

陕西蓝田柄杯鹿 (*Lagomeryx*) 的 发现及其意义*

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一新柄杯鹿的发现

1964 年四月, 古脊椎动物与古人类研究所蓝田调查队, 从该县泄湖公社高坡村采得了一个保存相当完好的柄杯鹿化石。由于这一发现具有生物上和地层上的特别意义, 特在本文加以描述。

柄杯鹿科 *Lagomerycidae* Pilgrim, 1941

柄杯鹿属 *Lagomeryx* Roger, 1904

复角柄杯鹿, 新种 *Lagomeryx complicidens* sp. nov.

正型标本 一近于完整之右“角”, 野外号: 64004。本所化石编号为 V. 2780。

层位与地点 上中新统。陕西蓝田泄湖人民公社高坡村附近。

特征 角柄长而直, 切面为椭圆形。接近眼孔处无基部。角顶掌状部由四个基本部分组成。但前枝又分为二, 后内枝亦分为二, 外枝分为三, 只有内枝为一, 共八叉。掌状部向前倾斜, 椭圆形, 中部微凸。

描述 由部分保存的眼孔位置和分叉的后内角部位判断, 这一角应为右边的。根部只保存了眼孔部分约 22 毫米直长。根部无基节部的任何痕迹, 角柄较长。前外从眼孔到掌状底 135 毫米。后内从根部到掌状底为 145 毫米。角柄很直, 毫无弯曲, 前内到后外较扁平, 中部直径为 18×14 毫米。成一以前外部较窄, 后内部较钝的轮廓。骨面稍受磨蚀, 但可以看出有沿骨干平行的条纹。

角顶端掌状部分, 比任何已知的柄杯鹿都复杂。但可以明显看出, 基本上由三部分(或四部分)组成。这几部分都是由柄顶端近根部分出的, 和其他次分枝由距柄顶端较远处分出来的极不相同, 这性质由掌状的腹面看的特别清楚。

第一主分枝(图 1, 1)显然代表前枝, 微向外, 根部通至角柄前外稜的内侧。它在距根部 14 毫米处分而为二, 内侧者较大, 腹侧尖端已破, 外侧者较小, 尖部也残缺, 断面圆形。根部宽 29 毫米。

第二主分枝(也可以再分作二主分枝 2_1 和 2_2), 根部连接在一起, 但 2_1 和 2_2 还是较清楚地分开。 2_1 代表向外的一枝, 尖端已破, 但圆锥状的形状还可看出。这一枝在较近根部

* 6 月 27 日收到。

和 2_2 分开,几可当作独立的一枝。 2_2 代表向后内的一主枝,但在距根部较远处又分而为二。前者较粗大,保存完整,后者较细小,尖端已破,但均呈圆锥形。 2_1 及 2_2 根部均宽 20 毫米,两者根部宽为 36 毫米。

