

THE ABRI DE CRO-MAGNON, LES EYZIES (DORDOGNE), AND THE PROBABLE AGE OF THE CONTAINED BURIALS ON THE BASIS OF THE EVIDENCE OF THE NEARBY ABRI PATAUD

BY

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In March 1868, M. Duruy, the Minister of Public Instruction, confided to M. Louis Lartet¹ the responsibility for the scientific investigation of the Abri de Cro-Magnon². This site (Fig. 1), like all the other caves and rock-shelters in the Les Eyzies area, is cut into the Upper Cretaceous (Coniacian) limestone cliff which flanks the Vézère Valley at this point. The rock-shelter is situated immediately north of what is at present the garage of the Hôtel Cro-Magnon, and it has a south-southwesterly exposure. It is located *ca.* 858 m. north-northwest of the village of Les Eyzies and *ca.* 130 m. south-southeast of the Les Eyzies railway station, lying

¹ Son of the illustrious paleontologist, M. Édouard Lartet, excavator of the Grotte d'Aurignac (Haute-Garonne) and co-investigator with Mr. Henry Christy of a series of classic sites in the Dordogne region between 1863 and 1865. Éd. Lartet died on 28 January 1871.

² The summary account of the Cro-Magnon locality, its stratigraphy and the report on the results of the early excavations, which is set forth in this paper, is based in the main on Louis Lartet's very clear and well organized contribution to *Reliquiae Aquitanicae* (see Édouard Lartet and Henry Christy, 1865-1875, pp. 62-72 and figs. 38-43). Several of his contemporary papers (Louis Lartet, 1868-a; 1868-b; 1868-c) have also been consulted.

only a few meters north of the point where the Departmental Route (D-47) crosses the railway tracks. The abri is *ca.* 15 m. above the Vézère, the low water level of which is + 58.25 m., and 177 m. distant therefrom. On the top of the cliff, at the foot of which the site occurs, there is a vertically-standing protrusion that roughly resembles an enormous mushroom. The original overhang, which formerly had a thickness of 5.00 m., extended out *ca.* 8.00 m. from the cliff covering an area roughly 17.00 m. long in north-south extent, but it disappeared a good many years ago. Indeed there no longer exist even any traces of the original deposits; the only item of interest in the abri itself is a commemorative plaque installed on the occasion of the Centennial of the discovery of Cro-Magnon Man (Baker, 1968).

The Abri de Cro-Magnon was discovered after the construction of the railway embankment had necessitated the removal of much of the talus and of a gigantic limestone block (*ca.* 310 m.³), as well as the removal of a projecting rock ledge above the talus. Near the end of March 1868 two contractors from Les Eyzies—MM. Édouard-François Bertoumeyrou (surnamed Pâges) and Justin Delmarès—removed still more of the talus to use in the construction of a nearby road (compare Baker, 1969), and at a depth of *ca.* 4.00 m. below the surface of the deposit they exposed the projecting ledge forming the overhang of the abri. Digging further below this feature, the two local men came upon worked flints, animal bones and human burials. Recognizing the inevitable importance of the latter, they ceased work and wrote to M. Abel Laganne, who was in Bordeaux at the time. When the latter returned, he exhumed two skulls and other fragments of a human burial, as well as some worked Reindeer bones and a series of flint implements in the presence of MM. Galy and Simon of Périgueux. It was at this stage of the investigations of the deposits in the abri that M. Louis Lartet arrived and took charge of the research.

The vault of the shelter had a deep vertical crack in it, and therefore at the outset M. Lartet decided to install a supporting pillar. In digging the hole for the foundation of this pillar, four dark levels of ashes (presumably Couches B, D, F and H, *cf.* sec-

