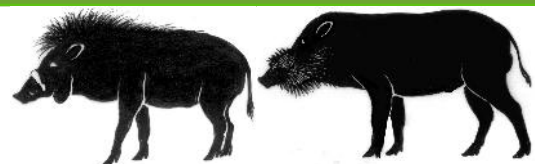


# Ecology and Conservation



## Early Chinese awareness of the 'horned' pig (genus *Babyrousa*)

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### Introduction

The adult male Babirusa (*Babyrousa* spp.) is recognised as a very unusual wild pig (Macdonald 2008) (Fig. 1). It is endemic to the Indonesian island of Sulawesi and some neighbouring islands. The extent of its range has been decreasing for many years (Leus et al. 2016; Macdonald 2017; Macdonald & Johansson 2017). We are very fortunate that there are Pleistocene depictions of this animal (Fig. 2), the female one of which has been dated to c. 33,400 BCE (Aubert et al.



Fig. 1. An adult male Sulawesi Babirusa. Photo: A.A. Macdonald

2014). These were found on cave walls in the South-west peninsula of Sulawesi, and highlight the historical local interest in this animal, in a region from which they subsequently have been exterminated (van Heekeren 1952, 1972). Outside its home range, however, early knowledge of the Babirusa appears to have been quite fragmentary. The somewhat 'hidden' geographical location of the Sulawesi, Togian, Sula and Buru islands (Sulawesi first began to appear on European maps in 1535 or 1537 (Thomaz 1995), together with an apparent lack of

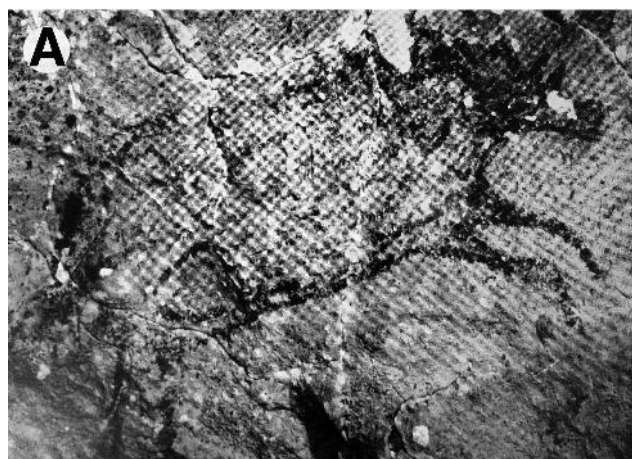


Fig. 2 A. The cave-painting, in red striped-line technique, of a charging [*Babyrousa*] boar; from South Sulawesi. (Heekeren 1972: plate 59).

Fig. 2 B. Drawing of the charging [*Babyrousa*] boar in A. (Heekeren 1972: p. 117).





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any commercial attractiveness at that time, partially explains why early seafarers from other countries (e.g. Portugal, China) were rarely drawn there. Although pieces of relevant information have undoubtedly been lost (see below), or are unrecognised as such, among the scattered remaining bits and pieces, elements of a larger 'jigsaw' can be traced back through time. In addition, the results of recent excavations have begun to reveal new and unexpectedly suggestive clues for future studies (van den Bergh 2016).

## Early European knowledge

Several accounts have been published describing the development of European awareness of the Babirusa (Deninger 1909; Mohr 1958; Tjiu & Macdonald 2016). Although the first Europeans to arrive in Indonesia were the Polo brothers, in c. 1292, and Odorico Mattiussi (Odoric of Pordenone), the Italian Franciscan friar and missionary explorer, came in the early fourteenth century, they did not go to the 'Babirusa' islands (Lach 1965). The Italian traveller, Ludovico di Varthema did reach Buru and the 'Spice Islands' in 1505 (di Varthema 1510), and the first Europeans to reach Sulawesi were the Portuguese sailors Simão de Abreu, in 1523, and Gomes de Sequeira (among others) in 1525 (Thomas 1995; Galvão 1563). The Portuguese remained unaware that the various peninsulas of Sulawesi represented component parts of one island until about 1560 (Thomaz 1995), whereas evidence from the Nagara-Kertagama (1365) indicated the merchantmen of the Javanese Majapahit knew the general outline of South and East Sulawesi at least since then, and were aware that it was one island (Gelpke 1992).

