

Very probably the early Pleistocene fauna extended to south China as indicated by the Ma Kai fauna in Yunnan Province. But our knowledge is too little to make affirmation.

2. Coming to Middle Pleistocene, China was zoogeographically divided into two provinces: South China and North China, more or less by the line of Yangtze River.

In South China, at least two forms of high primates, the fossil orang-utan and *Gigantopithecus*, struggled with the great Panda, big Tapir, *Stegodon*, *Rhinoceros*. And some of the remains of these animals left in caves and fissures and became fossilized.

The climate of South China of that time was certainly very similar to that of Burma, Indo-China and Malaya, because we found the South China mammals identical with those in the three adjacent countries.

But on the other hand, the geographical condition of South China was, in that time, quite different, from North China, since the mammalian faunas of these two Provinces differed greatly.

In North China, an ancestral form of human being, *Sinanthropus pekinensis*, was developed and lived in the caves of Choukoutien. By his intelligence and his usage of crude stone implements, he became victorious over the wild beasts, like the last survival of *Machairodus* from Pliocene, *Hyaena*, *Sinomegaceros*, *Rhinoceros*, etc.

The climate of Middle Pleistocene in North China was more arid than that of to-day on account of the presence of fossil Austrich, etc.

3. However, there was one bridging area, the Huai River Province, where some of the North China Middle Pleistocene mammals lived together with a few forms of South China.

Toward the Late Pleistocene, the Huai River Province might have been united with the North China Province, for some North China living animals, particularly the Pere David's deer, had their ancestral forms flourishingly developed here.

4. During the Late Pleistocene time the eolian Loess was deposited in North China and the climate was supposedly cold and dry. However, it was not so cold and dry as some geologists suggested, because the water-buffalo, elephant, *Rhinoceros mercki*, etc. were inhabited in this region.

5. The present day regions as north-eastern part of Inner Mongolian Autonomous District, Provinces Heilungkiang and Kirin were very probably linked in Middle Pleistocene with North China by mammalian fauna, as *Rhinoceros mercki* was commonly found in these two parts of Chinese territory.

But coming to the Late Pleistocene time, by the investigation of mammalian fauna, the North-East province was widely separated from the North China Province. In the former province, cold fauna as *Mammonteuus primigenius* and *Rhinoceros tichorhinus* (*Coelodonta*

*antiquitatis*) are known while in the latter one, mild or even some southern mammals are present. At the end of Pleistocene some decidedly southern species such as *Cynaiturus jubatus* and *Paguma* invaded into the Upper Cave of Choukoutien in North China.

6. It seems, the mammals of to-day still maintain the Zoogeographical subdivisions in China which outlined as early as the Pleistocene time.

The giant panda, the tapirs and the orang-utan which were once very popular in South China are now confined themselves to a quite small area in this region. The Pere David's deer, once widely distributed in the Huai River Region in Middle and Late Pleistocene time, migrated then to Hopei in Post-Pleistocene and at last became almost extinct but only preserved in the Royal Zoological garden.

Of course, numerous Chinese living mammals have thier ancestral forms beginning as early as the Pleistocene time in the same zoogeographical province.

At last, a few words on our research work of Quaternary mammals are necessary to be mentioned.

Our determination of a few species is quite problematic, especially for *Mammonteus primigenius*, *Rhinoceros tichorhinus* (*Coelodonta antiquitatis*) and *Elephas namadicus*.

Judging from the rich collection of the mammoth teeth from Kirin, it seems that they are something different from the typical Siberian one. And those from Tingsun and Tzeyang tentatively referred to the mammoth are also questionable. Therefore, a detailed study of Chinese mammoth is urgent for settling the question, very important for the Quaternary studies in China.

We know that *Rhinoceros tichorhinus* was present as early as lower Sanmenian in the Choukoutien deposits (Loc. 9, 13, 1 and 15) of M. Pleistocene, in the Sjara-osso-gol deposit of Late Pleistocene and in the whole region of North-East Provinces. Are all these forms identical? It is a question. Therefore, an extensive study on all these materials of wooly Rhinoceros is quite significant.

*Elephas* from South China caves, from the marly sediments of Huai River region, and from North China of Early, Middle and Late Pleistocene age, are all identified as *namadicus*. Seemingly they are not possible to be the same. Comprehensive investigation of all the so-called *Elephas namadicus* specimens is necessary, especially for the studies of Quaternary stratigraphy.

#### REFERENCES

- [ 1 ] Bien, M. N. & Chia, L. P., 1938. Cave and Rock-shelter Deposits in Yunnan. *Bull. Geol. Soc. China*, 18, 325—348.
- [ 2 ] Black, D., Teilhard de Chardin, P., Young, C. C. & Pei, W. C., 1933. Fossil Man in China. *Mem. Geol. Surv. China*, Ser. A, No. 11.
- [ 3 ] Bohlin, B., 1927. Die Familie Giraffidae. *Pal. Sin.*, Ser. C. Vol. 4, Fasc. 1.

