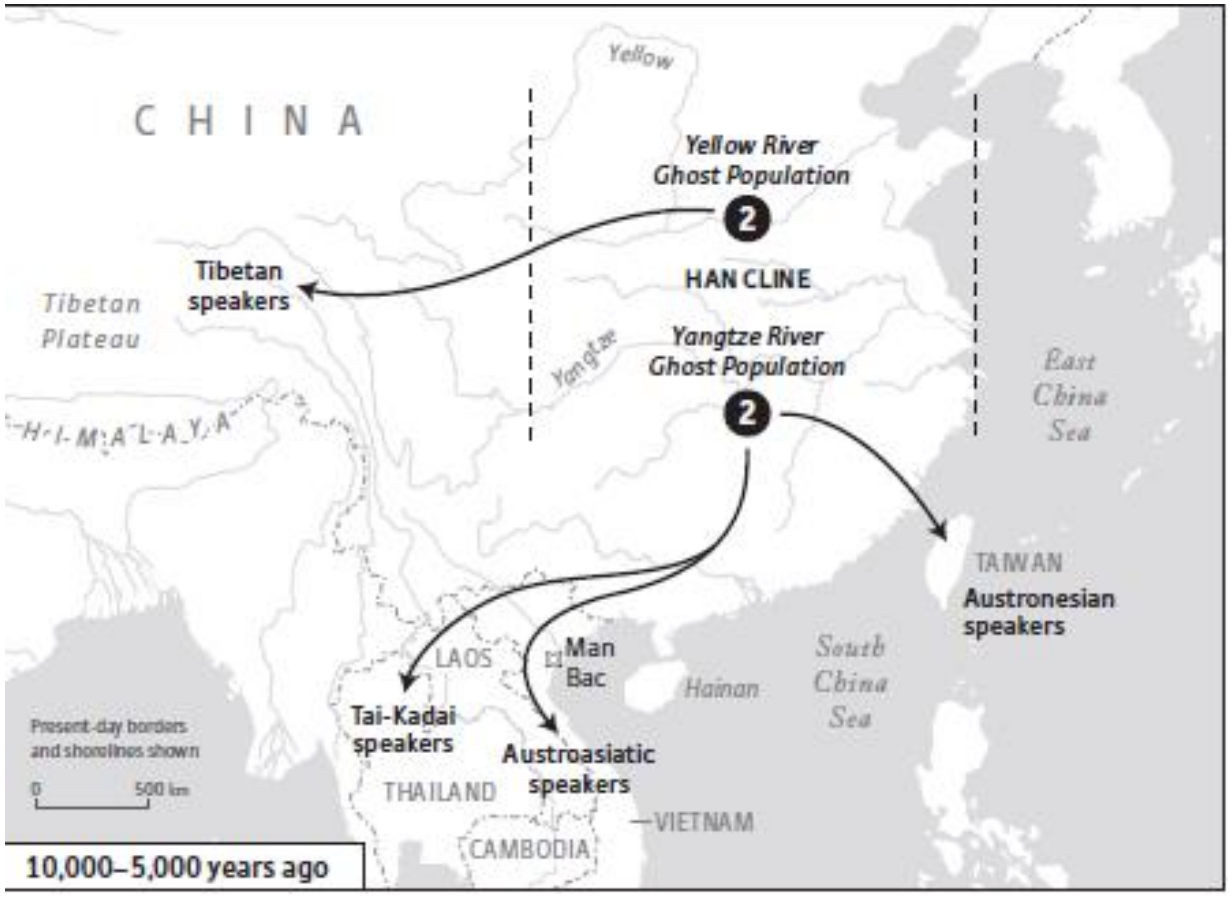
Ust'-Ishim, Central Siberia.
Kostenki 14, Western Siberia.
Goyet Q116-1, Belgium.
Mal'ta 1, Lake Baikal region.



"We have extracted DNA from a **40,000-y-old** anatomically modern human from Tianyuan Cave outside Beijing, China. Using a highly scalable hybridization enrichment strategy, we determined the DNA sequences of the **mitochondrial genome**, the entire nonrepetitive portion of **chromosome 21** (~30 Mbp), and over 3,000 polymorphic sites across the nuclear genome of this individual. The nuclear DNA sequences determined from this early modern human reveal that the **Tianyuan individual derived from a population that was ancestral to many present-day Asians and Native Americans but postdated the divergence of Asians from Europeans**. They also show that this individual carried proportions of DNA variants derived from archaic humans similar to present-day people in mainland Asia." *Abstract*.

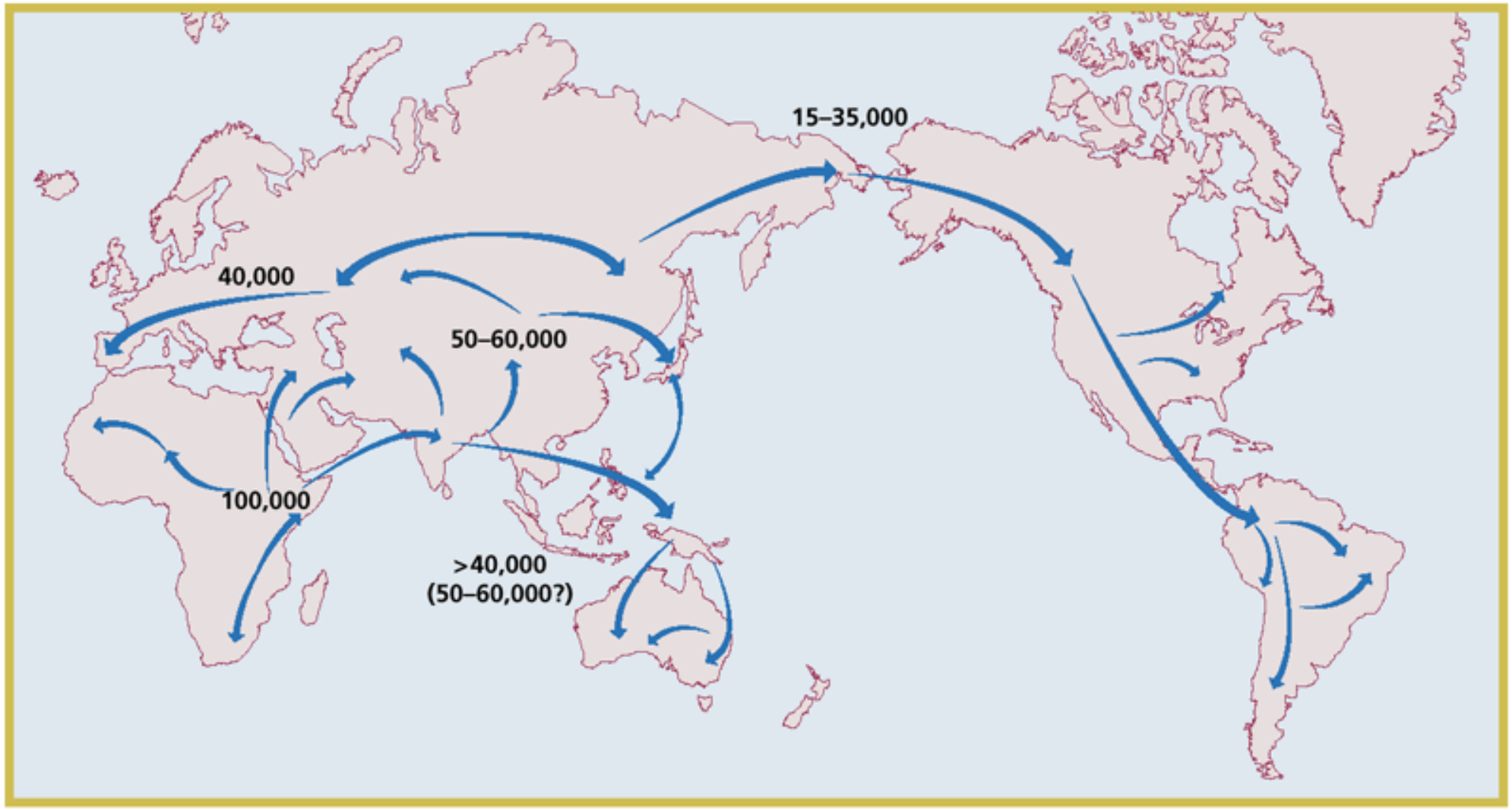
Fu, Q., …, S.Paabo. (2013). "DNA analysis of an early modern human from Tianyuan Cave, China." *PNAS* **110**: 2223-2227.



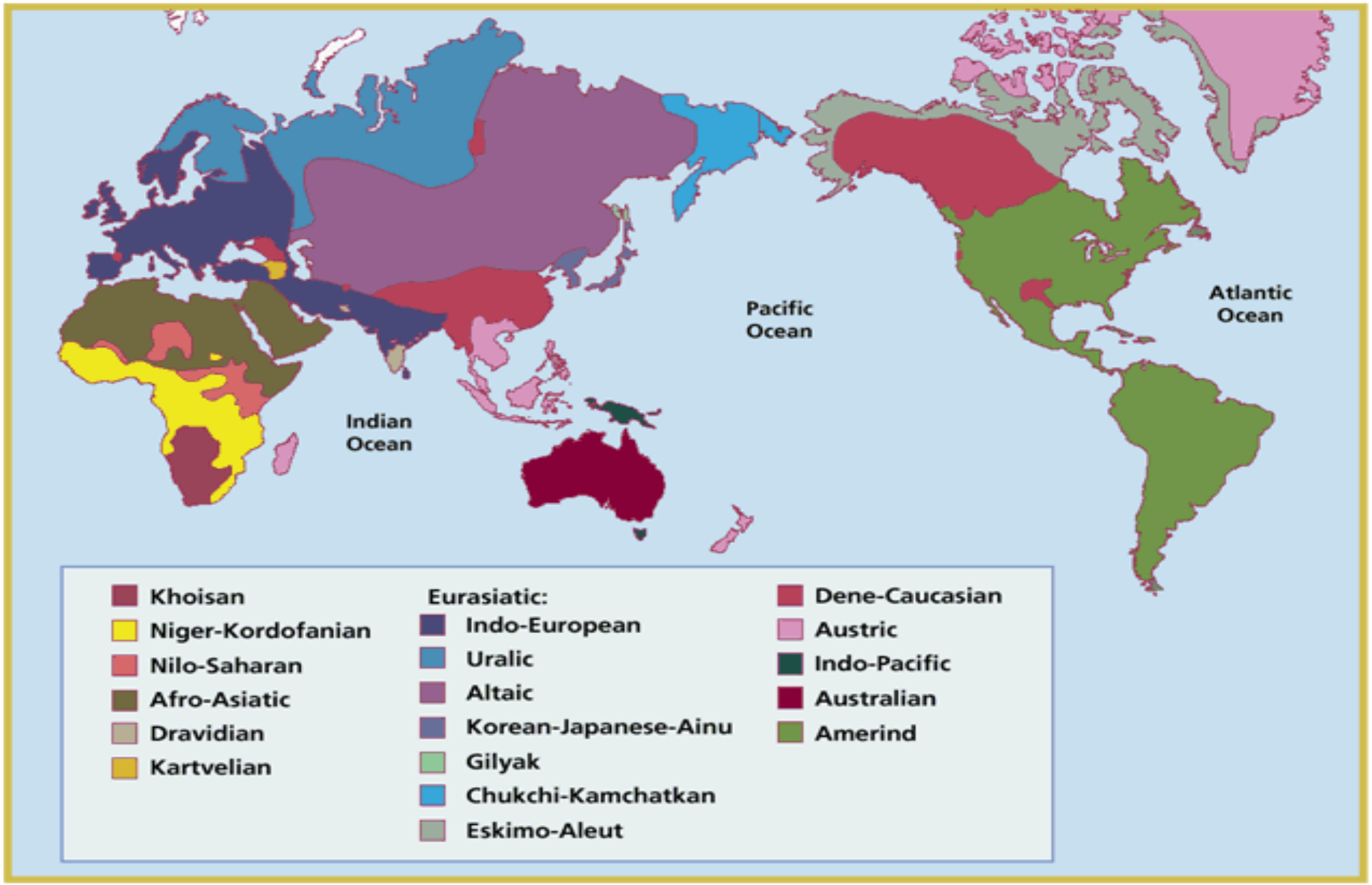


From: Reich, D. (2018.). **Who We Are & How We Got Here: Ancient DNA & the New Science of the Human Past**. Pantheon.

L.L.Cavalli-Sforza & M.W.Feldman.
The application of molecular genetic approaches to the study of human evolution. *Nature Genetics Suppl.* 33.266-75. 2003.

