ON THE DISTRIBUTION OF MEGACEROS IN CHINA

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In China, however, as due to relative late beginning of systematic scientific field-work we know few localities with Megaceros. Although it is today only a question of time to get additional materials of further localities, it may be too little in proportion to the vast-ness of Chinese territory to give an outline of Pleistocene Megaceros invasion and distribu-tion in China already today or in the immediate future. On the other side it seems to us, that this extinct Asiatic-European genus of Middle and Late-Pleistocene age as well as Euclenoceros Trouessart 1898 of Villafranchian may be of stratigraphic significance to correlate the type-localities of Europe with those of Asia, especially China, if we succeed in getting additional materials from Asia. This paper therefore may be a preliminary study of this interesting question 1).

The European status, as far as we know, is following:

(1) Early-Pleistocene (Villafranchian, Ältestpleistozän):

There have been some materials of Megaceros-sized deer recorded, but it is quite un-certain if they belong to Euclenoceros-, Orthogonoceros- or Dolichodoryceros-group, of what only the last will be regarded by us of being close related to Megaceros s. str. The large cervid of European Villafranchian is as well as in China a member of Euclenoceros-group.

(2) Lower Middle-Pleistocene (~Altpleizozän):

The Megaceros-group s. I. is represented by the genus Dolichodoryceros Kahlke 1952. As we have noted [Kahlke, 1951] side by side with Dolichodoryceros there is another Megaceros-sized cervid, Orthogonoceros verticornis (Dawkins) 1872, Orthogonoceros Kahlke 1952. The two species which are well distinguished will occur together at any locality of this type in Germany having been systematically excavated or investigated for a more or less long time.

1) The paper was written in Peking, Institute of Vertebrate Paleontology, Academia Sinica, while the referent was a guest of this institute. We are greatly in-debted to Prof. Dr. Young Chung-cheng, Prof. Dr. Pei Wen-chung, Dr. Chow Minchen and Mr. Chia Lan-po of this institute for giving their kind assistance. Furthermore we have to express our thanks to Mr. W. N. Scher-nakow and Liu Yen-chang, Museum of Harbin, Prof. Dr. Hsiao Tsai-yü and Mr. Hei Yen-chang, Museum of Natural History, Tientsin and Prof. Chao K. K., Institute of Paleontology, Academia Sinica, Nanking, who lend us their valu-able help by studying the collections in the above named institutes.
Dolichodoryceros süsensonensis Kah. is a low specialized Megaceros-like cervid with extraordinary long and thin main-tines, recalling in some way the type of Euctenoceros. The palmation of antlers is very poor but in principle more advanced than in Euctenoceros, only the brow-tine (first tine) shows broad flattening. Dolichodoryceros has been recorded from Süsenson (Germany, type-locality of D. süsensonensis), Voigtstedt (Germany), Mosbach (Germany) and from different localities of the Forest bed of East-England. From this stock, however, or a close related, Megaceros s. l. is believed to have descended.

(3) Upper Middle-Pleistocene (～Mittelpleistozän):

The type-locality of European Upper Middle-Pleistocene Megaceros is Steinheim an der Murr (Germany). There is no member of the archaic Dolichodoryceros- or Orthogonoceros-group. The well preserved specimens of this locality, Megaceros giganteus antecedens Berckhemer, have been published in 1941. The Steinheim-Megaceros is an extreme specialized giant-deer with a short beam and broad palmated antlers. The brow-tine shows a high palmation as well. All in all a Megaceros that recalls the type of Chouko-tien-giant-deer in a most curious way.

(4) Late-Pleistocene (Jungpleistozän):

The European Megaceros of this time may be divided into three sub-species: Megaceros giganteus hibernicus Pohlig 1892 of the British Isles, Megaceros giganteus germanicus Pohlig 1892 of Middle Europe and Megaceros giganteus italicus Pohlig 1892 of Italy. But this sub-species of the southern areas of Europe is still questionable [cf. Azzaroni, 1953, p. 50.] since there have been antlers recorded from Germany which are showing a similar type. The Late-Pleistocene polymorphous giant-deer shows a wide range of variation in size and antlers and is regarded as belonging to one species.

The Chinese Status, as we see, is following:

(1) Early-Pleistocene (Villafranchian, Ältestpleistozän):

As far as we know there is no trace of a cervid belonging to Megaceros s. l. in the Probosidiaparion-fauna of Lower Sammenian of North-China (Nihowan-beds). The large cervid of Chinese Villafranchian is a member of Euctenoceros-group, B. boulei (Teilhard and Piveteau 1930) and has its far-western equivalents in the deposits of France (Puy de Dôme, Alta Loire), England (Forest beds), and Italy (Toscana, Lombardia), cf. [Azzaroni, 1948, p. 61].

