

Louis Chaix and J. W. Hansen

Cattle with "forward-pointing horns": archaeozoological and cultural aspects

Introduction

This short report aims to present the discovery, at the Sudanese site of Kerma, of cattle bucrania displaying an unusual deformation which is very similar to those often depicted in the Saharan rock drawings.

Kerma was the capital of the Kushite kingdom. It developed from around 2600 up to 1500 BC, and reached ca 1000 km in length from north to south (Bonnet 1986). Due to Kerma's strategic position, midway between the Mediterranean world and sub-Saharan Africa, it played an important military and economic role (Bonnet 1997). The architecture of the ancient Kerma town bears witness to this double influence, and excavations of the immense necropolis, located a few kilometres to the east, have shed light on the complex funerary rites of this population which consisted of herders and warriors (Bonnet 2000). Domestic cattle made up the best part of the Kerma livestock and were the main providers of meat. They also played an important role in after-life, as their remains have been found in the Kerma graves in the form of derived products such as clothes or shrouds, bucrania as well as symbolic paintings on chapel walls (Chaix 1994; 2000; 2001; Chaix and Grant 1992).

The bucrania

These remains are an effect of skull cutting which preserves the anterior face and the horns. Each time period at Kerma is characterised by a different type of cutting (Chaix 1993; 2001).

Cattle bucrania are known from several cultures. They are often associated with the religious beliefs, for instance at Neolithic sites in Syria and Turkey (Coquegniot 2000; Mellaart 1967), or with the cult of the dead (Madagascar,

Celebes, Laddakh) (Battistini 1964; Koubi 1992; Harrer 1978). At Kerma, the excavations of the necropolis yielded several graves furnished with cattle bucrania facing the deceased at the southern border of their tumuli; this ritual took place from the end of Ancient Kerma period (around 2000 BC) onwards. These bucrania were cut in such a way as to preserve the nasal bones (Chaix 1993; Gratien 1985). At the end of the Middle Kerma and the beginning of Classical Kerma periods (around 1750 BC), bucrane presence had increased and it seems that their number in graves was linked to the social rank or to the wealth of the deceased. At the same time, the number of animals deposited in the grave pit also increased, as well as the amount of various food offerings (Chaix and Sidi-Mammar 1992; Chaix 2001). During this period, the bucrania were cut at the junction of the nasal and frontal bones. Finally, towards the end of the Classical Kerma period (about 1500 BC), bucrania became much more of a rarity and were cut at the base of the horns (Chaix 1993; Gratien 1985). Most of the graves of this late phase at Kerma were excavated between 1913 and 1916 by G. Reisner who only occasionally was referring to the occurrence of bucrania and gave no information concerning their number and position in the grave (Reisner 1923).

As we mentioned above, the cattle bucrania at Kerma are placed outside the tumuli, always to the south of the inhumation, and are facing the deceased (Fig. 1). They were placed in stereotypical rows around the tumuli, with cows and calves being placed at the front, followed by rows of bulls and cattle, then rows of cows again, and so on. They were positioned in the shape of a large half-moon, the tips of which reached the median diameter of the tumulus.

The number of bucrania in Kerma tombs varies from few to several thousand. This poses an archaeological problem which will not be discussed in this paper (Chaix 1993; Iacumin et al. 2001). Since 1994, we have discovered at Kerma the cattle bucrania with a very unusual deformation which tends to make the horns looking parallel to each other (Chaix 1996). Such a deformation is currently practised by certain populations of breeders in Eastern Africa (Turkana, Murle) (Johnston 1902; Jones 1984). It modifies the shape of the horns in a very recognisable manner: most modifications consist of a transverse flattening of the horn cores which, in effect, become elliptical instead of being round; this is accompanied by a flattening of their internal face. Furthermore, pressure applied on the horn cores creates a typical swelling on the intercornual crest. Secondary ossification also takes place. The modification makes the tips of the horn sheaths pointing forward, which gives the animal a very unusual appearance (Fig. 2). Some very rare cases of horn sheath anastomosis have been observed at Kerma. This produces a single sheath which wraps around both horn cores (Fig. 3). This deformation also modifies some measurements made of bucrania.