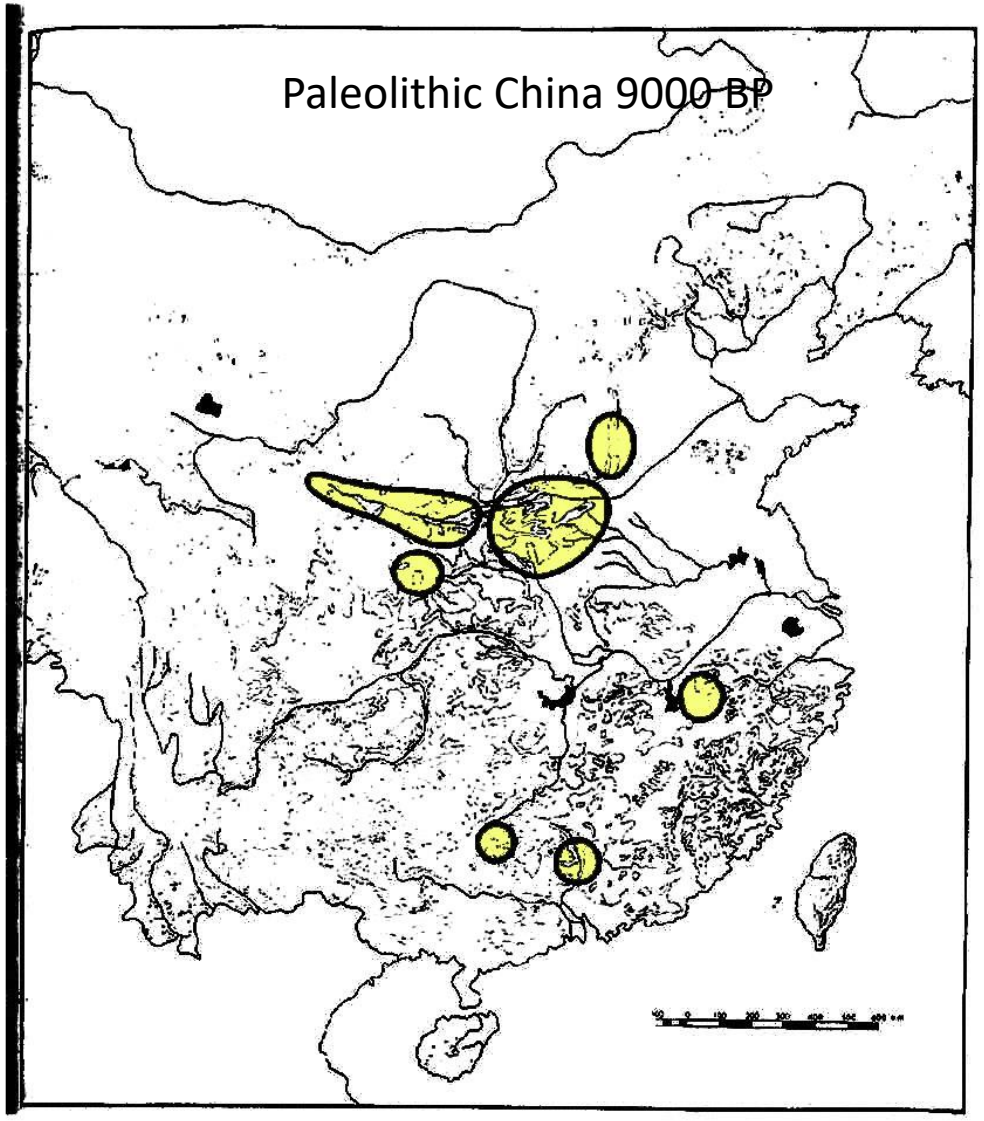


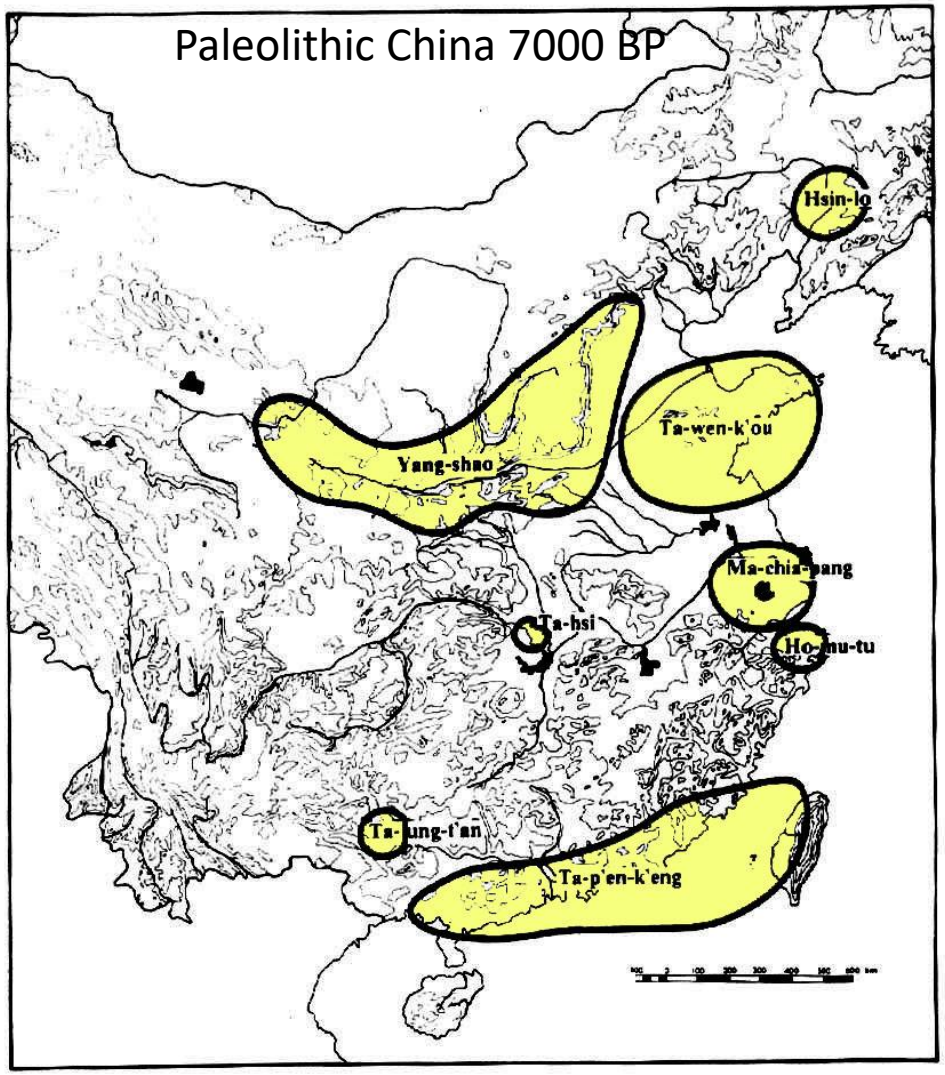
L.L.Cavalli-Sforza & M.W.Feldman. 2003. The application of molecular genetic approaches to the study of human evolution. ***Nature Genetics Suppl.*** 33.266-75.



The world now speaks some 6000 languages. These have been classified into 18 phyla by the late

Joseph H. Greenberg.





Maps from Chang, K.-C. 张光直 (1986:235)

The Archeology of Ancient China, 4th ed..

新乐
仰韶
大汶口
大溪
马家浜
河姆渡
大龙潭
大盆坑

红山
土珠
山背
石峡
昙石山
凤鼻头

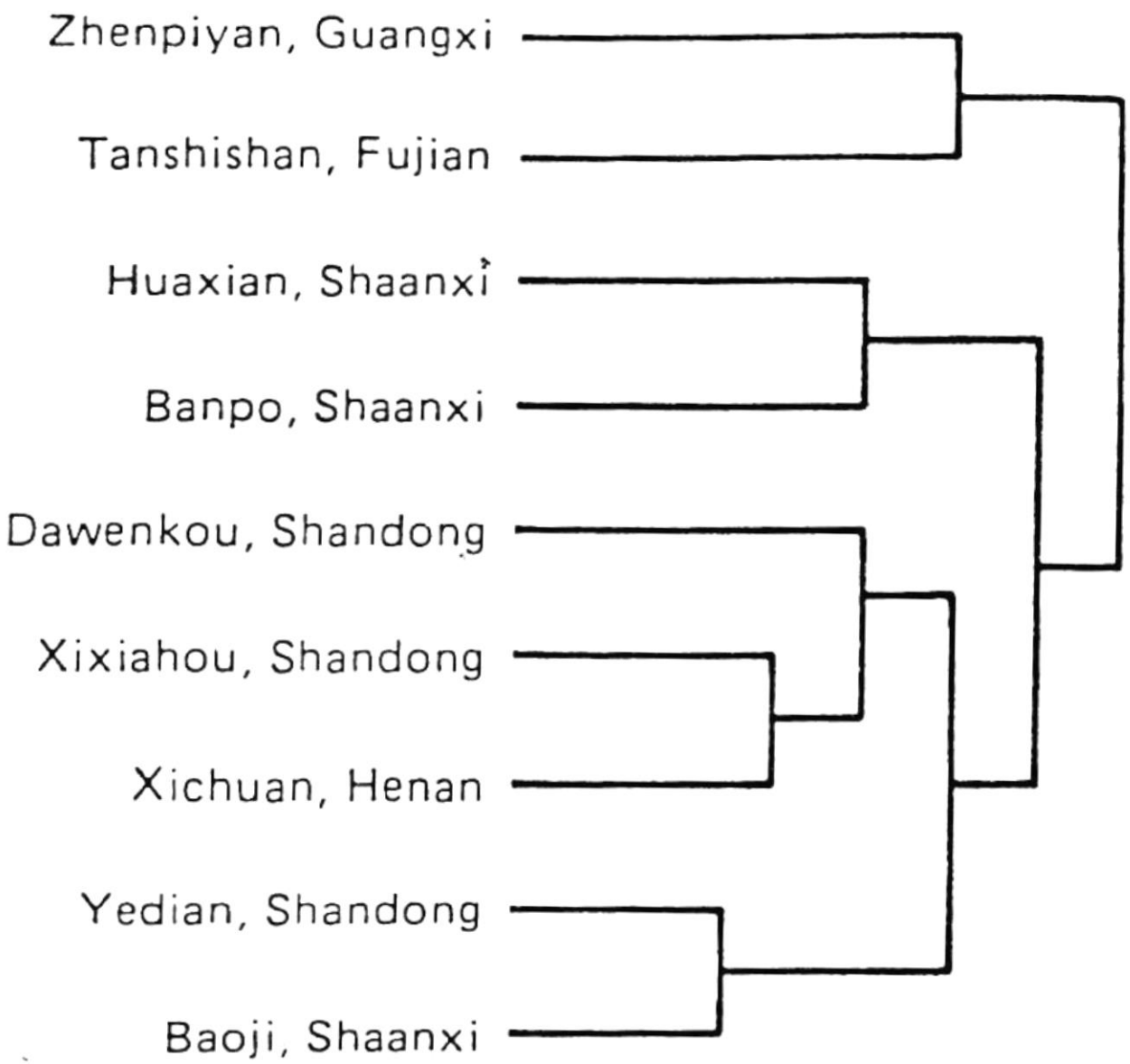
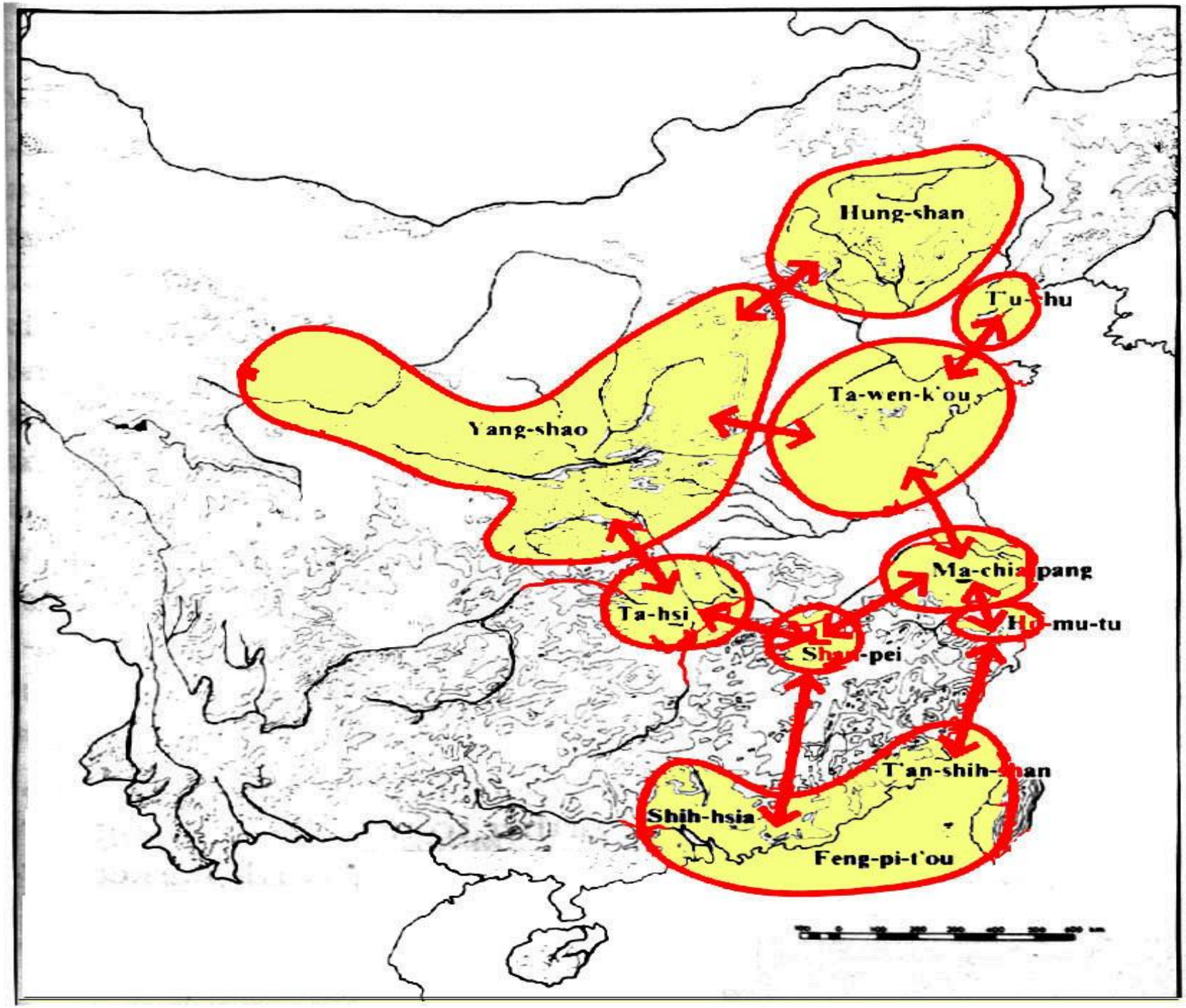


Figure 1. Average linkage analysis of Neolithic humans in China [From Wu and Olsen, p.121]

Wang, S.-Y. W. (1998). **Three windows on the past**. 508-534 in The Bronze Age and Early Iron Age Peoples of Eastern Central Asia. V.Mair, ed. University of Pennsylvania Museum Publications.

(2002). 徐文堪譯. **探索過去的三個窗口**. 1-30 東方語言與文化. 潘悟雲主編. 東方出版中心.

Wu, Xinzhi & F. E. Poirier (1995). Human Evolution in China, Oxford University Press.

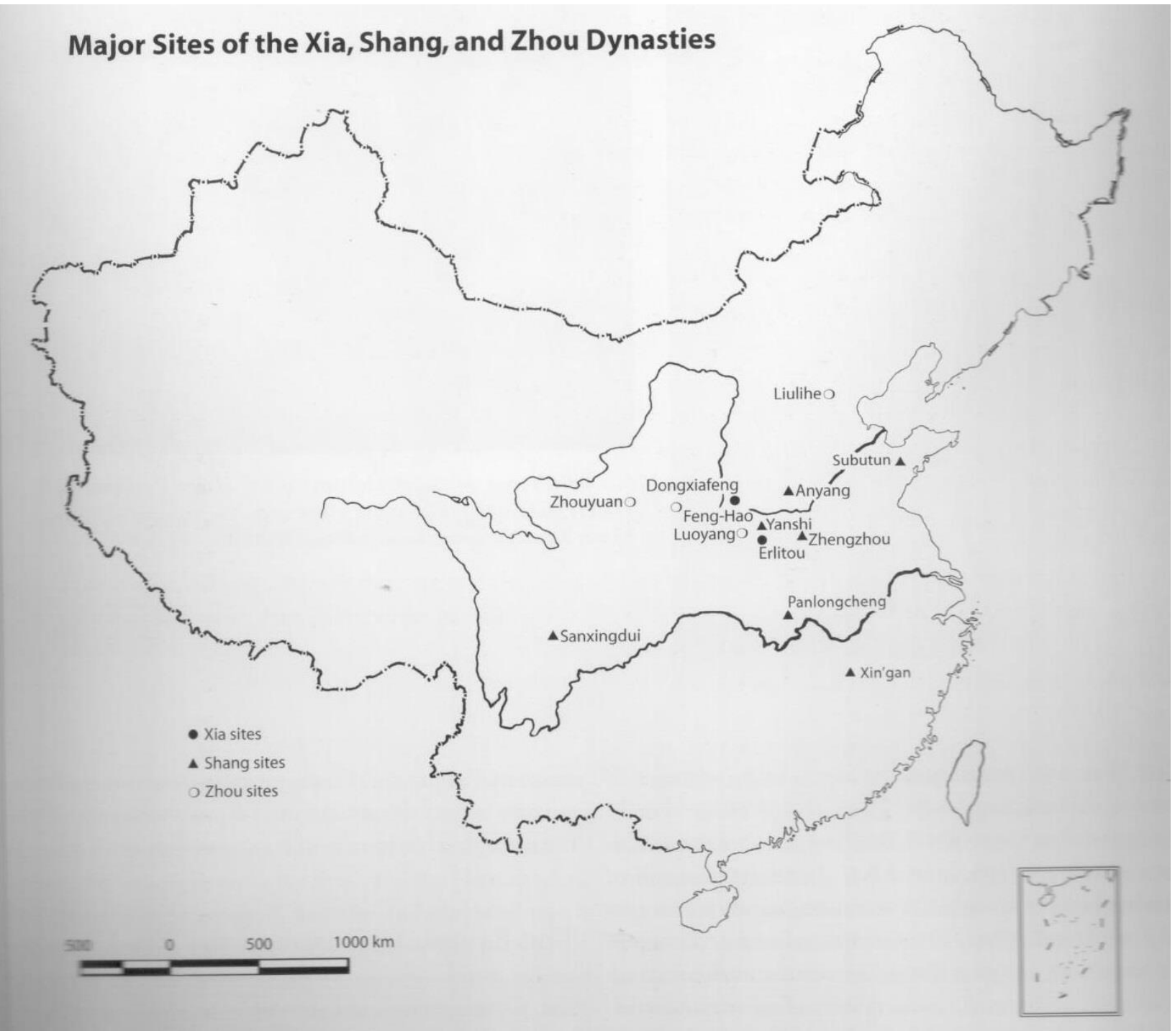


6000 B.P.

"Initial China"

张光直：初始的中国

Chang, Kwang-chih. 1986.
The Archeology of Ancient China.
4th Edition.
Yale University Press.



Chang, K.-C., et al., Eds. (2005). The Formation of the Chinese Civilization, *Yale University Press.*

三代:

夏 - 二里头

商 - 安阳

周 - 洛阳

Wang, S.-Y. W. (1998).

Three windows on the past.

