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DOES THE HUMAN FOSSIL SPECIMEN FROM REILINGEN (GERMANY) BELONG TO THE *HOMO ERECTUS* OR TO THE NEANDERTHAL LINEAGE?

ABSTRACT: The purpose of this article is to show that all of the archaic fossils discovered in Europe, when they are sufficiently complete to permit analysis, present Neanderthal features along with archaic features which are presumed to be unique to Homo erectus. *In western Europe, the differentiation of the Neanderthal lineage is well documented since the Riss. However, in central Europe the fossils from the Holstein and Saalian complex are considered to be either presapiens (above all Steinheim) or* Homo erectus. *During the past years, the hypothesis of a presence of Homo erectus in central Europe has been supported by the interpretation of fossil remains from Reilingen. Our study of the Reilingen fossil has not permitted us to confirm the status of* Homo erectus *for this specimen. Rather, we situate it in the Neanderthal lineage. In this article we present a succinct analysis of the Reilingen fossil in order to establish which of its features permit us to include it among the Neanderthals. The Reilingen fossil thus shows, in central Europe as in western Europe, the very ancient presence of the Neanderthal lineage.*

KEY WORDS: Reilingen – German fossils – Human evolution in Europe – Homo erectus – Pre-Neanderthal – Neanderthal – Archaic Homo sapiens

RÉSUMÉ: Le fossile humain provenant de Reilingen (Baden-Württemberg, Allemagne) est-il à rattacher à Homo erectus *ou à la lignée néanderthalienne?*
Le but de cet article est de montrer que tous les fossiles anciens mis au jour en Europe, lorsqu'ils sont suffisamment complets pour permettre une analyse, présentent des caractères néanderthaliens à côté de caractères archaïques présumés être propres uniquement à Homo erectus. *En Europe occidentale, la différenciation de la lignée néanderthalienne est bien documentée dès le Riss. En revanche, en Europe centrale l'on considère les fossiles provenant de l'holsteinien et du "complexe saalien" soit comme présapiens (c'est notamment le cas pour Steinheim), soit comme* Homo erectus. *Au cours de ces dernières années, l'hypothèse d'une présence d'*Homo erectus *en Europe centrale s'est trouvée encore renforcée par l'interprétation de restes fossiles provenant de Reilingen. Notre étude du fossile de Reilingen ne nous a pas permis de confirmer le statut* Homo erectus *pour ce spécimen. Nous le plaçons plutôt dans la lignée néanderthalienne. Dans cet article nous présentons une succincte analyse de ce fossile afin de préciser quels sont les caractères qui nous permettent de l'inclure parmi les représentants de la lignée néanderthalienne. Le fossile de Reilingen montre donc en Europe centrale, comme en Europe occidentale, l'enracinement très ancien de la lignée néanderthalienne.*

INTRODUCTION

In spite of the great quantity of ancient human fossil specimens discovered in Europe, a large number of questions remain concerning the first human inhabitants of this continent. More specifically, we do not know whether these ancient fossils belong to *Homo erectus* or whether they should be related to archaic *Homo sapiens* or else to a separate species typical of Europe that might be called *Homo heidelbergensis* (Rightmire 1990).

In the present state of our knowledge, while the existence in Europe of *Homo erectus* is presumed, no European fossil can be said to belong to this species with certainty. Beyond the difficulty of interpreting fossils that are often incomplete, this problem concerns the status of *Homo erectus* itself. After a long period of consensus, doubts have arisen concerning the diagnosis of this species and concerning its presence in Europe (for a broad discussion of this topic see: Bonifay, Vandermeersch 1991, Franzen 1994, Roebrocks, van Kolfschoten 1995).

The purpose of this article will not be to provide an answer to the question concerning the existence of *Homo erectus* in Europe. Rather, we aim to show that all of the fossils discovered in Europe – in western as well as in central Europe – when they are sufficiently complete to permit analysis, exhibit Neanderthal traits alongside with archaic traits that have been presumed to be typical of *Homo erectus* (*sensu lato*). The archaic European fossils thus exhibit very ancient roots in the Neanderthal lineage.

