

云南昭通一新种剑齿象, 并讨论 师氏剑齿象的分类和时代

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1960 年底, 本文前一作者在昆明云南省博物馆看到一些在该省昭通县采集的哺乳类化石, 包括一个带有完整的第三臼齿的剑齿象下颌骨标本; 代表一个构造较原始的新种。为了对产化石地层有所了解, 当时一同在云南工作的邱占祥、王伴月两同志即赴昭通作短期观察, 并希望能获得更多的化石。由于时间及交通关系, 只能对附近地层作了极初步的了解, 此外, 在当地收到一个属于同一种象的半个臼齿。

在这篇报告中, 我们对保存在云南博物馆的化石作了简单的报导, 对其中最重要的剑齿象标本作了描述。在研究这个标本时, 也对我国其他地区发现的各种剑齿象化石, 特别是和昭通标本比较接近和存在问题较多的师氏剑齿象的化石, 根据古脊椎动物与古人类研究所保存的正型标本的模型, 和一些已发表及未发表的材料作了一些观察, 对存在的问题提出了几点看法。

我们十分感谢好几方面的同志们对我们工作的支持和帮助。我们在云南工作期间, 云南省博物馆在工作和生活给了我们许多帮助并同意我们将昭通发现的象化石携回北京研究。邱占祥同志给我们提供昭通化石地点的地质资料。贾兰坡教授将尚未正式发表的山西芮城涇河的标本给我们参考研究。图版照象和绘图是分别由王哲夫和沈文龙二同志摄绘。

一、云南昭通更新世哺乳类

昭通盆地的新生代沉积, 过去大致分为上第三系及第四系两部分。第四系以砂及砾石层为主。据称在城北约 12 公里闹上地方的黄色细砂层中曾发现过风化甚烈之象牙(门齿)化石。

被认为属于上第三系的沉积物主要为粘土层, 厚度约数十到三百米, 成灰黑、灰绿、灰白等各种颜色, 中间并夹褐炭 1—10 层, 其中含淡水腹足类及植物遗骸。在昭通城西南的后海子及沙坝等地曾发现脊椎动物化石。

云南省博物馆收集的昭通发现的哺乳类化石都产自褐炭层中。化石牙齿釉质层均成发亮的乌黑色, 骨头及牙齿齿质层呈褐色。化石保存方式都相同, 看来都来自同一类型的沉积物中。到目前为止, 发现的哺乳类化石计有下列各种:

Felis sp.

Zygodon sp.

Stegodon zhuotongensis sp. nov.

Elephas sp. (cf. *E. hysudricus*)

Tapirus sp.*Equus* cf. *yunnanensis**Sus* sp.*Muntiacus* sp.

Bovids

以上化石种, 从属类上看, 絕大多数的时代都可以从上新世后期到更新世。但其中馬則限于更新世, 而軛齿象 (*Zygodon*) 的时代則不超过早更新世。馬化石只有一个上白齿, 与云南馬的相似。剑齿象的化石为一新种 (見后), 从构造上看, 可以从上新世到更新世, 但从它个体較大, 构造上也比东南亚 (緬甸、印度等地) 早更新世的 (*Stegolophodon latidens*) 进步, 因此, 看来其时代不会早于第四紀。馬化石, 特别是相近的种 (云南馬), 在我国南方 (云南、广西) 及緬甸均发现于早更新世。一种真象 (Cf. *Elephas hysudricus*) 也是东南亚早更新世較常見的, 虽然昭通的标本是否屬这一种尚待确定, 但照初步观察, 与这一种的頗相似。因此, 从整个化石羣看来, 昭通的动物羣的时代似为早更新世, 可与元謀云南馬动物羣 (Colbert, 1940; Pei, 1961) 和緬甸的上伊拉瓦底动物羣 (Upper Irrawaddy) (Colbert, 1943) 相对比。

因为化石沒有肯定的地点和地层记录, 材料也不多, 以上只是根据目前資料分析得到的初步結論, 还有待今后的工作和发现来确定或修訂。

二、昭通发现的一新种剑齿象化石的記述

昭通剑齿象 (新种) *Stegodon zhaotongensis* sp. nov.

