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# ABRI CASTANET (DORDOGNE, FRANCE): AN AURIGNACIAN SITE WITH BEAR PROCUREMENT. BEAR EXPLOITATION IN PALEOLITHIC TIME

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**Abstract**: The abri Castanet is located in Sergeac (Dordogne, France). At the beginning of the last century, the Abri Castanet was excavated by Peyrony who described 2 Aurignacian levels (Peyrony, 1935). The first one stands on the bed-rock and shows split based points and has been attributed to the Aurignacian 1 by Denis Peyrony. The examination of this material at the Musée National de Préhistoire in les Eyzies (France) allowed us to discover the existence of a bear phalanx with cutmarks. So the Abri Castanet can be considered as a new site with butchery marks on bear remains, which add to the about thirty examples known. When we examine these sites in literature, it seems that different bear procurement modalities can be shown.

**Key words:** Bear exploitation, Castanet site, Aurignacian, Upper Pleistocene, Southwestern France.

## PRESENTATION OF THE SITE

Abri Castanet is located in Sergeac (Dordogne, France), at the bottom of a cliff by the Vézère River. It is one of a series of such sites that includes the Abri des Merveilles, the Abri Blanchard, and la Souquette.

The Abri Castanet stands on a bedrock terrace. Before the first excavations, it was covered by large limestone blocks. In the nineteen thirties, the site was excavated by Peyrony, who described two Aurignacian levels (Peyrony, 1935).

On top, was an Aurignacian II level that contained a lithic industry with blades, notches, scrapers, and burins, a poor bone industry with flattened lozenge-shaped points and awls, and engraved limestone blocks. Faunal remains were rare. Reindeer dominated, followed by horse, bovids, wolf, fox, and brown bear.

Below this, resting on bedrock, an Aurignacian I level yielded a blade industry very rich in scrapers and poor in burins, with a number of other tool types. At this level, the fauna was dominated by reindeer and included roe deer, horse, bovids, deer, wild boar, ibex, lion, hyena, wolf, fox, wild cat, lynx, brown bear, and seal. Harlé made the identification of brown bear on the basis of a canine (peyrony, 1935).

During recent work for the new museum project at the Musée National de Préhistoire in les Eyzies, Stéphane Madeleine discovered a bear phalanx with cut marks in the Castanet Aurignacian I collection. In collections from recent excavations (by Pellegrin and White) there are no bear remains (J.-C. Castel, personal communication).

## FAUNA FROM THE AURIGNACIAN I (PEYRONY COLLECTION)

The remains consist of primarily of teeth, of the ends of long bones, and of small bones. There are only a few shaft fragments. There was probably a selection made during excavations. Some of the remains mentioned by Peyrony (1935) are absent from the Musée National de Préhistoire collections, such as the canine of *Ursus arctos,* and there are no remains of lynx nor of wild cat.

## BEAR IN THE AURIGNACIAN I COLLECTION

There are four specimens of bear in the Aurignacian I: a fragment of a canine, an upper second molar, and two first phalanges.

The upper M2 has an almost straight mesio-distal axis, while this axis is curved in the cave bear (Prat &