The earliest known European reference to a 'horned' pig from that region can be found in a manuscript written by the Portuguese soldier António Galvão, dated c. 1544; it was probably the preliminary version of his lost *Historia das Molucas* (Jacobs 1972). He wrote: 'A muitos porcos momtezes e grandes, e deles com cornos' [There are many large swine, some of them with horns].

Some years later Galvão (Galvano 1555) published the following (Fig. 3):

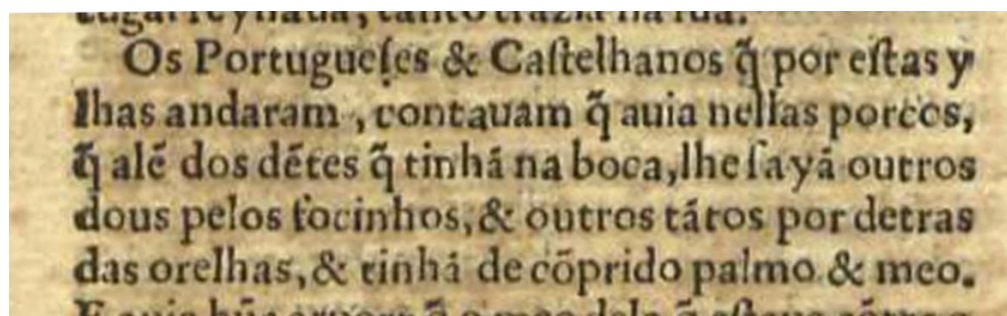
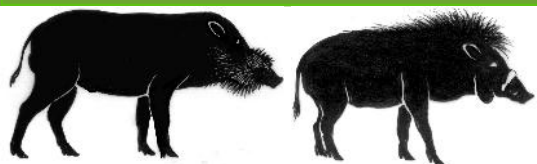


Fig. 3. Portuguese text by Galvão 1555 reporting the long canine teeth of the 'horned pigs' in the Moluccan islands (see Galvano 1555 in the references).

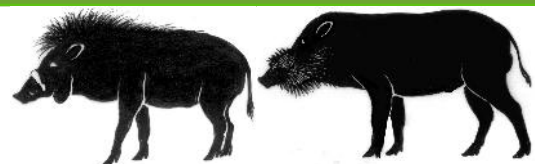
The Portugals and Spaniards which haue beene in these islands affirme, that there be certaine hogs in them, which besides the teeth which they haue in their mouthes, haue other two growing out of their snouts, and as many behind their eares, of a large span and an halfe in length' (Galvano 1555). It was not until some years later, on the 21st March, 1582, that Fr. Bernardino Ferrari sent to his superior, Fr Everard Mercurian, a description of the Babirusa that he had seen on Buru (Tjiu & Macdonal 2016; Jacobs 1980).







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The frequency of shipping from Europe to Ambon and the spice islands of the Moluccas increased through the sixteenth and seventeenth centuries, with the Portuguese predominance being replaced by that of the Dutch (Lach & Van Kley 1993; Subrahmanyam 2012). Sailors and traders brought back to Europe the extraordinary skulls of adult male Babirusa as well as some knowledge of this animal's biology. John Evelyn wrote in his diary (Evelyn 1955) on the 3-4th February 1644, in Paris, that on the north bank of the Seine running westward from the Pont au Change, part of the modern Quai de la Megisserie, ... 'here is a shop cal'd Noahs-Arke, where are to be had for mony all the Curiosities naturall or artificial imaginable, Indian or European, for luxury or Use, as Cabinets, Shells, Ivorys, Purselan, Dried fishes, rare Insects, Birds, Pictures, & a thousand exotic extravagances'. Six weeks later he reports in his diary that in Dieppe 'whatever the East Indys afford of Cabinets, Purcelan, natural & exotic rarities are here to be had with abundant choyce'. Borel, in 1649, mentions a Magasin des Indes in Lisbon where artefacts and curiosities from the East Indies could be purchased (Borel 1649 ).