特征: 一种个体較大, 齿冠构造較原始的剑齿象。白齿齿脊数少, 第三下白齿有典型的真剑齿象式的齿脊 6 个半。每一齿脊上的乳突数亦不多 (6—8 个)。齿冠低; 前寬, 末端尖。中沟在前面几个脊上清楚可見。白垩质几无。

材料: (1) 正型标本——左下颌, 上有不完整的第三下白齿 (图版 I, 图 1, 1a), 古脊椎动物与古人类研究所编号 (模型) V. 2647, 原标本保存于云南省博物館。(2) 副型标本——左下第三白齿前半部分 (图版 I, 图 2), 编号 V. 2648。

地点和时代: 早更新世; 云南昭通后海子 (或沙坝等地)。

标本描述: 左下颌标本的前、后部已經破損。水平枝保存部分的前面微收縮, 下前方內弯。这說明下颌是比較短的。

下颌上第三白齿的前端亦已破損。但从保存完整的齿根部以及下颌水平枝上表面在前方收縮的情况看来, 齿冠可能只有前面的一个半 (至多两个) 齿脊破去。因此, 完整的牙齿大概是由 6 个齿脊及前后跟座組成, 較少可能是标本上原先共有 7 个齿脊及一个后跟座。这个齿脊数目在真剑齿象属內是比較少的。

保存的头两个齿脊的各个乳突已經磨蝕得彼此連通, 第三脊仅中沟处尚分隔, 第四第五二脊磨蝕輕微, 尚可清楚地看出二者分別由 6 个和 5 个乳突組成 (組成前几个脊的乳突数較多)。所有各个齿脊皆为典型的真剑齿象式的脊状, 脊間无小的附乳突。齿冠頂面大致呈腎形, 在前四脊的基部分別寬 101(II)、106(III)、108(IV)、109(V) 毫米, 往后漸变窄, 至末端則成三角尖状。后几个脊的頂部又显著地窄于其底部, 这几个脊的中段微前凸。齿冠在磨蝕最輕微的最后二脊处高約 40 毫米。自保存的第 1 脊的前緣至齿冠末端

长 198 毫米,估計齿冠全长約 254 毫米。中沟在保存的第三脊上尚可看到。白垩質仅在最后几个脊的谷內微有发育。

材料中另一标本只保存了前四个半齿脊。保存的第 1 脊的前面很光滑,在动物死亡前已經使用磨蝕得只剩下一半。后面的几个脊的式样很象上述标本的前四个脊,这也說明上一标本的前面破去不多。在此标本上,前三个脊磨蝕很深,乳突分辨不清;第四脊磨蝕稍輕,上有乳突較多。中沟在前四个脊上皆清楚可見,其位置在第四脊上接近齿冠的中縱軸,往前則偏到舌側。在中沟附近的乳突較兩側者寬大,磨蝕后形成有些类似乳齿象类的“三叶式”图象,但是在谷的中部並沒有任何附乳突发育。仅在第一齿谷的內側有一个瘤状小齿柱。

比較和討論: 昭通剑齿象齿冠很低;齿脊数和每个脊上的乳突数少;后面的三个脊未充分发育;中沟在大多数脊上还存在,这些都是比較原始的特征,近于古剑齿象 (*Stegolophodon*) 的性質。但昭通的标本已經形成了真剑齿象 (*Stegodon*) 式的齿脊,脊間无古剑齿象內常見的附乳突,这些又說明它已經是一个典型的真剑齿象。因此,昭通的标本應該归到后一个属內,代表該属的一个齿冠結構原始的新种。

我国过去发现的剑齿象属化石有七、八种,整个說来,它們都比昭通的要进步。华南已知的各个种,如前东方剑齿象 (*S. preorientalis*), 东方剑齿象 (*S. orientalis*), 中国剑齿象 (*S. sinensis*) 等,它們的臼齿构造都比昭通标本进步得多,地質时代一般也較晚,除前东方剑齿象外,都为更新世中、后期。

