



Human palaeontology and prehistory

A late Middle Pleistocene hominid: Biache-Saint-Vaast 2, North France

*Un hominidé de la fin du Pléistocène moyen : Biache-Saint-Vaast 2, Nord de la France*Gaspard Guipert^{a,*}, Marie-Antoinette de Lumley^b, Alain Tuffreau^c, Bertrand Mafart^{a,b}^a Antenne de l'institut de paléontologie humaine, europôle méditerranéen de l'Arbois, bâtiment Villemin, BP 80, 13145 Aix-en-Provence cedex, France^b Département de préhistoire, Muséum national d'histoire naturelle, UMR CNRS 5198, institut de paléontologie humaine, 1, rue René-Panhard, 75013 Paris, France^c Laboratoire de préhistoire et quaternaire, université des sciences et technologies de Lille, 59650 Villeneuve-d'Ascq, France

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ABSTRACT

Among the Middle Pleistocene human remains discovered in Biache-Saint-Vaast (Pas-de-Calais, France), three cranial fragments were attributed to the same individual: Biache-Saint-Vaast 2 (BSV2). Three-dimensional virtual imaging methods have been used to assemble the various bones and to study the endocranial cavities. The fact that these remains showed most of the classical Neanderthal characteristics as well as several pleiomorphic characteristics suggests the existence of a phyletic relationship with the early European Neanderthals.

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R É S U M É

Parmi les restes humains découverts à Biache-Saint-Vaast (département du Pas-de-Calais, France) et datés du Pléistocène moyen tardif, trois fragments crâniens ont pu être attribués à un même individu : Biache-Saint-Vaast 2 (BSV2). L'imagerie numérique tridimensionnelle a été utilisée pour articuler et étudier virtuellement les différents ossements. L'observation, sur ces restes, d'une majorité de caractères observés chez les Néandertaliens classiques associés à plusieurs caractères plésiomorphes est en faveur d'une appartenance phylétique aux premiers Néandertaliens d'Europe.

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1. Presentation of the Biache-Saint-Vaast fossils

1.1. Location of the Biache-Saint-Vaast site

Biache-Saint-Vaast (Pas-de-Calais Department, France) is located between the towns of Arras and Douai in a val-

ley on the left bank of the Scarpe River. The site (50°18'N, 02°56'E), which is located at mid-height in this valley at an altitude ranging between 44 and 56 meters, is oriented south/southeast (Sommé et al., 1988). This open site was discovered on 24 April 1976 during excavation work at the Usinor iron foundry. Rescue excavations directed by A. Tuffreau, which continued up to 1982 (Tuffreau, 1988a; Tuffreau et al., 1982), led to the discovery of several human remains among the many faunal remains present at this site.

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1.2. Datation

All the human remains originated from layer IIa (Tuffreau, 1988b), where the average age is $175 \text{ ky} \pm 13 \text{ ky}$ (TL) (Huxtable and Aikten, 1988) and $253 + 53 / - 37 \text{ ky}$ (ESR) (corresponding to marine isotopic stages 6 and 7) (Yokoyama, 1989). They were associated with lithics and faunal remains. The continental flora and fauna detected, which were of the “moderate” type, suggest that this level and the human fossils it contains date back to the beginning of stage 7 (7a), and that their age is more nearer to 200,000 than 150,000 years BP (Sommé et al., 1988).

1.3. Human remains

Two fragmented human skulls were excavated at two places in layer IIa. Fragments of the parietal and temporal bones, an almost complete occipital bone, a portion of the *maxilla* and 11 teeth were discovered in situ in May 1976 (Vandermeersch, 1978). These remains (which were denoted Biache-Saint-Vaast 1 or BSV1) were initially attributed to a young female whose age-at-death ranged between adolescence and the early adulthood. According to Rougier (2003), however, the sex of BSV1 cannot be determined. A female attribution has been suggested in view of the fact that some of the traits of this skull are not very highly developed (Rougier, 2003). These traits include a whole set of Neanderthal anatomical characteristics: a small mastoid process, a rounded cranial contour in the coronal plane, and an occipital chignon. A phyletic position between late *Homo heidelbergensis* and the first *Homo neanderthalensis* has been proposed for this fossil (Dean et al., 1998; Rougier, 2003; Vandermeersch, 1978, 1982).

The other human bone fragments were identified on 8 November 1986 by P. Auguste during a study on the faunal bones. They originated from the same archeostratigraphic level as the other human remains and included a frontonasal fragment and fragments of the left parietal bone, the left temporal bone and the sphenoid and occipital bones. An anatomical connection was traced between the temporal bone, the greater wing of the left sphenoid bone, and the left parietal bone, which suggested that they belonged to the same individual (Biache-Saint-Vaast 2 or BSV2). The frontonasal and occipital fragments were also attributed to the same individual because their dimensions were compatible and because they were located in topographic proximity at the site.

The aims of the study on the BSV2 fossil were:

- to analyse its anatomical characteristics;
- to perform virtual reconstruction of BSV2;
- to discuss its phyletic position.

2. Preservation of the BSV 2 human remains

2.1. Frontonasal fragment

The frontal bone was damaged *post mortem* and is incomplete. The following parts of the frontal were found: most of the supraorbital torus, the base of the frontal squama, and the zygomatic process (Fig. 1). The metopic

suture is not visible. Part of the coronal margin (9 mm) is preserved under the left stephanion. Synostosed fragments of the two nasal bones (maximum length of the right one: 5 mm) are preserved.

The frontal bone shows multiple disoriented fractures including three major ones. A posterior fracture extends transversely from the right frontotemporal landmark to the left third of the squama, from where it is prolonged obliquely towards the left coronal suture. A second fracture (D, Fig. 1) extends antero-posteriorly from the right third of the squama to the right supraorbital torus. A portion of the right supraorbital torus between the supraorbital notch and the glabellar area is missing from fracture D. A third fracture (G, Fig. 1) extends obliquely from the left external third of the squama to the left third of the left supraorbital torus.

Few gaps are present on the outer table of the squama.

2.2. Left parietal bone

This bone, of which only 6 fragments still exist (Fig. 2) corresponds to the lower half of the left parietal bone. The outer table includes some gaps. The coronal suture is no longer present. The most anterior point is located in the region of the sphenion. The upper fracture crosses almost the entire lower half of the bone, below the temporal lines. The inferior and superior temporal lines are conserved posteriorly. The posterior and lower limits of the bone are the lambdoidal and squamous sutures, both of which are incomplete.

2.3. Left temporal bone

The left temporal bone consists of 6 fragments (Fig. 2). It is the best preserved of all the BSV2 bones found. The upper part of the squama is fractured. This fracture is fairly curvilinear. The suprameatal crest is damaged. Part of the zygomatic process and the articular eminence are both preserved. The tympanic plate is complete. The external auditory meatus is intact. The posterior portion of the articular fossa is present. The mastoid notch is intact. The base of the styloid process is broken. The tegmen tympani is preserved.

The semicircular canals and the cochlea are preserved. The bony labyrinth was studied using 3-D imaging methods, and the results obtained will be presented below.

The endocranial surface was eroded *post mortem*. The groove of the occipital artery has been fractured distally with respect to the level of the juxtamastoidian eminence.

2.4. Sphenoid bone

Only 2 fragments of the temporal side of the left greater wing of the sphenoid bone are still present (Fig. 2).

2.5. Occipital bone

The 3 remaining fragments correspond to the basilar part of the occipital bone and the 2 condyles (Fig. 3). The right condyle is incomplete, whereas the left one is intact. The sphenoid-occipital suture is fused. Only the anterior part of the completely fused intra-occipital synchondrosis

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