- [ 4 ] ———, 1935. Cavicornier der Hipparion-Fauna Nord-Chinas. *ibid.*, Ser. C, Vol. IX, Fasc. 4.
- [ 5 ] Boule, M. & Teilhard de Chardin, P., 1928. Le Paleolithique de la Chine (Paleontologie). *Archives de l'Institut de Paleontologie Humaine* (Paris), Mem. 4.
- [ 6 ] Chia, L. P. (賈蘭坡), 1953. Fossil Locality from North Kiangsu (in Chinese). *Acta. Pal. sin.*, 1(1), 36—39.
- [ 7 ] Colbert, E. H., 1935. Siwalik Mammals in the American Museum of Natural History. *Trans. Amer. Phil. Soc. N. S.* 26, pp. i—x, 1—401.
- [ 8 ] ———, 1938. Fossil Mammals from Burma in the American Museum of Natural History. *Bull. Amer. Mus. Nat. Hist.*, 74, 255—436.
- [ 9 ] ———, 1940. Pleistocene Mammals from the Ma Kai Valley of North Yunnan, China. *Am. Mus. Novitates*, No. 1099.
- [ 10 ] ———, & Hooijer, D. A., 1953. Pleistocene Mammals from the Limestone Fissures of Szechuan, China. *Bull. Am. Mus. Nat. Hist.*, 102, Art. 1.
- [ 11 ] Gaudry, A., 1872. Sur des ossements d'animaux quaternaires que M. l'abbe David a recueillis en Chine. *Bull. Soc. Geol. France*, Ser. 2, T. XXIX, p. 177.
- [ 12 ] Hopwood, A. T., 1925. A New Species of Buffalo from the Pleistocene of China. *Ann. & Mag. Nat. Hist.* (London), Ser. 9, 16, 238.
- [ 13 ] ———, 1935. Fossil Probosciden from China. *Pal. Sin.*, Ser. C, vol. IX, Fasc. 3.
- [ 14 ] Ishijima, W., 1939. On Fossil Rhinoceros from Ku-hsiang-tung, Near Harbin. *Jub. Public. Prof. H. Yabe's*, pp. 321—331.
- [ 15 ] von Koenigswald, R., 1935. Eine fossils Säugetier fauna mit Simia aus S. China. *Proc. Acad. Sc., Amsterdam*, 38, 872—879.
- [ 16 ] ———, 1939. The Relationship Between the Fossil Mammalian Faunae of Java and China, with Special Reference to Early Man. *Peking Nat. Hist. Bull.*, 13(4), 293—298.
- [ 17 ] Koken, E., 1885. Ueber fossile Säugetiere aus China. *Pal. Abb.*, vol. III, Fasc. 2.
- [ 18 ] Licent, E., 1930. The Na Ye Li Sanmenian Fossiliferous Deposit. *Bull. Geol. Soc. China*, 9, 101—104.
- [ 19 ] Lonnberg, E., 1924. On a New Fossil Porcupine from Honan. *Pal. Sin.*, Ser. C, vol. 1, Fasc. 3.
- [ 20 ] Mansuy, H., 1916. Sur quelques mammiferes fossiles recemment decouverts en Indochine (Memoire preliminaire). *Mem. Serv. Geol. Indochine*, 5(2), 1—26, pls. 1—7.
- [ 21 ] Matsumoto, H., 1915a. On Some Fossil Mammals from Szechuan, China. *Sc. Rep. Tohoku Imp. Univ.*, Sendai, Ser. 2, 3(1).
- [ 22 ] ———, 1915b. On Some Fossil Mammals from Honan, China. *Sc. Rept. Tohoku Imp. Univ.* Sendai, Ser. 2, 3(1). No. 1.
- [ 23 ] ———, 1926d. On Some Fossil Cerwids from Shantung, China. *ibid.*, Ser. 2, 5(2), 38—41.
- [ 24 ] ———, 1927. Hipparion richtbofeni Koken. *ibid.*, Ser. 2, 5(4).
- [ 25 ] Matthew, W. D. & Granger, W., 1923. New Fossil Mammals from the Pliocene of Szechuan, China. *Bull. Amer. Mus. Nat. Hist.*, 48, 563—598.
- [ 26 ] Pearson, H. S. 1928. Chinese Fossil Suidae. *Pal. Sin.*, Ser. C, vol. V, Fasc. 5.
- [ 27 ] Pei, W. C., 1930. On a Collection of Mammalian Fossils from Chiachishan, near Tongshan (Hopei). *Bull. Geol. Soc. China*, 9, 371—378.
- [ 28 ] ———, 1935. Fossil Mammals from Kwangsi Caves. *ibid.*, 14, 413—425.
- [ 29 ] ———, 1936. On the Mammalian Remains from Loc. 3 at Choukoutien. *Pal. Sin.*, Ser. C, vol. VII, Fasc. 5.
- [ 30 ] ———, 1939. A Preliminary Study on a New Paleolithic Station Known as Loc. 15 within the Choukoutien Region. *Bull. Geol. Soc. China*, 19, 147—188.