In western Europe, the differentiation of the Neanderthal lineage is well documented since the Riss (isotopic stage 7). For example, on the specimens discovered in France, features which are undoubtedly Neanderthal exist on the fossils found in the Suard cave at La Chaise (Piveteau 1970), which have been dated to the first half of the Riss (isotopic stage 7) (Schwarcz, Debenath 1979). The morphology of the occipital bone (S 9) is entirely similar to that observed on the classic würmian Neanderthals and it would not be surprising to encounter such a cranial fragment in the series of Neanderthal fossils coming from the southwest of France. In the absence of data concerning the geological age of this specimen, no trait would have permitted us to place it among the pre-würmian fossils. Similarly, the fossils from Biache-St-Vaast in France, also dated to the first part of the Riss (Tuffreau, Sommé 1988), show Neanderthal features in the occipital and temporal regions (Biache 1; Vandermeersch 1978) and in the frontal region (Biache 2; M. A. de Lumley, oral communication, Collège de France, 1988). Thus, on the basis of data available in western Europe, all of the ancient fossils discovered beginning in the isotopic stage 7, since they exhibit Neanderthal features, give testimony to the differentiation of the Neanderthal lineage and are to be considered as pre-Neanderthals both from a chronological and from a phylogenetic point of view.

In central Europe, however, there is no consensus among palaeoanthropologists concerning the origin of the Neanderthal lineage. Some authors consider the ancient fossils from the Holstein and from the "Saalian complex" to be presapiens – this is the case, for example, for the human cranium of Steinheim, which is supposed to display a "modern" morphology (Czarnetzki 1982, 1983, Adam 1984); other authors believe that *Homo erectus* is present in the same period – for example the fossils found at the site of Bilzingsleben (Vlček 1991, Mania, Vlček 1987, 1993, Bonifay, Vandermeersch 1991, Vlček 1991). During recent years, the hypothesis concerning the presence of *Homo erectus* in central Europe has found new support by interpretation of the human fossil from Reilingen.

Our study of the Reilingen fossil has not led us to confirm the status of *Homo erectus* attributed to this specimen. We would place it rather in the Neanderthal lineage. In this article we will present a succinct analysis of this fossil in order to specify which of its features permit us to place it among the Neanderthals.

THE RECORD OF DISCOVERY AND AGE OF THE REILINGEN SITE

The best known fossils in western Germany have been discovered in Baden-Württemberg: in particular the jaw of Mauer and the famous Steinheim cranium. In this same region, another important discovery was made in 1978 in the small village of Reilingen, situated to the southwest of the city of Heidelberg.

As with the other two fossils found in this region, Reilingen was discovered by accident and not during an organized excavation. In the case of this human fossil, as of the two others, questions remain concerning its geological age. The Reilingen specimen includes the incomplete *calvarium* of a young adult. This *calvarium* consists of two complete, fused parietal bones, the right temporal bone, which lacks only the zygomatic process and a small portion of the medial part of petrous bone, the occipital bone, which is partially broken on the right side of the nuchal plane and of the occipital plane. Since the discovery of Reilingen, a small segment of bone of the occipital plane on the right side of this fossil was removed for analysis in the hope of clarifying the problem of its geological age. The results of the different analyses undertaken have not yet been published. Due to the fragmentary state of this specimen, it is difficult to evaluate its cranial capacity. However, all of the estimations calculated on the basis of isolated bones (parietal and occipital), according to the method established by Poissonet *et al.* (1978), indicate a cranial capacity for Reilingen superior to 1250 ccm.

The fossil cranium of Reilingen comes from Rhine river deposits which can reach deep levels in this region. These fluvial deposits are dredged at various places in order to obtain gravel and sand for commercial use. This was the reason for the digging that yielded the human fossil of

Reilingen. The excavation of these sediments is done with dredging machines which usually dig below water level. The extracted gravel is sifted according to size and it is generally along with the larger objects thus recovered that fossil specimens are found. As in the case of the fossil cranium of Reilingen, this method of discovery does not provide any indication of the exact stratigraphy corresponding to the fossils.

On May 17th 1978, the fossil cranium of Reilingen was transported, along with 38 other fossil remains and large mammal teeth, to the Museum of Natural History of Stuttgart (Staatliches Museum für Naturkunde). We do not know the exact date of its discovery, which may have been several days or several months before its arrival in the museum in Stuttgart. In this period, the maximum dredging depth in the Quarry that yielded the skull was 28 meters below the ground water taste. However, this fossil might very well have been situated at higher levels, and this should therefore be considered to be a maximum possible depth. Digging in the quarry ended in 1979, during the year following the transfer of the fossil to the Museum of Natural History in Stuttgart. Today the site of Reilingen exists as a lake in a recreation center.