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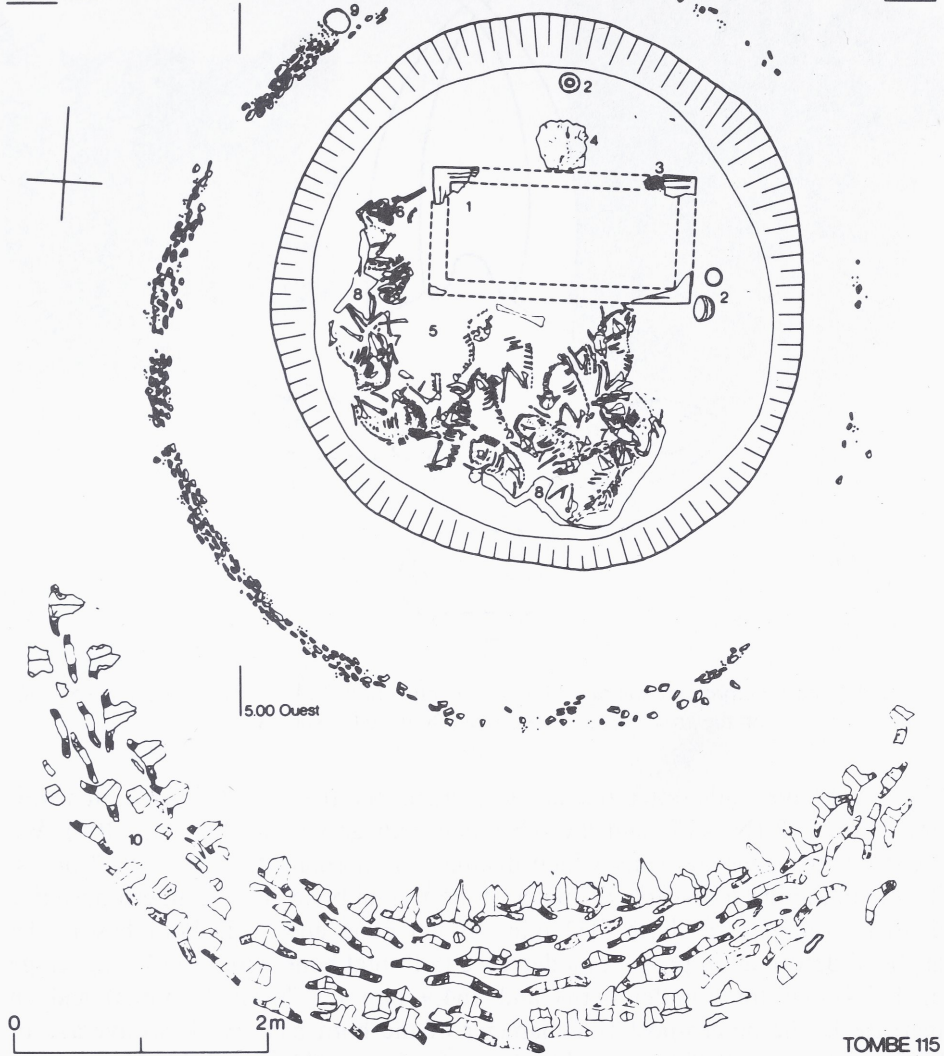


Fig. 1. Plan of the Middle Kerma period grave No. 115 (whole bodies of sheep and pieces of meat are deposited to the south and north of the dead; cattle bucrania are always deposited to the south, outside the tumulus) (Drawing B. Privati).

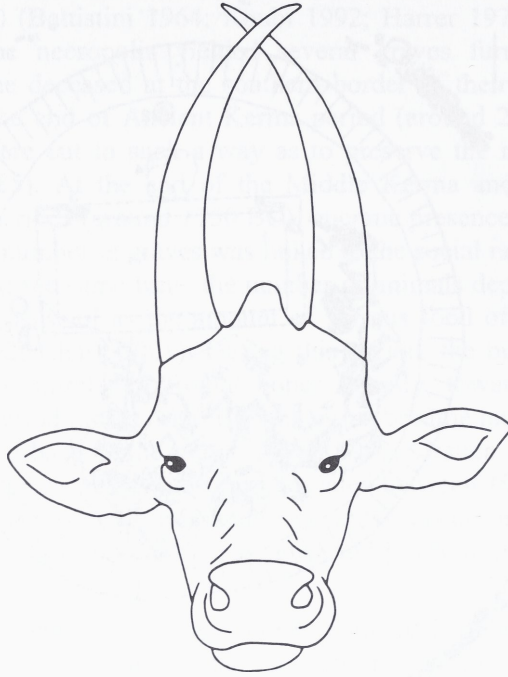


Fig. 2 . Schematic representation of a " forward pointing horn " cattle after the bucrania No. 46 from the grave No. 253 at Kerma (Drawing G. Roth, MHNGE).