- [31] Pei, W. C., 1940a. Note on a Collection of Mammal Fossils from Tanyang in Kiangsu Province. *Bull. Geol. Soc. China*, **14**, 379—392.
- [32] ———, 1940b. The Upper Cave Fauna of Choukoutien, *Pal. Sin.*, N. S. C. No. 10.
- [33] ———, 1956. Quaternary Mammalian Fossils from Hsintsai, South-Eastern Part of Honan, (in Chinese with English Summary). *Acta Palaeont. Sin.*, **4**(1), 67—76.
- [34] Ringstrom, T., 1927. Ueber Quartäre und Jungtertiäre Rhinocerotiden aus China und der Mongolei. *Pal. Sin.*, Ser. C, vol. IV, Fasc. 3.
- [35] Schlosser, M., 1903. Die Säugetiere Chinas. *Abb. Bayr. Akad. d. Wiss.*, II cl., vol. XXII, Fasc. 1.
- [36] ———, 1924. Fossil Primates from China. *Pal. Sin.*, Ser. C, vol. 1, Fasc. 2.
- [37] Sefve, I., 1927. Die Hipparionen Nord-Chinas. *Pal. Sin.*, Ser. C, vol. IV, Fasc. 2.
- [38] Sowerby, A. de C., 1933. Horns of a New Deer and Other Relics from the Waste of Yin, Honan. *China Journ.*, **19**, 141—144.
- [39] Takai, F., 1941. Two Fossil Bovids from the Vicinity of the City of Harbin, Manchoukuo. *Bull. Tokyo Sc. Mus.*, No. 5.
- [40] Teilhard de Chardin, P., 1926. Etude géologique sur la Région du Dalai-noor. *Mem. Soc. Geol., France*, N° 1, Ser. T, III, Fasc. 3.
- [41] ———, 1936. Fossil Mammals from Loc. 9 of Choukoutien. *Pal. Sin.* Ser. C., vol. VII, Fasc. 4.
- [42] ———, 1937. The Proboscideans of Southeastern Shansi. *ibid.*, Ser. C. **13** (1).
- [43] ———, 1938. The Fossils from Loc. 12 of Choukoutien. *ibid.*, N. S. C. No. 5.
- [44] ———, 1940. The Fossils from Loc. 18 Near Peking. *ibid.*, No. S. C. No. 9.
- [45] Teilhard de Chardin, P. & Pei, W. C., 1941. The Fossil Mammals of Loc. 13 in Choukoutien. *ibid.*, N. S. C. No. 11.
- [46] Teilhard de Chardin, P. & Piveteau, J., 1930. Les Mammifères Fossiles de Nihowan (Chine). *Ann. de Paleont.*, vol. XIX.
- [47] Teilhard de Chardin, P. & Trassaert, M., 1937. Pliocene Camelidae, Giraffidae and Cervidae of South-Eastern Shansi. *Pal. Sin.*, N. S. C. No. 1.
- [48] ———, ———, 1938. Cavicornia of South-Eastern Shansi. *ibid.*, N. S. C. No. 6.
- [49] Teilhard de Chardin, P. & Young, C. C., 1931. Fossil Mammals from Northern China. *ibid.*, Ser. C, vol. IX, Fasc. 1.
- [50] Teilhard de Chardin, P. & Young, C. C., 1936. Mammalian Remains from Anyang. *Pal. Sin.*, Ser. C, vol. XII, Fasc. 1.
- [51] Tokunaga (Yashiwara), S. & Iwasaki, J., 1902. Notes on a New Fossil Mammal (*Desmostylus*) *Journ. Coll. Sc. Imp. Univ. Tokyo*, vol. XVI, Art. 6.
- [52] Tokunaga, S. & Naora, N., 1934. Report of Diggings at Hochiakou, Kuhsiangtun, Kirin. *Reports of the First Scientific Expedition to Manchoukuo*, Sect. II, part. I.
- [53] Young, C. C., 1929. Note on Fossil Mammals from Kwangsi. *Bull. Geol. Soc. China*, **7**, 125—130.
- [54] ———, 1931. On Some Fossil Mammals from Yunnan. *Bull. Geol. Soc. China*, **11**, 384—393.
- [55] ———, 1932. On the Artiodactyla from the *Sinanthropus* Site at Choukoutien. *Pal. Sin.*, Ser. C, vol. VIII, Fasc. 2.
- [56] ———, 1935. Notes on a Mammalian Microfauna from Yenchingkou Near Wanhhsien, Szechuan. *Bull. Geol. Soc. China*, **14**, 247—248.
- [57] ———, 1939. New Fossils from Wanhhsien (Szechuan). *ibid.*, **19**, 317—332.
- [58] ———, 1935. On a New Trogontherium from Hsiatsaohwan, Shihhungsien and with Notes on the Mammalian Remains from Chi-Tsu, Wuhohhsien, Anhwei, (in Chinese with English Summary), *Acta Palaeont. Sin.*, **3** (1), 55—66.

- [59] Young, C. C. & Pei, W. C., 1933. On the Fissure Deposits of Chingsingsien. *Bull. Geol. Soc. China*, **13**, 63—72.
- [60] Young, C. C. & Liu, P. T., 1950. On the Mammalian Fauna at Koloshan Near Chungking, Szechuan. *Bull. Geol. Soc. China*, **30**(1—4), 43—90.
- [61] Young, C. C. & Chow, Minchen M., 1955. Pleistocene Stratigraphy and New Fossil Localities of Shihhung and Wuho, Northern Anhwei, (in Chinese with English Summary). *Acta Palaeont. Sin.*, **3** (1), 43—53.
- [62] Zdansky, O., 1924. Jungtertiare Carnivoren Chinas. *Pal. Sin.*, Ser. C. vol. II, Fasc. 1.
- [63] ———, 1925. Fossils Hirsche Chinas. *ibid.*, Ser. C. vol. II, Fasc. 3.
- [64] ———, 1928. Die Säugetiere der Quartarfauna von Choukoutien. *ibid.*, Ser. C. vol. V, Fasc. 4.

## 中國第四紀哺乳動物羣的地理分佈

(中文摘要)

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除台灣和西藏、新疆地區以外，我國的第四紀哺乳動物羣的分佈可以劃分為四個區域：除了北方和南方二個主要區域，淮河區可認為是這二個主要區之間的過渡地帶，而東北區是北方區一個側枝。

### (一) 北方區

北方區包括河北、山東、陝西、山西、甘肅、河南北部和內蒙古自治區的西南部。本區有四個不同地質時期的動物羣：

#### (1) 下三門期的 *Proboscideipparion-Equus* 動物羣

*Proboscideipparion-Equus* 動物羣的標準地點是河北北部桑乾河的泥河灣。在黃河三門區和在汾河河谷的下部也有同樣的動物羣。這個動物羣的主要特徵是有一些第三紀末期的種屬的殘餘代表，如 *Proboscideipparion*, *Elasmotherium* 等；同時有許多近代哺乳動物的屬如 *Equus*, *Elephas*, *Camelus*, *Bison*, *Ovis* 等的初次出現。根據動物羣的性質，這一時期代表由第三紀到第四紀的過渡時期。