A number of studies have attempted to determine the chronology of the Reilingen fossil. An age for the site has been proposed both on the basis of the fauna discovered and of stratigraphic data. These analyses obtain results that are not always consistent with each other. From the stratigraphic point of view, the Rhine deposits of this region have been well known for a number of years: above all, following the discovery of the Reilingen fossil, thanks to the analyses of M. Löscher (1981, 1989) of deposits from the sites of Bühl and of Reilingen which are situated close to one another. According to Löscher, the 28 meters dug up contain only sediments of the last glacial and the last interglacial, with a maximum age of 115,000 B.P. This opinion is also shared by a research group composed of several geologists who have been working for a number of years in this region. The disagreements between M. Löscher and this research group concern only the maximum age attributed to these sediments, which for this group of geologists should be set at 125,000 B.P.

In contrast to these stratigraphic interpretations, the kinds of fauna found at a depth of 28 meters and studied by R. Ziegler (1996), indicate a longer period of deposition for these sediments. According to R. Ziegler, the fauna found at Reilingen correspond to a mixture of interglaciary fauna with some elements from a cold period.

The faunal assemblage includes two components which are of interest for dating the site of Reilingen, indicating a maximal and a minimal age for this site. These two faunal indicators are, first of all, the presence of *Trogontherium cuvieri* and, secondly, of *Elephas antiquus*. This latter animal which yields the most recent age for this faunal assemblage, corresponds in central Europe to the end of the last interglacial and to the beginning of the last glacial. This age is thus in accord with the data of the geologists. If the Reilingen cranium belongs to the faunal assemblage of *Elephas antiquus*, it would be contemporaneous in Germany with Neanderthal human fossil remains from Salzgitter-Lebenstedt, or with those of Neanderthal (Bosinski, Henke 1993, Bosinski *et al.* 1995). However, it should be noted that the presence of *Elephas antiquus* is shown only by one very worn tooth, belonging to a young specimen. Its relation to this species has recently been subject to debate (*EuroMam* excursion, 1996).

The other important faunal presence is that of *Trogontherium cuvieri*, which gives the oldest age for the Reilingen deposits. This beaver is generally acknowledged to have existed in central Europe during the "Holstein" and during the "Saalian complex" (Heinrich 1991, von Koenisgswald 1973, 1992, von Koenisgswald, Löscher 1982). Its most recent presence is attested to by the site of Schöningen in the Rheindorf interglacial which is situated within the "Saalian complex" (Kolfschoten 1995, Mania 1995). If the Reilingen fossil corresponds to the chronology of this faunal assemblage, it would be contemporary in Germany to the fossils of the Bilzingsleben site where, indeed, *Trogontherium cuvieri* has been found among the fauna, or to the Steinheim human remains (where this beaver was not discovered, although the conditions of the discovery do not permit us to exclude its presence) or also to Biache-St-Vaast in northern France.

Some researchers (von Koenisgswald *et al.* in print) support the possibility of a reemergence of *Trogontherium cuvieri* during the last interglacial (notably in the site Gross-Grohrhein). If this is the case, there would be no contradiction between the analyses of the fauna and those furnished by geological studies.

In conclusion, the question of the age of the deposit which yielded the human fossil of Reilingen remains open. This fossil belongs to an interglacial phase: either to the Holstein (isotopic stage 9) and "Saalian complex" (isotopic stage 7) or to the last interglacial (isotopic stage 5).

THE FIRST INTERPRETATIONS OF THE HUMAN FOSSIL OF REILINGEN

The first news of this fossil discovery was announced to the scientific community in 1987 by E. Vlček. Then, in 1989, two short preliminary studies were published in German (Adam 1989, Czarnetzki 1989). At the conclusion of their analyses, the two authors of these studies proposed two different phylogenetic interpretations of the Reilingen fossil. For Adam, it belongs to *Homo sapiens sapiens* (archaeomorphic *Homo sapiens*). Adam has only recently accepted the fact that these fossil remains are Palaeolithic (oral communication, Mauer conference, January 1995). In contrast, A. Czarnetzki, insisting on the great antiquity of this fossil, has attributed it, to *Homo erectus*. For Czarnetzki, the Reilingen human fossil remains represent a separate sub-species: *reilingensis*. Czarnetzki advanced this viewpoint in a more detailed