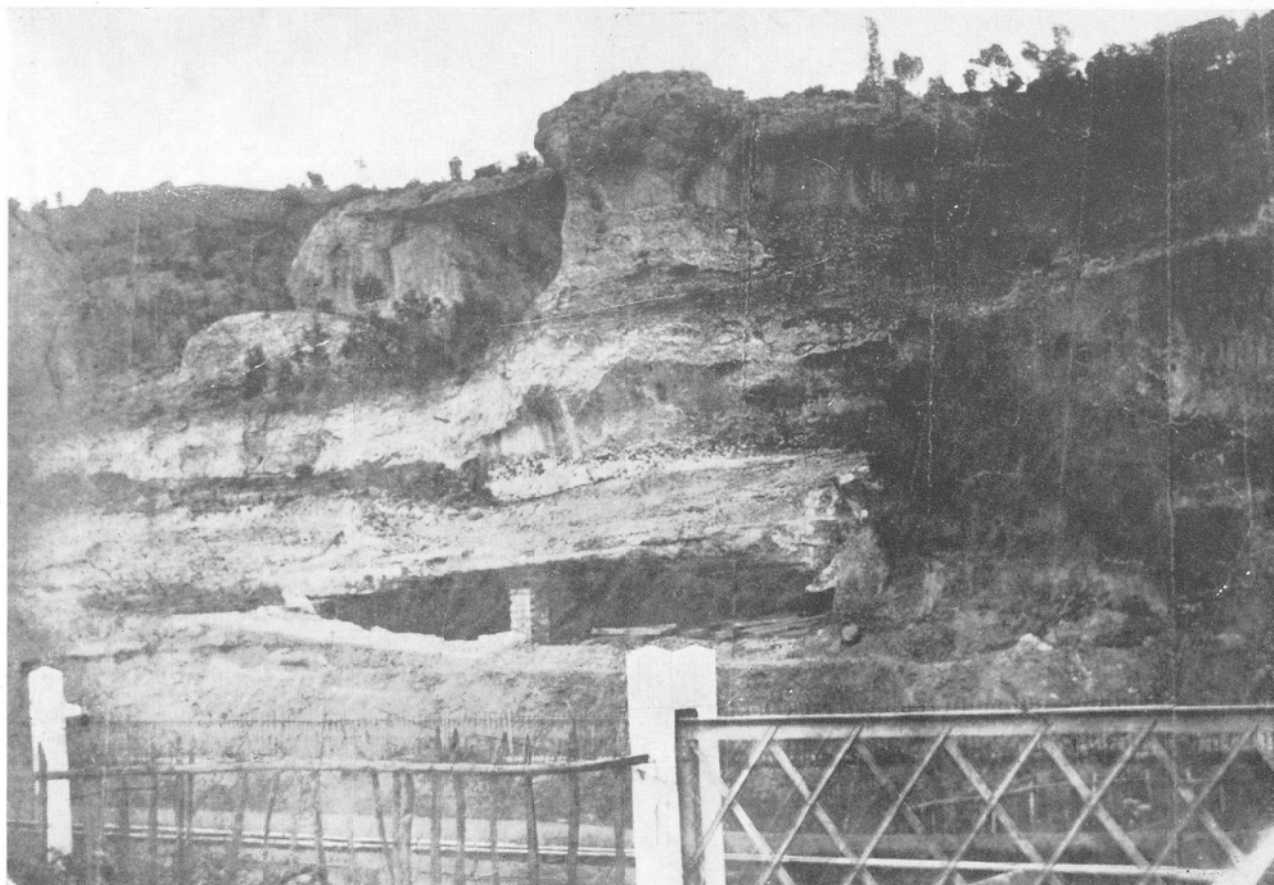


Fig. 1.—The Abri de Cro-Magnon, Les Eyzies (Dordogne). This photo was taken by E. Cartailhac in 1869 the year following the discovery of the site.

tion below) were identified lying one above the other (Figs. 2 and 4). In the lowest of these (Couche B) the stump of a tusk of a Mammoth came to light. Once the pillar had been installed, the various levels were each carefully excavated in turn. Of interest is the fact that these increase in thickness from below upward. From top to base the section as given by L. Lartet (1868-a, Fig. 5; 1868-b; 1868-c; 1865-1875, Fig. 41 and pp. 67-68) is as follows:

COUCHE	DESCRIPTION	THICKNESS
L	Talus deposits over the abri and partly within it: sterile.	4.00 m. to 6.00 m.
K	Calcareous debris. This yielded all the human skeletal material at the rear of the shelter ³ except the "Old Man"; also worked flints mixed with broken animal bones.	Thickness not given. Estimate: ca. 2.00 m. of deposit from surface of K to base of B.
J	Limited extent of ash, only traces of which were actually seen by L. Lartet.	5 cm.
I	Yellow calcareous debris containing clay-sized particles. This deposit yielded flints, bone tools, amulets, pendants and animal bones.	Thickness not given.
H	Black ashy couche; the most extensive and thickest horizon. Basin-shaped hearth at center cut into the underlying couche. This was the richest level in flints, bone tools, nuclei, quartz pebbles, charcoal and animal bones. L. Lartet states that apparently it represented a longer occupation of the site than any of the other couches.	Thickness varied from 10 cm. to 60 cm.; average: 30 cm.
G	Greasy red earth with bones and objects that were similar to, but fewer than those of the overlying Couche F.	30 cm.