#### (2) 上三門期的 *Sinanthropus-pachyosteus* 動物羣

這個動物羣的特徵是人類 *Sinanthropus pekinensis* 的初次出現。它的標準地點是著名的周口店。

#### (3) 黃土期的 *Elaphurus-ultima* 動物羣

*Elaphurus-ultima* 動物羣有代表性的動物是 *Sinomegaceros ordosianus*, *Bubalus wonsjocki*, *Bos primigenius*。這個動物羣的標準地點是內蒙薩拉烏蘇。

#### (4) 更新世以後的 *Davidianus* 動物羣

*Elaphurus davidianus* 是一種現在還生活着的哺乳動物，現在已經沒有野生種了。在更新世中期在淮河區有這種動物；但到了更新世以後的時期這種動物廣泛地分佈在北方區，

特別是在河北。

## (二) 南方區

南方區包括四川、雲南、湖北、湖南、貴州、廣西、江西、廣東、江蘇、浙江、福建。在這區中有二個動物羣。

### (1) 南方洞穴中的 *Pongo-Ailuropoda* 動物羣

這個動物羣的標準地點是四川萬縣鹽井溝。動物羣中有代表性的動物是 *Pongo cf. satyrus*, *Gigantopithecus*, *Ailuropoda*, *Megatapirus*, *Rhinoceros sinensis*, *Stegodon orientalis* 等。根據動物羣的一般性質，它的時代可認為是更新世中期。

### (2) 資陽的 *sapiens-Mammonteus* 動物羣

*sapiens-Mammonteus* 動物羣發現於四川資陽，這個動物羣的時代是更新世晚期。我們對這個動物羣的知識還知道得比較少。

## (三) 淮河區

在治淮工程中，在淮河地區發現了幾個新地點，如江蘇沐陽的嶂山，安徽泗洪的下草灣，河南新蔡等地。這個區有代表性的第四紀哺乳動物是 *Trogontherium cuvieri*, *Elephas namadicus*, *Stegodon sp.*, *Cervus (Rusa)*, *Sinomegaceros* 等。在這個動物羣中有幾種動物如 *Trogontherium*, *Elephas namadicus*, *Sinomegaceros* 是北方區 *Sinanthropus-pachyosteus* 動物羣中很常見的，而有幾種動物如 *Stegodon*, *Cervus (Rusa)* 是南方區 *Pongo-Ailuropoda* 動物羣中很普通的。因此，我們認為淮河區是北方區和南方區之間的過渡地帶。

## (四) 東北區

東北區包括內蒙古自治區東北部、黑龍江、吉林。在這個區中有更新世晚期的 *antiquitatisprimigenius* 動物羣。這個動物羣的最重要的地點是內蒙扎賚諾爾、哈爾濱的顧鄉屯，和吉林榆樹的周家油房。

這個動物羣的特徵是有許多典型的北方種類，如 *Alces*, *Capreolus*, *Mammonteus primigenius*, *Rhinoceros tichorhinus*；而且和西伯利亞同時代的動物羣有着密切的關係。

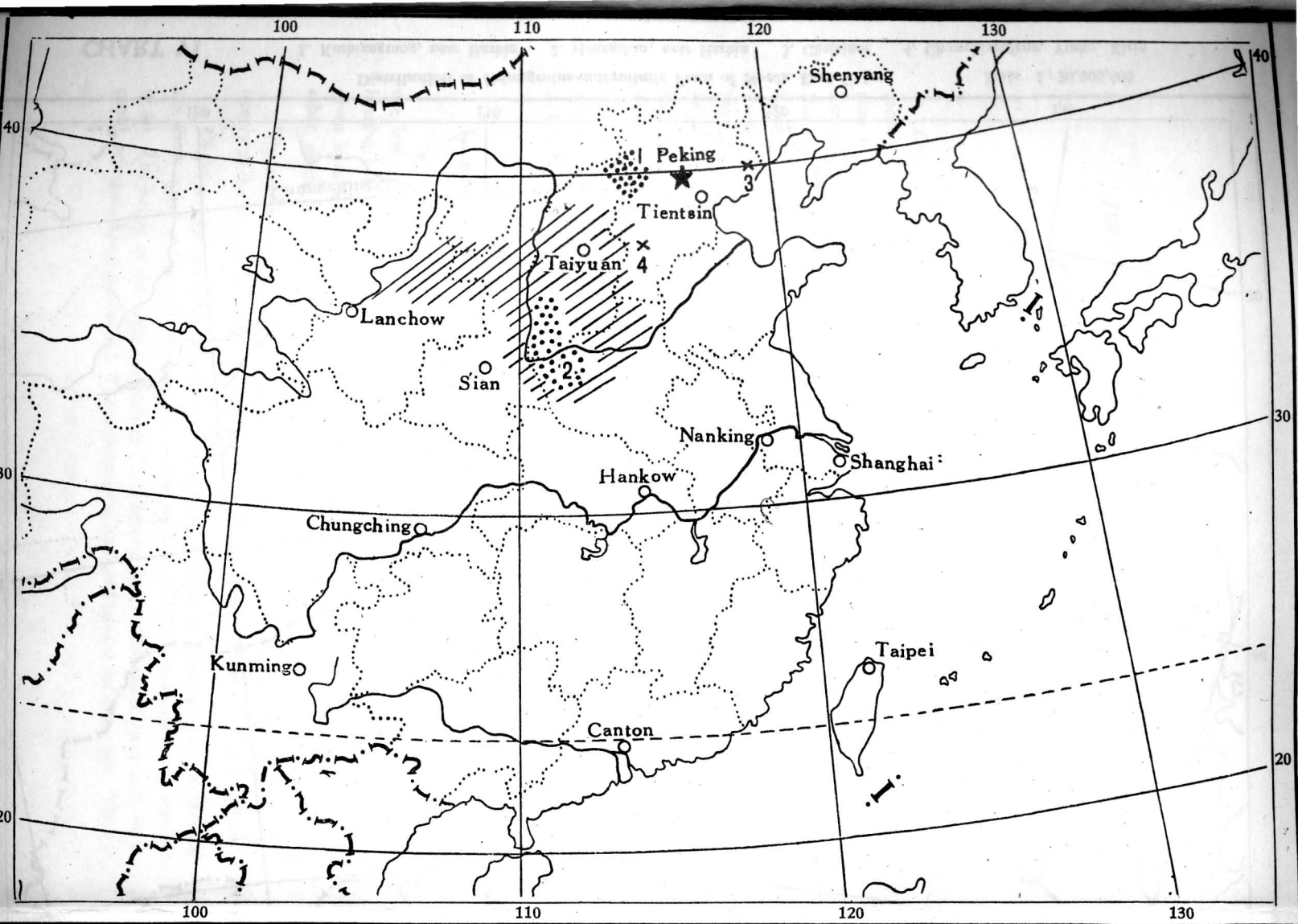
在更新世初期，北方區的氣候漸漸變寒冷和乾燥了，許多蓬蒂期的動物絕滅了或向南遷移了。到了更新世中期，中國大陸以長江為界分成了北方和南方二個區。在這個時候南方區的氣候與緬甸、印度支那、馬來亞很相像；而與北方區顯然不同。