## The early Chinese perspective

However, almost nothing has been reported from the Chinese perspective, the neighbouring country most likely to have archives of its early awareness of the 'horned' pig. An early European reference to that knowledge could have been Nieuhof's 1682 account, derived from Chinese sources, of the Sukotyro, a large ox-like pig-animal with teeth coming out of its face between the eyes and the ears (Fig. 4) that was said to have come from Indonesia (Nieuhof 1682). However, Nieuhof, like Piso before him, published illustrations that corresponded more closely to the anatomy of the Babirusa (Tjiu & Macdonald 2016; Nieuhof 1682; Piso 1658).



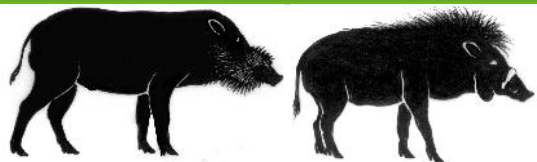
Fig. 4. Illustration of the Sukotyro from the title page of Nieuhof, 1682 (see Nieuhof 1682 in the references).

knowledge of the Klabat region in Northeast Sulawesi (Wang Ta-Yuan ca. 1349). In the early Ming period (1368 to c. 1400) Chinese maritime trade was put under strict government control;

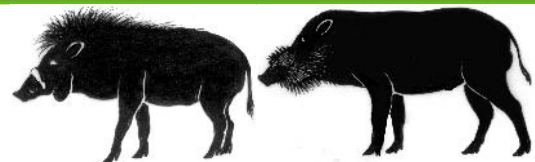
To what extent were there Chinese sailors and traders in that region of Indonesia who might have likewise seen the Babirusa? In 1544 Galvão wrote (Jacobs 1971) that the Chinese 'were the first to buy cloves wholesale in the islands'. During the Yuan period (1279-1368), the available evidence points to Chinese vessels navigating from the South China Sea to the Sula Islands and through the Celebes Sea to Eastern Indonesia to carry out trade there (Ptak 1992, 1993). A number of Chinese junks sailed to the Moluccas each year, presumably to purchase cloves (Wang Ta-Yuan ca. 1349). There is also information that refers to







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private shipping was largely discouraged through the enforcement of strict laws (Cao Yonghe 1984). Nevertheless, it would seem likely that private traders continued to travel from China to the Moluccas throughout the fourteenth and fifteenth centuries (Ptak 1992).

It was to the huge, 10,000 volume 'Imperial Encyclopaedia', Gujin Tushu Jicheng (Complete collection of illustrations and writings from the earliest to current times) that the author first searched for an early reference in Chinese to the horned pig. The renowned scholar, Chen Menglei, began this compilation of knowledge in 1701 during the Qing Emperor Kangxi's reign; it was not published until after the Qing Emperor Qianlong had ordered its revision, which was undertaken from 1723-1725 by another scholar and official, Jiang Tingxi. It was printed in 1726 (Jiang Tingxi 1726). The Gujin Tushu Jicheng provided a comprehensive survey of all that was best in the literature of the past, including accounts of many different mammals, reptiles, amphibians, birds, fish and insects, together with additional 'miscellaneous' and 'strange' members of each class. Several pig-like animals were recorded, including the Jie Zu, the Shang Gao and the yellow-bodied white-headed Wen Lin. An extraordinary black-headed pig is also depicted, the Jing Feng, and it was described as looking like a deer (the Indonesian words babi = pig and rusa = deer). However, tellingly, both the text and the illustration indicate clearly that this strange (mythical) animal had two heads.