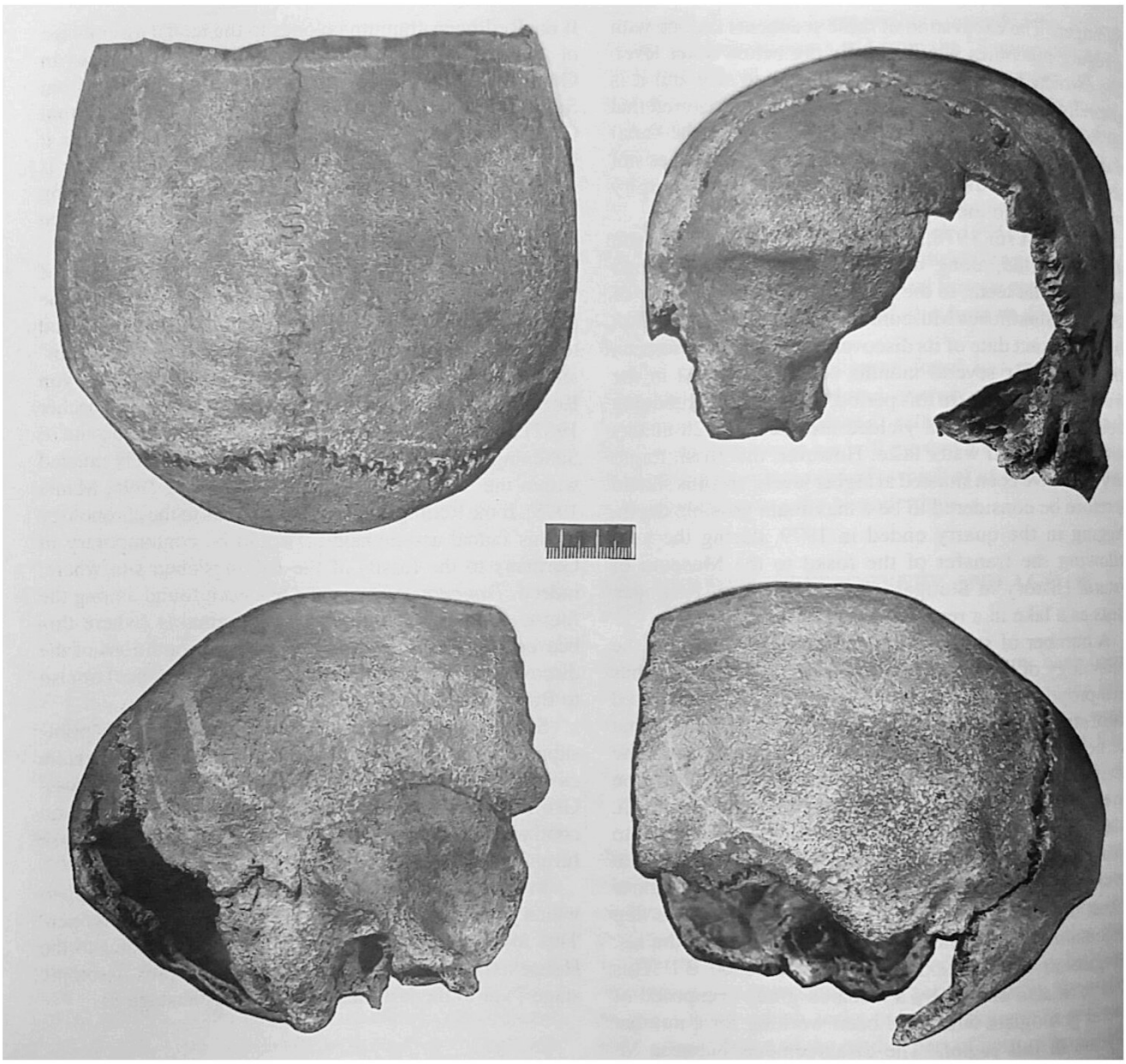

FIGURE 1. a: Norma verticalis (above, left); b: Norma occipitalis (above right); c: Norma lateralis right (below, left); d: Norma lateralis le (below, right) of Reilingen.

second article published in French (1991). At the end of his study, this author concludes:

"In spite of the mosaic of its evolved or unique and archaic features, the Reilingen specimen represents an evolutionary stage which is more *Homo erectus* than *sapiens*, and different than all forms already known of this taxon ... Thus it may be formally designated under the name of *Homo erectus reilingensis*." (the present author's translation)

In fact, the analysis of the features cited by this author (eleven archaic and five evolved) does not corroborate the diagnosis of *Homo erectus* even if one accepts the hypothesis that it represents a separate sub-species. The features cited by Czarnetzki, like the differentiatio between archaic and evolved features, must be carefull examined. If the features related to the robusticity of th bones (the robusticity of the *crista supramastoidea*, th robusticity and massive size of the root of the zygomati process) may be considered to be archaic, they nonethele hardly have any taxonomic significance, since they ma be found just as well on *Homo erectus sensu lato*, as o the Neanderthals or even on the most ancient specimen of modern man. Thus, these features cannot by themselv be diagnostic. Similarly, certain features taken to b "evolved" by this author do not permit us to establis Reilingen as a separate sub-species of *Homo erectus*. Thus

for example, "the well-developed mastoid process" present on fossils attributed to *Homo erectus sensu lato*, most notably on Asian fossils, but also observed on Reilingen, is also characteristic of modern man.