目前，在我國第四紀哺乳動物的研究中，還存在着一些問題。有幾種動物的鑑定還值得重新考慮，如對於 *Mammonteus primigenius*, *Rhinoceros tichorhinus* 和 *Elephas namadicus* 的鑑定。

根據吉林的豐富的猛獁象白齒的材料，似乎吉林的猛獁象與西伯利亞的原型種有些不同。丁村和資陽的猛獁象是不是猛獁象還存在問題。

*Rhinoceros tichorhinus* 在更新世中期的周口店堆積中就有，在更新世晚期薩拉烏蘇的堆積中也有，但是不是屬於同種？

南方和北方區的 *Elephas namadicus* 是不是屬於同種，也都值得作更進一步的研究。



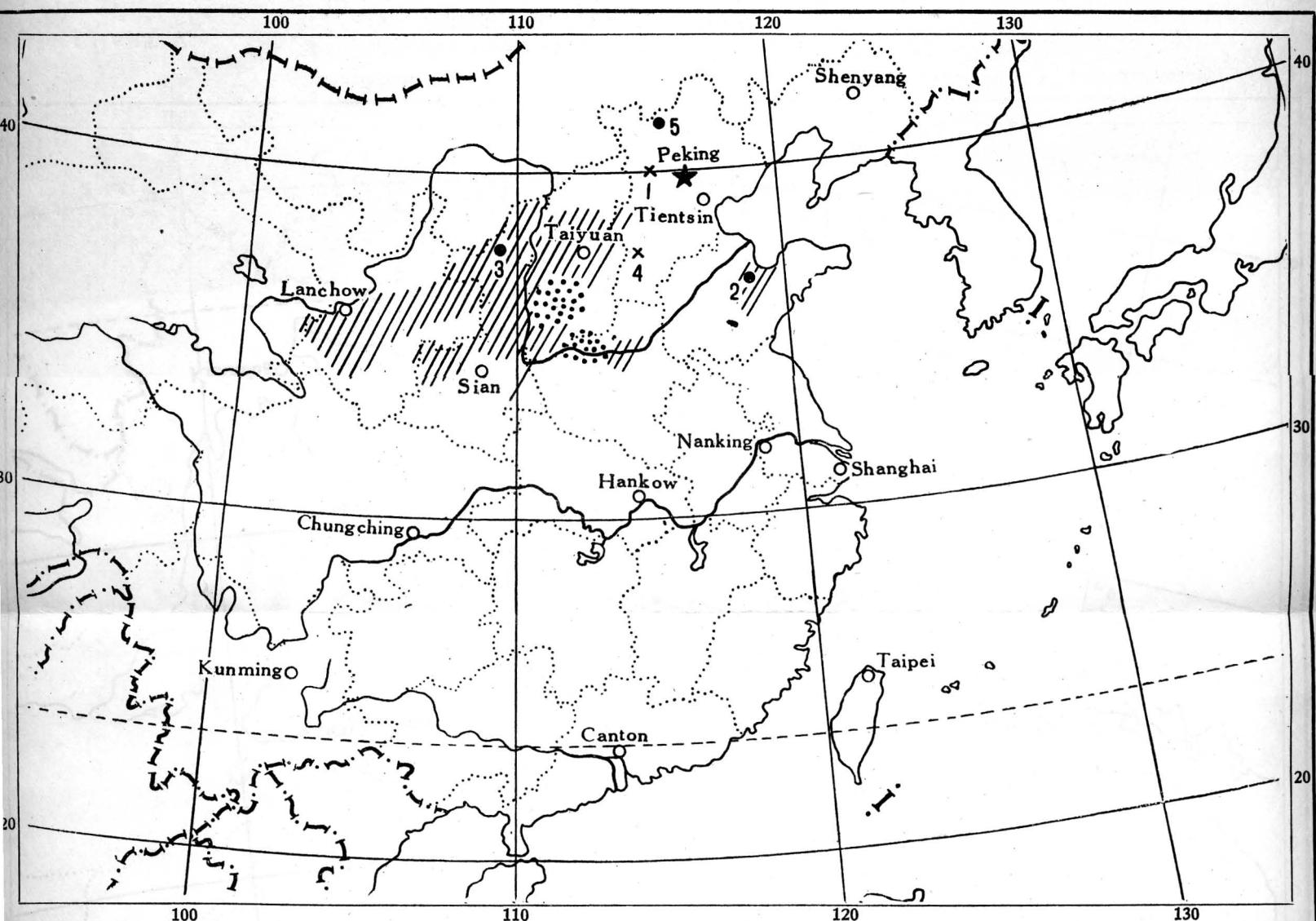
Distribution of *Proboscidean-Equus* Fauna of North China Provinces