Of perhaps somewhat more direct relevance to the Babirusa, in section 126 Birds and Insects, subheading 'Exotic Animals 4/4, of the Gujin Tushu Jicheng, the following text was found:

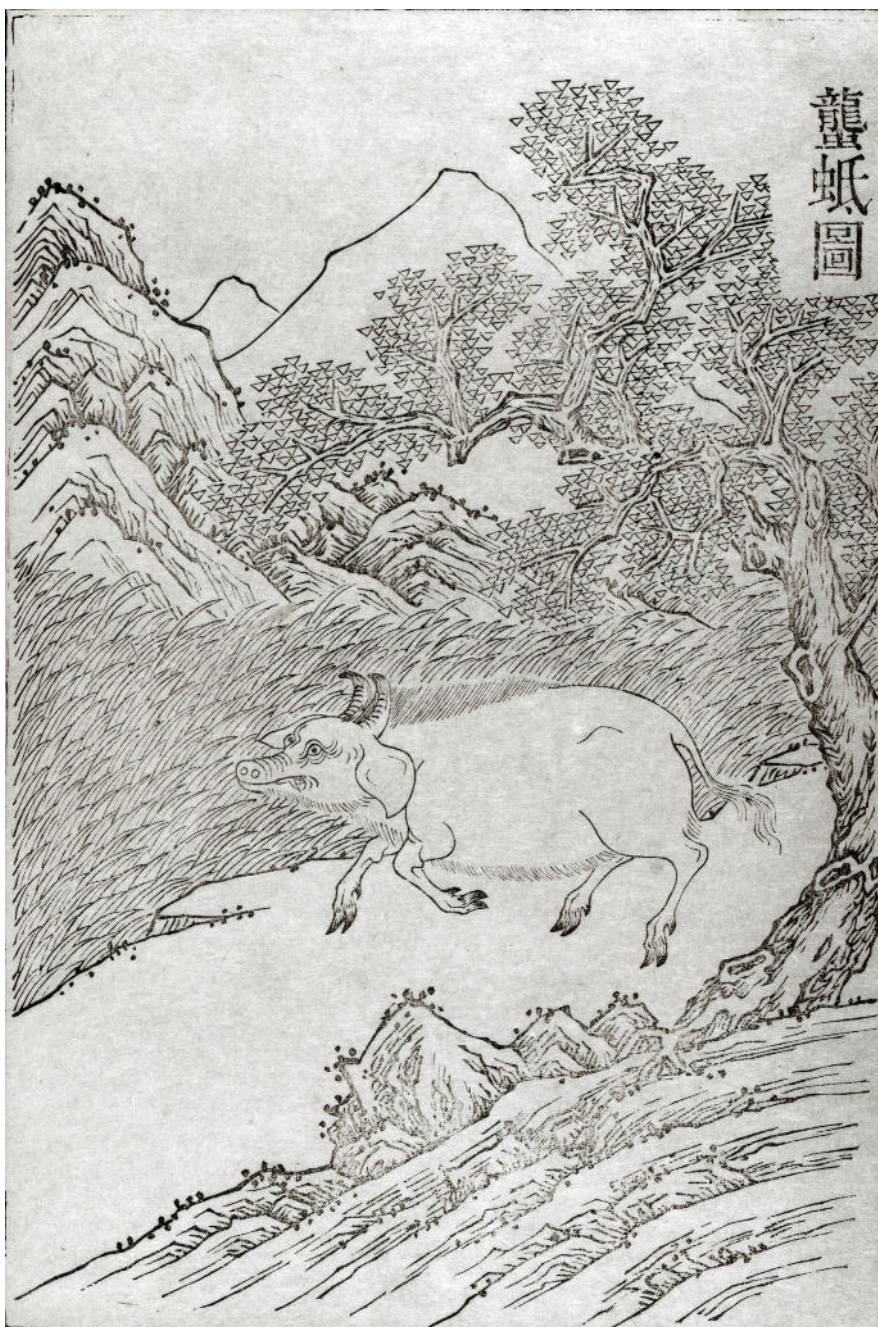
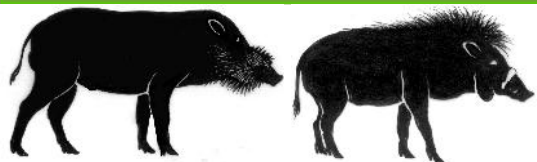
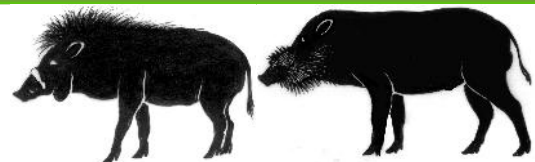