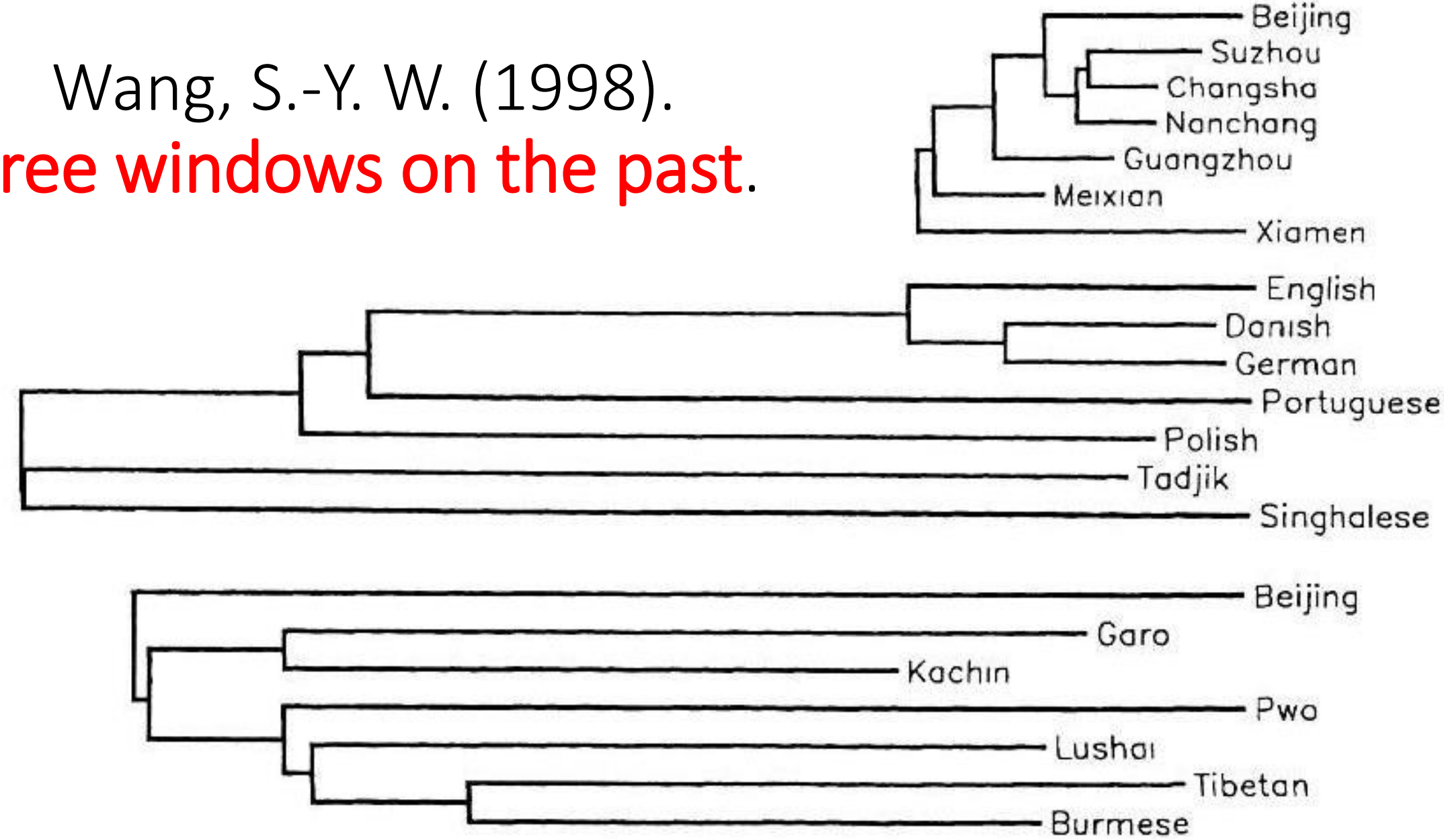
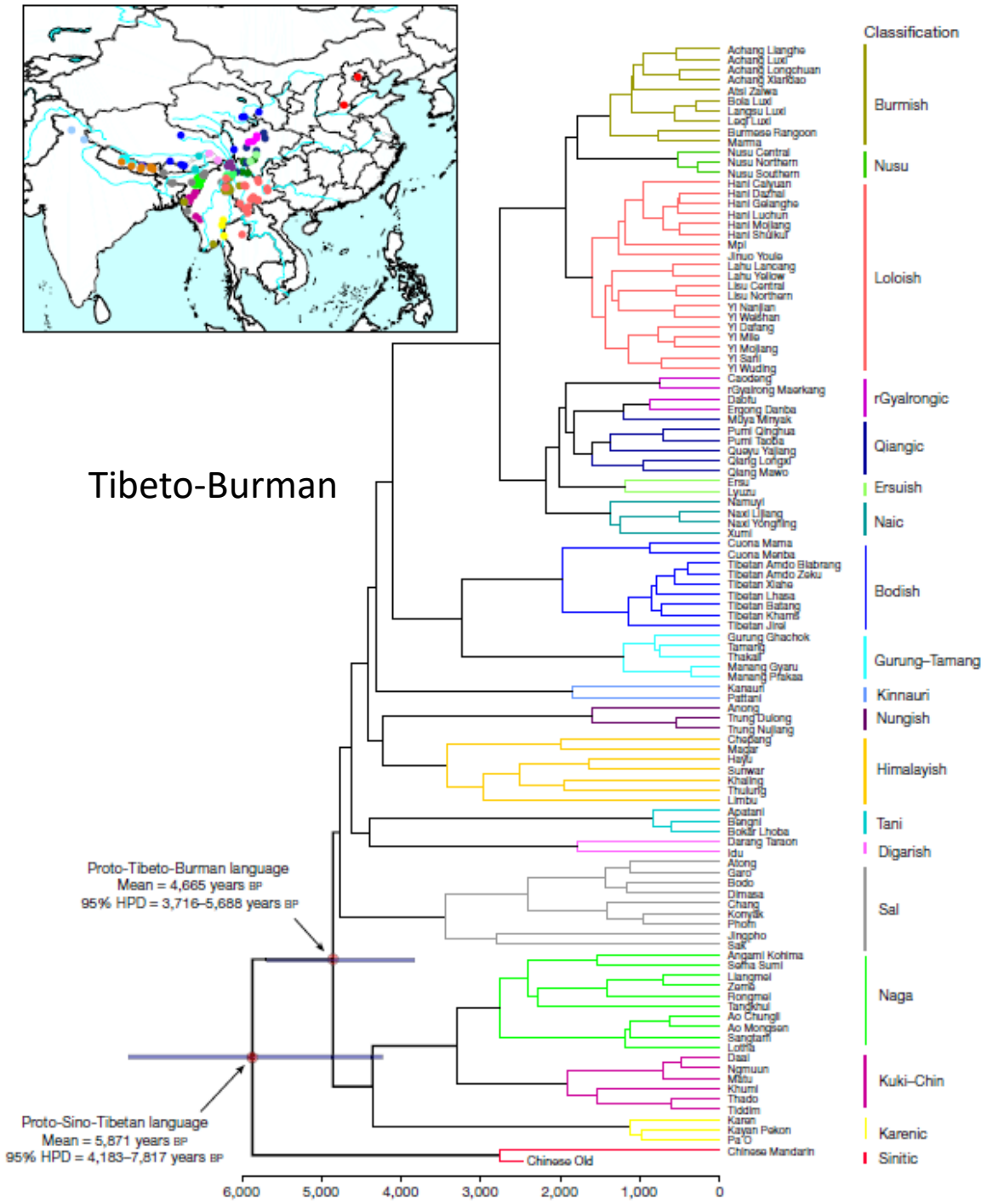


Figure 4: Additive trees for Sinitic, Indo-European, and Sino-Tibetan languages.



Zhang, Menghan, Shi Yan, Wuyun Pan, Li Jin. 2019.

Phylogenetic evidence for Sino-Tibetan origin in northern China in the Late Neolithic.

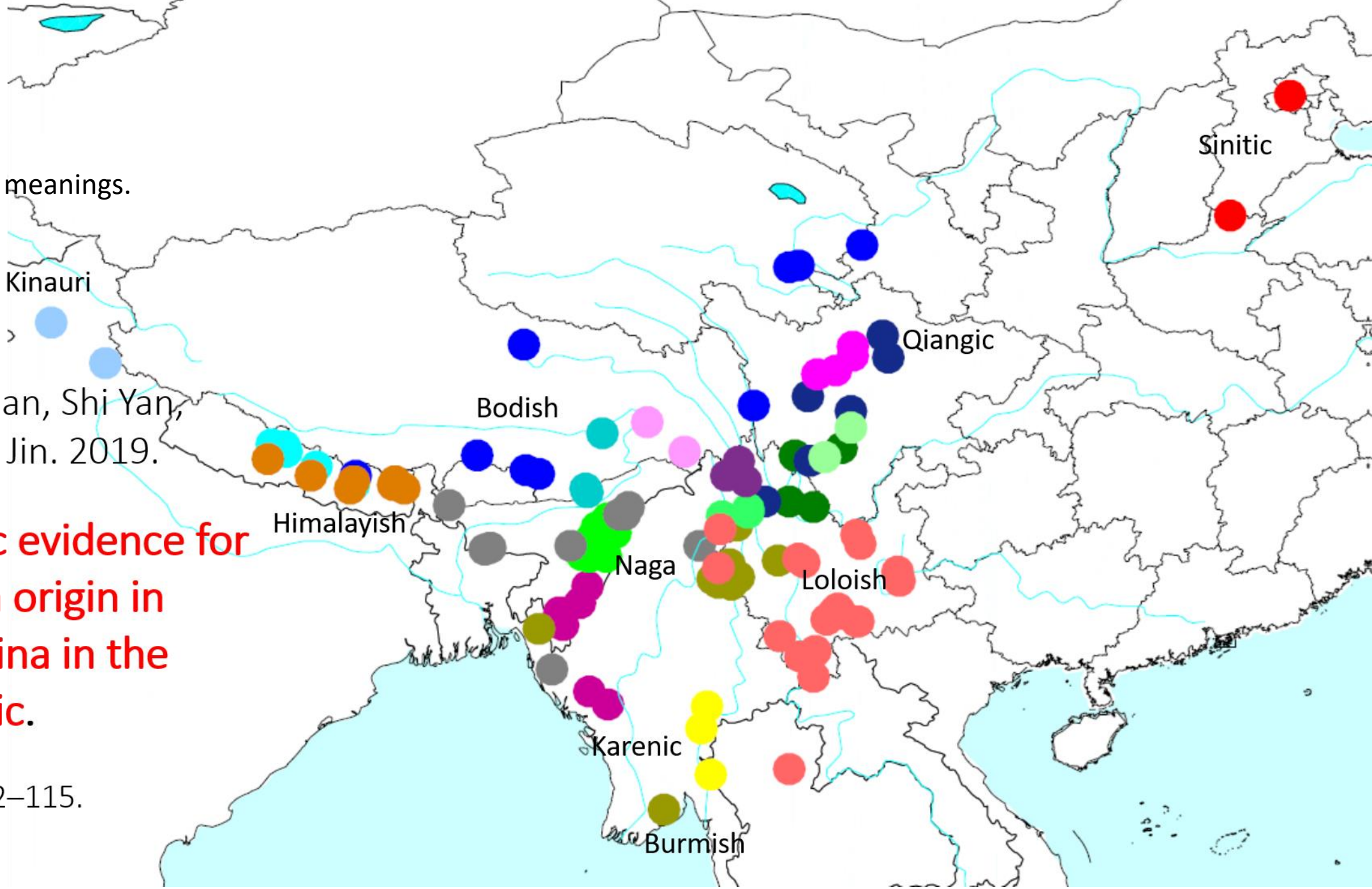
Nature 569: 112–115.

张梦翰，严实，潘悟云，金力。复旦大学。

See comment:

Lapolla, R. J. 2019. The origin & spread of Sino-Tibetan languages. *Nature* **569**: 45-47.

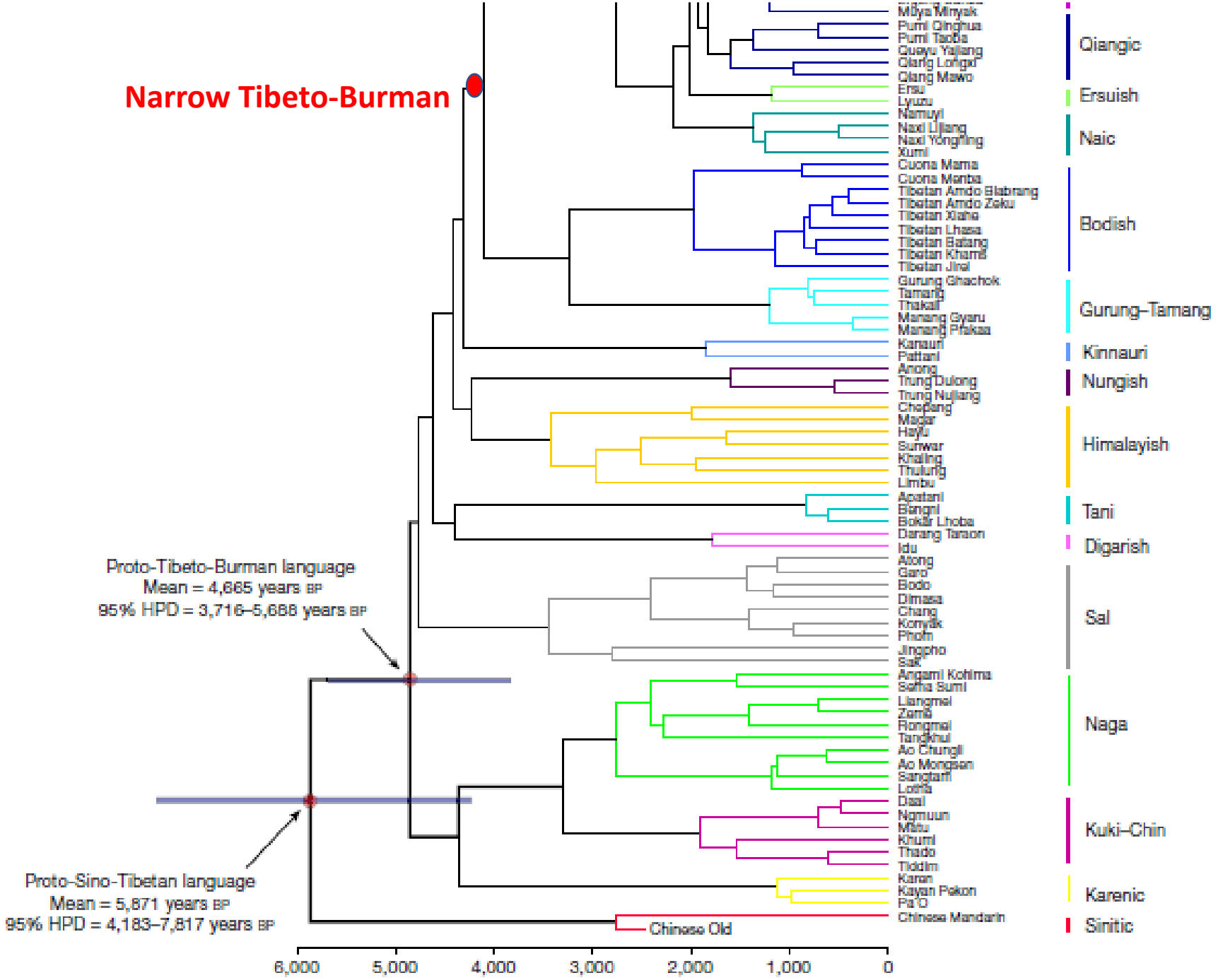
109 languages,
19 groups,
949 lexical root meanings.



Zhang, Menghan, Shi Yan, Wuyun Pan, Li Jin. 2019.

Phylogenetic evidence for Sino-Tibetan origin in northern China in the Late Neolithic.

Nature 569: 112–115.