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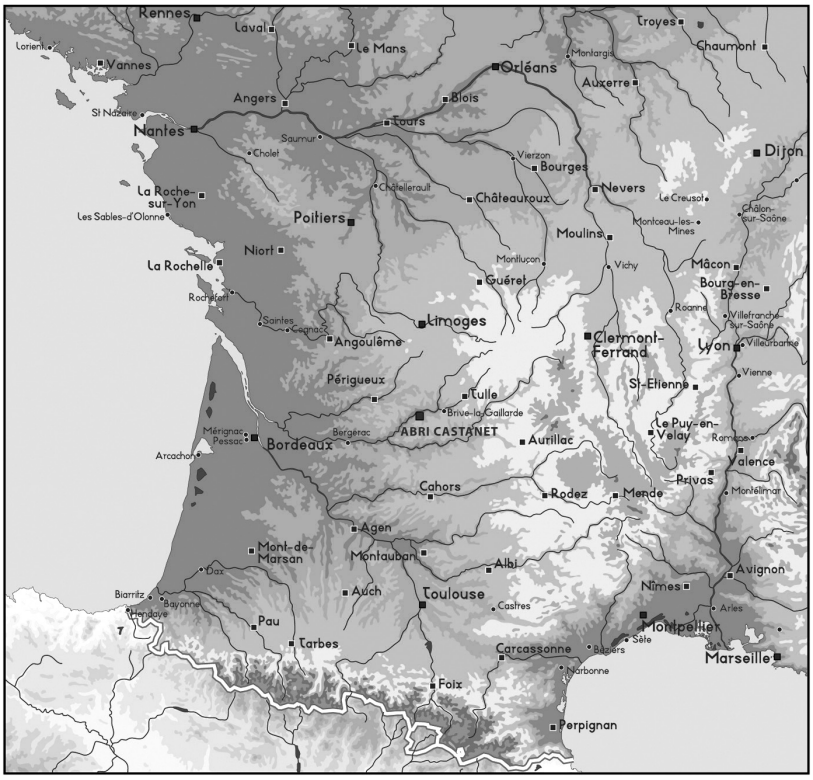


Figure 1. Map of France with the location of the abri Castanet.

Thibault, 1976). The distal part is small with a limited number of reliefs (fig. 2), and it is smaller than the upper M2 of the cave bear studied by Prat & Thibault (*op. cit.*).

The *Ursus arctos* $M^2$ measured by Torres (1984) have mesio-distal diameters ranging from 20 to 42 mm, with values peaking between 34 and 36 mm, while the mesio-distal diameters of cave bear are greater than 38 mm. Thus, on both morphological and biometric grounds, this tooth can be assigned to *Ursus arctos.* It displays one particularity, a supplementary cusp on the mesio-buccal side just above the base of the crown (fig. 2).

It should also be noted that this tooth served as an ornament - the distal root was perforated.

The dimensions of the first phalanx, which bears cut marks, are shown in tab. 3 (the height cannot be measured because of heavy erosion of the edges). It is difficult to determine the species on the basis of dimensions of the first phalanx. The data provided by Torres (1984) overlap for *Ursus spelaeus* and *Ursus arctos,* and our specimen stands in the overlapping area. This specimen seems to be rather slender and may therefore belong to a brown bear.

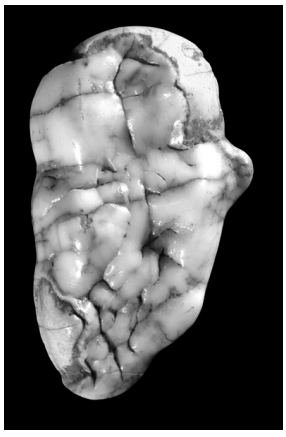

Figure 2. *Ursus arctos*: Second upper molar, occlusal view (photograph by P. Jugie, MNP, les Eyzies, France).

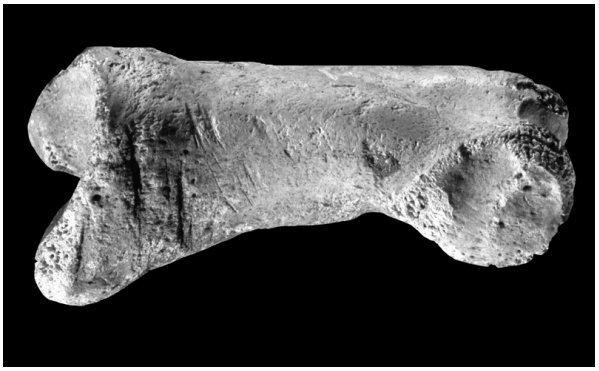

Figure 3. *Ursus arctos:* cut marks on the first phalanx (photograph by P. Jugie, MNP, les Eyzies, France).