We agree with A. Czarnetzki's opinion that the Reilingen fossil undoubtedly exhibits a group of features that are at once archaic and evolved, but in our opinion the evolved features are, however, derived and typical of Neanderthals. It is these evolved features that make it possible for us to place the Reilingen fossil in the Neanderthal lineage. The presence of Neanderthal features has already been noted by D. M. Waddle (1993), but this author relates the Reilingen fossil to "archaic" *Homo sapiens*. Let us summarize these features.

THE NEANDERTHAL FEATURES OF THE REILINGEN FOSSIL

Numerous studies have attempted to determine precisely which features are Neanderthal ones. These features are becoming increasingly well-known, above all on the cerebral and facial cranium (*Cf.* notably Stringer *et al.* 1974, Trinkaus *et al.* 1988).

Thus the examination of the totality of the Reilingen calvarium makes it possible to place derived Neanderthal features in relief, alongside a great number of archaic traits, certain of which persist among the Neanderthals, as well as features which seem to be particular to this fossil. Among these latter features, one finds, for example, in superior view, a symmetrical depression on each side of the sagittal suture in the anterior part of the parietals after the coronal suture.

As with the Neanderthals, in superior view (*Figure 1a*) the maximum width of the cranium is found in the back, after the auditory meatus. Following this widening, the cranium narrows in shape just before the lambdoid suture. This places in relief a well differentiated occipital chignon or bun.

This chignon, often present on Neanderthals, is also quite visible on Reilingen in lateral view. It is accentuated by a flat zone on the parietals before the lambda located on the medial sagittal plane before the lambdoid suture. This lambdoid flattening is often present on pre-würmian fossils, such as Biache 1 (Vandermeersch 1978), and is also accentuated and well visible on the fragment of parietals that fit on the occipital bone from Salzgitter-Lebenstedt. It is always difficult to orient an incomplete cranium, however, it seems that the vertex is situated quite clearly after the bregma. Among the Neanderthals, there is a noticeable platycephaly and the vertex is always situated after the bregma on the sagittal suture toward the middle of the parietal bone.

Among the archaic features of Reilingen, let us note the almost quadrangular shape of the parietal bones. The squamous suture is smaller than the sagittal suture. In general, there is barely any convexity on the four sides. The coronal suture is almost rectilinear. The temporal lines are weakly marked. They thicken before the asterion, forming a slight protuberance, but not a *torus angularis* typical of *Homo erectus* (*Figure 1c*, right lateral view).

In posterior view, the cranium exhibits a rounded shape (*Figure 1b*, occipital view). However, this is not indeed a derived form, not exactly a rounded "en bombe" morphology, typical of the Neanderthals. The "en bombe" morphology, considered to be derived, is due to a combination of features: 1) the reduction and flattening of the mastoid region (*pars mastoïdea*), which is obliquely oriented in a medio-inferior direction; 2) the lack of development of the mastoid region; 3) a maximum cranial width situated at a moderately elevated position; 4) weak parietal tubers (*tuber parietalia*); 5) temporal lines which are not strongly accentuated; 6) the absence of sagittal keeling (carena). On the Reilingen fossil, as we have just seen, the temporal lines (*linea temporalia*) are not well defined and there is no sagittal keeling on the posterior part of the parietals (there is very slight keeling, however, on the first part of the parietals). Only the mastoid process (*processus mastoïdeus*) is present on the right side; as on the Neanderthals, it is medially oriented, but very well-developed. Moreover, the parietal tubers are more visible than on Neanderthals. They are situated toward the middle of the bone, in an intermediary position between the low position of very ancient fossils (the skull is in this case called "tent shaped") and the very high position of modern humans (called house-shaped or pentagonal). In view of the whole group of these features, the posterior profile of the cranium of Reilingen is less "en bombe" than that of the Neanderthals. In fact, the shape described above for Reilingen recalls that of fossils from the last interglacial, such as Saccopastore 1 (Condemi 1988a, 1992).