Scale 1:20,000,000

CHART I

- Reddish clay
- Lacustrine and river deposits
- Cave deposits

1. Nihowan 2. Region of Sanmen Gorge 3. Tongshan 4. Nanyehli



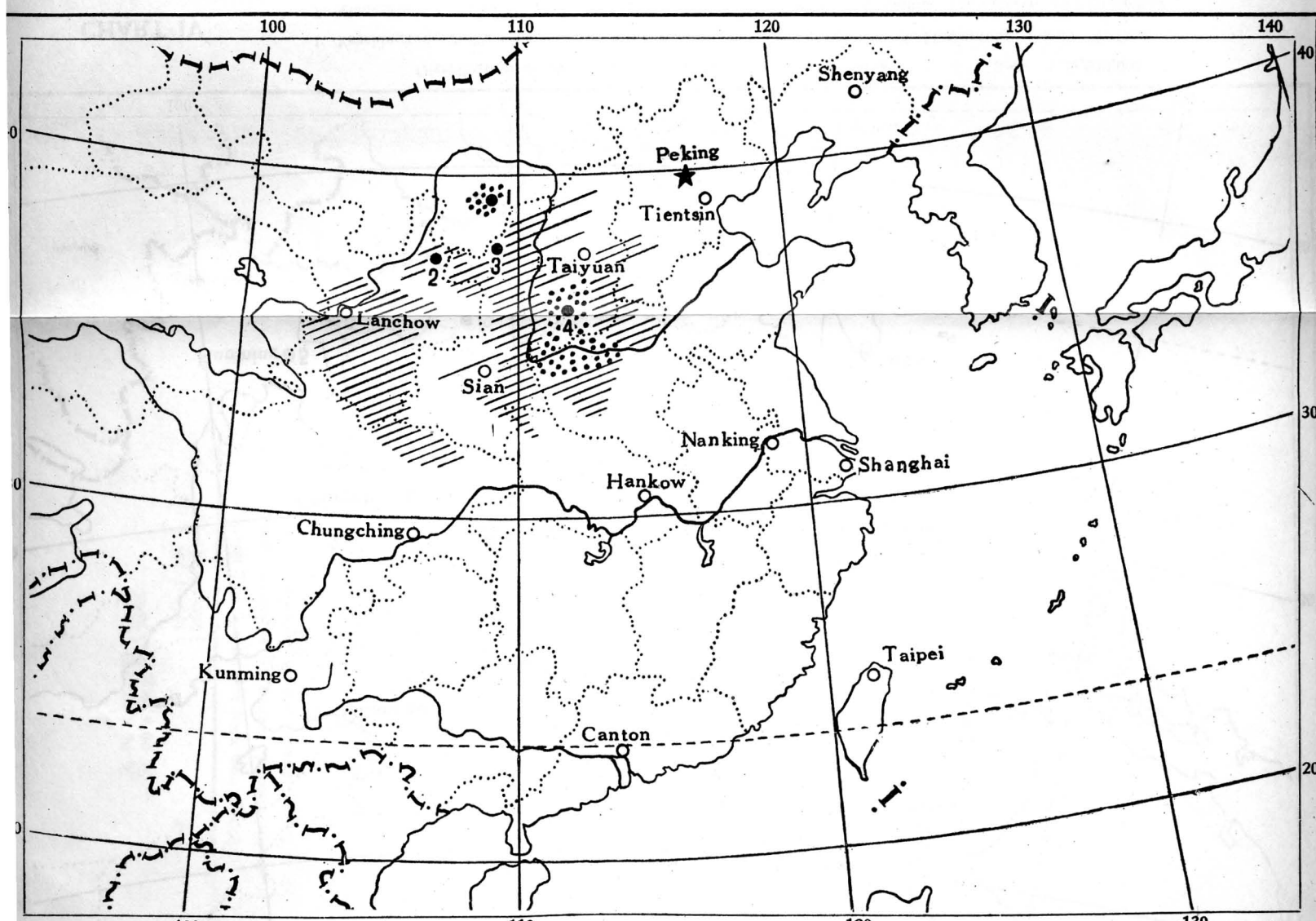
Distribution of *Sinanthropus-pachyosteus* Fauna of North China Provinces

Scale 1:20,000,000

CHART II

- Reddish clay deposits
- Lacustrine and river deposits
- Cave deposits

1. Choukoutien 2. Yitu of Shantung (Zdansky) 3. Yülin (Teilhard and Young) 4. Chingshihling 5. Ch'ihcheng of Hopei (Chia and Chai)