北方发现的各种剑齿象,时代大都为上新世,只有近年来才发现在較晚的地层中(更新世早期及中期)也有这一属象类的代表。一般說来,上新世的各个种的臼齿带有較多的原始性質。

发现于山西榆社的桑氏剑齿象 (*S. licenti*) 是我国目前已知剑齿象属化石中最原始者,除了較小外,上第三臼齿有 6 个齿脊,每一齿脊一般有四、五个乳突,在前几个脊上还有清楚的三叶式結構,这些性質都和昭通剑齿象的較为接近,甚至可以認为比后者的更为原始一致。但是桑氏剑齿象的臼齿齿冠的形态特点,例如齿冠后部不甚收縮,略成方形,后面的脊(第五、第六)发育比較完全,齿脊兩側的外壁較陡直,脊間的沟較深等,使得桑氏剑齿象的臼齿构造显得更接近于晚期的(或比較“典型的”)臼齿的型式,而昭通剑齿象的相应的构造显得和古剑齿象的牙齿較为相似。这些差别表示这两种象在系統上有一定的距离。根据現有的資料,还不能看出它們之間真正的关系来。

师氏剑齿象 (*S. zdanskyi* Hopwood) 及一些可能是它的同物异名的种是本属內在我国北方发现材料最多和分布較广的一个“种”,关于它的研究工作做得也較多。但無論在分类和时代上还有不少問題,有几点我們将在本文內作初步探討(見后)。但無論是典型的师氏剑齿象或与之相近的种(如榆社剑齿象 *S. yushensis* Young) 都比昭通的种进步。师氏剑齿象个体較大,下第三臼齿有 7 个半以上的齿脊,齿冠較高。榆社剑齿象只有一个上第二臼齿为代表,但齿脊的乳突数較多,牙齿的一般构造已完全与晚期典型种相同。

昭通标本也有一些与山西涇河的剑齿象相似的性質,主要是臼齿齿冠的外輪廓都成后部收縮的腎状形,前面脊有較显著的中沟,第一脊的后方谷部有一孤立的乳突等。这些相似点显然在分类上不是很重要的。

剑齿象化石在东南亚各国分布均相当广泛，种类也很多。但是很难有可与昭通直接比較的类型。除了归于古剑齿象属的各种以外，一般都是較为进步的种，例如在地区和层位上較近的緬甸更新統中發現的 (*Stegodon elephantoides*) 虽然牙齿的齿冠較低，与昭通标本較相近似，但第三臼齿的齿脊至少有 10 个。

綜合各方面的特征和与相近种的比較，我們可以看出，昭通剑齿象比其他目前已知的各个种具有更多的重要特点，表示它更接近于古剑齿象中的进步类型（例如：*Stegolophodon latidens*），并可以作为从后者进化到“真剑齿象”属的中間类型的代表。

三、师氏剑齿象的性質与时代

(1) “分类” 概 况

在上节內討論关于昭通剑齿象化石与我国各有关剑齿象种比較中，提到师氏剑齿象的問題，这里再作一些补充。

师氏剑齿象 (*Stegodon zdanskyi* Hopwood) 的化石至今仅发现于华北，主要在山西境內。正型标本是一个第三上臼齿的前半部分，是在上海购买的 (Hopwood, 1935)。后来德日进和湯道平 (Teilhard de Chardin and Trassaert 1937) 記述了大量在榆社盆地收集的标本。他們把基本上相近而变化相当大的許多标本都归入这个种內。以后，楊鍾健、刘东生等也記述过一些这一种象的标本 (Young and Liu, 1949)。德日进和罗学宾 (Teilhard de Chardin and Leroy, 1942) 在整理中国哺乳类化石資料时，曾經将胡步伍 (1935) 在定师氏剑齿象时定的另一个种——药鋪剑齿象 (*S. officinalis* Hopwood,) 和楊鍾健定的在榆社盆地“上新統”发现的一个种，榆社剑齿象 (*S. yushensis* Young, 1935) 合并入师氏剑齿象，认为都是后者的同物异名。药鋪剑齿象的材料很少，种的特征不是很明显，是否是一个独立种尚有問題，有可能就是师氏剑齿象。榆社剑齿象的标本 (正型)，原作者认为是一个第三上臼齿，实际上可能是一个第二臼齿。但是作为一个第二臼齿仍然比师氏剑齿象的相当的臼齿小得多，牙齿釉质层的結構也比較細致，不象后者的那样粗壮和較簡單。因此，显然不是属于同一个种的。