Generally speaking, the occipital bone of the Neanderthals is characterized by great breadth, displayed by the biasterionic breadth and by its shortened and very convex occipital plane. The first of these is an archaic feature while the second, typical of this population, is due to the presence of the occipital bun.

The occipital bone of Reilingen, as that of the Neanderthals, is robust and exhibits an extensive biasterionic breadth (118 mm), which is within the limits of variation known for this population (m =120 mm; N = 7; Hublin 1978). The occipital plane (*planum occipitale*) is quite convex and, as we have seen, the development of the occipital bun is considerable. The occipital bun and the convexity of the occipital plane can be evaluated by a ratio (lambda-inion chord/biasterionic breadth). Reilingen (52.5) is close to the value observed on the last predecessor of the classical Neanderthals as well as on the classical Neanderthals themselves (Gibraltar 1 [53], Saccopastore 1 [52.5], classical Neanderthals [46.8 – 53.6; N = 5]; Condemi 1992). The Reilingen ratio is far from ratios obtained on European fossils which do not display an occipital bun (Petralona [56.7] and Vertesszöllös [57.7]; Condemi 1992). The similarity of the Reilingen occipital bone to those of Neanderthals and pre-Neanderthals can

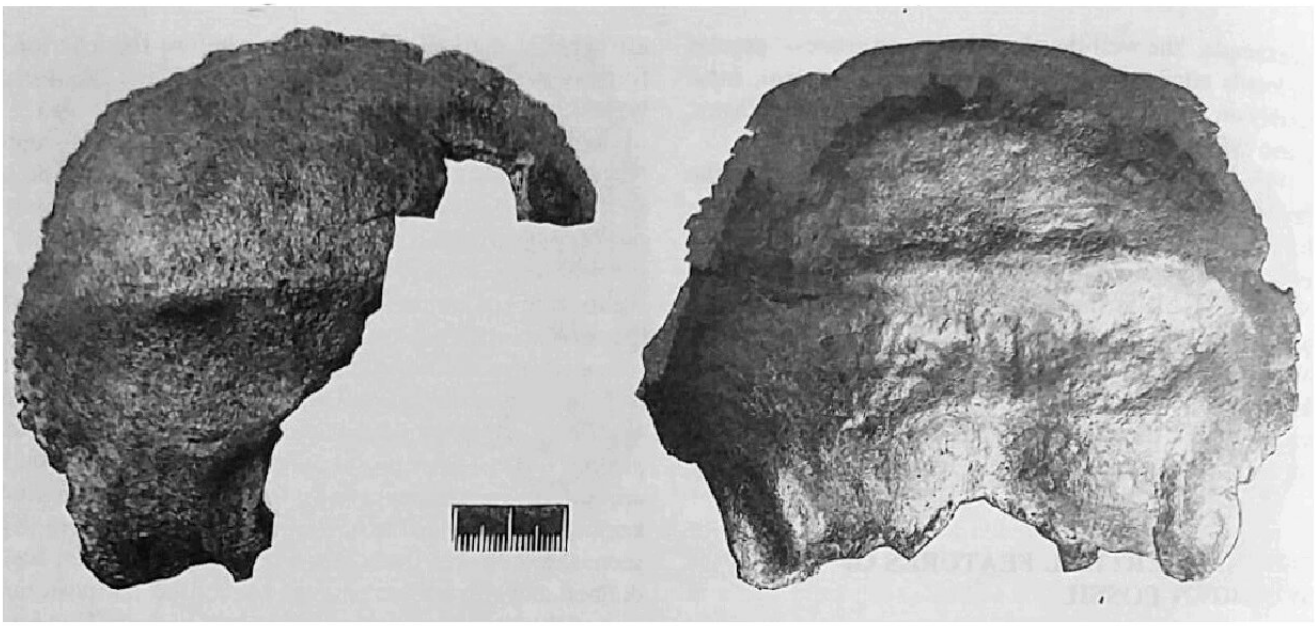

FIGURE 2. a: Occipital bone of Reilingen (left); b: Salzgitter-Lebenstedt (right).

also be illustrated by the values of the occipital angle (lambda-inion-opisthion). If we accept the supposed position of the opisthion advanced by K. D. Adam (1989) on the basis of the small fragment of the occipital rim, the occipital angle of Reilingen would be 113°. It would thus be very close to the angles observed among pre-würmian fossils such as La Chaise, abri Suard (115.3°; Piveteau, 1970), Saccopastore 1 (118.3°; Condemi 1992) or Salzgitter-Lebenstedt (112.5°; Hublin, 1978). This angle can be determined only on three classical Neanderthals (La Chapelle-aux-Saints [119°], La Ferrassie 1 [126°] and Spy 2 [119.3°]). Once again, all of these values are larger than those observed on Petralona (101°) and Vertesszöllös (103°), which do not display any occipital bun.