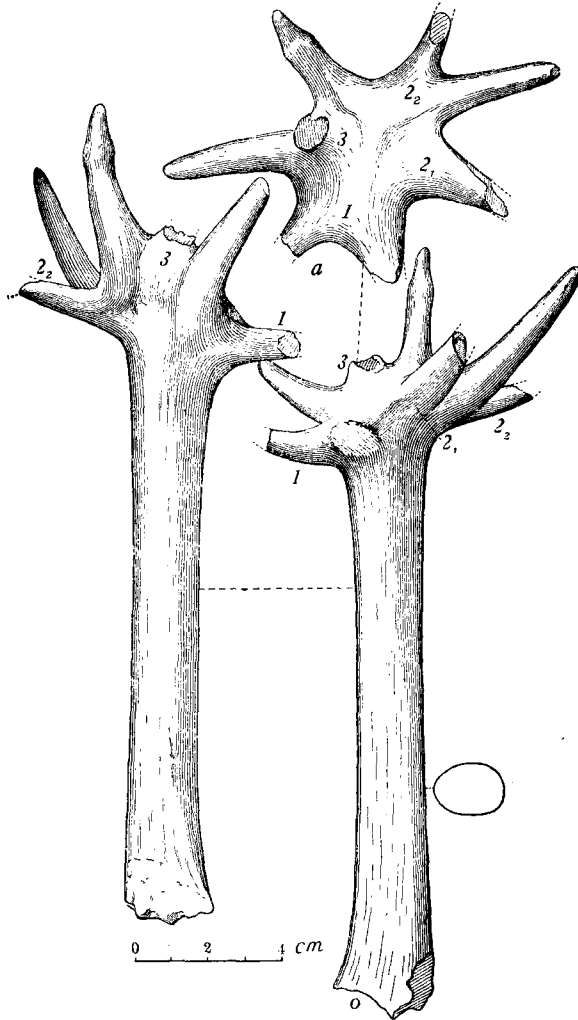


图1 复角柄杯鹿,新种。右角内视、外视及顶视,附茎部切面。
a. 前面, o. 眼孔部, 1—3 表示不同分枝。详见正文, 原大 1/2。

Fig. 1, *Lagomeryx complicidens* sp. nov. A right "horn" in inner and outer views with palmature of the dorsal view and the cross-section of the shaft. a, anterior side; o, orbital border; 1—3 indicating the various branching of the tine. For details see text. 1/2 nat. size.

第三主分枝为代表向后外的一枝,在距根部约 15 毫米处又分为三枝,两边者较完整,中间者在距根部很近处破裂。完整的两分枝也作尖圆锥状。向后的一枝,在距尖端不远处作肿胀状,显然为病态发育(受伤而复愈)。中间破裂的疤距两边者距离差不多相等,所以应当看作是不属于任何一个的分枝。

由以上记述可以认为,这一掌状物一级的分枝应为三,二级的分枝应为一,而三级的分枝成为四,共八枝,如图一所示。这八个分枝所幅展而成的掌状面约作圆形,没有任何象涂氏皇冠鹿那样前后拉长之状。所成的面,后高前低,向前倾斜,远不如涂氏皇冠鹿和三叉柄杯鹿那样近于平坦,也不如辛氏柄杯鹿那样近于直的倾斜。各分枝的面几乎都是平滑的,仅有很轻的条状组织。在掌状体的腹侧,特别是 3 (有凹入部分) 可以看出有和柄部相连的裂纹。

鉴定与讨论 以上所描述的标本,应属柄杯鹿这一属似无疑间,因为它和这一属已知的种,同具有显然没有脱落现象的角和长而附有或多或少复杂的分枝和掌状部分。

到目前为止,一共有五种已知的柄杯鹿,欧洲二,亚洲三,都是上

中新统的。蓝田的化石和其他五种俱不相同,可列表于次(331 页)。

以上列举的七个性状,多数可靠,少数乃根据原作者复原图判断(特别是 6 和 7),不一定可靠。但无论如何,蓝田标本和这些都有显著的区别。如果要找近似的种的话,当以通古尔的二叉柄杯鹿较为相近。和山旺的辛氏柄杯鹿相差最远,几无一性状相同。和柴达木柄杯鹿也有很大区别。和欧洲的二种除柄部较接近外,差别也不小。

	藍田標本	<i>L. simpsoni</i> (Shanwang)	<i>L. tsaidamensis</i> (Tsaidam)	<i>L. triacuminatus</i> (Tung Gur)	<i>L. meyeri</i> (Stätzling)	<i>L. praestans</i> (Chitenay)
1. 柄 Pedicle	直長 Straight and long	向後彎曲長 Curved and long	向前彎曲長 Curved and long	直長 Straight and long	微彎長 Nearly straight and long	同左
2. 柄断面 Cross-section of the pedicle	較扁平 Compressed	圓 Circular	相當圓 Nearly rounded	? 同左 Nearly rounded as judged by the figures of Colbert	較圓 Rather rounded	同左 Rounded
3. 頂端分枝處占全長 Length of the palmated whole "antler"	小於 $\frac{1}{3}$ Less than one third	大於 $\frac{1}{3}$; 德標本 $\frac{1}{2}$ More than $\frac{1}{3}$; Teilhard's specimen about $\frac{1}{2}$	—	非常大於 $\frac{1}{3}$ Largely more than $\frac{1}{3}$	約 $\frac{1}{5}$ About $\frac{1}{5}$	非常大於 $\frac{1}{3}$ Largely more than $\frac{1}{3}$
4. 上端分枝 Main forks	基本 4, 共 8, Basically 4 with 8 branches	基本 2, 共 3, (Young's specimen) 基本 2, 共 5 或 6 (Teilhard's specimen)	4—5 依步林圖 4—5 According to Bohlin's interpretation	基本 3, 共 5 Basically 3 with 5 or more branches	基本 3 Basically 3 with? 5 branches	基本 2 With 2 branches
5. 次生分枝數 Number of secondary forks	3—4	1—2	?	1—2	1—2	1
6. 整個角對於頭的位置 Position of the whole "antler" to the skull	向後傾斜 Slanting moderately backwards	下部後傾, 上部向上, 甚至有向前趨勢 Lower part slanting backwards while the upper part directs upwards and slightly anteriorly	?	向後傾斜 Slanting backwards	稍向後傾 Slightly backwards	向外向前 Anterolaterally
7. 掌狀部分對於角干的位置 Palmated part in relation to the beam	大約與干軸成 20° Moderately large ca. 20° to the axis of the beam	很小, 幾與干軸平行 Very small, almost parallel to the axis of the beam	小, 稍向前傾 Small, seemingly slanting anteriorly	小, 幾與干軸垂直 Small, nearly perpendicular to the axis of the beam	同左 Same as the preceding one	小, 較向前傾 Small, rather oblique in position with the axis of the beam