(2) Middle-Pleistocene (～Alt- und Mittelpleistozän):

Until today we do not know any fossil from China that is to refer to Orthogonoceros or Dolichodoryceros s. l. or to a related type.
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Without knowing any ancestral form the well known giant-deer Megaceros (Sinomegaceros pachysteuxs) (Young) 1932 occurs at Choukoutien and other localities of Upper Saumian age. Teilhard, in 1936 established a second species of Choukoutien-Megaceros, less thick in jaw-bones, after having studied the Megaceros-remains of Choukoutien region, especially the recent (1951) discovered materials of layer 30—33 (Locality 1) we can not follow this view any more. As we will discuss in a second paper, Choukoutien-Megaceros shows a wide range of individual variation as already mentioned by Young in 1932b and Teilhard and Pei in 1941. Less thick jawed in the basal-layers of Locality 1 (as in Locality 13), the thickening is increasing in the upper layers. But there are extreme specimens in the lower layers as well as in the upper. On the other side the antlers in general show one type with the only exception that the broken specimens of Locality 1 are sometimes more extreme palmated. These facts may enable us to give a rough correlation of the different localities in the Choukoutien area as far as we know enough Megaceros-materials of each place. According to the above mentioned variation of jaws and antlers it seems impossible to make any conclusions on only a few specimens. In this way, however, we are able to correlate the basal-layers of Locality 1 (~level 28—33 m) with Locality 13 (partly?).

(3) Late-Pleistocene (Jungpleistozän):

It is still impossible to draw a first picture of the Late-Pleistocene Megaceros of China. The best preserved specimen, a skull with broken antlers in the Museum of Tientsin, was collected in Sjaaroosogol [Teilhard and Pei, 1941, p. 92]. The beam is well marked as well as the palmation. But all main-tines are missing and the brow-tines are broken too. We only can recognize that the animal also developed a broad flattening in this time. As it is shown in the sketch map, Megaceros ordosianus Young reaches a similar south-distribution as the Choukoutien-giant-deer. Today, however, we may preliminary refer all Megaceros remains found together with the Late-Pleistocene fauna of China to Megaceros (Sinomegaceros) ordosianus (Young). After accumulating further materials in the Chinese collections a revision is necessary.

Distribution of Middle- and Late-Pleistocene Megaceros.

Cervidae Gray, 1821

Megaceros Owen, 1844

Sinomegaceros Dietrich, 1933

Megaceros (Sinomegaceros) pachysteuxs (Young), 1932

Synonym:

1925. Cervus canadensis fossiles Zdansky, 1925 (p. p.), [Zdansky, 1925]
1925. Pseudaxis magnus Zdansky, 1925 (p. p.), [Zdansky, 1925]
1925. Rusa pachynathus Zdansky, 1925 (p. p.), [Zdansky, 1925]


Localities (Figure 1, Distribution of *Megaceros* in China):

1. Panchiapu (河北宣化縣家堡), [Zdansky, 1927, p. 16]
2. Chingshang (河北懷來), [Zdansky, 1927, p. 17]
3. Choukoutien (北京周口店), [Localities 1, 2, 3, 7, 9, 11, 13, 15; 19, Zdansky, 1928; Young, 1929; Young, 1932; Pei, 1936; Teilhard, 1936; Du, 1950; Pei, 1934; Teilhard and Pei, 1934; Pei, 1939; Hu, 1953].
4. Luanping (河北遵化), [Young, 1932, p. 61]
5. Chingshihling (河北井陘縣青石嶺), [Young and Pei, 1934, p. 65]
6. Huailai (河北懷來), [Teilhard and Young, 1930, p. 4]
7. Chihcheng (河北赤城), [Young and Chow, 1956, p. 608; Chia and Chai, 1957, p. 54]
8. Chingshuichian (山東兗縣清水河), [Zdansky, 1925, p. 47; Young, 1936, p. 183]
9. Yenchiauchung (山東兗縣鴻家莊), [Matsumoto, 1926, p. 35]
10. Yuanchiu (山東招遠), [Zdansky, 1925, p. 76]
11. Talichung (河南濟源大李莊), [cf. this paper, p. ]
12. Tiwu (河南滎池), [Young and Pei, 1933, p. 84; Young, 1935, p. 37]
13. Tungkou (河南啐池), [Young and Pei, 1933, p. 84; Young, 1935, p. 37]
14. Jungtsin (山西永濟), [Young, 1938, p. 513]
15. ? Fenglingtu (山西永濟風陵渡), [Bien, 1934, p. 444]
16. ? Chingyang (甘肅靈隴), [Teilhard and Young, 1930, p. 4]
17. ? Yulin (陝西榆林), [Teilhard and Young, 1930, p. 16]