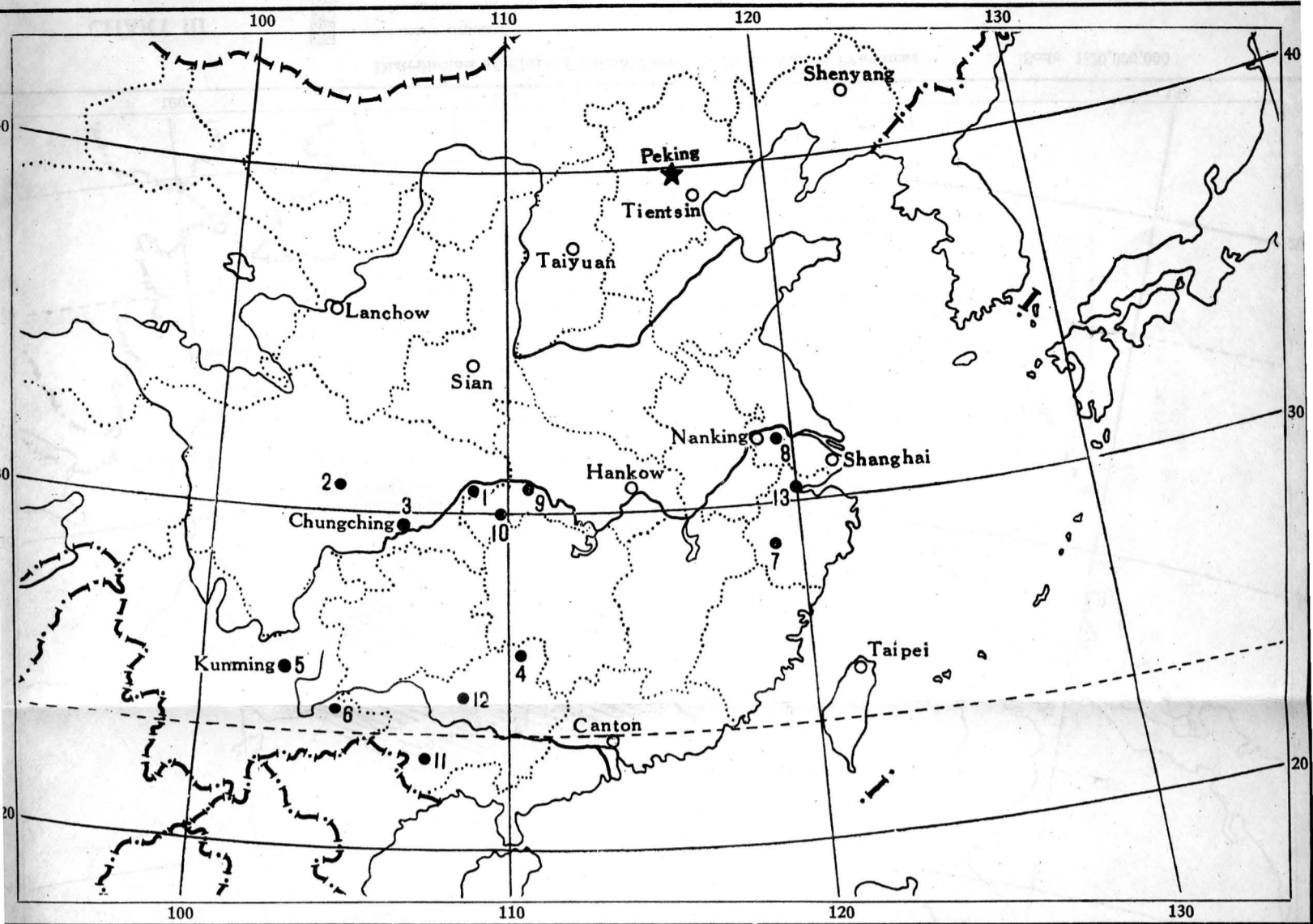


Distribution of *Elaphus-ultima* Fauna of North China Provinces

Scale 1:20,000,000

CHART III

- Loessic deposits
- Lacustrine and river deposits

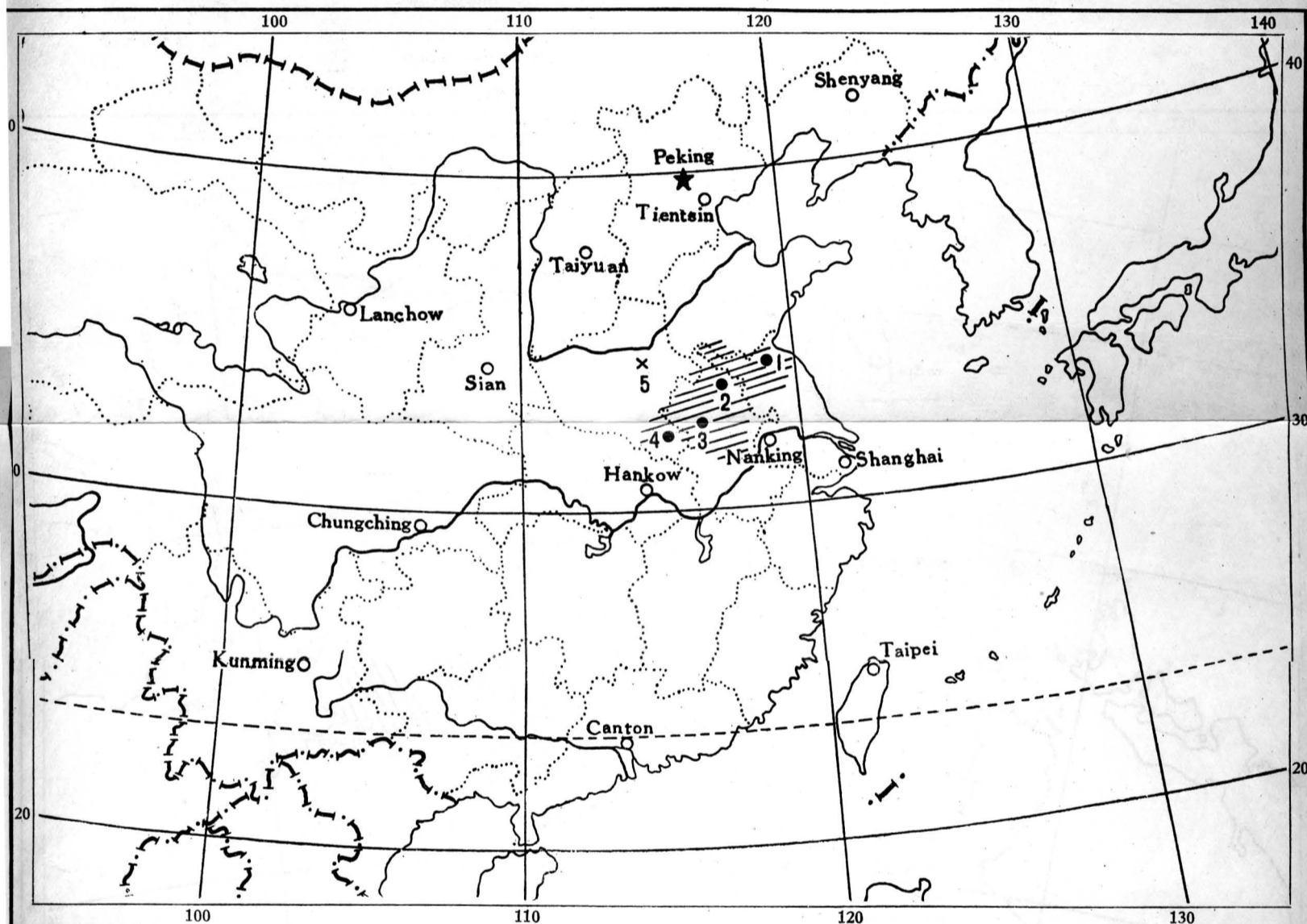


Distribution of *Pongo-Ailuropoda* Fauna of South China

Scale 1:20,000,000

CHART IV

1. Yenchingkou 2. Tzeyang 3. Koloshan, near Chungching 4. Hsingan 5. Hoshantung, Fumin 6. Chinpei  
7. Kiangshan 8. Tanyang 9. Changyang 10. Enshih 11. Taksin 12. Laipin 13. Liuhsia, near Hongchow.



