

## **Domestication of buffalo**

Archaeological, anatomical, and historical evidence supports the contention that both river and swamp buffalo are descended from wild Asian buffalo (*Bubalus arnee*), although the swamp type is morphologically more similar to *B. arnee* than is the river type.

Genetic evidence clearly points to independent domestication of the two types. Cockrill (1981) stated that the river buffalo was first domesticated about 4,000–5,000 years ago in the riverine civilizations of the Euphrates and Tigris, and the Indus, but recent studies have concluded that the most likely area where this took place is the western region of the Indian subcontinent (Kumar et al. 2007). In contrast, the time and place of domestication of the swamp type is uncertain and subject to debate. Cockrill (1981) suggested that the swamp buffalo was domesticated in the Yangtze valley, also about 4,000–5,000 years ago. However, there is no evidence that the endemic distribution of *B. arnee* included central China, and archaeological and genetic studies of Chinese buffalo do not support domestication in China. Groves (2006) noted that the oldest putative domestic buffaloes come from Neolithic sites (4500–6000 BCE) in southern China, and archaeological findings at Ban-Chiang, northeastern Thailand show that water buffalo were already domesticated there by around 600 year BCE. Genetic data (Zhang et al. 2011) indicate that the domestication center for swamp buffalo was in a region encompassing the far south of China, and northern Thailand and Indo-China. Following domestication in this region, it spread south through peninsular Malaysia to the islands of Indonesia (Sumatra, Java, and Sulawesi), north/northeast into central China, and then through an eastern island route via Taiwan to the Philippines and Borneo.