Fig. 5. The Longzhi illustration from Gujin Tushu Jicheng published in 1726 (see Jiang Tingxi 1726 in the references).





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'Wu Sun [Everlasting] Animal. In the south, [there is] an animal that looks like a deer, but is a pig. [It has] two teeth coming out of its head like deer horns. [This animal] is friendly towards humans and begs for grain. [The animal] is called 'everlasting / unwoundable / invulnerable' beast. People cut its flesh for food.'

However, it is the additional piece of information, included in section 124, Birds and insects, subheading Exotic Animals 2/21, of the Gujin Tushu Jicheng, which is perhaps most interesting: 'in mount Kun Wu, there is an animal, it looks like a pig, with horn(s). Its sound is like loud crying, [and] it is called Long Zhi. [People] eat the animal, [in order] not to have nightmares.' And this 'Long Zhi' animal was illustrated (Fig. 5). It is clearly porcine, set in mountainous countryside, and has hair on its ventral surfaces and at the end of its tail. Two horns emerge from the occipital or caudal surface of its head and curl to point rostrally. Interestingly, they do so in a manner similar to that painted onto the cave walls of south Sulawesi (Fig. 2).

The earlier, and richly illustrated, Sancai Tuhui (Pictorial Encyclopedia of the Three Powers), which was published in 1609, contains many descriptions and representations of animals (Wang Chi & Wang Si Yi 1609.). Unfortunately, perhaps due to an editorial confusion with an identically named mythical fox (that had nine tails and nine heads), in the London copy the illustration beside the descriptions of the 'horned' pig - Long Zhi – was that of the nine-tailed fox, and not the horned pig itself. Four descriptions of other pigs are appropriately illustrated in the Sancai Tuhui.

The earliest illustration of the Long Zhi that is still extant can be found in the edition of the Shan Hai Jing (Guideways through Mountains and Seas) with commentary by Wang Chongqing, published in 1597 and again in 1619 (Shan Hai Jing 1597). It is interleaved with the reprint of the (text only) 1537 edition by the same editor (Strassberg 2002). The image (Fig. 6A) from Plate XXXIII, was designed by Jiang Yinghao, courtesy name Wulin, from Guangling (modern Yangzhou, Jiangsu) and was engraved by Li Wenxiao (Strassberg 2002). The accompanying text states:

The first guideway through the Central Mountains begins at the Bo Mountains, the first of which is Sweet-Jujube Mountain [the precise location of all these mountains is uncertain]. The Combined River emanates from here and flows westward into the Yellow River. ... Eight hundred li (during the Tang dynasty [618 – 907 C.E.] one li = 323m) southwest along the second guideway through the Central Mountains stands Fresh Mountain. Three hundred li farther west stands Bright Mountain ...