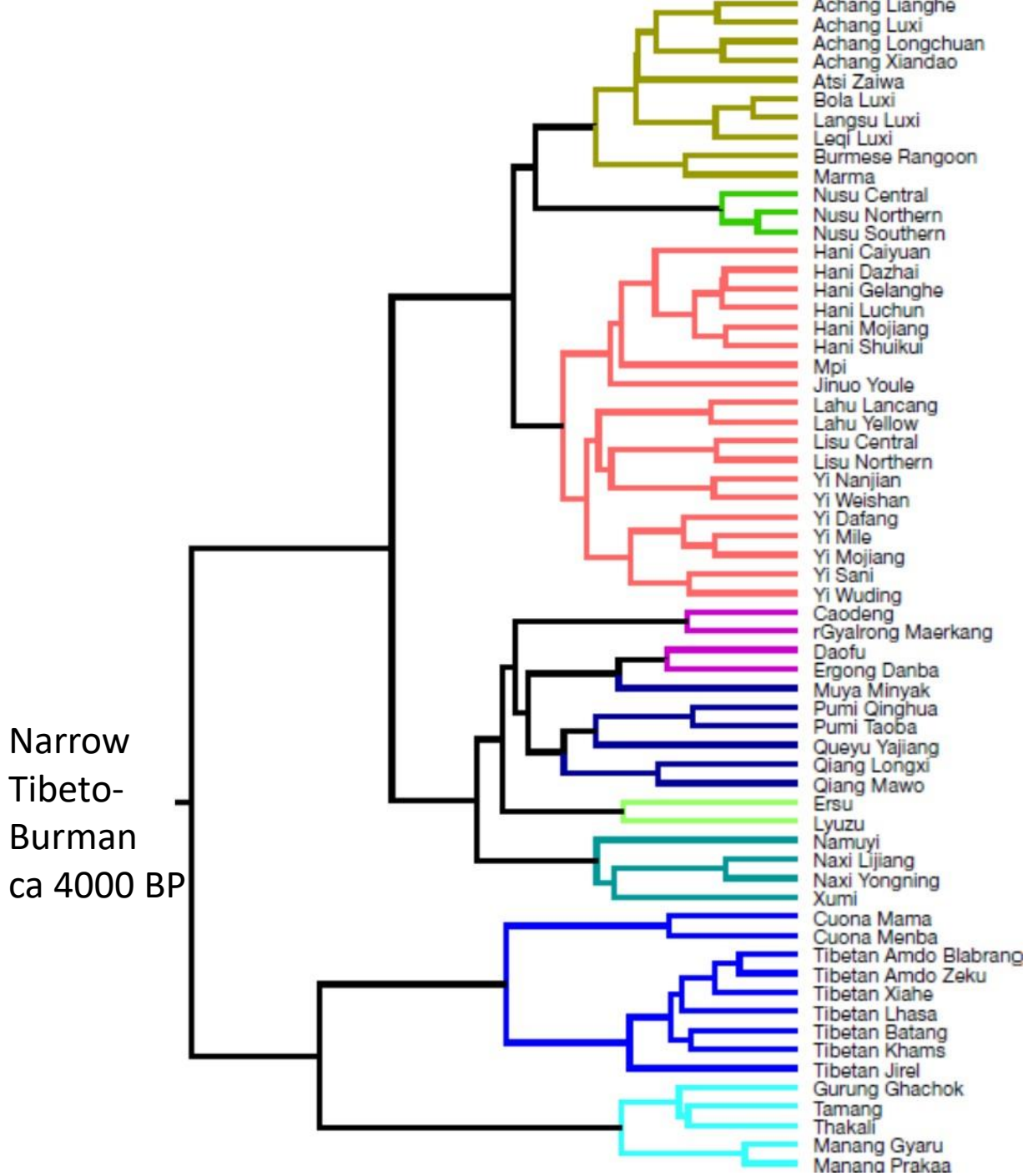


Dates of last common unity:

Sino-Tibetan
mean 5871 BP

Tibeto-Burman
mean 4665 BP

Narrow Tibeto-Burman
ca 4000 BP



Some Tibeto-Burman languages in Chinese:

阿昌
仰光缅语
哈尼 - 6
基诺
拉祜
彝 - 7
普米
羌
纳西
安多藏语 - 2
拉萨藏语 - 5
达芒

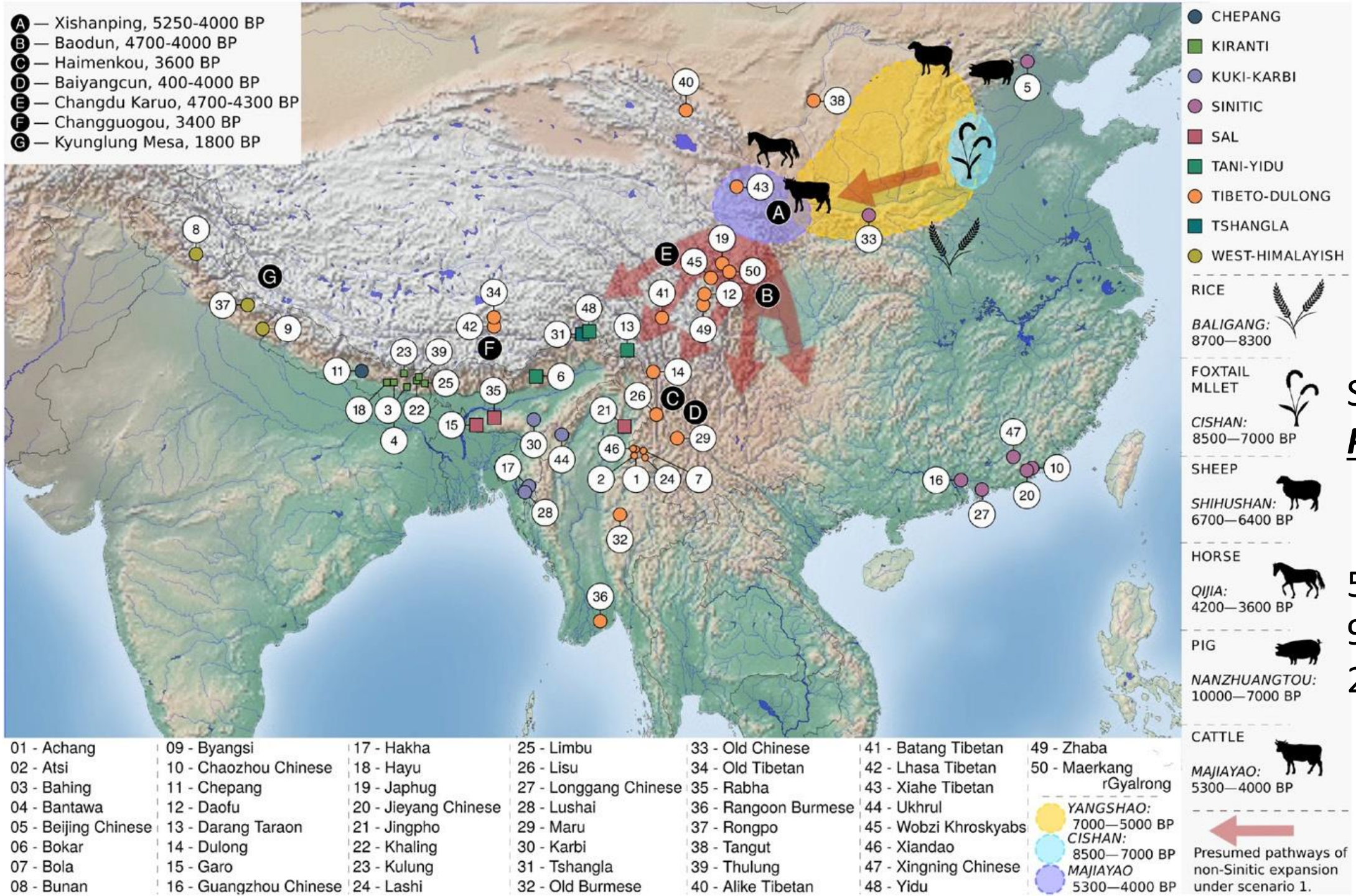
Dated language phylogenies shed light on the ancestry of Sino-Tibetan

Laurent Sagart[a,1], Guillaume Jacques[a,1], Yunfan Lai[b], Robin J. Ryder[c], Valentin Thouzeau[c], Simon J. Greenhill[b,d], and Johann-Mattis List[b,2]

[a]Centre de Recherches Linguistiques sur l'Asie Orientale, CNRS, Institut National des Langues et Civilisations Orientales, Ecole des Hautes Etudes en Sciences Sociales, 75006 Paris, France; [b]Department of Linguistic and Cultural Evolution, Max Planck Institute for the Science of Human History, Jena 07743, Germany; [c]Centre de Recherches en Mathématiques de la Décision, CNRS, Université Paris-Dauphine, PSL University, 75775 Paris, France; and [d]Australian Research Council Center of Excellence for the Dynamics of Language, Australian National University, Canberra, ACT 0200, Australia

Edited by Balthasar Bickel, University of Zurich, Zurich, Switzerland, and accepted by Editorial Board Member Richard G. Klein April 8, 2019 (received for review October 19, 2018)

"The Sino-Tibetan language family is one of the world's largest & most prominent families, spoken by nearly 1.4 billion people. Despite the importance of the Sino-Tibetan languages, their prehistory remains controversial, with ongoing debate about when & where they originated. To shed light on this debate we develop a database of comparative linguistic data, & apply the linguistic comparative method to identify sound correspondences & establish cognates. We then use phylogenetic methods to infer the relationships among these languages & estimate the age of their origin and homeland. Our findings point to Sino-Tibetan originating with north Chinese millet farmers around 7200 B.P. & suggest a link to the late Cishan & the early Yangshao cultures."



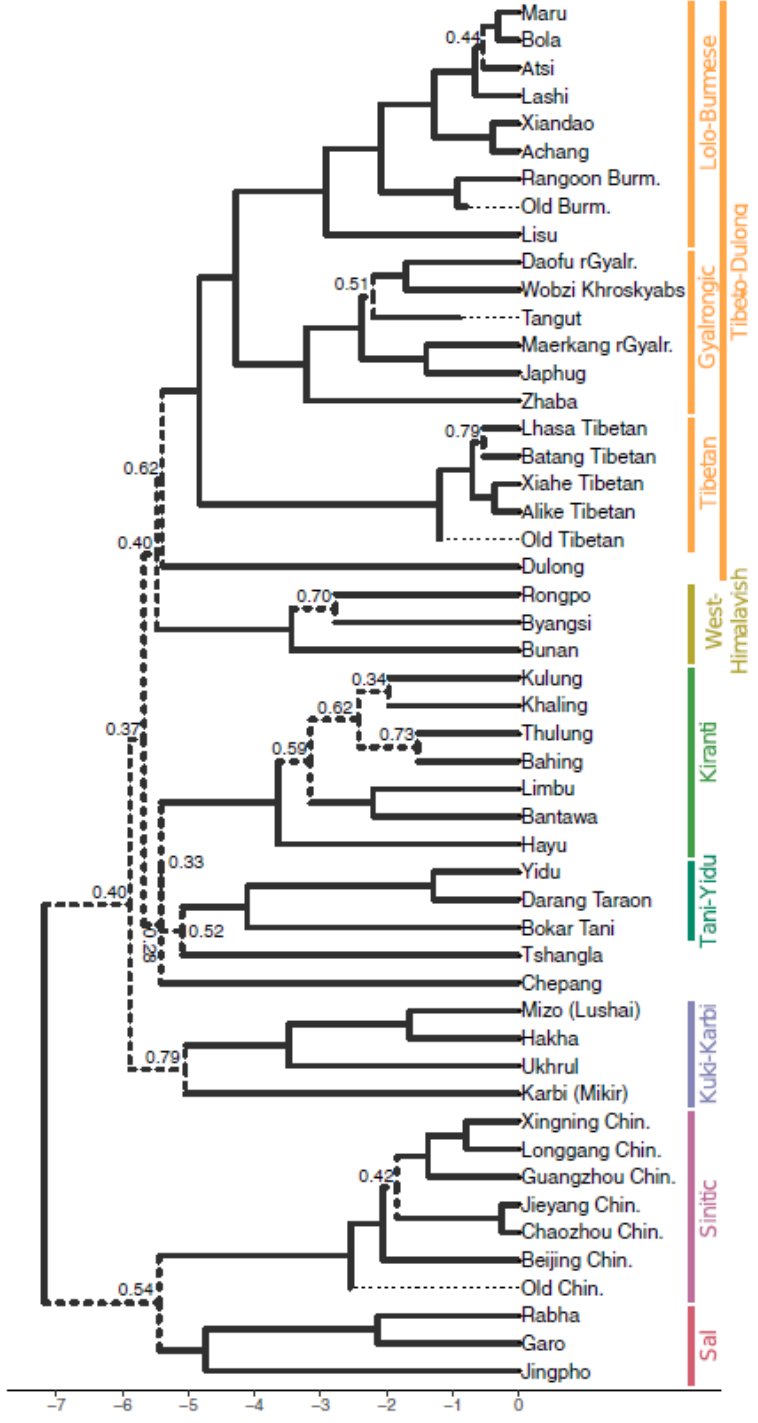
Sagart et al. ***PNAS*** 2019.

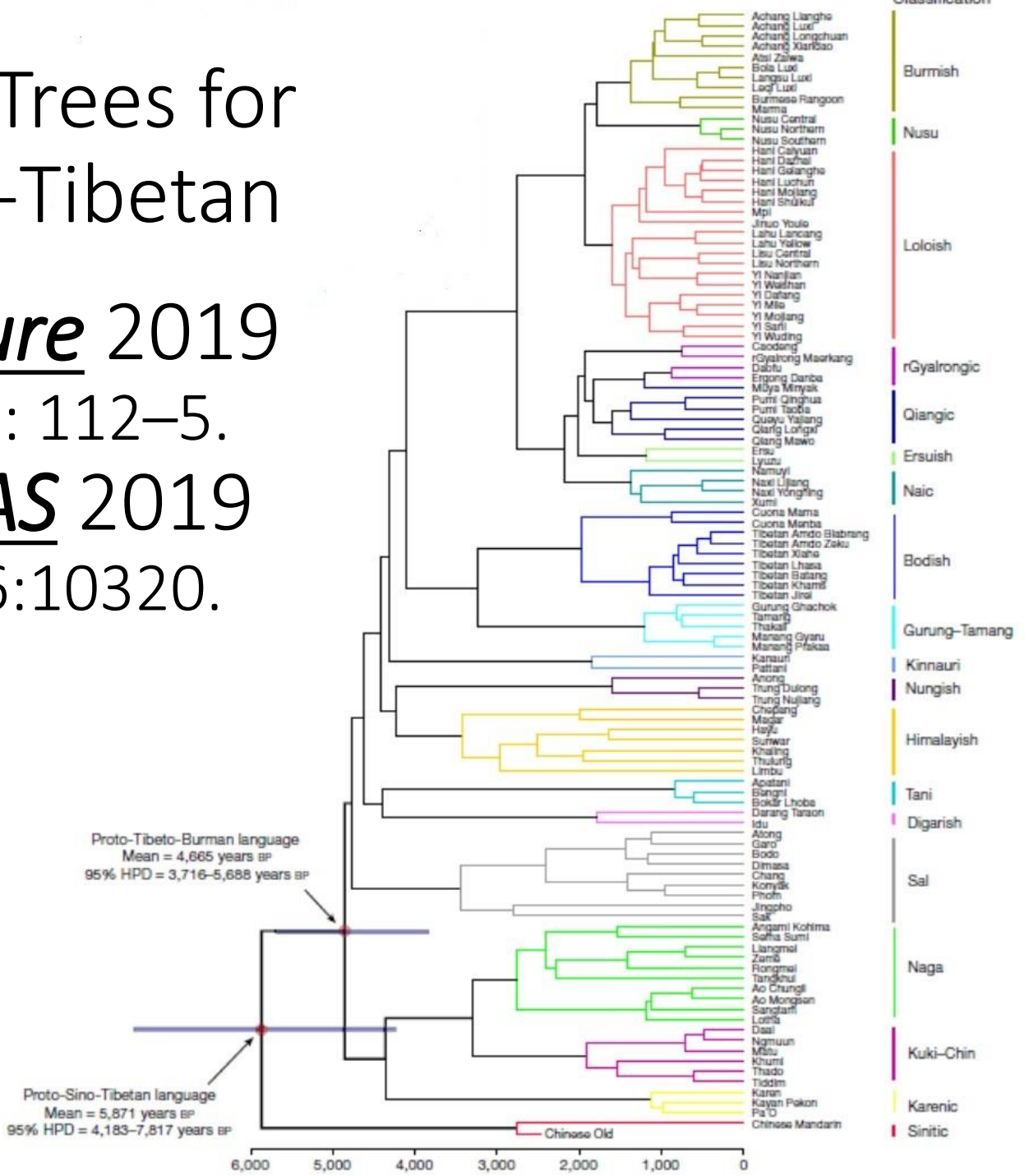
50 languages,
9 groups,
250 words.

Two Trees for Sino-Tibetan

Nature 2019
569: 112–5.

PNAS 2019
116:10320.





“According to Ku Tsu-yu (1624-1680), there were 10,000 kuo at the time of the Great Yu. By the end of T'ang, the founder of the Shang dynasty, the number of kuo had dropped to more than 3000. At the time of King Wu Wang of Chou, conqueror of the Shang dynasty, only 1800 kuo remained. At the beginning of the Eastern Chou (771B.C.) 1200 kuo were left, and at the end of the Spring and Autumn Period (481B.C.) that number decreased to just over 100, of which only 14 were considered major states.” *P.27*.