由于掌状的特殊结构,再加上直长而较扁的柄,蓝田标本,应代表一新的柄杯鹿,其特性已见上。兹定名为复角柄杯鹿。

对于已知中国柄杯鹿的注释

在欧洲已知的两种柄杯鹿 (*L. meyeri* 和 *L. praestans*) 在此不拟具论。它们都比我们的较原始,掌状分枝也比较简单。

中国已知的其他三种(蓝田标本除外),除通古尔标本外,均保存于本所,今乘研究之便,可作如下的注释。

1. 通古尔的三叉柄杯鹿 可述的不多,其主要掌状三叉大约相等,靠外一枝有次生分枝,实际上前部还有一主枝,并具有分叉(在复原图上作三小枝)。应当说是一可靠的种。此种原归皇冠鹿属,作者本人及一些古生物学家均公认为归柄杯鹿属。

2. 柴达木的柄杯鹿 其原型标本,和可能归于这一种的标本,均在手边,经对照原记述加以比较,有如下的意见。

步林的361材料,据原作者称属于同一个体,但未能完全凑于一起,我把原材料对比一下,自不能有所怀疑,它的主干向前弯曲(凸面向前),并称 *L. meyeri* 及其他种为向外(这在 Stehlin 的复原图上看不是很清)。如果左右鉴定不错的话,虽然柴达木标本和山旺 *Heterocemas* 的原型标本大小相近,也有弯曲,但前后恰相反。至于顶部掌状构造,相去更远,前者有小而向左右伸展的顶部,和山旺及通古尔见的均不相同,但和后者较近。和蓝田标本的广大而前后延伸的掌状顶部也不同,所以柴达木标本,应当代表一具有特性的种。至于上部分枝,步林当作五个,从一些零碎的分枝来看相当之长。最长的比蓝田最长的还长,和其他两种差不多,也可当作一特性。

3. 山旺的柄杯鹿 原来我所描述的异角鹿正型是很特殊的,当初初步所订之系统,已由德日进改为和他所描述的新型相近,而一同列入柄杯鹿属。现在把所有山旺保存的鹿类标本加以比较(包括解放后胡长康 1957 年所描述的和新采而未描述的一些不完整的角干和角分枝),得出两个截然相反的看法。

一个看法是德氏所描述的标本,尽管照他所说和我原有标本相同,但还有一些显著的区别。如他的标本分枝在全长一半以下部分(全长为 220 毫米,柄部 97 毫米,正型全长 215 毫米,柄部 139 毫米,均为 2/3),并非如他所说为三分之一的分枝部分。其次,正型标本,只有两个主分枝,单一者倾向前,有次分枝向后,一外一内,此在大体上和 Stehlin 的 *L. praestans* 有些相象,不过后分枝的分叉较高些,也很短。德氏所描述的标本,照他的解说为左侧,那末他所谓下部破了的角显然朝外,而非朝前,且视为又有次生分枝的。上部的三叉角(德氏照的 a、b、c 和原型极不相同。次生分枝很低, a 不能当作原型的次生分枝,相当两后枝,一内一外,倒可以相当于正型主枝。这显然不能照德氏所想,仅仅用年龄和个体变形来解释的。照这样的看法,德氏的标本应另作一种,不与正型相同。在这一种可能下,这个标本,至少应当作一新种。名为德氏柄杯鹿。