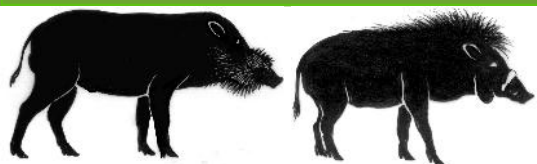
LONGZHI. Two hundred li farther west stands Mount Kunwu. On its heights is much copper. There is a beast here whose form resembles a pig but with horns. It makes a sound like a baby crying and is called Longzhi. Eating it will prevent blindness.'

Three other pig-like creatures are illustrated; the Lili, the Dongdong and the Dangkang.

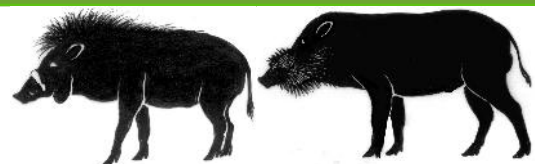
Jiang's designs were included in a later again edition of the Shan Hai Jing, published during the Chongzhen era (1628-1644), in which the Long Zhi (Fig. 6B) was engraved by Liu Suming from Jiansyang, Fujian (Shan Hai Jing c. 1628-1644).







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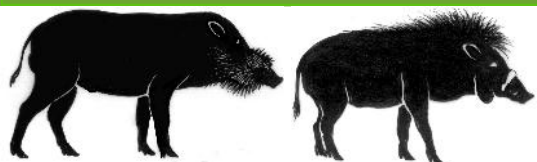
The information about the Long Zhi in these encyclopaedias can be traced back to a much earlier edition of the Shan Hai Jing. The many pieces of early writing that comprise this book were first compiled between c. 4th to c. 1st century BCE, from the Warring States period to the Western Han dynasty (Strassberg 2002; Knechtges & Chang 2014; Guo Fu zhu 2004). The Shan Hai Jing is China's earliest surviving cosmography and typically blends empirical fact, hearsay and fantasy within a geographical framework (Shan Hai Jing c. 1628-1644). Sometime between 310 and 324 CE its foremost commentator, Guo Pu, courtesy name Jingchun, effectively established the final version that has since then been repeatedly copied, re-edited and reprinted through the centuries (Shan Hai Jing c. 1628-1644; Guo Fu zhu. 2004). He wrote; 'there is an animal with the shape like pig. It has tusks stretching forward like horns, as well as a wailing sound. The name of this animal is Long Zhi'(Guo Fu zhu 2004). Guo Pu also drew attention to a nine-headed fox that was suspected to have the same name, Long Zhi. The text describing the Long Zhi subsequently appeared in the encyclopaedic 987 C.E. Taiping Yulan (Imperial Digest) edited by Wu Shu, Lü Wenzhong, Wang Kezhen and Tang Yue (Wu Shu et al. 987). The creation of this encyclopaedia has been described in detail (Kurz 2007).

These Chinese images and texts raise a number of questions. Might there be records of the receipt of diplomatic gifts of the Babirusa or 'horned' pigs by the Court in early China? Are there additional records of paintings or other illustrations of 'horned' pigs in early China? To what extent might these illustrations reflect the observations and related accounts of Chinese sailors and merchant who visited Indonesia?

The artists of the illustrations reproduced here had clearly not seen the animal. Indeed, it might be suggested that there is something of a parallel in the pattern of their depiction when they are compared with the early European illustrations of 'hairy' Babirusa from Buru by artists who had never encountered those animals; from strangely wild to more closely resembling the familiar domestic pig (Tjiu & Macdonald 2016). However, it is of interest that the earlier depiction was of a pig with dorsal body hair (Figure 6A), and that the slightly later version was portrayed as having no hair, except on its neck and tail (Figure 6B). Guo Pu wrote short, somewhat playful, poems about the odd appearance of the creatures depicted in the illustrations of the Shan Hai Jing to which he had access at that time (310 to 324 C.E.)(Guo Fu zhu 2004; Guo Pu 1958). The poet Tao Yuanming (365-427 C.E.) is also said to have been looking at illustrations of the Shan Hai Jing when composing poetry about this work (Strassberg 2002; Knechtges & Chang 2014). The sixth century artist, Zhang Sengyou, is attributed with painting 247 illustrations of the Shan Hai Jing; however, these, like others of that time, are no longer extant (Knechtges & Chang 2014). Could these early images have borne a closer resemblance to something observed?