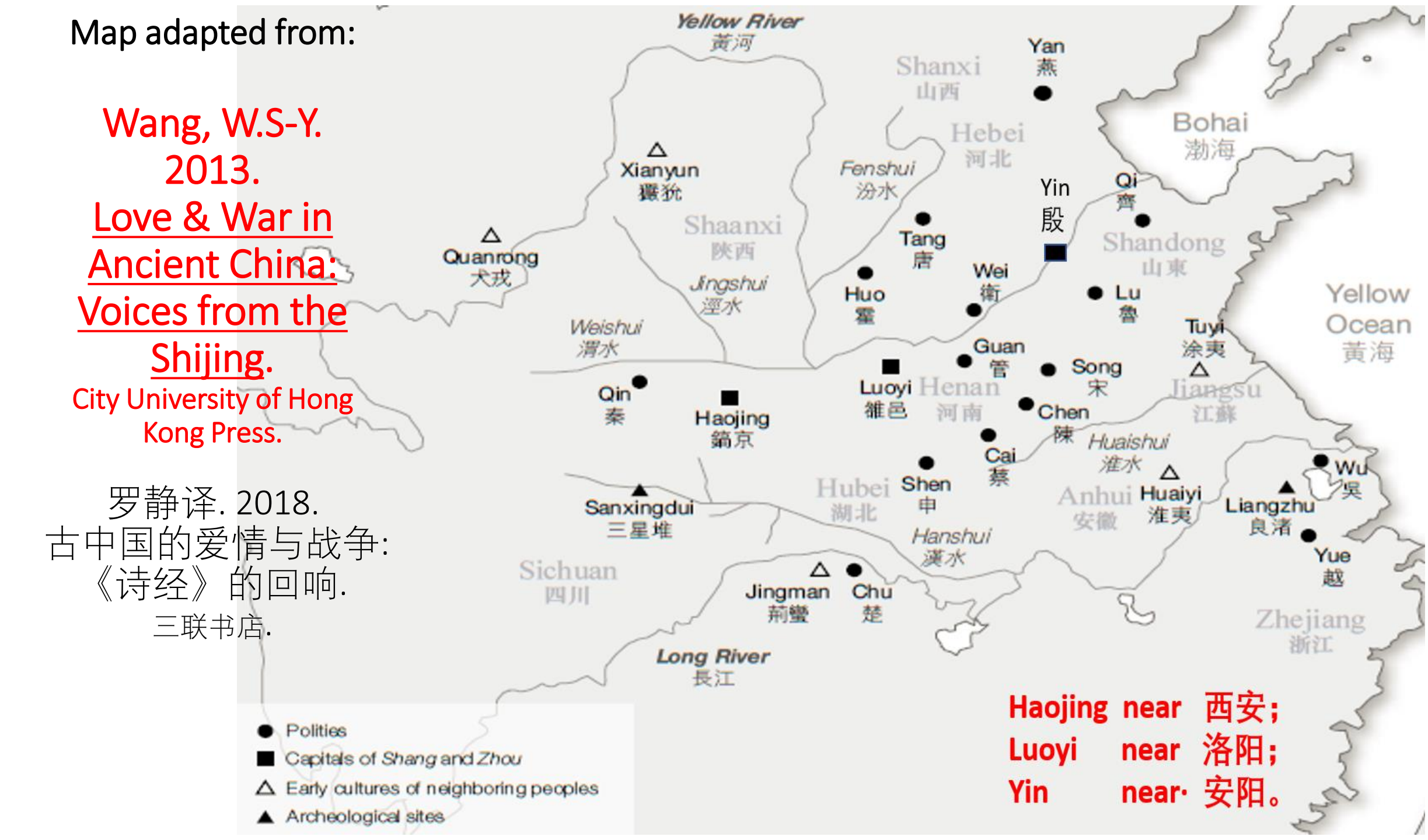
Chang, K. C. (1983). Art, Myth, and Ritual, Harvard University Press.

顾祖禹 (1624-1680) 。读史方輿纪要。Vol.1.

Map adapted from:

Wang, W.S-Y. 2013. Love & War in Ancient China: Voices from the Shijing. City University of Hong Kong Press.

罗静译. 2018. 古中国的爱情与战争:《诗经》的回响. 三联书店.



East Asia

4th C.E.

1.匈奴
契丹
高句丽
夫余

2.柔然
鲜卑
前秦

3.东晋

4.吐谷浑

5.鄯善
于阗
龟兹

6.乌孙

谭其骧：中国历史地图集

代序4　1953年全国**第一次人口普查中，自报登记的民族名称全国总共有400多个**。分析这张自报族称的名单，发现其中有不少问题。有些自报是少数民族的实际上却是汉族，… 由于不同原因他们自认为或被认为是一个民族，而且有一定的名称，例如广西的“六甲人”、湖南的“哇乡人”等。有些是某一少数民族的一部分，由于不同原因，被分为若干民族
而且各有不同的族称，例如云南的“阿细”、“撒尼”、“阿哲”、“普拉”等，其实都是彝族的分支。因之，我们**不能直接根据自报的族称来决定**他们是不是一个民族。*费孝通 2018.*

我们必须对这些自报的族名逐一进行甄别。这是一项比较复杂的工作，从1953年开始起直到1982年告一段落，**一共进行了30多年**。每个民族在经过我们识别之后，还要和当地有关民族群众协商，取得同意后，才由中央分批审定和公布。1954年确认了38个少数民族，1965年确认了15个少数民族，1985年又确认了2个少数民族，至此一共确认了55个少数民族。 加上汉族，**中国这个多民族国家一共有56个民族**。*费孝通 2018.*

贾敬颜.“汉人”考. *费孝通 2018:164.*

“中华民国代替了清王朝，清朝的满、蒙古、汉三个民族等级之成法自然在革除之列。中华民国申明，**汉、满、蒙古、回 藏是民国的五大民族** … 表示了中国是一个统一的多民族国家。其实，当时的蒙古、回、藏并不限于单一的民族，蒙古中至少包括达斡尔、鄂温克等，回部中包括回族、维吾尔、哈萨克等新疆地区伊斯兰教的各民族。藏族则包括了羌族以至甘、青、川境内的一些语言属汉藏语系的民族。大概也只是在‘**五族共和**’之说倡导以后，‘**汉人**’才正式改称‘**汉族**’“

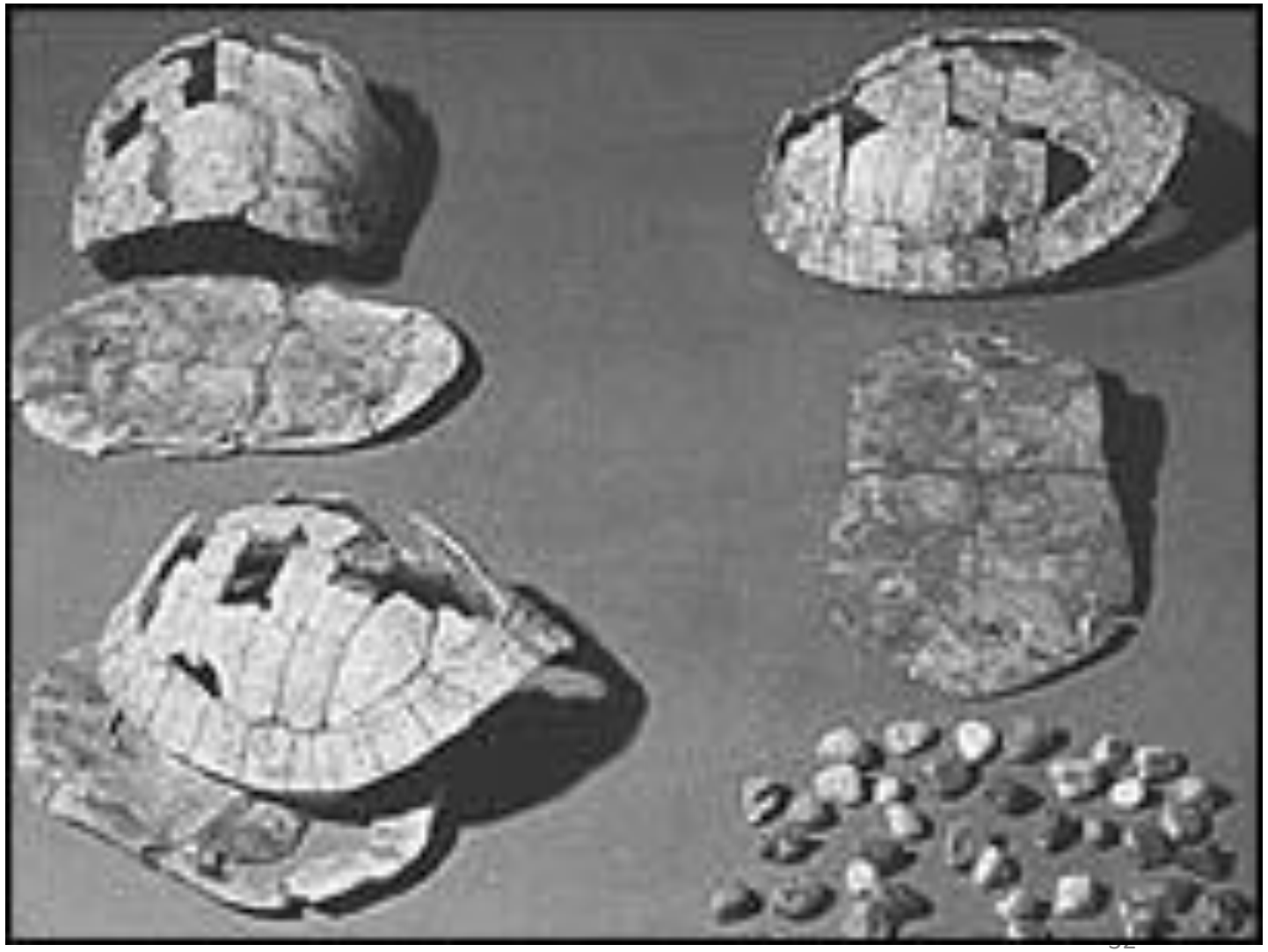
Zhang, J., et al. 1999. Oldest playable musical instruments found at Jiahu early Neolithic site in China. *Nature* **401**: 366-8.

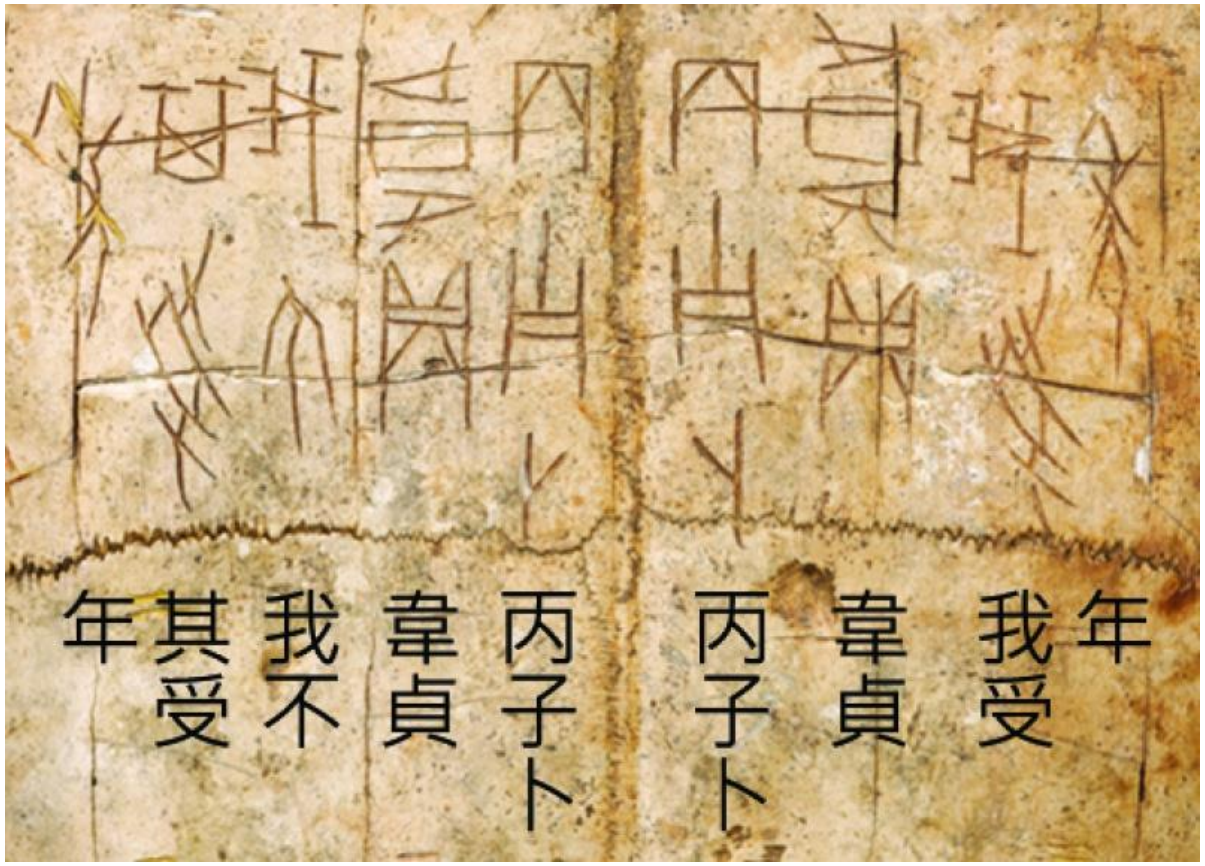
賈湖

Bone flutes from burials at Jiahu. Top to bottom: M341:2, M341:1, M78:1, M253:4, M282:20, M282:21. Scale is in centimetres.

李学勤，　賈湖

Li Xueqin, et al. 2003. ***Antiquity*** 77(295): 31-45.
The earliest writing? Sign use in the seventh millennium BC at Jiahu, Henan Province, China.





The text is symmetric on two sides of the plastron, written from the center outward. The affirmative is on the right, the negative on the left. The two sentences conjoin to from a yes-no question, or A-not-A question, a syntactic form which persists to the present day. See Wang, W. S.-Y. (1967). "Conjoining and deletion in Mandarin syntax." Monumenta Serica **26**: 224-236.

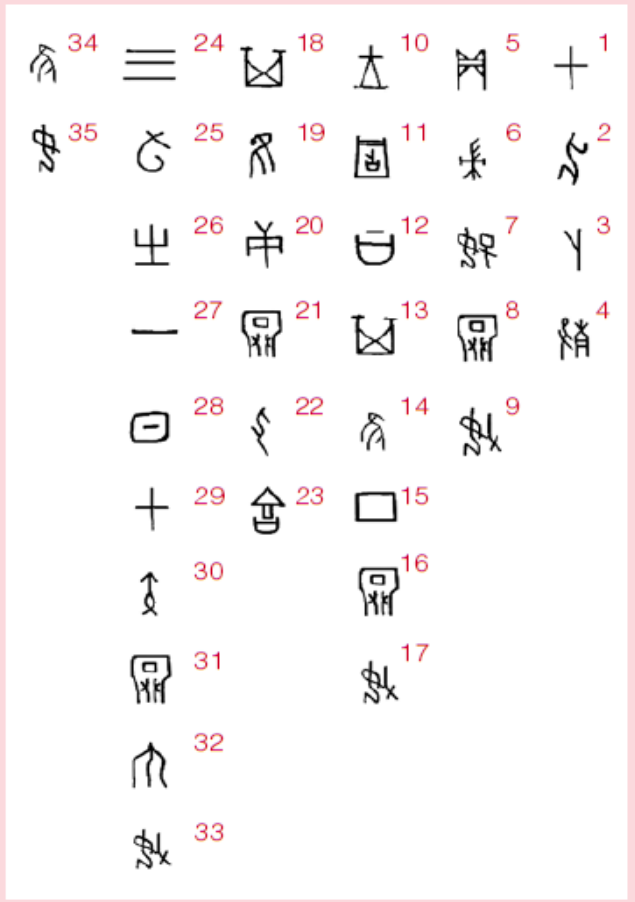
徐中舒 1990.甲骨文字典 四川辭书出版社.

陳光宇, et al. 2017. 商代甲骨中英讀本, 上海人民出版社.

http://museum.sinica.edu.tw/education_detail.php?id=30

《乙編》867號「 韋」是貞人 。

Figure 9
Fuhao's Inscription



1	2	3	4	5		6	7	8	9		10	11
甲	申	卜	殼	貞		婦	好	娩	妨		王	固
12	13	14	15	16	17		18	19	20	21	22	23
曰	其	惟	丁	娩	妨		其	惟	庚	娩	弘	吉
24	25	26	27	28	29	30	31	32	33		34	35
三	旬	又	一	日	甲	寅	娩	不	妨		隹	女

Modern characters of the inscription

Figure taken from: Wang, W. S.-Y. 2013. **Love and War in Ancient China: Voices from the Shijing**. City University of Hong Kong Press.
王士元著, 罗静译. 2018.
古中国的爱情与战争:《诗经》的回响. 三联书店.

D.Keightley1978. Fig.12: Based on Bingbian 247.1.

"- Crack making on jiashen. Què divined.

- Fuhao's childbearing will be good.

- The king, reading the cracks, said: 'If it be a ding day childbearing, it will be good. If it be a geng day childbearing it will be extremely auspicious.

- On the 31st day, jiayin, she gave birth. It was not good. It was a girl."