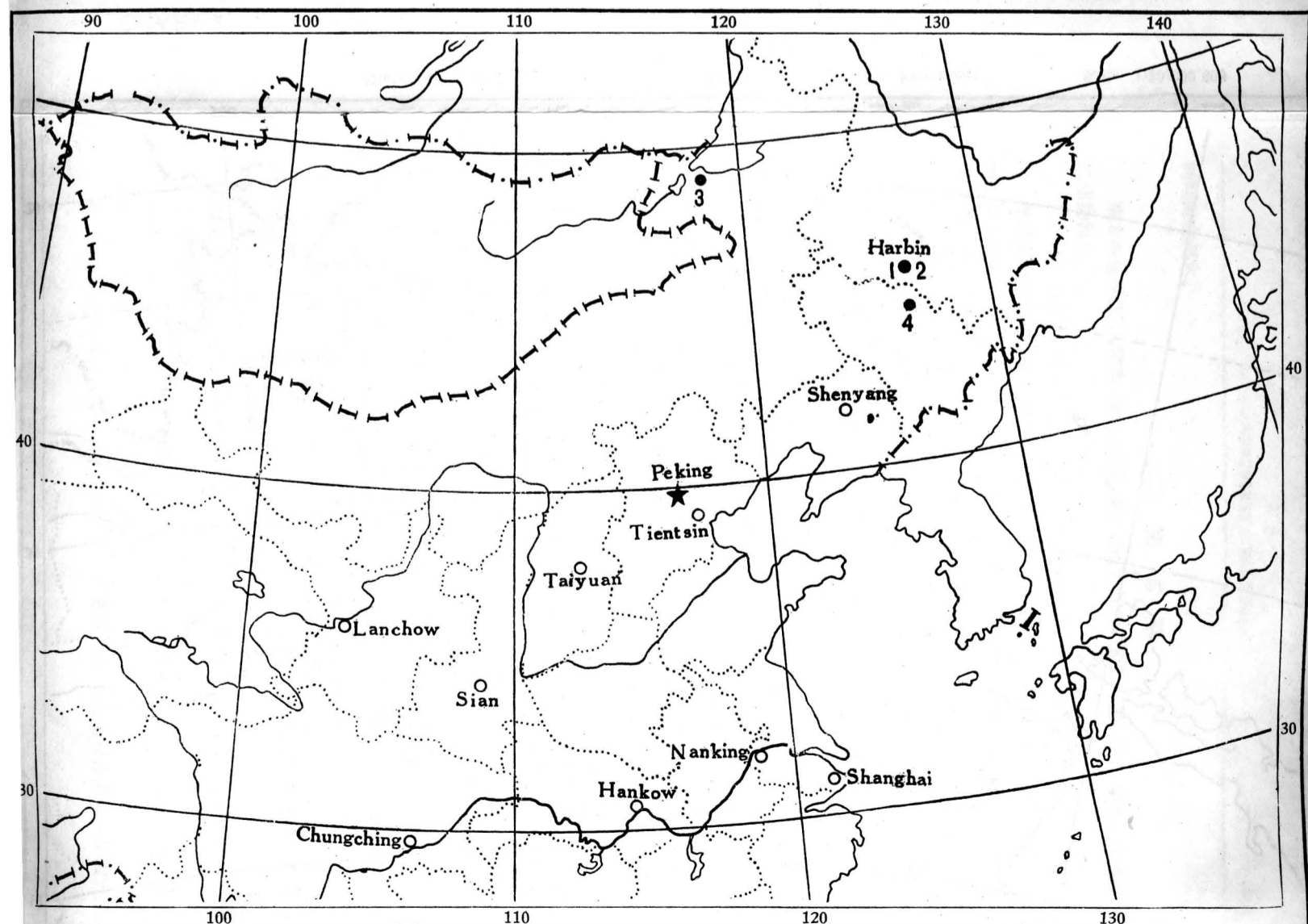
Distribution of *Tragontherium-Elaphurus* Faunas of the Huai River Province

Scale 1:20,000,000

CHART V

- ▨ Sandy and marly deposits  
x Cave deposit

1. Changshan, Shuyang 2. Hsiatsaowan, Szechung 3. Chitsuai, Wuho 4. Shintsai, Honan 5. Yuhsien, Honan



Distribution of *Primigenius-antiquitatis* Faun of North East China

Scale 1:20,000,000

CHART VI

1. Kushiangtung, near Harbin 2. Huangshan, near Harbin 3. Chalainor 4. Chowchiayufang, Yushu, Kirin