There was a lot of shipping between China and Indonesia during the 5th to 7th centuries C.E. (Wolters 1967). Animal transfer occurred too; for example, in 647 a salmon-crested Moluccan cockatoo was brought to the Chinese court as a gift from an 'island nation' (Schafer 1963; Ptak 2012). Were mammals also transported from the Indonesian islands to China? During the first five hundred years of the millennium early Chinese records make it clear that Malayo-Austronesian seamen (K'un-lun) and ships (kunlunpo) based in Southeast Asia, sailed the routes between Southeast Asia and China (Wolters 1967; Manguin, 1994). They were the nomads of the Southern Ocean. Exactly when this far-reaching inter-island maritime activity began is unknown.





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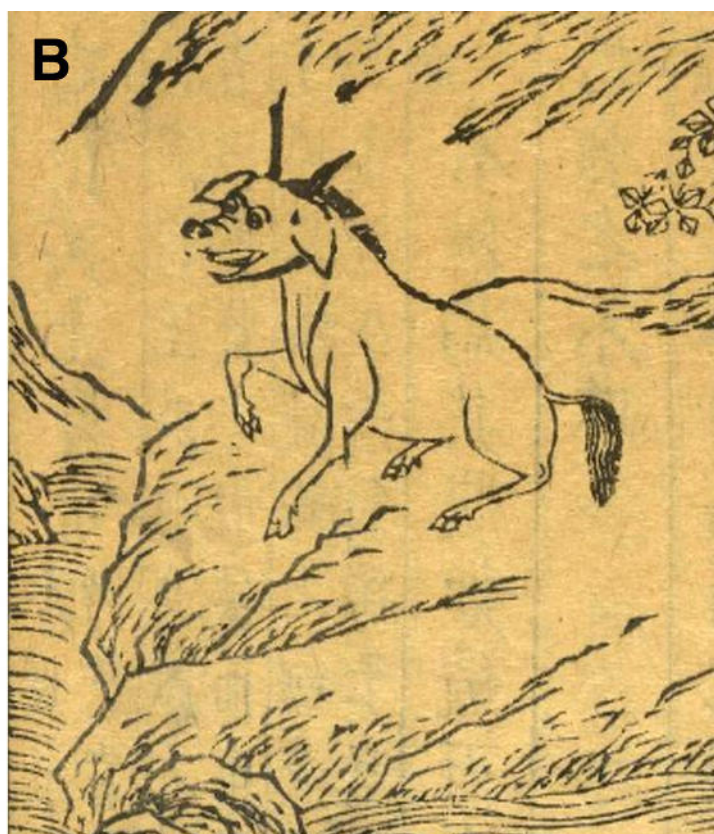


Fig. 6 A. The Longzhi illustration from the Shan Hai Jing published in 1597 and 1619 (see Shan Hai Jing 1597 and Strassberg 2002 in the references).

Fig. 6 B. The Longzhi illustration from the Shan Hai Jing published during the Chongzhen era (1628-1644) (Harvard-Yenching Library of the Harvard College Library, Harvard University, see Shan Hai Jing (c. 1628-1644) in references).

Considerable care must be taken with the interpretation of early sources. A good example is perhaps the report of a 'pig-like horned' animal (among the very many other wild mammals) in the vast imperial wildlife park of Han Wu Ti (140-187 BCE), which extended from the capital, Hsien-yang, across the countryside south of the Wei river (Schafer 1968). The animal's name was reported as Chüeh tuan. However, a detailed language analysis has shown that this animal was not a pig, but a rhinoceros (Yen 1969).