未描述的标本中,有一主干,也向后弯曲,比两者均稍细,另有更残破主干,大小相同,还有三个分枝的末段。这些标本,可以归正型,或德氏的标本一型中,因材料太破,难作肯定。

把我 1937 年所描述而未能定出來的標本 (p. 226, Fig. 10, c and d) 和德氏的標本相比, 倒可以認為 c 是相當德氏的圖 a、b、c 部分 (a 殘缺)。不過掌狀部稍寬一些, 而分枝却短一些。至 d 却有可能相當於我原來正型的後上枝末梢部分, 不過約大一半, 應代表一較大的個體。

胡長康所描述的角, 似乎不屬於涂氏皇冠鹿 (見下), 但也不完全和德氏的標本相同。這個標本的三分枝在同一平面上, 也沒有次生分枝, 只有在下一解說下, 才可能歸於一種。

另外一個看法是, 假設山旺的鹿化石是十分多變形的, 不但如德氏所述, 他的標本和原來正型標本, 都是一種, 而且連我原記述的 *Stephanocemas colberti* 也可歸此種, 支持這個說法的事實為兩個角 (特別是正型圖 10, a)。看來和德氏的標本的分叉處, 也有些可比之處, 前角低, 後者高, 其中有一斜的面。

兩個看法相比, 後者似難以成立, 因其角干直而短, 再加上還有基節部的痕迹, 所以我們認為原來所定的 *Stephanocemas colberti*, 在分類上與目前所討論的柄杯鹿屬完全不同。

關於柄杯鹿的系統位置

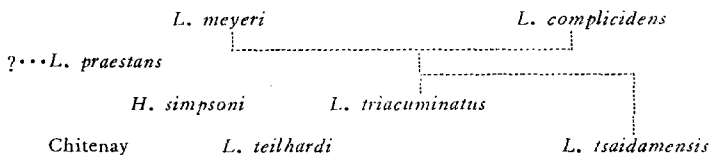
早在 1939 年德日進研究了山旺的標本以後, 就提出應把中新統一些原始的鹿, 包括柄杯鹿、原麕 (*Procervulus*) 列為一新科, 但未給名稱。1941 年皮克林 (1941, a. p. 136; 1941, b) 發展了這個概念, 並建議用柄杯科 (*Lagomerycidae*) 這一名稱。1945 年在辛普生的哺乳動物分類原理 (1945, pp. 158, 268) 中有一定保留地採用了這個辦法, 而把它列入於麒麟超科中。差不多同時的羅美爾脊椎古生物學教科書 (1945, p. 621) 卻沒有這樣做, 而仍把柄杯鹿列入鹿超科中的古鹿科 (*Palaeomerycidae*)。新出版的法國古生物學大全第六卷偶蹄類部分把它列為亞科, 但仍放在鹿超科的鹿科中。1962 年蘇聯所出古生物學基礎哺乳動物部分 (p. 342, 361) 把它當作一科, 和鹿科與麒麟科並列, 但在內容上無任何增加。多年以來材料並沒有什麼增加, 同時也反映出關於柄杯鹿的系統位置, 還是一個未解決的問題。但是共同之點是都同意把柄杯鹿當作一科或亞科, 以強調其系統上的位置。

藍田發現的復角柄杯鹿, 為近年來這一科唯一的新材料, 而且化石保存完好。就這個標本看, 角很直而較扁, 杯狀部與柄部無顯著脫落的痕迹。我本人支持德日進、皮克林、辛普生等的做法, 不但當作一科, 而且認為其關係距麒麟科更近一些, 應列入麒麟鹿超科之下。看來這一科的系統位置, 科內成員及其大體關係可以表列如下:

Infra-order Pecora

超科 Superfamily Giraffoidea 辛普生, 1931

科 Lagomerycidae Pilgrim 1941



Europe	Burdigarian	Vindobonians	Sarmatian	上新統
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山 旺

通古爾

藍田
柴達木

由这表所示,只有辛氏亚角鹿和欧洲的 *L. praestans* 可以有关,其他亚洲三种都和欧洲的麦耶氏柄杯鹿可能有关。这样安排也表示:虽然这些含柄杯鹿化石的地层均归上中新统,但有可能山旺较老,通古尔次之,而蓝田和柴达木差不多同时。