³ The human skeletons, together with the burial accessories, were found in a small area in a hollow at the very back of the abri. Stratigraphically they were lying at the depth of Couche J where this feature was absent. Therefore, it is equally correct to state that they were either in the basal portion of K or in the upper part of I, since Couche J, which was only 5 cm. thick, separated these two deposits (fig. 3).

COUCHE	DESCRIPTION	THICKNESS
F	Carbonaceous hearth level which did not extend to the rear wall of the abri. An extensive hearth in this couche had reddened the surface of the underlying Couche E. Contained worked flints (mostly scrapers), bone tools, nuclei, quartz (+ granite) pebbles, charcoal (abund.), broken and burnt bones.	20 cm.
E	Fragments of fallen limestone debris reddened by fire under the hearth. Sterile.	50 cm.
D	Hearth level containing charcoal, worked flints, bone and burned bone.	10 cm.
C	Limestone debris fallen from the roof. Sterile.	25 cm.
B	Basal hearth level containing blackish ash, broken bones, burnt bones, and a portion of a Mammoth tusk.	5 cm. to 15 cm.
A	Talus deposit overlying bed-rock (base not reached).	over 70 cm.

Large- and medium-sized limestone blocks were scattered throughout the deposits, and L. Lartet (1865-1875, p. 71) states that it was necessary to use gunpowder to break up and remove some of the largest of them. But apparently no breakage or damage to either the skeletons or the archaeological material resulted from these explosions. Indeed, since there is no specific statement in any of the reports that appear in either *Reliquiae Aquitanicae* or in any of the other contemporary publications describing the actual discovery of any of the burials, one can only conclude that they had all been found and removed prior to M. Louis Lartet's arrival at Les Eyzies. Dr. Paul Broca (1868-a; 1868-b; 1865-1875, pp. 97-102) describes five adult skeletons plus "several" infants (compare also Vallois and Billy, 1965, p. 269; Vallois, in Vallois and Movius, 1952, pp. 74-75)⁴. One fact seems to be certain: all

⁴ The following individuals are now preserved in the Musée de l'Homme, Paris: No. 1, the "Old Man"; No. 2, an adult female; No. 3, an adult male; and No. 4, fragments of two adult skulls, de Quatrefages and Hamy (1874-a;