(2) 师氏剑齿象的地质时代

胡步伍在定立师氏剑齿象这个种时，由于沒有关于化石的地点和层位資料，沒有說明它的地质时代。后来，由于許多新材料的发现，一般都认为它是华北三趾馬动物羣的一个成員，其时代为早上新世。但德日进等在研究榆社盆地的大量化石时，对于它的时代为蓬蒂期这一点，还不能确定，而在中或上上新統 (榆社統 II 带) 中則肯定有了它的存在。德日进并在他后来的工作中更对此作了明确的肯定 (德日进 1941 “东亚地质及人类原始”)。但是，另外一些作者，如楊鍾健、刘东生及我国一般文献中，都仍然将它作为比較典型的上新世早期的一种剑齿象。实际上在过去很长一段时期內 (1935—1960)，可能除了榆社的一些材料外，沒有一个标本是有較明确的地点記錄的。

最近，胡长康 (1962) 描述了一个甘肃礼县的师氏剑齿象标本，和它共生的有大唇犀等化石。但从礼县的化石名单看来，属于較晚时代的可能性仍然是存在的 (与榆社統 II 带化

石比較)。

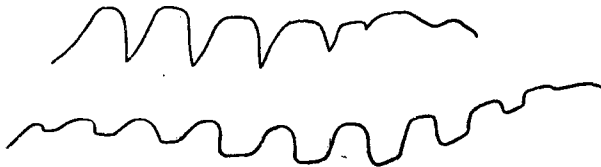
(3) 山西太原青龙鎮和芮城匭河的劍齒象化石

目前关于师氏劍齒象的时代方面的資料,最突出的是山西太原和芮城的发现。前者据王择义(1961)的鉴定“似为师氏劍齒象”。这个化石发现于更新統中,与梅氏犀(*Dicerorhinus mercki*)一起,因此其时代可能为更新世中期。劍齒象化石,一个第二臼齿,有5个半齿脊,比榆社劍齒象还小,或者说只有典型的上新世种(如甘肃礼县的)的一半左右,因此,看来可能不会是师氏劍齒象。

芮城匭河的劍齒象化石与肿骨鹿(*Megaloceros pachyosteus*)、扁角鹿(*M. flabellatus*)、“披毛犀”(*Coelodonta* sp.)等共生,并同时发现有石器。这一动物羣經賈兰坡等(賈兰坡、王择义、王建,1962)研究后认为其时代为中更新世初期。劍齒象化石經初步鉴定认为也是师氏劍齒象。

匭河的标本(一个右下第三臼齿)和师氏劍齒象从一般形态上观察,的确很相似。但是,我們如果和过去已知的师氏劍齒象的丰富材料比較,尽管其中表现的变异范围很大,匭河的标本还是表现有好些重要的差别。首先,师氏劍齒象是过去知道的劍齒象属中最大的一个种。第三下臼齿的最大长度可达335毫米,但是匭河的标本比这还要长大(343毫米);其次,师氏劍齒象的第三下臼齿至多只有八个齿脊,而匭河的标本则有9个完全的齿脊,后面还有一个相当发达的跟座;另外,匭河的牙齿的齿脊前后壁比較陡立,谷部寬闊,

近于“U”形,和师氏劍齒象有明显的差别(見附图),后者齿脊的壁成斜坡状,谷底部为較窄的“V”形。从这些特征看来,如果两者是属于同一支系(phylum)的話,那末,显然匭河的标本要比师氏劍齒象进步。



劍齒象第三下臼齿縱切面上齿脊谷部形状示意图

上: *Stegodon zdanskyi* 据德日进图版 VI. 图 3 榆社标本。

下: *Stegodon chiai* sp. nov. 据匭河标本。

由于上述这些臼齿形态和地质

时代的差别,我們认为匭河的标本是劍齒象属的一个新种,并訂名为:

賈氏劍齒象(新种) *Stegodon chiai* sp. nov.