应当指出,斯太林并不相信原始的鹿发现于亚洲而向欧洲发展(1937, p. 213),因之寇伯特的解释(1940, pp. 5—6)是多余的,以上的表只说明系统关系,丝毫不说明亚洲的种是从欧洲来的。我们对于中新统,特别是中中新统和以前的化石知识还所知太少,有可能将来能如古鹿(*Archaeomeryx*)的那样,在中亚大量发现(如1959年)。也只有发现更多的古老柄杯鹿,才能说明问题。

关于皇冠鹿

由于最初把柄杯鹿和皇冠鹿当作一属(Colbert, 1936)以及两属在多数地点一同发现(通古尔、柴达木)所以在此讨论一下皇冠鹿,看来不是多余的。至少就我国说,皇冠鹿分布较广,在地层上有特殊意义,也可以帮助进一步了解柄杯鹿。

通古尔的涂氏皇冠鹿 为这一属的典型种,材料也最完整,并且从幼到老的角均有代表,必然为一可靠的种,和 *L. triacuminatus* 共生。

柴达木和乐都的皇冠鹿 步林(步, p. 26, 108)在青海所找的皇冠鹿有两地点,一为柴达木(407),三个标本,只有一个亲见(407, 图40—41)和368一个标本;一为青海湖东接近甘肃的乐都县(碾北县,原归甘肃省)一个标本。所有标本都为冠状部,其中三个腹侧的和角柄接触的“疤”可看出,尤以较完整的乐都标本,最为清楚。由此标本看,和通古尔 *S. triacuminatus* 有两显著区别,一为“疤”位于中心,而不是如后者靠近前端,二背侧的平台部分也不如后者之前后拉长。407那一标本,如考虑到后部已破,疤也较在中部。这一标本凸侧破裂处,可能有一分枝。由这些性质看,青海的标本,似代表另一种,兹取名为青海皇冠鹿(*S. chinghaiensis* sp. nov.)。乐都发现皇冠鹿,十分重要,说明青海东部也有上中新统的存在,这和甘肃西部永登享堂附近舍利沟猪地点,只不过一百公里左右,可以和甘肃系相比较。

山东临朐山旺的皇冠鹿 前已说过,寇氏皇冠鹿归之柄杯鹿的可能不大,那末它还是应当最接近于皇冠鹿,不过这个标本很特殊,主要为三主分枝,而前者位置较低,真正形成的掌状面很小。有兴趣的是两个标本都和柄部紧相连接。正型标本清楚的有基节部的雛型,副型标本虽然无瘤状突,但也有界限可寻。德日进(1939, p. 272 脚注)不承认这个基节部的存在,因而将它还归于柄杯鹿。但也可能不当作为残存而是开始的基部。那就是应当比其它皇冠鹿更原始一些(简单的冠部,支持这说法)。因为如上所述,这一种的柄是短的,很难归入柄杯鹿。

苏联东哈萨克斯坦的皇冠鹿 苏联东哈萨克斯坦扎依桑盆地(Zaisan)所发现的皇冠鹿(Беляева, 1949),就所掌握的模式看,为一标准的皇冠鹿冠部,比柴达木的标本大,也稍大于通古尔的涂氏皇冠鹿,共有五分枝,但也沒有明显的前后拉长的冠状背面。是否为一新种,难以断定。无论如何这一属在中亚的发现是很有意义的。

以上四个皇冠鹿地点,其中三个是在中国,同产柄杯鹿。在通古尔,还有第三种,谷氏二角鹿(*Dicrocerus grangeri*)(另一种未命名),二角鹿在柴达木似乎也发现有两种,但带有

問号,未肯定。此外还有?*Eostylloceros* sp., 和另一种鹿 *Cervidae* indet。柴达木盆地的化石地点分布与地质情况,至今还未見发表。尽管如此,可以认为照原作者的結論当作一个动物羣,而这一动物应为上中新統的可能性是特別大的,至少由皇冠鹿和柄杯鹿看来是如此。