We have studied two bucrane specimens, the first one was associated with grave No. 238 (N: 417) and the other one with grave No. 253 (N: 1404). We recorded two measurements which distinguish "normal" from "parallel" horns, i.e. the minimum transverse diameter of the frontal bone and the antero-posterior diameter of the horn base (TD min. frontal bone and APD horn base). The artificial deformation produces a decrease in frontal bone width (with an average of 153.4 mm for parallel horns and 164.9 mm for "normal" horns) and an increase in the antero-posterior diameter of the horn base (with an average of 92.5 mm for "parallel" horns and 64.6 mm for "normal" horns; Table 1).

So far, only four graves containing deformed bucrania have been found at Kerma. Their proportion compared to "normal" pieces of bucrania varies between 15.4 and 17.9 %. The bucrania with parallel horns were not placed at random but they seem to be a part of the general organisation of the whole assemblage of them. For instance, in grave No. 185, the seven deformed pieces were placed after the second row of "normal" bucrania, at equal intervals. In grave No. 253, now under excavation, there were more than 4350 pieces of

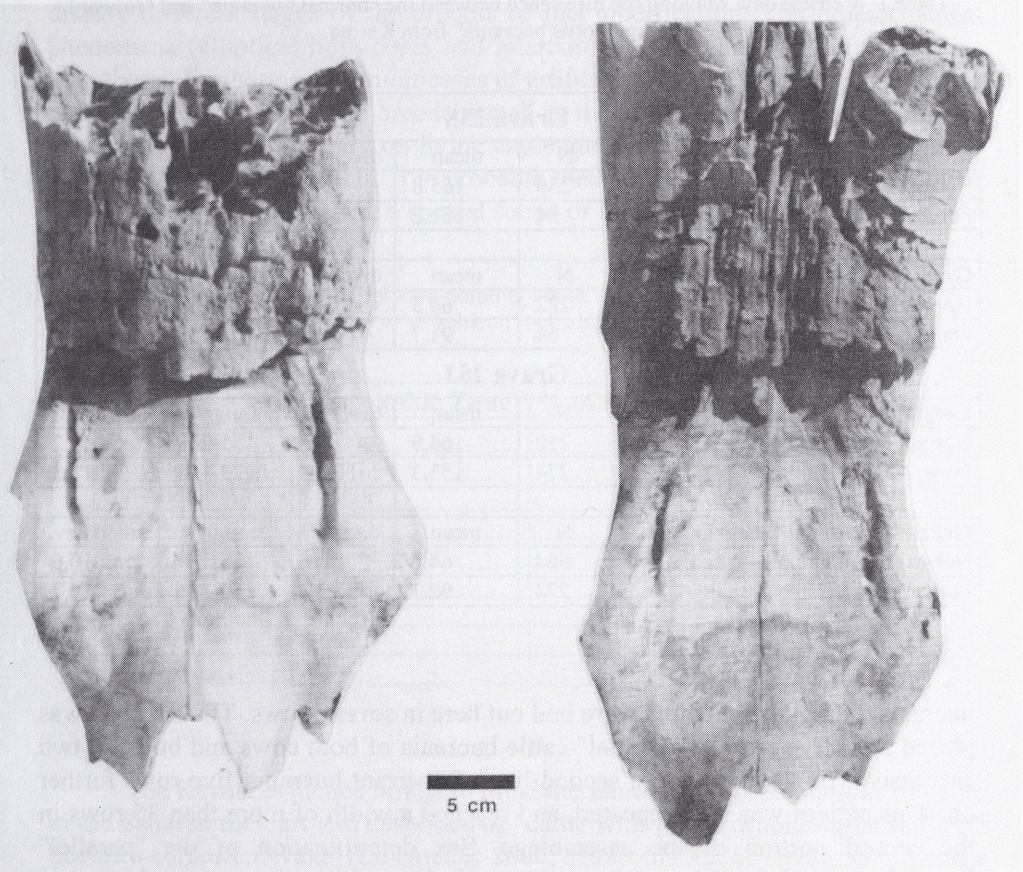


Fig. 3. Two examples of cattle skulls from Kerma with a single horn-sheath surrounding the two horn-cores (Kerma, grave no. 253, bucrania no. 1729 and 1680).