4.32. Inscription on pottery sherd found at Dinggong Village, Shandong Province.

5.8. Pottery sherd with inscription, from Longqiuzhuang, Gaoyou, Jiangsu Province. 4.5 cm long. Institute of Archaeology, Chinese Academy of Social Sciences.

Chang, K.C., et al., Eds. (2005). The Formation of the Chinese Civilization, Yale University Press.

DIALOGO
DI
GALILEO GALILEI LINCEO
MATEMATICO SOPRAORDINARIO
DELLO STVDIO DI PISA.
E Filosofo, e Matematico primario del
SERENISSIMO
GR. DVCA DI TOSCANA.

Doue ne i congressi di quattro giornate si discorre sopra i due

MASSIMI SISTEMI DEL MONDO
TOLEMAICO, E COPERNICANO;

Proponendo indeterminatamente le ragioni Filosofiche, e Naturali tanto per l'vna, quanto per l'altra parte.

CON PRI VILEGI.

IN FIORENZA, Per Gio: Batista Landini MDCXXXII.

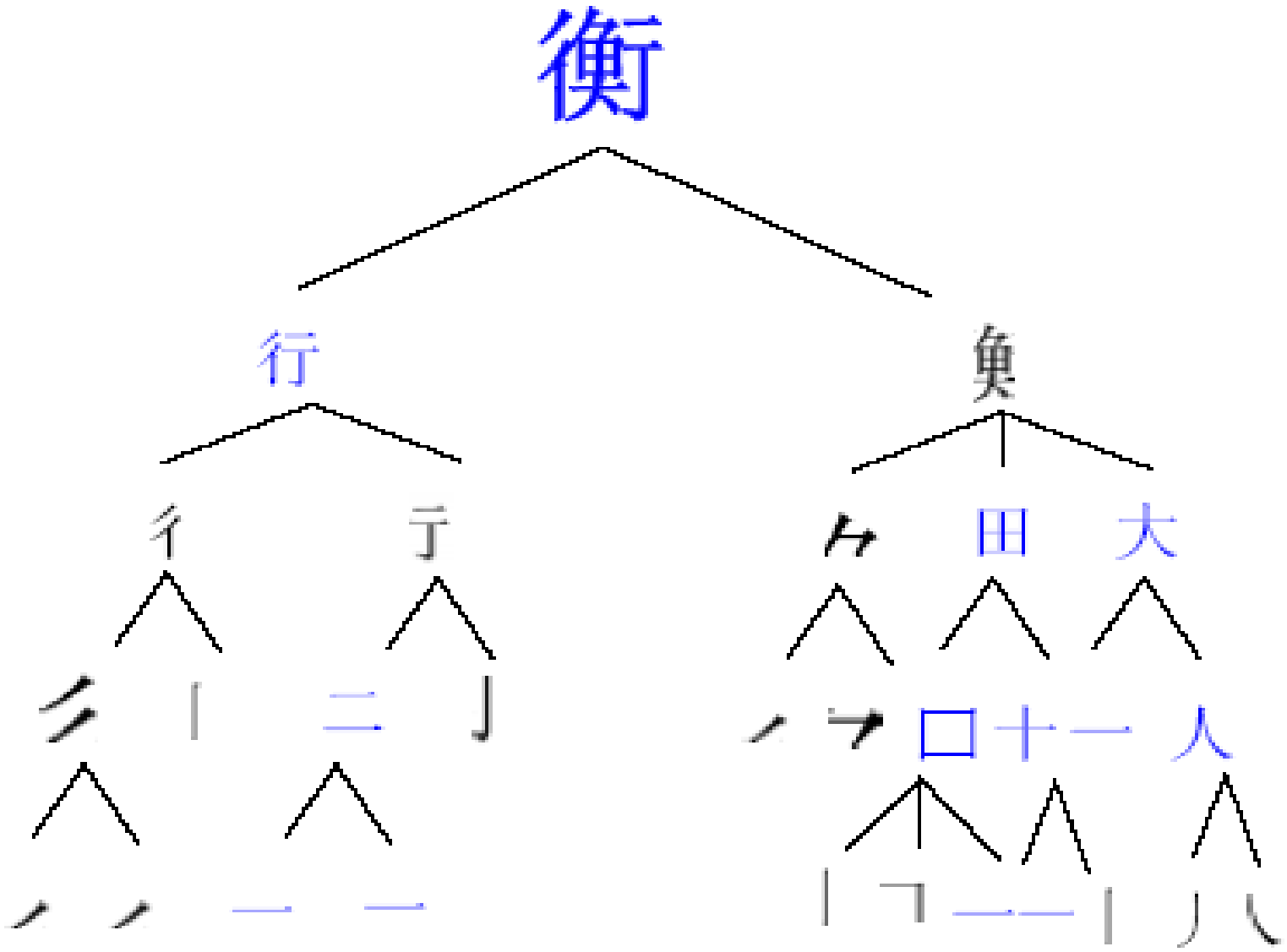
CON LICENZA DE' SVPERIORI.

"But of all other stupendous inventions, what sublimity of mind must have been his who conceived how to communicate his most secret thoughts to any other person, though very far distant, either in time or place? And with no greater difficulty than the ***various arrangements of two dozen little signs upon paper****? Let this be the seal of all the admirable inventions of man."*

Radical Positions

Left		water		wood
Right		knife		head
Top		grass		bamboo
Bottom		fire		vessel
Outside		encircle		clothing
Inside		graph		melon

The hierarchical structure of a sinogram



Challenging sinograms

1。八 人 入

2。己 已 巳

3。日 目 曰

4。土 士　　未 末

5。田 由 甲 申 胃 冑

6。大 太 犬　王 玉 主

7。哀 衰 衷

8。兵 乒 乓 戉 戊 戍 戌

9。丐 丏　宮 官

10。束 柬 東

See: Yang, R. and W. S. Y. Wang (2018). "Categorical perception of Chinese characters by simplified and traditional Chinese readers." Read Writ **31**(5): 1133–1154.

Low Integers in East Asian Languages

	Mandarin	Cantonese	Xiamen	Shanghai	Japanese	Korean	Vietnamese
一	yi Iu	jat IVu	tsit IVu	yi? IVu	ichi	일 il	một
二	er III	ji IIIv	li IIIv	ni IIIv	ni	이 i	hai
三	san Iu	saam Iu	sã Iu	se Iu	san	삼 sam	ba
四	si III	sei IIIu	si IIIu	si IIIu	shi	사 sa	bốn
五	wu II	ng > m IIv	go IIv	ng IIv	go	오 o	năm
六	liu III	luk IVv	lak IVv	lo? IVv	roku	육 yuk	sáu
七	qi Iu	cat IVu	ts'it IVu	qe? IVu	shichi	칠 chil	bảy
八	ba Iu	baat IVu	pue? IVu	ba? IVu	hachi	팔 pal	tám
九	jiu II	gau IIu	kau IIu	jiu IIu	kyu	구 ku	chín
十	shi Iv	sap IVv	tsap IVv	ze? IVv	ju	십 sip	mười

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Yi Seon-bok and G A Clark. 1983 Observations on the Lower and Middle Paleolithic of Northeast Asia. *Current Anthropology* 24(2): 181–202.

Eom, I.-S. 嚴翼相. (2019). "韓漢同源說的問題與韓漢語言關係." Language and Linguistics **20**: 131-147.
Eom, I.-S. (2015). 2,200 years of language contact between Korean and Chinese. .
Oxford Handbook of Chinese Linguistics: 226-236.

柳宗元 (773-819)　　江雪

千山鳥飛絕	jue2
萬徑人蹤滅	mie4
孤舟蓑笠翁	…
獨釣寒江雪	xue3

	BJ Pinyin	HK Jyutping	Japanese Kana	Korean Hangul
絕	jue2	zyut	ぜつ zetsu	절 jeol
滅	mie4	mit	めつ metsu	멸 myeol
雪	xue3	syut	せつ setsu	설 seol

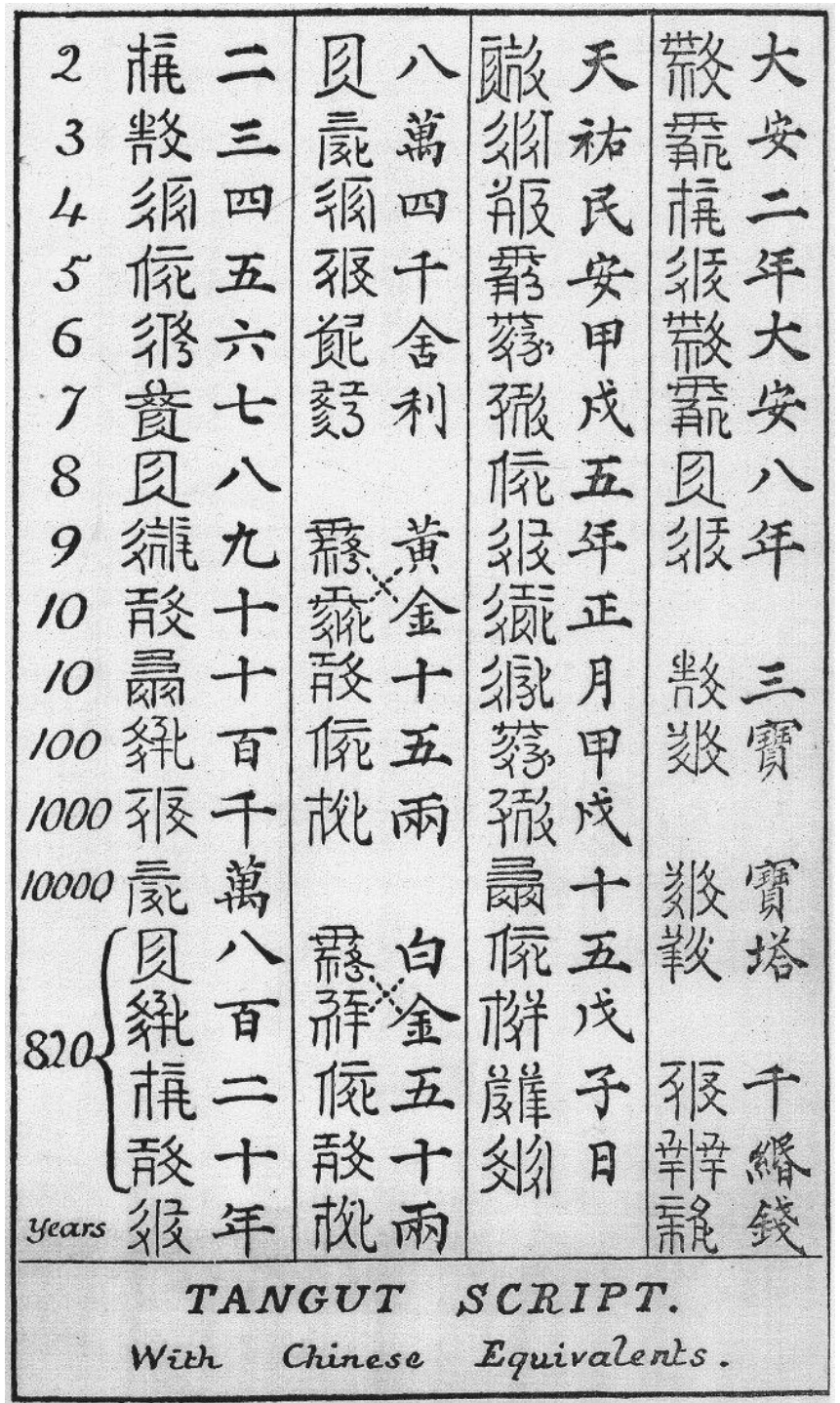
Eom, I.-s. 2019.

"Sino-Korean coda -l and the syllabic structure of Old Sino-Korean."

Lingua **218**: 14-23.

目加田 誠•唐詩散策 1979:102.

千山鳥飛絕 sen zan chou hi zetsu	千山　鳥飛ぶこと絕え sen zan tori tobu koto tae
萬徑人蹤滅 ban kei jin shou metsu	万径　人蹤滅す ban kei jin shou messu
孤舟蓑笠翁 ko shuu sa ryuu ou	孤舟　蓑笠の翁 ko shuu sa ryuu no ou
獨釣寒江雪 doku chou kan kou setsu	独り寒江の雪に釣る hitori kankou no yukini tsuru



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中央研究院 · 語言學研究所

Cheung, K.-h. and R. Bauer. 2002.
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Many peoples have used the square hierarchical architecture to create new sinograms, or to invent new scripts.

Лёнгэ ляншу.

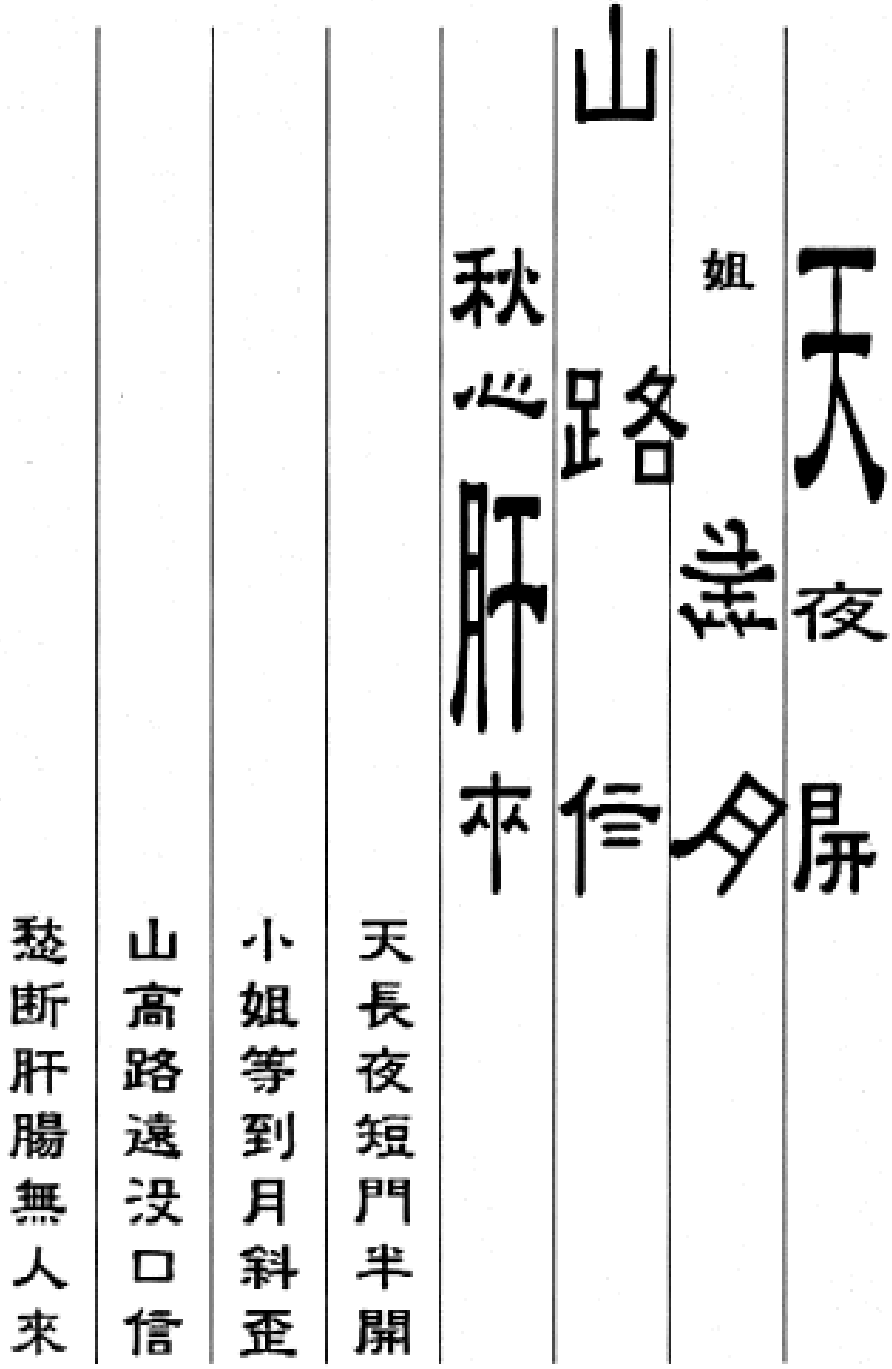
Лёнгэ ляншу зэ фулинни зудилэ. Мынмынди чўлэлигэ щүн. Йигэ подичи шонли фу, чёнхали. Ди эргэ мэ дунтан. Мэ форли, та пахали, жуончын сыжынли.

Щүн до гынчян вынтуэ, та чи ду бу чўли. Щүн ба тади лян вынлихар, дончын сыдёли, зугуэли.