关于皇冠鹿的系統位置,几乎一致认为归于麋亚科,无何問題。几乎所有已知的(寇氏皇冠鹿除外)皇冠鹿掌状部均脫落,清楚說明和鹿一样是脫落的。相反的所有比較完整的柄杯鹿(柴达木柄杯鹿,是破裂,非脫落),柄部与分枝部均連在一起(尽管还有相愈合的痕迹),說明是不脫落的。

以上文稿准备过程中,本所李传夔同志帮助搜集有关标本和文献,胡长康同志提出一些意見,应当致謝。

本文研究未包括有关牙齿在內,因为在有牙齿的地点,其共生情形还是不明确的。这个問題有待以后发现了角和牙齿連在一起的头骨后,才能一并解决。

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ON A NEW *LAGOMERYX* FROM LANTIAN, SHENSI

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DISCOVERY OF A NEW *LAGOMERYX*

In April 1964 a field party of IVPP under the leadership of L. P. Chia discovered a nearly complete "horn" of *Lagomeryx*. It was found from the vicinity N. E. of the village Kaopu of the Yehhu commune. Since this find is of two-fold interest both biologically and stratigraphically, it is described and discussed in the present note.

Family Lagomerycidae Pilgrim 1941

Genus *Lagomeryx* Roger 1904

Lagomeryx complicidens sp. nov.

Material: A nearly complete right "horn". Field number 64004; Cat. no. V.2780.

Horizon and locality: Upper Miocene, N. E. of Kaopu, Yehhu, Lantian, Shensi.

Diagnosis: Shaft of the "horn" long and straight with the cross-section oval. The palmate area composed mainly of three or four parts. Anterior one branching out into two. The same for the posterior inner one. The external main tine is re-divided into three. Only the inner one is not divided. Altogether eight branches. The palmate middle part is oval in outline and inclines slightly anteriorly with the middle somewhat convex.

Description: Judged by the partly preserved orbital border and the direction of the forked posterior inner tine, this horn is certainly to be interpreted as the right side. Only about 22 mm straight length of the orbital border at the base of the horn is preserved. No trace of burr is observed. The shaft is rather long, anterior externally from the border of the orbit to the base of palmate part, 135 mm; the posterior inner length, 145 mm. The shaft is perfectly straight without any trace of curvature. It is weakly compressed with flat antero-inner and postero-external sides. Cross-section at the middle, 18×14 mm. The antero-external side is somewhat narrower than the broader posterior inner side. The surface of the bone suffered from erosion but rather fine, striations along the shaft are still observable.

The upper part of the "horn" is mostly complicated than any other known members of this genus. It is evidently composed of three (or rather four) parts. All the main parts are starting to branch at point quite near the base of the upper end of the shaft. They are easily distinguishable from the sub-forking which are branching far away from the shaft. This feature is clearly seen both in dorsal and in ventral sides.

The first main fork (Fig. 1., 1) represents evidently the anterior branch, little externally. The base of it lies a little at the anterior external ridge of the shaft. It forks into two sub-branches about 14 mm from the base, the inner one being larger and external one smaller. The ends of both are somewhat damaged. The cross-section of the outer one is circular while the inner one more flat. Breadth at the base, 29 mm.

The second main fork may be considered as two main forks, 2₁ and 2₂ in Fig. 1.

The base of it is firmly connected together but 2_1 and 2_2 are deeply separated. 2_1 represents the external branch, the tip of which is broken but it is clearly pyramidic in shape. It is separated from 2_2 rather near the root of the palmature, so that it may be considered as an independent branch. 2_2 represents the posterior inner branch. It is forked again at the point rather far from the base. The anterior one is larger and robust and the posterior one smaller and the tip is broken. Both are pyramidical. The base of 2_1 and 2_2 20 mm in breadth; base of both 2_1 and 2_2 , 36 mm in breadth.

The third main branch represents the external one. At the point about 15 mm from the base it is divided into three sub-forks. The middle one is damaged while the other two are intact and also pyramidic. The posterior one shows pathological development as clearly indicated by the swollen near the tip. It was probably injured and then recovered in life. The middle one is situated almost at the midway and should be considered as an independent sub-fork. Breadth at the base, 37 mm.