Table 1
Faunal data from the Aurignacian I, Abri Castanet.

| Taxon | NISP |
|---|---|
| *Crocuta spelaea* | 1 |
| *Canis lupus* | 52 |
| *Vulpes/Alopex* | 15 |
| *Ursus* sp. | 4 |
| *Cervus elaphus* | 7 |
| *Rangifer tarandus* | 336 |
| *Rupicapra rupicapra* | 2 |
| *Capra ibex* | 1 |
| *Bovinae* | 16 |
| *Equus* sp. | 32 |

Table 2
*Ursus* sp. Measurements of the second upper molar.

| | Mesio-distal diameter (1) | Bucco-lingual diameter (2) | 2/1 |
|---|---|---|---|
| Castanet | 35.2 | 20.8 | 59.09 |
| *Ursus spelaeus* | 75 | | 75 |
| Prat & Thibault, 1976 | 37.5-52 | | 47.3-58.2 |
| | 44.95+/-0.65 | | 51.82+/-0.53 |

Table 3
*Ursus* sp. Measurements of the first phalanx.

| Ph 1 | Proximal transversal diameter | Proximal antero-posterior diameter | Minimum transversal diameter | Distal transversal diameter |
|---|---|---|---|---|
| Castanet | 21.8 | 18.6 | 14.2 | 16.7 |

The cutmarks (fig. 3) are located on the dorsal face and on one lateral face of the first phalanx described above. Some are superficial, but most are very deep. These marks indicate use of the hide. In general, carnivore hides are usually taken at the beginning of winter, when they are at their best.

This gives no idea of the way in which the bears were used, and it is more or less impossible here to make such a determination. Given the small number of remains, one may surmise that this was not the place where the animal died, nor even the location where the carcass was processed.

## EXPLOITATION OF BEARS IN THE PALEOLITHIC

The site of Castanet can be added to the list of paleolithic sites yielding evidence for the exploitation of bears (Armand *et al.*, 2004).

Up until recently the exploitation of bears in the Paleolithic had been denied, however most researchers now agree that bears were indeed occasionally used by prehistoric populations (Fosse *et al.,* 2002; Auguste, 2003; Quilès, 2003 and 2004).

Stiner (1994) has suggested a predation model based on ethnographic observations of Native American Indians: according to her, prehistoric groups may have also opportunistically collected bears during the first stages of hibernation.

Pacher (2000) *in* Münzel & Conard (2004) analyzing ethnographic data on bear hunting since the 17th century shows also that winter was generally the favoured season for hunting bears.

The archaeological data does not always allow determining the mode and season of procurement. For Stiner *et al.* (1996), on a hibernation site it is taphonomically difficult to distinguish between attacks on a living bear from those on an already dead animal. But, if the animal's skin was removed, then this means that the bear died very shortly before being skinned, either because it was killed or because scavenging took place not long after its death. It was probably a planned activity that took place during denning time. However in the case of meat and marrow extraction, the timeframe for consumption is not strictly fixed, as it depends on taste preferences and food tolerance which cannot be known today. And we can have any certitude about the strategy and the period of procurement. Additionally, remains of young individuals may also indicate the season.

We have surveyed zooarchaeological studies which deal with bear procurement in order to find any patterns

in the available data which may confirm this scenario and be used to elucidate the reasons behind such exploitation.

## BEARS AS RESOURCES

Cutmarks interpreted as representing the removal of the animal's skin were found on cranial fragments at Höhle Fels (Münzel & Conard, 2004), on a mandible at Madonna dell' Arma (Quilès, 2003), and at Taubach (Bratlund, 1999), and on a skull and mandible at Biache-Saint-Vaast (Auguste, 1995).

Striations observed on a patella from the Aurignacian levels at Arcy have been interpreted as the result of a skinning process (or disarticulation) (David & Poulain, 2002).