It is above all in regard to its morphology that the Reilingen occipital bone may be related without doubt to the Neanderthal lineage (*Figure 2a*, occipital bone). The occipital plane of the occipital bone shows two traits that are diagnostic for this population. There is a single, large and shallow (15.5 mm, 41 mm circa – approximate value, given that the right part of the bone is incomplete) supra-occipital fossa (*fossa supratoralis*). Its surface is porous and its contours only weakly marked. It stands above a small transverse occipital torus (*torus occipitalis transversus*) which, as on the Neanderthals, is bilaterally well-developed and depressed in its medial portion. The most protuberant points of this torus are situated laterally under the inferior lateral extremity of the supra-occipital fossa. The features are quite visible on the left side of the bone, which is complete, as well as on the right side, just before the break, where the torus thickens. The torus is much more laterally extended than on the (classical) Neanderthals. This is a feature common to all pre-würmian European fossils (Condemi 1992).

The nuchal plane (*planum nuchae*) of the Neanderthals exhibits many archaic features, which indeed are systematically present on Neanderthals, but there are few features which can be considered to be derived. The nuchal plane of Reilingen is preserved on its left side and in its medial region. The relief is quite visible, as also in the medial region. The external occipital crest (*crista occipitalis externa*) is thus present. It is spread out and rounded. All of the marks of the muscular insertions and all of the reliefs are well-delineated and clear. Hence, in the medial region of the left side of the *musculus semispinalis capitis* a small depression is visible, which is sometimes considered to be a feature of Neanderthal occipitals (Hublin 1978). Between the marks of the *musculus rectus capitis posterior major* and of the *musculus capitis obliquus superior* the bone thickens, but there is not really a tuber. By the clear delineation of the muscular reliefs and by its robusticity, the morphology of the nuchal plane of Reilingen resembles that observed on pre-würmian fossils placed in the Neanderthal lineage, such as the rissian occipital (Schwarcz, Debenath 1979) of La Chaise, abri Suard (S 9) or the Riss-Würm occipital (Segre 1983) of Saccopastore 1, or else the Riss-Würm or early Würm occipital (Bosinski *et al.* 1993) of Salzgitter-Lebenstedt. On all of these fossils the reliefs are also well-delineated. Unfortunately, the juxtamastoid eminence on the Reilingen fossil is not entirely present. However, on the right temporal bone the temporal lip of the tempo-occipital suture (*sutura occipito-mastoidea*) does not appear to be very accentuated and does not extend below the mastoid process (*processus mastoideus*) which, however, is broken at its apex.

Generally speaking, the temporal bone of the Neanderthals exhibits a great number of archaic traits

(Condemi 1988b, Elyaqtine 1995). but there are few derived traits characteristic of this population. On Reilingen, the mastoid process is oriented toward the front and slightly medially. If the first of these two traits is found on ancient fossils, the second is nonetheless considered to be Neanderthal. It is generally considered that the presence of a small mastoid process, hardly separated from the temporal bone (*pars petrosa*), represents a derived feature (Vallois 1969). As we have seen on Reilingen, the mastoid process is big and well-individualized. It points down, well below the level of the juxtamastoid eminence (*Figure 1c*, right lateral view). These latter two features would seem to separate Reilingen from the Neanderthals. However, as we have already had an occasion to note (Condemi 1990-91, 1991), these two features are traits present uniquely on western Neanderthals, especially on those from southwestern France. They are moreover observable in this geographic region beginning in the Riss, notably on the temporal bone from La Chaise, abri Suard (Piveteau 1970, Piveteau, Condemi 1988).

On the mastoid apophysis of Reilingen there is a slight thickening of the bone which is not however a real anterior mastoid tuber (*tuberculum mastoideus anterior*). The presence of this feature, which is considered to be a Neanderthal feature (Santa Luca 1978, Hublin 1978), is variable among the pre-würmian fossils of western Europe.