According to the preceding description, the palmate part of the horn may be considered as composed of three main branches with one secondary branch and four tertiary ones. The area formed by the eight radiated branches at the middle of the palmature is nearly rounded in outline and not so strongly extended antero-posteriorly as in the case of *Stephanocemas thompsoni*. This palmature is slanting anteriorly not in nearly horizontal position as that of the named form and *Lagomeryx triacuminatus*. It is, however, not so steep as in the case of *L. simpsoni*. The surface of those branches is nearly smooth and only weakly marked by some striations. In the ventral side of the palmature, especially near 3, with excavated area, the faint trace of the separation of the shaft and the complex upper part is indicated.

DETERMINATION AND DISCUSSION

That the fore going described specimen belongs to the genus *Lagomeryx* seems beyond any doubt, because all the known members of this genus show the same non-deciduous antler, long shaft and more or less complicated forks with palmature.

There are five well known species of *Lagomeryx*, in Europe two and Asia three, all Upper Miocene. The specimen from Lantian differs remarkably from all the known forms as shown in the tabulated way in the Chinese text (p. 331).

Since some features are deduced from the reconstruction of various authors (especially 6 and 7), their actual value may be doubted. Nevertheless, it is clear that the Lantian specimen differs from all of them. It is somewhat closer to *L. triacuminatus* and far apart from *L. simpsoni*. It is also quite different from *L. tsaidamensis* and the European species.

For the sake of the complexity of the palmature of the "horn" in addition to the straightness and the weakly compressed nature of the shaft, we propose to name it as *Lagomeryx complicidens*, new species, the diagnosis of which is already given in preceding pages.

COMMENTS ON THE KNOWN CHINESE LAGOMERYXIDS

There is little to say about the European lagomeryxids. They are more primitive, geologically older and with much simpler branches of the tine.

With the exception of the Tun Gur specimens all the others are kept in the Museum of IVPP, so that it is possible to make some side by side comparisons.

As concerning the Tun Gur *Lagomeryx* we have little to add. In addition to the three main branches there is still an anterior one which is again divided into three small ones. This is certainly a well defined species.

Bohlin's type of *Lagomeryx tsaidamensis* (361) was found from one site and belongs to one single individual but failed to put the main parts together. The main shaft curves anteriorly, a fact quite different from all the others. Its size approaches that of the type of *Heterocemas* but the way of bending is quite different. The palmate part is small and extends transversally, a feature distinguishing also from all the known forms. It is also a well established species.

In Shanwang of Shantung, the question is more complicated. The type of *Heterocemas* is considered by Teilhard as the same as his specimen with more complicated tines. In 1957 C. K. Hu described another tip part of tine as belonging to *Stephanocemas thompsoni*. According to my present observation, it is clear that the two specimens (Teilhard's type and my type) are quite different from each other. In Teilhard's specimen the following features are evident: 1, The lowest branch starts at the lower half of the whole tine complex and not at the upper one third as given by him (Whole length, 220 mm, Length of the shaft, 97; In the type of *Heterocemas*, Length, 215 mm. Length of the shaft, 139 mm.); 2, In the type of *Heterocemas* there are only two main branches, the single one directed anteriorly while the posterior one is re-divided: one externally and one posteriorly. Such construction is comparable with that of *L. praestans*, only the bi-fid part of our specimen lies much higher and shorter. 3, In Teilhard's specimen (According to him a left one) the lowest tine (his d) is directed apparently laterally and almost vertically situated. The other three branches (his a, b, and c) are quite different from that of ours. All these features cannot be simply explained the way of individual variation or polymorphism. It is very improbable to deduce the type of Teilhard from that of ours.

We feel it is more probable to consider Teilhard's specimen as a separated species for which we like to propose the name *Lagomeryx teilhardi*, new species. It may include the part of tine given by me in 1937, Fig. 10, c. and also C. K. Hu's specimen. The latter is larger and may represent an old individual. The fragments of tines collected recently are too poor for given a precise determination. Most of them are referable to *Heterocemas* rather than to *L. teilhardi*. The specimen given in my previous paper, Fig. 10, d may represent a bi-fid part of the posterior inner tine, but larger.

The wholly absence of an palmate area in *Heterocemas simpsoni* (in *L. teilhardi* it is incipiently indicated) suggests that the genus name *Heterocemas* may be retained as another genus of the family lagomerixidae for the primitive stage of development.