In the carpal region, marks found on a pisiform at Goyet (Germompré & Sablin, 2001), and on a pyramidal at Badalucco (Quilès, 2003) are interpreted as being tied to a skinning activity, while Bratlund (1999) hesitates between meat processing and skinning for the marks found on a pisiform at Taubach.

With regards to evidence from the tarsals, the only indication is of a calcaneum at Taubach (Bratlund, *op. cit.*).

Marks found on metapodials are more frequent: there is mention of them at Biache-Saint-Vaast (Auguste, 1992), at Goyet (Germompré & SABLIN, 2001), at Arcy (Roblin-Jouve, 2002; David & Poulain, 2002), at Höhle Fels (Münzel *et al*. 2001 and Münzel & Conard, 2004), at Divje Babe (from an illustration *in* Turk & Kavur, 1997) and at Taubach (bratlund, 1999).

The fractured metapodials at Arcy are also interpreted by David & Poulain (2002) as a result of an activity linked to acquisition of hides.

## SEASONS OF PROCUREMENT

In Font-de-Gaume cave (Armand *et al.*, 2004), the bone remains with butchery marks were found on a hibernation site, and indicate a meat and marrow extraction process. We therefore have no indication of the season.

In the cave of Les Cèdres, milk canines imply an occupation of the site in the winter months (Crégut-Bonnoure, 1995).

For David & Poulain (2002), the Aurignacian levels of Arcy are the site of bear hibernation. The authors don't conclude on the season of procurement. Since the hides were used, we believe the bears were butchered during denning time. This would certainly be the case also at Moscerini, Sant' Agostino, Hayonim, sites studied by Stiner (1994 and 2005) and at Fate, la Caune de l' Arago, Badalucco and Madonna dell' Arma, sites studied by Quilès (2003).

At Madonna dell' Arma, for Quiles (2003), this would even be a case of hunting in a bear den.

In the case of the Castanet bear, as we mentioned earlier, it is not a hibernation site, and we have no indications about the seasonality of exploitation.

At the site of Hohle Fels, Münzel & Conard (2004) come to the conclusion that the site was occupied in the winter months, based on the data obtained from the tooth eruption stages of horses, and remains of cave bear cubs indicate "an interaction between humans and bears during the transition of winter to spring".

At the Pauline cave, young individuals carry butchery traces and according to the age indicated by the mandibules, Cordy (1974) thinks they died in the winter.

Similar conclusions were drawn for Geissenklösterle (Münzel *et al.*, 2001*)*: cutmarks were found on bear cubs aged 3-4 months, which would indicate the end of winter.

At Biache, Auguste (1995) observes that very young bear cubs are absent, while adults and sub-adults dominate, and «le rapport mâles/femelles en légère faveur pour les premiers indiquent une acquisition d'individus isolés; ceci correspond bien au comportement plutôt solitaire des ursidés et rejette un abattage des animaux hibernant». He puts forward the hypothesis of a spring hunt for the aurochs, with an intensive marrow extraction process to compensate for the poor quality of the meat in this season, and a fall hunt for the bear, as it is the meat, fatty in this season, which was mostly used.

## BEAR PROCUREMENT STRATEGIES

Bear procurement strategies are often impossible to determine at sites where bear remains show butchery marks.

However, at Hohle Fels, bear hunting is proved by the presence of a lithic point inplanted in a vertebra (Münzel & Conard, *op. cit.*).

According to Auguste (2003), the presence of numerous cutmarks and an analysis of age cohorts (showing a peak for sub-adults and adults, which is not the pattern observed in dens) demonstrate that Biache is a kill site.

At Taubach, cutmark frequencies correspond to the values observed at hunting camps (Bratlund, 1999).