种的特征: 一种进步的劍齒象,个体大于本属中目前已知的任何一个种。下第三臼齿长大,由九个齿脊組成;齿脊較高,前后壁近于陡立;各齿脊間的谷寬闊,略成U形。

时代: 更新世中期。产化石地层层位可能与周口店地点(下部?)相当。

种名贈与賈兰坡教授,作为他对山西第四紀地层、古生物和石器研究上作出了許多貢獻的紀念。

太原青龙鎮的“师氏劍齒象”化石,从层位上看来,可能和賈氏劍齒象有关系。由于目前缺乏可以直接对比的材料,还不能作更多的推論。

四、結 語

(1) 云南昭通的哺乳类化石羣从整个組成上看来，应该是一个代表更新世初期的动物羣，在层位上可与元謀动物羣的层位及緬甸的“上伊拉瓦底层”对比。

(2) 昭通的剑齿象(新种) (*Stegodon zhaotongensis* sp. nov.) 在許多主要特征上接近于古剑齿象 (*Stegolophodon*)。因此，从形态上說，可以代表目前剑齿象屬中最原始的一个种。

(3) 过去被訂为“师氏剑齿象”的标本中，包括不同类型的化石，有的可能不是属于这个种的，如太原青龙鎮的标本。

(4) 德日进等认为药鋪剑齿象和榆社剑齿象是师氏剑齿象的同物异名。我們认为榆社种与师氏剑齿象有很大差别，应为一独立的种。

(5) 山西芮城匭河发现的被鉴定为“师氏剑齿象”的标本，与后者有重要区别，代表本屬内一个很进步的新种——賈氏剑齿象 (*Stegodon chiai* sp. nov.)，其时代为更新世中期。

(6) 师氏剑齿象的时代最早认为是在上新世早期，后来的发现表示可能包括整个上新世及更新世的早期及中期。根据本文内的分析，我們认为目前能肯定的只有上新世中期(及后期?)，早期的还有疑問。更新世的化石和上新世的有很大区别，不能认为是属于同一种的。

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EARLY PLEISTOCENE MAMMALS OF CHAOTUNG, YUNNAN, WITH NOTES ON SOME CHINESE STEGODONTS

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During a visit to the Provincial Museum of Yunnan in Kunming the senior author of the present paper was brought to the attention of a collection of mammalian fossils from Chaotung Basin in the northeastern part of that province. These fossils were later entrusted to the authors for study. In order to have an understanding of the geological condition of the fossil locality a short trip to Chaotung was made by Mr. C. H. Chiu and Miss P. Y. Wang who are then with him in the field. Besides some data on the occurrence of the fossils a molar fragment of a stegodont was also collected by them during the trip. The preservation of the fossil as well as its specific identity with the one in the Museum collection give testification to that they are of same provenance. The contents of the present paper include a notice of the fauna with more detail description of a new species of *Stegodon* and a preliminary discussion on some Chinese stegodonts.

I. PLEISTOCENE MAMMALIAN FAUNA OF CHAOTUNG, E. YUNNAN

The fossil bearing younger sediments of the Chaotung Basin are divisible into two parts, the lower one of which is considered generally as of late Pliocene age. It consists chiefly of lacustrine clays with intercalating lignitic beds. Overlying above it is a series of sands and gravels unquestionably of Pleistocene age. The mammalian fossils under consideration are all from the lower part in or near certain lignitic beds. Fossils of freshwater gastropods are also found in abundance. All the fossil bones are of such characteristic chocolate color as is usually the case with fossils preserved in lignitic sediments and the enamels of the teeth are all jet black and with shiny appearance. The mammalian fossils identified in the collection include the following species:

Felis sp.