**Carvidae** Gray, 1821

**Megaceros** Owen, 1844

**Synomegaceros** Dietrich, 1933

**Megaceros** (Synomegaceros) *ordsianus* (Young), 1932

**Synonym:**

1925. *Cervus canadensis fossolis* Zdansky, 1925 (p. p.), [Zdansky, 1925]
Late-Pleistocene of China. Associated fauna: Ursus arctos Linné, Ursus spelaeus Rosenmüller, Crocuta crocuta ńě por (Matsumoto), Panthera tigris (Linné), Coelodonta antiquitatis (Blumenbach), Equus hémiones Linné, Equus przewalski Poljakoff, Sus scrofa Linné, Ceruś canadensis fossils Zdansky, Bubalus anslojekii Boule and Teilhard, Boś primigenius Bojanus, Bison cf. pricus (Bojanus), Mammothus primigenius (Blumenbach).

Localities (Figure 1. Distribution of Megaceros in China):

I. Harbin-Chengyang (Harbin-Čchengyang) (黑龍江哈爾濱),

II. Harbin-Kuhsiántung (黑龍江哈爾濱淶囲),

III. Changchun (吉larında春),

IV. ? Chaoyang (遼寧朝陽),

V. Shangpot (河北宜化),

VI. Chiaonikwan (河北宜化),

VII. Hsintsai (河南新安),

VIII. Sjaraëssøvil (内蒙伊克昭盟, 薩拉烏蘇河),

IX. Tingtsum (山西襄汾丁村),

[Tolmacheff, 1953, p. 5]
[Yin, 1931, p. 159; Tokunaga and Naora, 1934, p. 62—64]
[Licent and Teilhard, 1930, p. 23—35]
[Zdansky, 1925, p. 79; Young, 1932b, p. 61]
[Zdansky, 1925, p. 82]
[Zdansky, 1925, p. 82]
[Pei, 1936, p. 98]
[Boule, Breuil, Licent and Teilhard, 1928, p. 57—59; Teilhard and Pei, 1941, p. 92]
[Kuo, Young, Pei, Chow, Woo and Chia, 1955, p. 101]

Examining the whole Middle-Pleistocene fauna of North-China, it is stated that this fauna on one side becomes more and more palaeartic, a process that was already started with the beginning of Villafranchian. Eucenocreros bouleii have died out but is replaced by another big-antlered cervid of the same zoogeographical region, the giant-deer. But besides the immigration from the North and North-West there comes from the South the water-buffalo-group and Sinanthropus pekinensis (Pithecanthropus pekinensis), both showing Indo-Malayan affinities, cf. Teilhard [1941, p. 25].

In Europe, Eucenocreros, the big-antlered deer of Villafranchin is replaced by Early Middle-Pleistocene (～Altpleistozän) Orthogomoceros and Dolichocerceros, at least all by Megaceros (Late Middle-Pleistocene Mittelpleistozän). Together with the first true giant-deer Megaceros giganteus antecedens Bergkheimer, that recalls the type of Choukoutien. Megaceros, quite remarkably the same water-buffalo-group with characteristic horn-cores is reaching Middle-Europe (Steinheim/Murr and Schönebeck/Elbe).

In 1941, Teilhard, correlating these facts, came to the conclusion, that the two invasions into Middle-Europe and North-China, the both extreme outside provinces of the palaeartic area, appear to have taken place approximately at the same time. We may add as due to an increasing of climate in the whole region. Even if we suppose that the invasion of Megaceros and water-buffalo-group was some time earlier in China than in Eu-
Fig. 1. Sketch-Map showing the fossil localities mentioned in this paper.

● 1—17 Localities of Megaceros (Sinomegaceros) pachyosteus (Young).
○ I—IX Localities of Megaceros (Sinomegaceros) ordosianus (Young).
rope, we have to remember that the main-fauna of Steinheim an der Murr (Germany) is of Upper Middle-Pleistocene age (~Mittelpleistožän, Mindel-Riss-Interglacial) and that together with the Steinheim-fauna an early man of Homo-group is living while together with the far-east prolongation of that mixed "palearctic" Megaceros-Bubalus-fauna a member of Pithecanthropus-group is to be found.