Table 1. Metrical data showing the difference between the "normal bucrania" and "forward pointing horns bucrania" from Kerma.

Grave 238					
Minimal frontal breadth	N	mean	diverg.	range	stand.dev.
Normal bucrania	239	165.8		130-210	14.2
Forwarded bucrania	54	151.2	-14.6	130-180	11.4
Greatest diameter of horncore	N	mean	diverg.	range	stand.dev.
Normal bucrania	222	64.5		46-89	10.4
Forwarded bucrania	54	91.7	+27.2	62-135	14.4
Grave 253					
Least frontal breadth	N	mean	diverg.	range	stand.dev.
Normal bucrania	750	164.9		135-210	14.2
Forwarded bucrania	274	153.3	-11.6	125-193	11.3
Greatest diameter of horncore	N	mean	diverg.	range	stand.dev.
Normal bucrania	664	64.6		35-101	10.6
Forwarded bucrania	274	92.1	+27.5	52-196	16.7

bucrania. "Parallel" bucrania were laid out here in several rows. The first one was placed after five rows of "normal" cattle bucrania of both cows and bulls, in two successive rows. There was a second line of aberrant bucrania five rows further on. This pattern was then repeated, and reached a width of more than 35 rows in the central portion of the assemblage. Sex determination of the "parallel" bucrania showed that they are not very much dimorphic. An extensive biometric study revealed that the limit between males and females for the horn core APD is placed around 100 mm. The sample from grave No. 253 of a total 274 deformed bucrania consist of 189 female and 85 male deformed bucrania (respectively 68.9% and 31.1%). By comparing this data with the "normal" bucrania, based on the minimum frontal TD, which seems to be the most discriminant measurement, we were able to set the limit between males and females at around 165 mm. This sample of "normal" bucrania was made up of 550 females (54.2%) and 463 males (45.8%). Thus, in both cases, females were more numerous, but the percentage of males seems too high to represent the true sex ratio of a herd.

This brief description shows that bovines with deformed horns existed at Kerma within a funerary context. They were placed among "normal" bucrania which, however, were more numerous. These "aberrant" specimens were always the result of artificial deformation. Several bucrania belonging to young calves

display different stages of the process of this modification. The biomechanical phenomena (elliptical horn cores and intercornual bulges) seem to confirm this hypothesis. Furthermore, similar cases of artificial deformation are known among present-day Eastern African breeders such as the Murle or the Turkana. Unfortunately, they are known only on living cattle and no craniological study has been carried out on these animals. It is probable that the deformed bucrania at Kerma belonged to cattle possessing a special social or religious importance.

Table 2. Percentage of "forward pointing horns" cattle in different phases of the Saharan rock art.

Phase	Geographic Zone	% of "forward pointing horns"
Old-Middle	Oued Djerat	> 40%
Old-Middle	Messak	ca. 26%
Middle	Atlas	> 50%
Middle-Late	Tassili-n-Ajjer	< 10%
Late	Ahnet	ca. 35%
Late	Aouenat	ca. 25%
Late	Ennedi	ca. 21%
Late	Aïr	<10%

The Kerma evidence brings to mind the numerous representations of cattle in the Saharan rock art and described as "cattle with forward-pointing horns" or "boeufs a cornes en avant" (Le Quellec 2000; Muzzolini 1986; 1995), among them are the engravings at Jebel Nuquay in Libya, where bovid protomes display a single horn which is bifid at its tip (Fig. 4), a morphology similar to some bucrania discovered recently at Kerma (Gandini 1999). The first rock-art representations of "forward-pointing horns" were found at Tassili-n-Ajjer (Fig. 5) and were attributed to the "round-head" period which probably dates to 7th millennium BC. They are in association with drawings of "Negroid"-type humans (Table 2). Other examples from the Central Sahara (Fig. 6 and 7) belong to the "Bovidien ancien -évolué" style.