Zygodon sp.

Stegodon zhaotongensis sp. nov.

Elephas sp. (cf. *E. hysudricus*)

Tapirus sp.

Equus cf. *yunnanensis*

Sus sp.

Muntiacus sp.

Bovids

Among the mammals listed above some are of little value for dating; but the presence of some of these are significant. The occurrence of *Equus* and *Elephas* give confirmative evidence for a Pleistocene dating of the fauna. That of *Stegodon* and *Zygodon*

phodon are difficult to ascertain at present, but certainly they are in no way in collision with such an inference. Therefore, it seems to be reasonable to consider the Chaotung fauna as a correlative of Yuanmo or Makai fauna (Colbert, 1940; Pei, 1961) of the same region, which may in turn be correlated with the *Gigantopithecus* fauna of Kwangsi and Upper Irrawaddy of Burma (Chow, 1958).

II. DESCRIPTION OF A NEW SPECIES OF *STEGODON* FROM CHAOTUNG, YUNNAN

Stegodon zhaotongensis sp. nov.

Diagnosis: A *Stegodon* of rather large size. Molars with few ridges and primitive in structure. Third lower molar with six fully developed ridges and a talonid; each ridge crest consists of a few (6—8) mammillae; median sulci distinctly present on all but the penultimate ridge. Crown of tooth very low, broadly reniform with narrower posterior. Cement almost nonexistent.

Type: A fairly complete left mandible with essentially complete third molar (IVPP-V2647); Paratype—anterior half of another tooth (V2648).

Locality and Horizon: Houhetze, Chaotung (=Zhaotong) District, E. Yunnan; Lower Pleistocene sands and lignitic beds.

Remarks: The type molar has an estimated length of 254 mm. It has rather broad crown, the measurement for the anterior four complete ridges are: 101(II), 106(III), 108(IV), 109(V). The crests are comparatively low (around 40 mm.) and narrow-topped. Each ridge consists of a few mammillae, those near the median sulcus are stronger than the lateral ones. The fifth and sixth ridges have only 6 and 5 mammillae respectively. Besides, the number of ridges as well as the mammillae on each ridge are fewer than in any other known stegodonts. These and a number of other characters such as the brachyodonty of crown, scantiness of cement, etc. indicate that the molar is very primitive in structure. It is in many respects similar to those characteristic of the genus *Stegolophodon*. But it has fully developed *Stegodon*-type ridge crest with multiplication of conules and that the presence of accessory conules are not apparent. Therefore, the Chaotung specimen is essentially a typical *Stegodon*, but with very primitive molar structure.

In comparison with the known species of *Stegodon*, the new species seems to bear closer resemblance to *S. licenti* from Lower Pliocene (Zone I of Yushe) of Shansi. Both show a number of characters which are considered to be primitive to the group. However, though *S. licenti* has similar small third molar with six ridges, each of which consist of but 5—6 conules, it differs from the Chaotung specimen in having posterior ridges fully developed as the anterior ones and in that all the crests are compressed in such fore-and-aft direction that the sides are high and much steep-sloped as in the more advanced later forms. While those of *S. zhaotongensis* are very low, with gently sloped and narrow-topped crests.

All the other known species are too advanced in molar structure to entice a direct comparison with the new species.

III. NOTES ON SOME CHINESE STEGODONTS

Stegodon zdanskyi Hopwood is the commonest stegodont found in N. China. As the type specimen was bought in Shanghai, the age of it was at first unknown. Later more specimens were discovered from the Pliocene of Shansi. While most of the authors consider it to be Pontian, Teilhard de Chardin (1937, 1941), however, held the view that only its occurrence in Middle or Upper Pliocene (Zone II of Yushe) is verified and that the generally supposed Pontian age of the species is doubtful. In recent years a number of localities with fossils of this species have been reported. Thus it is now supposed to have a stratigraphical range from Lower Pliocene to Middle Pleistocene inclusive (Wang, 1961; Chia etc., 1962; Hu, 1962).