Recently Pei Wen-chung [1957, p. 13] comparing the Middle-Pleistocene fauna of China with some European suggested to be of the same age stated "that the mammalian fauna of China is by no means different, in general character, from that of Forest bed in England, Abbeville (Camps de Mars) in France, Val d'Arno in Italy and Mosbach in Germany." For reasons given above, our opinion this matter is, that the Chatkoutien-fauna belongs to the palearctic area of the Great-Interglacial-Period s. l. (Mindel-Riss-Interglacial), that means not to be correlate with the European localities given by Pei [1957, p. 13] but approximately with the closing phases of European Middel-Glaciation or the early phases of Mindel-Riss-Interglacial. In this opinion we agree (p. p.) with Black, Teilhard, Young, and Pei [1933, p. 61], not with Pei [1931, p. 177; 1939, p. 10; 1957, p. 13] and Kurtén [1956, p. 40-41; 1957a, p. 266; 1957b].

The Megaceros- mandibula of Talichung.

The fossil was collected in 1957 by the Party No. 127 of Central- and South-China Bureau of Coal-Geology in gravels near Talichung (大李庄) in Northern Honan and handed to the Institute of Vertebrate Paleontology, Academia Sinica, Peking. No further remains of associated fauna have been recorded. The specimen, a left lower jaw (Cat. No. V 925) of Megaceros (Simomegaceros) pachyostei, is broken and very much worn. The thickening of the jaw-bone is something intermediate (?), P₂ is missing, also parts of M₃ (reconstructed) and P shows the advanced condition.

Dimension (in mm):

<table>
<thead>
<tr>
<th>P₂—M₃</th>
<th>P₃—M₃</th>
<th>P₄—M₃</th>
<th>M₁—M₃</th>
<th>M₂—M₃</th>
<th>P₂—P₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>ca. 119,5*</td>
<td>106,3</td>
<td>88,8</td>
<td>72,8</td>
<td>—</td>
<td>ca. 46,8*</td>
</tr>
</tbody>
</table>

REFERENCES


* Measurements taken at the alveoli of P₂.


Dietrich, W. O., 1933. [Review of:] C. C. Young "On the Artiodactyla from the Sinaarthropus Site at Choukoutien" [Pal. Sinica (C) 8], Neues Jahrb. f. Min. USW., Referate III, 1933, p. 475.


周口店第十一地點的靈餐類化石及其他哺乳動物化石。中國古生物學會會訊, 4期, 頁7—8。


周口店第十九地點及天順背洞的哺乳動物化石。中國古生物學會會訊, 6期, 頁8—9。


中國人類化石的發現與研究, 科學出版社出版, 頁1—104。


**Megaceros** 在中国的分布

（摘要）

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中国目前 **Megaceros** 的材料除了周口店以外还很贫乏。我们根据现有资料对于 **Megaceros** 在中国的分布做了初步的研究和作了一个分布图。

一般学者认为 [参看 Teilhard, 1941] 中国北部更新世中期的动物群的全北区的色彩愈来愈淡了，这个过程从维拉方期就已经开始。

在本文中对于欧洲和中国的更新世大角鹿的发展作了比较。中国维拉方期的大角鹿与欧洲的大角鹿属于同一属 [Euclenoceros, 参看 Teilhard, Piveteau 1930; Azzaroli, 1948]; 但至今在中国还没有发现过相当于欧洲中更新世初期的大角鹿 (Orthogonoceros, Dolicho-

doryceros)。

对比中国和欧洲中更新世晚期的动物群，这两个全北区的两端地区中都发现了真正的大角鹿 **Megaceros**：如中国的 **Megaceros (Sinomegaceros) pachyosteus** (Young)，欧洲的 **Megaceros giganteus antecedens** Berckhemer。

Teilhard 在 1936 年根据周口店第 9 及第 13 地点新发现的 **Megaceros** 的材料定了一个新种，这一新种的下颌骨的厚薄程度较浅。但是我们研究了周口店的 **Megaceros** 的材料,
特别是最近（1951年）发现的第30—33层（LOC. 1）的材料后，我们与 Teilhard 有不同的意见。这一个问题将在另一篇文章中再讨论。

这二个全北区两端地区的更新世晚期的动物群的特点是 Megaceros 的存在：如欧洲 Megaceros giganteus 的 3（?）个亚种和中国的 Megaceros ordosianus。

EXPLANATION OF PLATE I

_Megaceros (Sinomylodon) pachyosteus_ (Young) (The _Megaceros-_mandible of Tali-chung), Left Lower Jaw Cat. No. V 925.

Fig. 1. Lateral view, × ½.
Fig. 2. Dental view, × ½.

_図版Ⅰ説明

_Megaceros (Sinomylodon) pachyosteus_ (Young)（大李庄發現的 _Megaceros_）左下
顎骨編号 V 925。

图 1. 側面視，× ½.
图 2. 頂面視，× ½.