In summary, a following scenario of the development of the deformation of cattle horns could be presented at this stage of our research: the place of origin of these deformations seems to be the central Saharan mountains, in particular the Tassili. The drier episode during the Saharan Neolithic, around 7000 BP, seems to have forced certain pastoral groups practising horn deformation to emigrate to the Atlas mountains, the Egyptian Nile Valley, and to the Nubia (Kerma area)

(Muzzolini 1982; Gabriel 1996; Kuper 1988). The return to a more humid climate, around 3000 BP may have generated a movement of populations out of the Nile Valley (via Darfour ?) and towards Central Sahara, from the Atlas to the great plains situated to the north of the present desert zone, and perhaps even from shelters in the central Saharan mountains to surrounding areas. At that time, horn deformation was no longer very frequent, but it was still practised.



Fig. 4. Cattle with a single horn-sheath. Rock engraving from Jebel Nuqay (South-eastern Libya) (after Gandini, 1999).

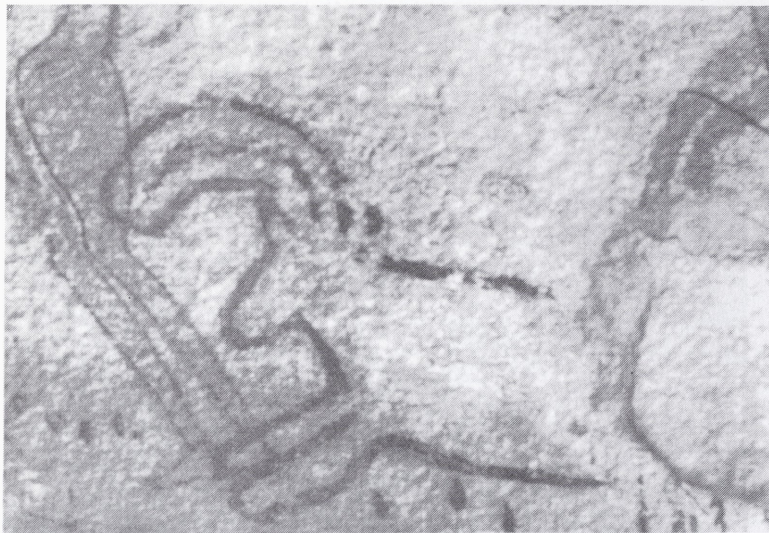


Fig. 5. Cattle with "forward pointing horns". Rock-picture from the site of Sefar, Tassili-n-Ajjer (photo J. D. Lajoux).

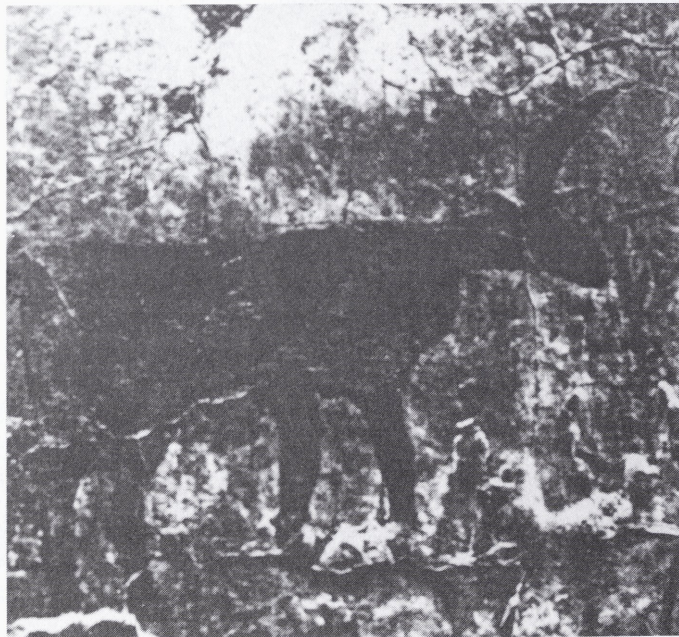


Fig. 6. Cattle with " forward pointing horns" from Ti-n-Rerhoh, Tassili (photo J. W. Hansen).



Fig. 7. Cattle with "forward pointing horns" from Amarak, Tassili (photo J. W. Hansen).

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