Щүн зудё, нэгэ да фушон халэ, щётуэли: «Щүн ги ни зэ эрдуэшон чёчёр фэ сали?» Ди эргэ хуэйдади: «Щүн фэсы, ю бу хо жынни, таму до зуэнанчўр, ба ляншуму лёха, пони».

(Л. Н. Толстой).

Sinograms are not only an artform for aesthetic enjoyment, in calligraphy and to complement paintings, they also are often associated with frivolity and fun …




韓國
HALL OF KOREAN FILM
無盡韓色

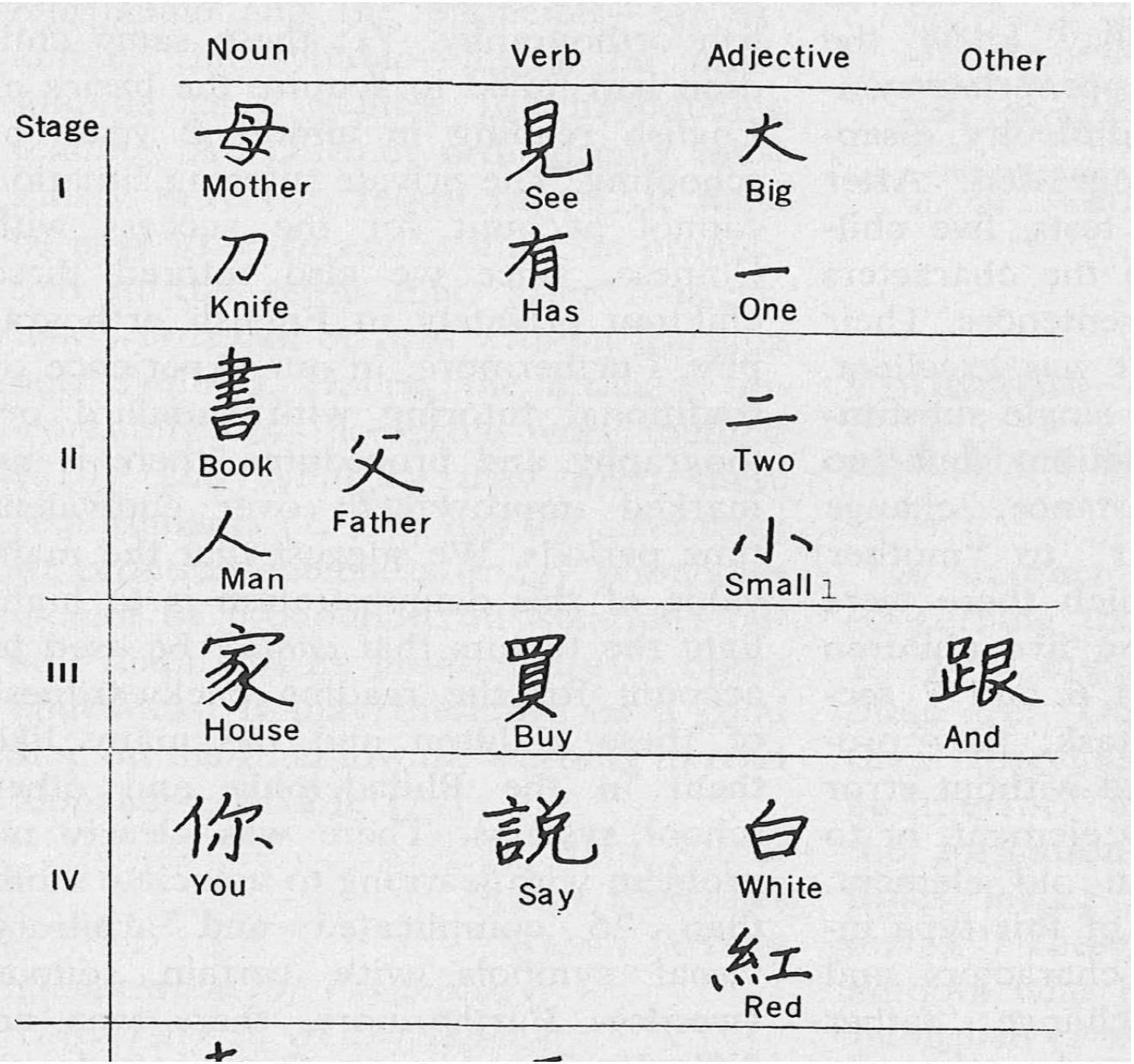
xun yu 熏鱼　　chao xiaren 炒虾仁

HK 九龙塘 王家沙

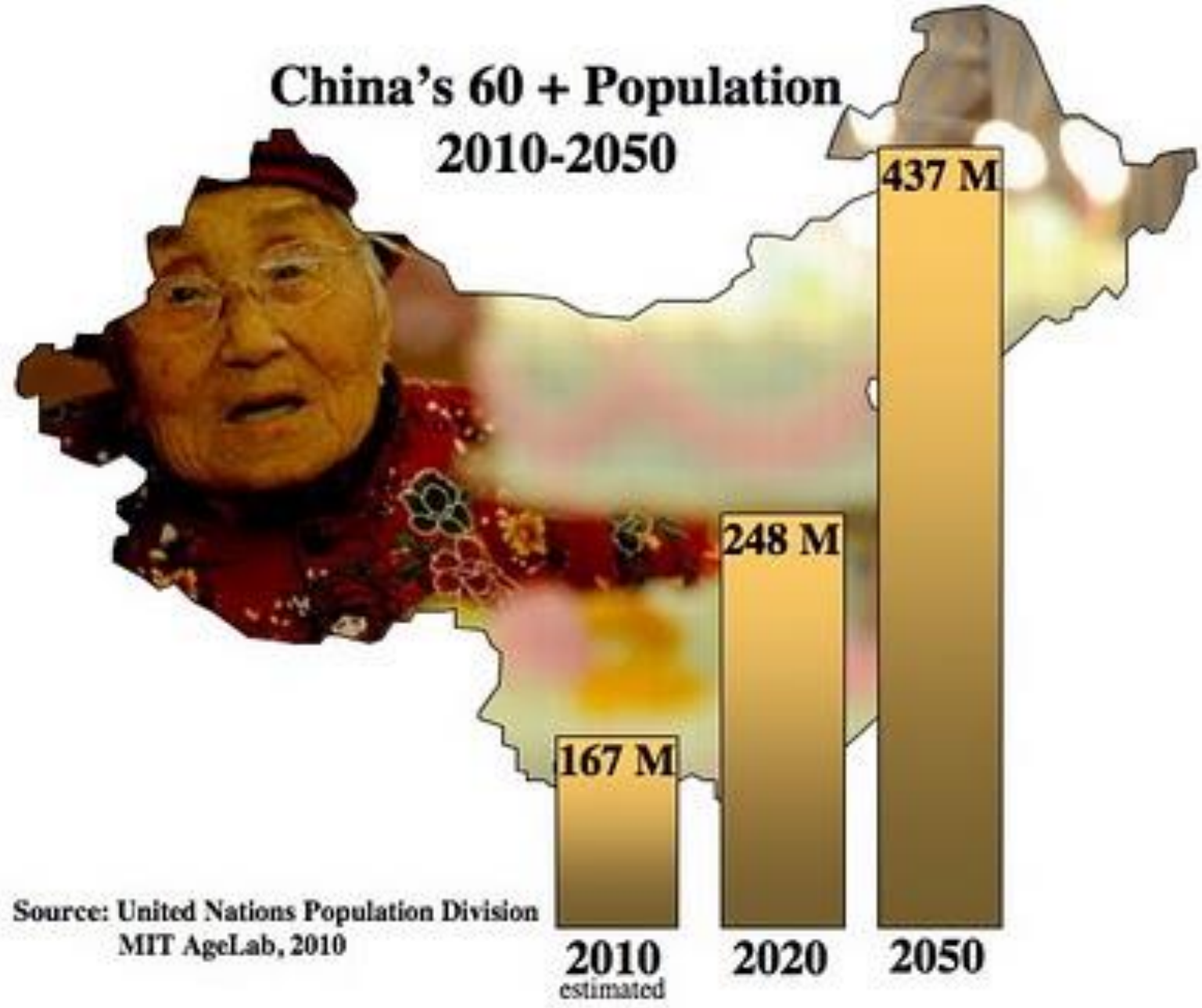
Fun with sinograms

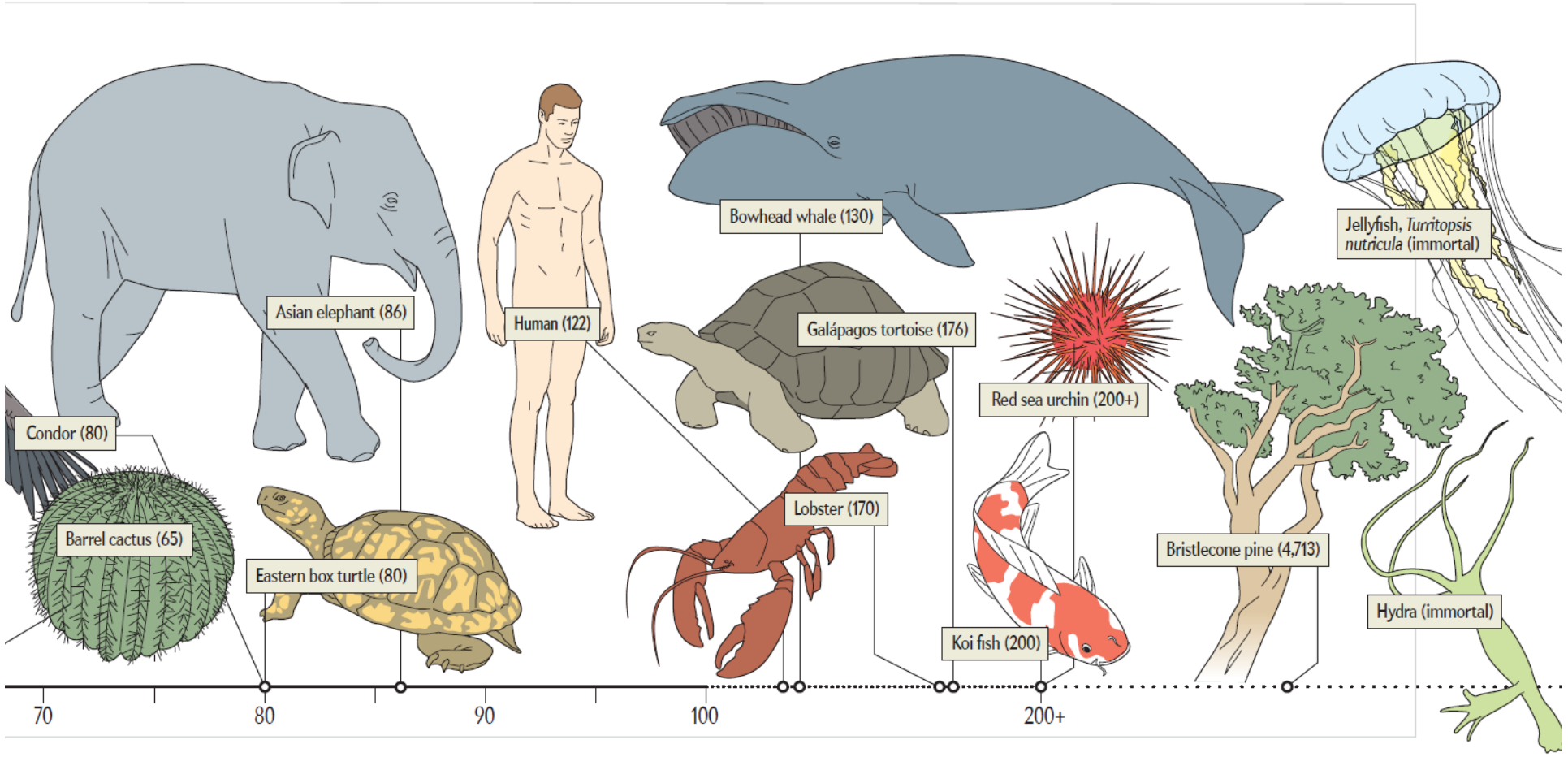
葱 *cong*

莲 *lian*

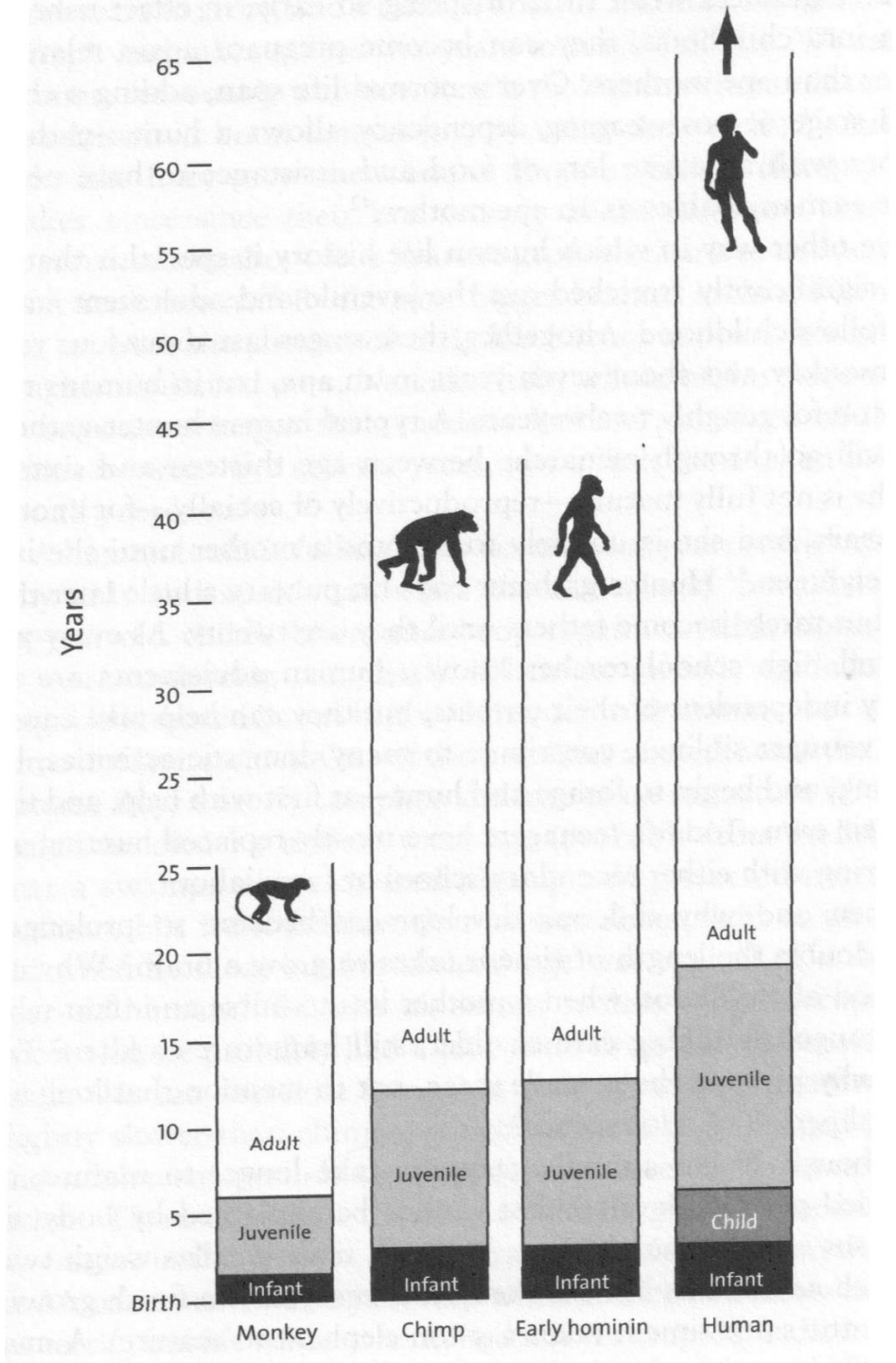


Rozin, P., et al. 1971. "American children with reading problems can easily learn to read English represented by Chinese characters." *Science* **171**: 1264-7.


China's 60 + Population
2010-2050
437 M
248 M
167 M
2010
estimated
2020
2050
Source: United Nations Population Division
MIT AgeLab, 2010



Kirkwood, T. 2010. "Why can't we live forever." Scientific American Sept. 42-49.