Bez (1995) also found striations on a metatarsal belonging to a bear of Tibet at the site of Les Cèdres. Since they are situated on the inferior side of the bones, he stresses that this may represent meat processing rather than skinning, as the underside of a bear paw is rich in meaty and fatty tissues. In his 14th century book on hunt-

ing, Phébus (translated 1986), explains that "ses pieds sont meilleurs à manger que tout ce qu' il porte".

Butchery marks linked to the skinning process are rather frequent on the first phalanges. These are found at Castanet, as well as at Hayonim (Stiner, 2005), at Badalucco and Fate (Quiles, 2003), at Sant' Agostino (Stiner, 1994), in the Aurignacian layers of Arcy (David & Poulain, 2002 and Roblin-Jouve, 2002), at Biache (Auguste, 1995) and at Taubach (Bratlund, 1999). At the Caune de l' Arago (Quilès, 2003), there is mention of cutmarks on a phalanx with no further precision.

Striations on the second phalanx were observed in just a few sites: at Moscerini (Stiner, 1994), at Arcy (David & Poulain, 2002 and Roblin-Jouve, 2002), at Biache (Auguste, 1995) and at Taubach (Bratlund, 1999).

The meat of the bear was used at Biache-Saint-Vaast (Auguste, 1992), at Taubach where the cut marks are present on the entire skeleton (Bratlund, 1999), at Hohle Fels, where the marks are found on humerus and pelvis (Münzel & Conard, 2004). At Font-de-Gaume, we find them on a femur, a humerus and ribs (Armand *et al.,* 2004), at the Caune de l' Arago and at Badalucco on ribs (Quilès, 2003), at Portel also on a rib (Gardeisen, 1994), at Fate on a rib and 2 ulnas (Quilès, 2003) and probably at Divje Babe: although there is no mention of the use of bear meat in the site report, the illustrations show butchery marks on a rib (Turk & Kavur, 1997).

Finally, the use of the animal's tongue is suggested by the cut marks found on a hyoid bone at Fate (Quilès, 2003).

The fracturation of bones in the following sites demonstrates marrow extraction: Hohle Fels (Münzel & Conard, 2004), Font-de-Gaume (Armand *et al.*, 2004), in the Aurignacian layers of Arcy (David & Poulain, 2002), Divje Babe (Turk & Dirjec, 1997) and Goyet (Germompré & Sablin, 2001).

The gravettian layers at Hohle Fels, rich in ash, contain large burned bones that are identified as bear remains. It seems that these bones were used as combustibles at this site (Münzel & Conard, 2004).

## CONCLUSION AND PERSPECTIVES

The number of Paleolithic sites which attest to bear exploitation will surely increase. The recent analyses of old collections is of particular interest as it has brought to our attention 2 new cases (Font-de-Gaume and Castanet)

If the first phalanx with cut marks really belongs to a brown bear, the Aurignacian site of Castanet and the Epigravettian one of Polesini (Stiner, 1994), at the current state of research, are the only ones which suggest that the brown bear was exploited in the Upper Paleolithic. For all other sites of this period, when exploitation took place, the species concerned was the cave bear (Armand *et al.,* 2004).

The use of hides, as illustrated at Castanet and other sites, seems to be the primary reason for exploiting bears. It is interesting to note that there is a notable variability in the location of cut marks.

For the season of exploitation, it is only possible to associate it with the period of hibernation. It is not very precise. Germompré & Sablin (2001) demonstrate that the timing and length for the dormancy period varied with climatic conditions, but not in contradiction with the theory of exploitation during the first stages of hibernation.

Exploitation during the fall hunt at Biache does not contradict this hypothesis. However, the records at Geissenklösterle and Hohle Fels, where exploitation occurred during the winter/spring transition, contradict this idea.

In order to further understand the notion of seasonal bear exploitation, it would be useful to carry out skeletochronological studies.

Bear-specific procurement strategies are not always opportunistic. Bears were hunted at Biache, Taubach and Hohle Fels. However hide procurement was probably a planned activity. Nonetheless bear exploitation still appears to have been a marginal activity when compared to herbivores procurement.

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