On Reilingen, as among many archaic fossils and among Neanderthals, a tympano-mastoid incisure may be observed. The opening of the auditory meatus (*meatus acusticus externus*) is circular in form and perpendicular to the plane of the root of the zygomatic processus (*processus zygomaticus*). Elyaqtine (1995) has noted that a circular auditory meatus is typical of würmian (classical) Neanderthals. All of the prewürmian European fossils exhibit an auditory meatus which is oval-shaped." The auditory meatus on Reilingen is surrounded in its anterior portion by a well-individuated postglenoid process *(processus zygomaticus posterior)*. The tympanic ring is relatively fine on its antero-lateral edge, while the postero-inferior edge is thicker and recalls of the pre-würmian European fossils.

The temporal squama (*pars squamosa*) of Reilingen is relatively well-rounded as on the pre-würmian fossils and on the Neanderthals. While it is, however, relatively low on the latter, it is high on Reilingen (46 mm). It is of interest to note that it approaches that of Petralona in its dimensions, above all by its height (43 mm; Murrill 1981), which is the largest height observed on the pre-würmian European fossils. However, the shape of the squama on Petralona is different from that of Reilingen, since Petralona's anterior edge is subtriangular.

Among these archaic features of the squama, the presence of a supra-mastoid crest should be noted, which ends in a supra-mastoid tuber (*tuberculum supra-mastoideus*).

Among the Neanderthal traits there is a strong inclination of the temporal groove toward the front and bottom between the temporal squama and the root of the zygomatic process. This feature which is found on all of the classical Neanderthals, has been well described on the fossils of La Quina by H. V. Vallois (1969).

In lower view, the temporal bone exhibits many archaic features which are also for the most part present on the Neanderthals. Hence, the glenoid cavity (*fossa temporalis*) on Reilingen is large and poorly delimited. The articular tuber is concave in the transversal direction. The digastric groove does not reach the stylomastoid foramen directly. but it is separated from it by a small bony ridge which divides the digastric groove in two segments. The stylomastoid foramen and the root of the styloid process are in an internal position in relation to the digastric groove (*Figure 5*, inferior view of the temporal bone). All of these features are found on both the pre-würmian European fossils and on the Neanderthals.

CONCLUSION

Our study of the human fossil of Reilingen has placed in evidence a large number of archaic features on this specimen. Let us summarize them. On the parietal bone: the quadrangular and slightly convex form, the thickening of the temporal crest on its posterior edge (at the location of the angular torus); on the occipital bone: the great width of the biasterionic and the robusticity of the reliefs on the nuchal plane; on the temporal bone: the presence of a well-developed supramastoid crest, of a tympano-mastoid incisure, of an articular tuber which is concave in the transversal orientation, of the occipito-mastoid lip of the large justamastoid eminence forming a crest, of the digastric groove interrupted by a bony ridge, of the location of the styloid process in internal position in relation to the digastric groove and to the stylomastoid foramen and also the position of the auditory meatus under the root of the zygomatic apophysis.

We would like to emphasize the fact that most of these archaic traits are found on both the fossils termed *Homo erectus* (*sensu lato*) and on the Neanderthals. But we cannot confirm the status of *Homo erectus* for the fossil of Reilingen since, as we have just shown, it exhibits features which are undoubtedly Neanderthal, which leads us to place Reilingen in the Neanderthal lineage. Among these let us recall, on the parietal bone, the position of the vertex after the bregma; on the occipital bone, the presence of a supra-occipital torus bilaterally well-developed, above which extends the suprainiac fossa; on the temporal bone, the rounded shape of the squama and the sharp inclination of the temporal groove toward the front and the bottom between the temporal squama and the zygomatic process.

The question to be raised concerns whether the presence of these Neanderthal features observed on Reilingen could accord with a very ancient geological age (Holstein and/ or "complex Saalien"). In western Europe, as we have seen in the first part of the present article, and as we have

indicated in the course of this brief analysis, Neanderthal features are present beyond any possible doubt beginning in the Riss (isotopic stage 7). Should further research confirm the ancient geological age of the Reilingen fossil, we would gain a decisive argument to show that central Europe, like western Europe, has witnessed the evolution of a single population leading up to the Neanderthals. If, however, this fossil belongs to the last interglacial, the Neanderthal features observed on the Reilingen fossil would then be similar to those present among its western European contemporaries.

It is of particular interest to note that an increase in analyses has led to a more frequent attribution of ancient European fossils to the Neanderthal lineage while the number of fossils attributed to *Homo erectus* has steadily diminished. This fact might provide an argument to partisans of the thesis that *Homo erectus* never existed in Europe, while supporting the hypothesis of a very ancient autochtone European population, leading up to the Neanderthals. The Neanderthals conserve a large number of archaic features while acquiring others that are uniquely characteristic of them.

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