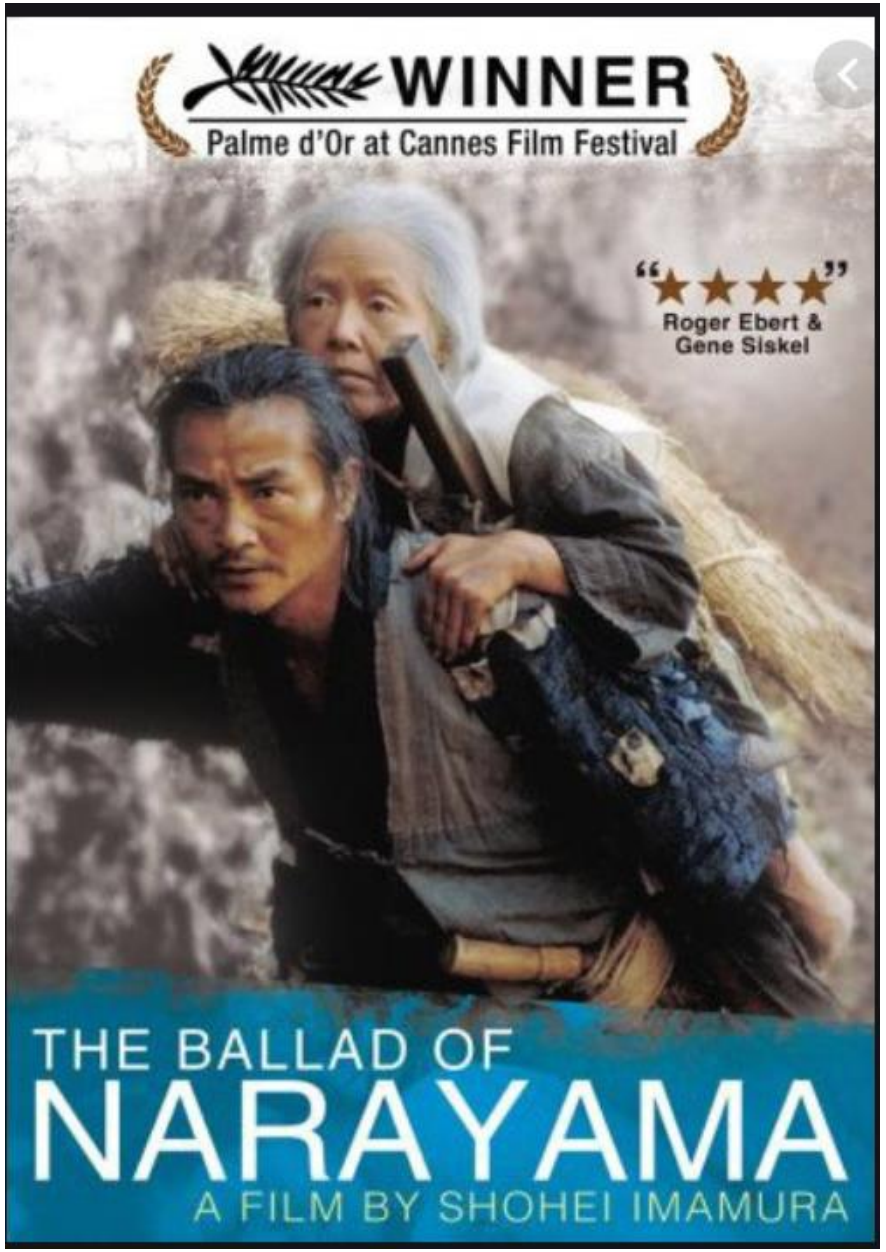


Lieberman, D.E. 2013.
Figure 13.

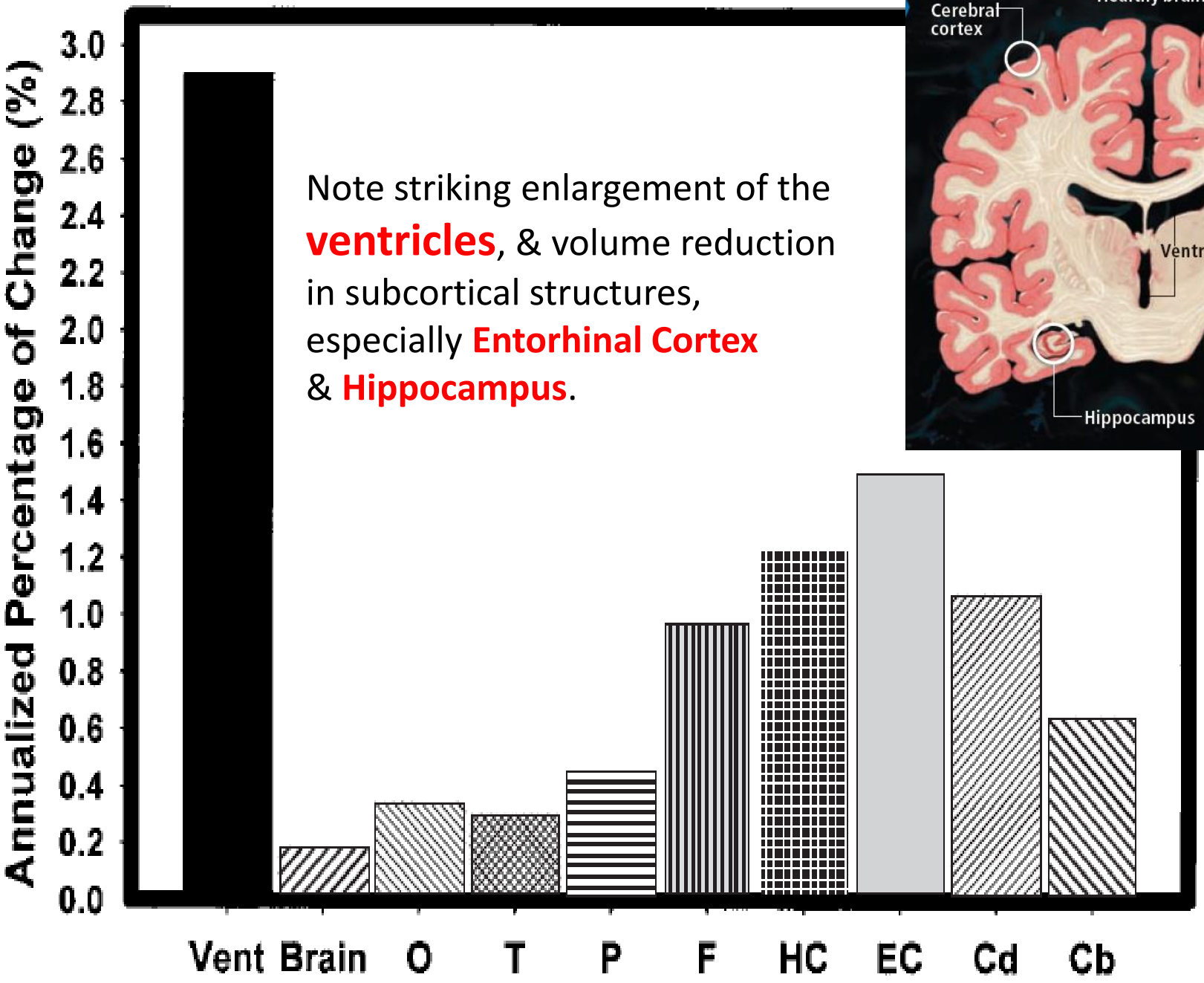
***The Story of the Human Body: Evolution, health, and disease*.**
Pantheon.

,论语 ：
“吾十有五而志于學，
三十而立，
四十而不惑，
五十而知天命，
六十而耳順，
七十而從心所欲，不踰矩。”

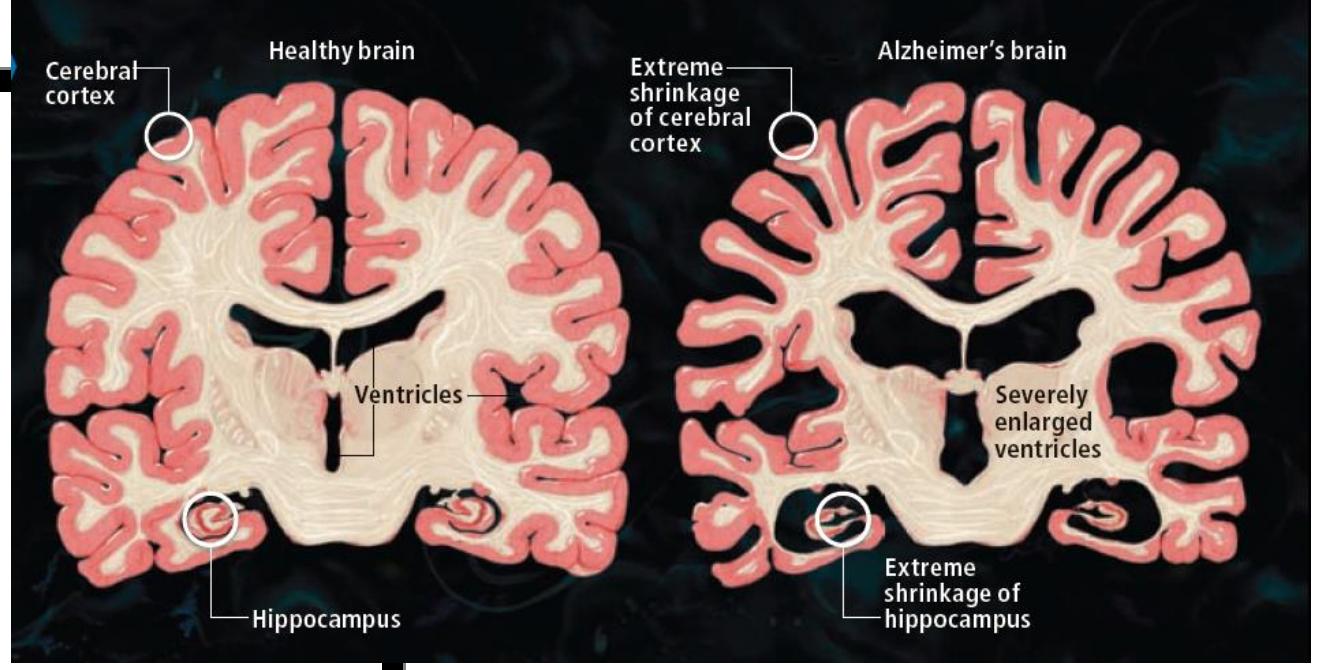
“What should society do when a member becomes old and sick, … and a burden? What should a family do? In some poor societies, the elderly are cast away when they become too much of a burden to support. The Inuit Eskimos supposedly put their elders on ice floes, floating them away to their death by starvation; such accounts have been found in fiction, but their factual basis remains controversial. Better known, perhaps, is the Japanese account of ubasute 姥捨, a custom that allegedly took place in the distant past, as vividly described in the successful 1956 novel *Narayama bushiko* 楢山節考 by Fukazawa Shichiro 深沢七郎. In the novel, elderly members of society are carried by their families to a remote, desolate place in the mountains where they are left to die. The novel was the basis of two films, in 1958 and 1983, respectively.” *Wang 2019:606*.



Professor Charles Kuen Kao (高錕) (1933-2018), was the recipient of a Nobel Prize in Physics in 2009, & was known as the
"Father of Fibre Optics".
He had Alzheimer's Disease, as did his father.

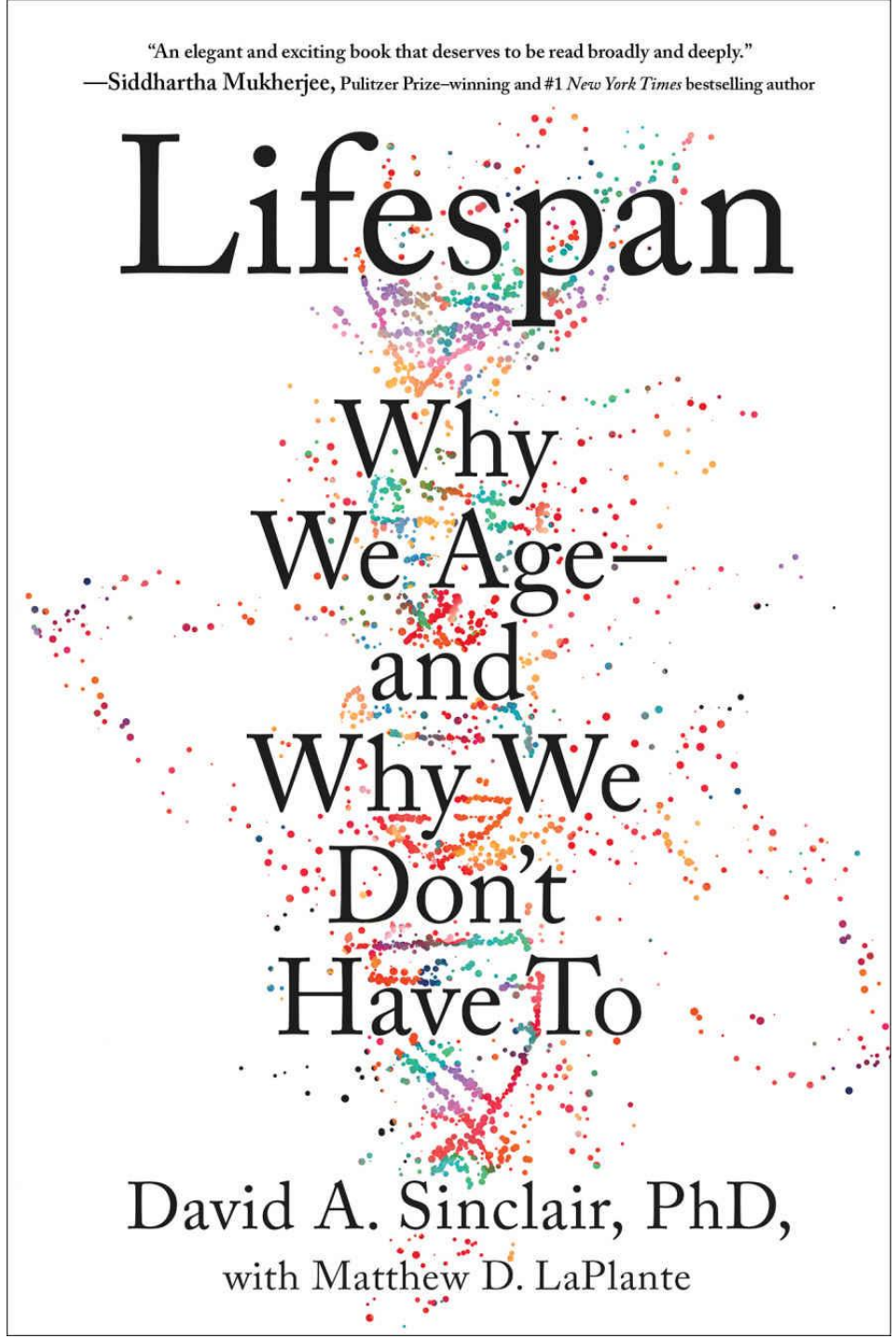


Note striking enlargement of the **ventricles**, & volume reduction in subcortical structures, especially **Entorhinal Cortex** & **Hippocampus**.



Cabeza, R.et al. eds. 2005:41. *Cognitive Neuroscience of Aging: Linking Cognitive and Cerebral Aging*: Oxford University Press.

Stix, G. 2010. Alzheimer's: Forestalling the darkness. *Scientific American* 50-7.



Sinclair, D., et al. 2019. NY: Atria Book. P.307:

"Because, yes, I do hope to be here for a long time to come. There are plenty of X factors that could interfere with that goal. I could get hit by a bus tomorrow, after all. But it's getting easier and easier to imagine being around—happy, healthy, & connected to friends, family members, & colleagues—past my 100th year.

How long past my 100th year?

Well, I think it would be nice to see the twenty-second century. That would mean making it to my 132nd year. To me, that is a remote chance but not beyond the laws of biology or way off our current trajectory. And if I do make it that far, perhaps I'll want to stick around even longer. There's so much I want to do—and so many people I'd like to help. I'd love to keep nudging humanity down what I believe is a path to greater health, happiness, & prosperity, & to live long enough to know what path we take."

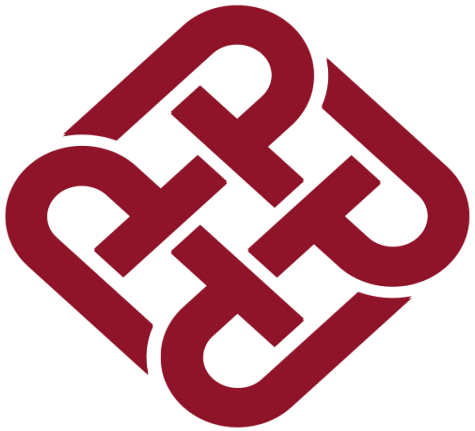
ありがとうございました！

Thank you！

謝謝！

감사합니다

3q!



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