## Conclusions

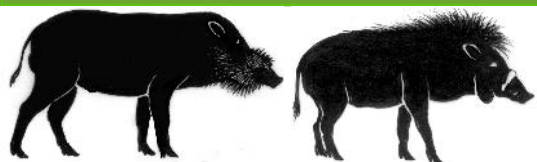
This article has sought to open the door to a very large area of possible study, the early Chinese knowledge of the 'horned pig'. Helpful guides to additional resources now exist (Bocci 2010). No more than a very small start has been made here. However, an excellent example of what might be possible, with knowledgeable access to the archives, paintings, poetry and other writings of China, has been ably demonstrated recently by the scholarly analysis of early Chinese knowledge of the cassowary (Lai Yu-chih 2013). Time will tell what other information is available about the 'horned pig', and indeed other wild pigs, in ancient China.

## Acknowledgements

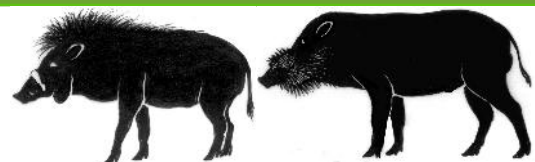
The generous assistance of librarian staff at the British Library, the Universities of Cambridge, Durham, Edinburgh, Leiden, London (School of Oriental and African Studies), the Needham







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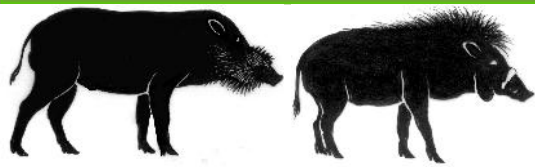
Research Institute, the Wellcome Institute for the History of Medicine and the Fuzhou University Institute of Global Civilization and the Library of Western Books, China in providing access to their collections is gratefully acknowledged. A particular thanks is due to the following: Dr Frances Wood and Graham Hutt at the British Library; Professors Kristofer Schipper and Yuan Bingling at Fuzhou University Institute of Global Civilization and the Library of Western Books, China; Dr Yang Lixin and Dr Xiaochao Chen at the University of Edinburgh; Masaaki Ito of the Babirusa Foundation Tokyo, Japan; Professor Rao Ping-fan in whose Institute of Biotechnology at Fuzhou University, China, where a most constructive sabbatical was spent. The author would also like to thank the British Library for permission to use the image of the Long Zhi in the Gujin Tushu Jicheng, the Harvard-Yenching Library of the Harvard College Library, Harvard University for the use of the image of the Long Zhi in the Shan Hai Jing published during 1628-1644, and the University of California Press for the use of the image of the Long Zhi in the Shan Hai Jing published in 1597. The University of Edinburgh and the Balloch Trust generously provided funding support.

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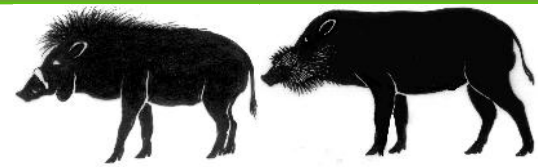
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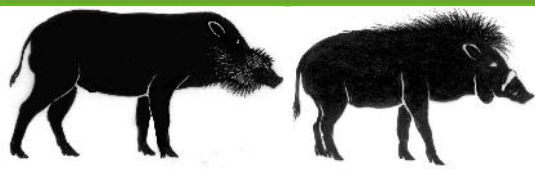


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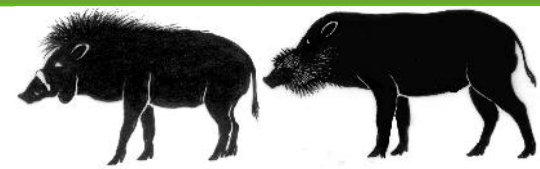


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