The taxonomic status of the species is likewise in a state of confusion. The type specimen of the species is the anterior half of an third upper molar, a cast of which are now available in IVPP. The species is well founded and characterized by its large size and rather primitive molar structure. Later, Teilhard de Chardin and Trassaert had assembled into it a host of forms from the Yushe Basin and, in addition, they considered that *S. officinalis* Hopwood and *S. yushensis* Young as synonymous. An closer examination of all the available materials reveals that the species as understood by Teilhard and his associates (1937, 1942) is not a coherent one. The character of *S. officinalis* is not yet clear, it is possibly synonymous with *S. zdanskyi*. The specimen described by Young as *S. yushensis* is of a second upper molar instead of being the third as was thought by the original author. Nevertheless it is much smaller than the corresponding tooth of *S. zdanskyi* and has more crenulated enamels. Evidently it is specifically different from the latter.

The specimen described by Wang (1961) from Taiyuan, Shansi, is found in association with *Dicerorhinus mercki*. It is claimed to be of Middle Pleistocene age. The tooth, an upper second molar, is still smaller than that of *S. yushensis* and over 50% smaller than in *S. zdanskyi*. But the occurrence of a stegodont with Merck's rhinoceros in a definitely Pleistocene horizon is highly interesting.

Another complete lower third molar, from Kehe on the northern bank of Huangho River in Shansi, evidently not rolled, was recorded recently by Chia, C. Wang and C. Y. Wang (1962). The specimen which is determined as that of *Z. zdanskyi* were excavated from Middle Pleistocene sands together with the other mammalian fossils including those of *Megaloceros flabellatus*, *M. pachysteous*, *Coelodonta* sp. etc. Besides, there are Paleolithic implements found in close association. The locality or site has been correlated with Lower part of Loc. I deposits of Choukoutien.

We found that the tooth in question, though resembles that of *S. zdanskyi* in general, differs in some important points that the specific identity of the two can hardly be maintained. The Kehe specimen differs from the type and other more typical specimens of *S. zdanskyi* in, first of all, being much larger in size. It is 343 mm. long. While the largest M_3 in the other is only 335 mm. Secondly, it has nine complete ridge plates plus a tylonid instead of eight. Besides, the ridges on Kehe specimen are more widely separated from each other by broad valleys and the slopes of the ridges are higher and steeper. As a whole the tooth is considerably more progressive than that of *S. zdanskyi*. We suggest to consider it as a new species of stegodont as defined below:

Stegodon chiai sp. nov.*

Diagnosis: An advanced stegodont larger than any known species of the genus. Lower third molar long, with nine fully developed ridges plus tylonid; ridge plates high, steep-sloped, and separated from each other by broad "U" shaped valley.

Distribution: Pleistocene (Middle) of North China.

IV. CONCLUSION

(1) The mammalian fauna of Chaotung, E. Yunnan, is most probably one of Early Pleistocene. It is characterised by the presence of such forms as *Equus* cf. *yunnanensis*, cf. *Elephas hysudricus*, and *Zygodon*. It can be considered as a correlative of the Makai and Upper Irrawaddy.

(2) The new species, *S. zhaotongensis*, is the most primitive stegodont hitherto described on the basis of molar structure.

(3) The fossil stegodonts formerly grouped under the specific name *S. zdanskyi* include a heterogeneous array of forms. *S. yushensis* is specifically distinct. The specimen from the Pleistocene of Taiyuan is definitely not of *S. zdanskyi*.

(4) The tooth identified as "*S. Zdanskyi*" from Kehe is a form considerably more advanced than *S. zdanskyi*. It is a new species to which the name *S. Chiai* is proposed.

(5) The geological age of *S. zdanskyi* which was for some time thought to range from Early Pliocene to Middle Pleistocene is untenable. Its presence in Pleistocene is not proved and unlikely.