SYSTEMATIC POSITION OF LAGOMERYX

Following Teilhard's idea in 1939 Pilgrim erected the name lagomeryxidae under the super-family Giraffoidea. Simpson followed it in 1945 with some hesitation. In all the important latter works (Romer, 1945; Viret, 1962 and Orlov, 1962), it was considered either as a family or as a sub-family under the super-family cervoidea without, however, much new data concerning this interesting group. This shows also that the systematic position of the family is not yet settled.

The Lantian specimen is the only new material secured recently. It is well preserved with straight and compressed shaft and well developed palmature and subdivision of

tines, but no clear deciduous tine and consequently wholly absence of the burr. This seems to support the idea of Teilhard, Pilrím and Simpson in regarding the genus as the representative of an independent family and closer to Giraffoidea rather than to Cervidae. Its systematic position and relationship of various known forms are given in the Chinese text p. 333.

In doing so, it is clearly shown that only the *Heterocemas simpsoni* stands closer to the European *L. praestans* possibly also *L. teilhardi* and the other three may be related to *L. meyeri*. In this arrangement it is supposed that the various localities of the *Lagomeryx*-bearing Beds may not be exactly of the same age, although they are Upper Miocene in the broad sense. The Shanwang Series is older, then Tun Gur and Lantian and Tsaidam may be the youngest.

This systematic sketch does not mean at all that the Asiatic forms are derived and migrated from Europe. We know actually very few about the old cervids in the older strata of Asia. Some day we may find more rich remains of those forms in the Lower Miocene and Oligocene Beds like the Eocene *Archaeomeryx*-finds in 1959, so that we shall have better position to discuss this problem latter.

A REVIEW OF STEPHANOCEMAS

Since *Stephanocemas* and *Lagomeryx* were first considered as belonging to the same genus and both occurred together (Tun Gur and Tsaidam), it is perhaps not out of place to discuss this interesting genus here. *Stephanocemas* is widely distributed and stratigraphically very interesting for helping us to understand better the remains of *Lagomeryx*.

Stephanocemas thompsoni Colbert is the type species of this genus. It is richly represented by many specimens of tines from young to old. It was found in association with *Lagomeryx triacuminatus* and *Dicrocerus grangeri*.

The *Stephanocemas*-remains from Chinghai described by Bohlin. P. 26 and 108 are based on specimens of two localities, one is Tsaidam proper and the other is Lotuhsien, E. Chinghai. As judged by the figures given by the author they are quite different from those of Tun Gur. First, the scar left by the shaft lies nearly at the center (in *S. thompsoni* it is more anteriorly); Second, the palmate part is not so antero-posteriorly elongated as in the case of the Tun Gur species. The branches of the tines appear also simpler. The Chinghai specimen is most probably a new species for which we propose to name it as *Stephanocemas chinghaiensis* new sp. with the Lotu specimen as the type. The discovery of the genus *Stephanocemas* from Lotu is very interesting, suggesting that the Upper Miocene Beds are developed in the most eastern part of Chinghai and quite near (about 100 km) the *Listrodon*-bearing Upper Miocene Beds at Hsingtang, Yungteng, W. Kansu.

Concerning the *Stephanocemas colberti*, as we have noted before, it is very improbable that it belongs to *Lagomeryx*. It is more probable a true *Stephanocemas*, by its short shaft and many other characters. It is more primitive than the other species.

This genus is also recorded in Zaisan Basin of Central Asia. As judged by the cast, it is a typical *Stephanocemas*, larger than that of Tsaidam and smaller than that of the Tun Gur species, with five branches. There is no distinct elongated surface at the dorsal side of the palmature.

Among these four localities of *Stephanocemas* (actually five) three (four) are known in China, all associated with *Lagomeryx*. In Tun Gur there are two forms of *Dicrocerus*.

In Tsaidam there are also some other kinds of Cervids found in association. The geological condition and the distribution of the fossils from Tsaidam are still not available. We can only agree with Bohlin's conclusion that the fauna of Tsaidam represents a single faunistical unit. He considers it as Pontian in age. But at least from the study of the *Stephanocemas* and *Lagomeryx*, it seems more probable that it is Upper Miocene in age.

There is no divergent opinion concerning the systematic position of *Stephanocemas*. All authors agree to put it under the sub-family Muntiacinae. With the possible exception of *S. colberti* (although with faint development of burr) all the forms with deciduous antler, are a sharp contrast to that of *Lagomeryx*.