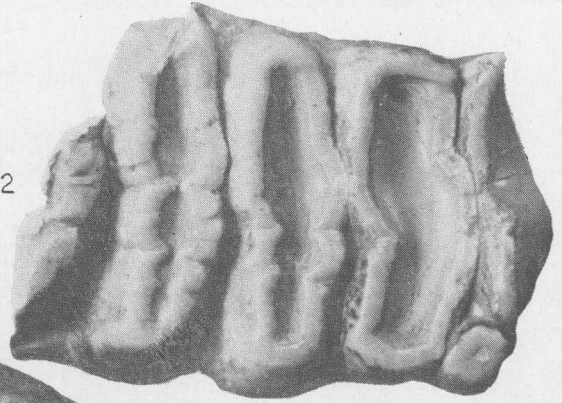
(6) For many years it was thought that in general the stegodonts become extinct in N. China at the beginning of Pleistocene. It is now evident that they survived at least to Middle Pleistocene as in S. China.

* Chia, L. P., Wang, T. Y., Wang, C., 1962. Kehe-an Early Palaeolithic site in S. W. Shansi. Mem. Sino. S. Inst. Vent. Paleon. and Paleoanth., Acad. Sin.

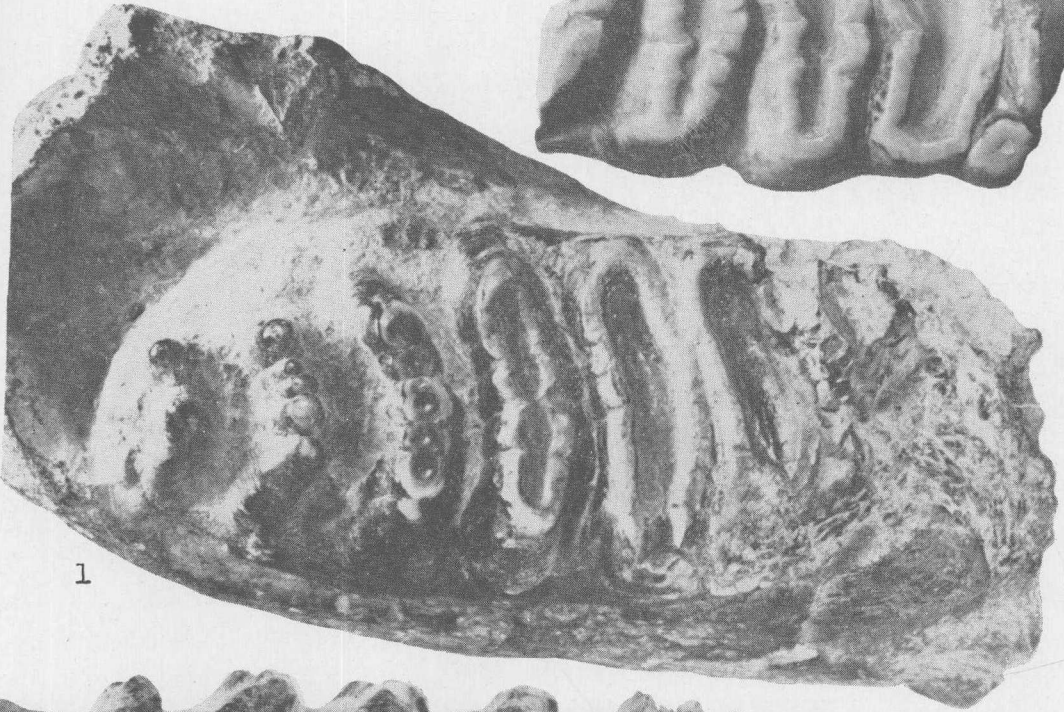
图 版 說 明

1. *Stegodon zhaotongensis* sp. nov. 正型标本, 左下頷及第三下白齿。1. 頂面觀, 1a. 舌面觀。× 1/2。
2. *Stegodon zhaotongensis* sp. nov. 副型标本, 左下第三白齿的前半部。× 1/2。

2



1



1a