N-E

S-W

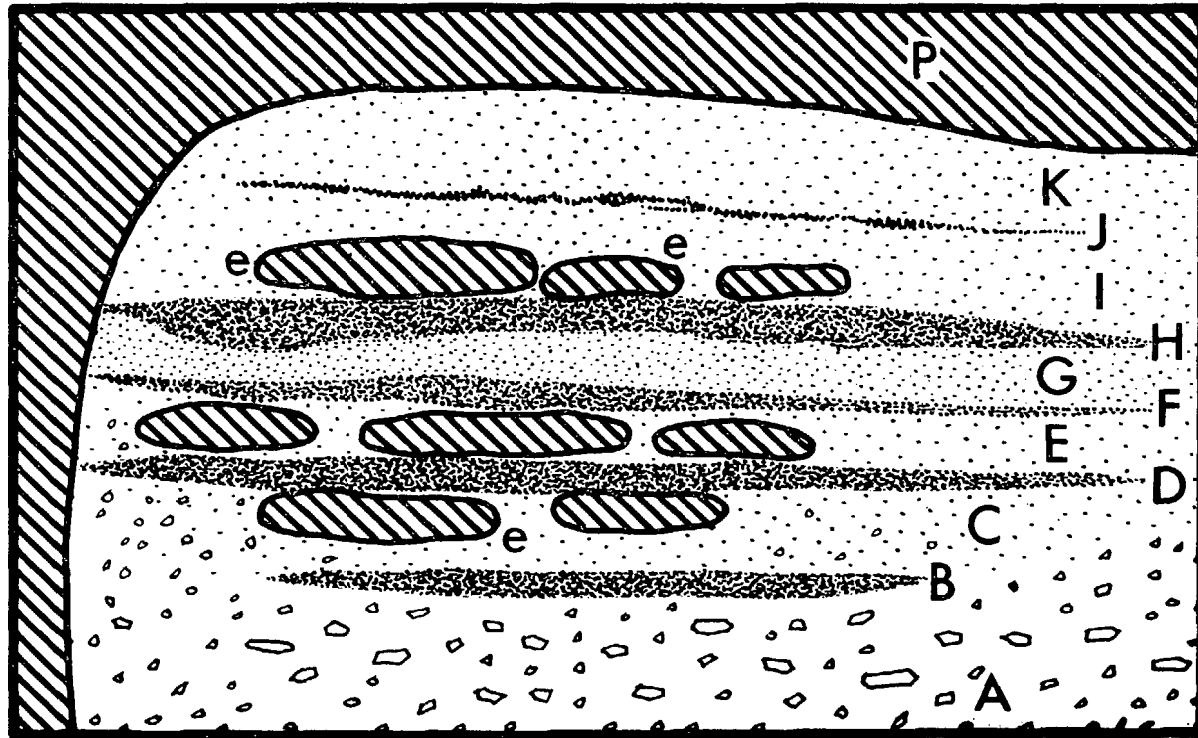


Fig. 4

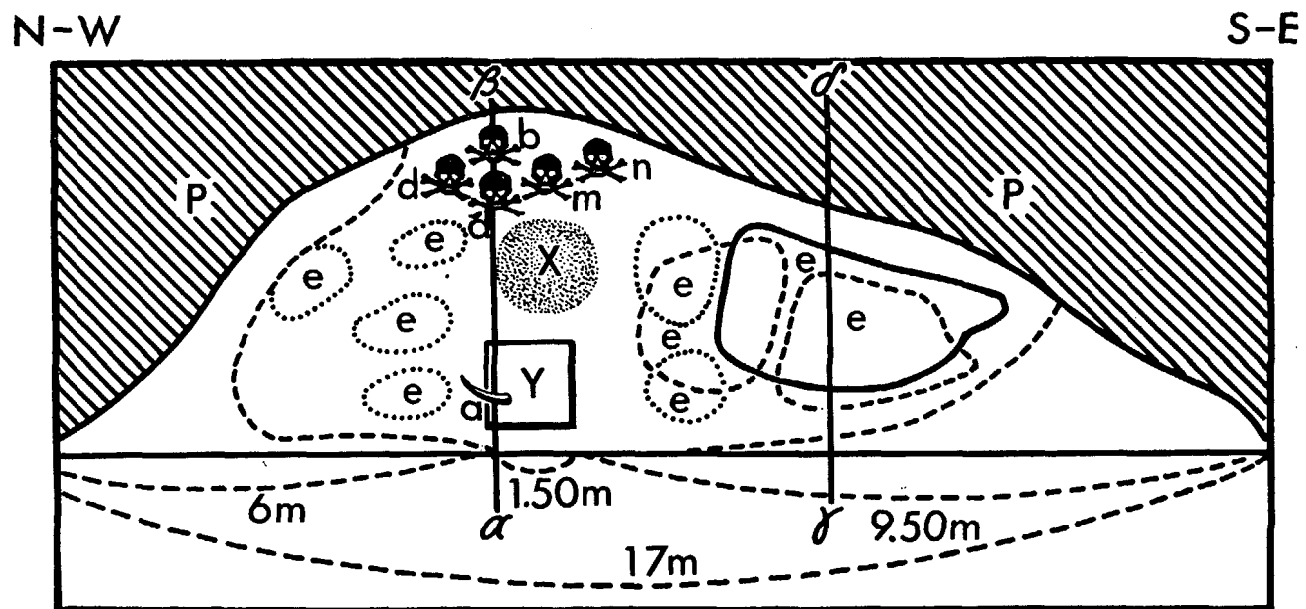


Fig. 3

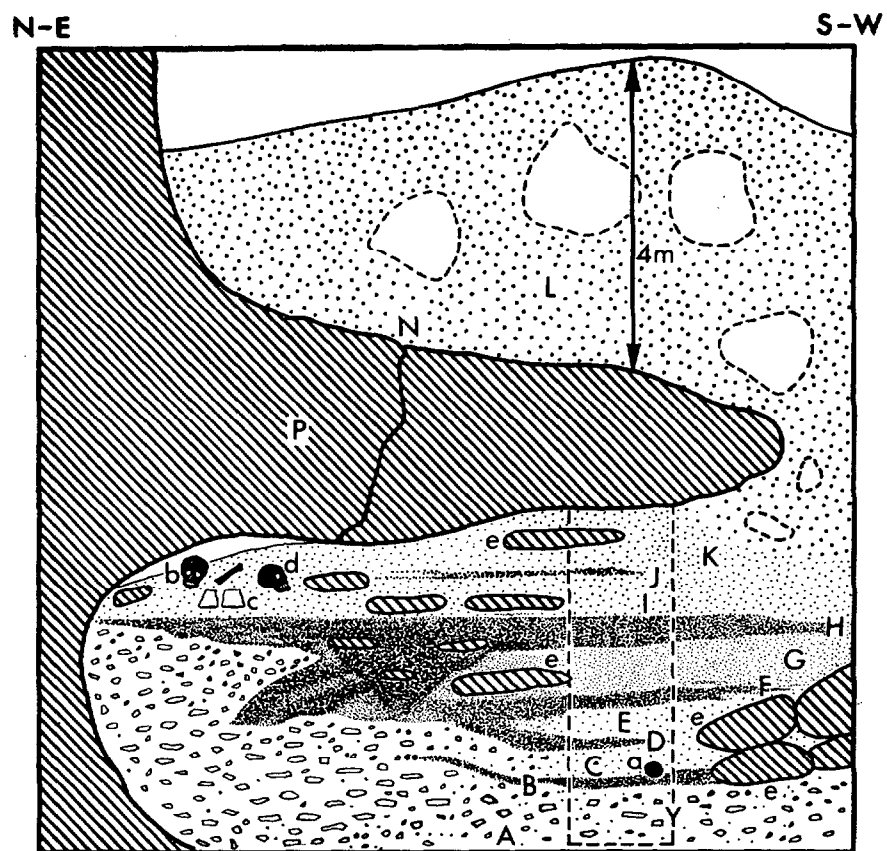


Fig. 2

of them were found together in a relatively small area in a depression or hollow at the very rear of the abri on approximately the stratigraphic horizon of Couche J, the uppermost of six occupation levels at the Abri de Cro-Magnon. Furthermore, it is stated that the skull of the "Old Man" was resting on the surface of the deposits in a nearby hollow which had not been filled up by the talus deposit (Couche K), and that since it had been exposed to the calcareous drip from the roof, a stalamic coating had been formed on some of the exposed parts. The bones of the four other adults were lying within a radius of 1.50 m. of the "Old Man" in the upper zone of the talus deposits. On the "Old Man's" left was the skeleton of a female whose skull exhibits a deep wound in front that was considered to have been made by a cutting instrument. By her side lay the remains of an infant which had not reached its full development. The other three skulls all seem to have been males.

Among the human remains lay some 300 marine shells, each of which had been pierced with a hole (compare *Reliquiae Aquitanicae*, 1865-1875, B-Pl. XI). The most numerous species (*Littorina littorea*, the common periwinkle, together with *Purpura lapillus*, *Turritella communis* (= *T. cornea*) and *Fusus Jeffreysianus* (= *F. Islandicus*), all abound today on the coasts of Aquitania and Poitou, according to Fischer (1876, p. 483), who suggests that they were probably used as elements of necklaces, bracelets or other ornamental attire. In this same general area numerous frag-

1874-b; 1882, pp. 44-52), who established the "Race de Cro-Magnon" based on their study of the human remains from this site, considered that specimen No. 4 represented a single individual, and hence they give four as the total. Other authorities, however, record various figures. For instance Dr. Vallois and Mme. Billy (1965, p. 53) state that on his arrival, Louis Lartet was told by the local workers that a total of fifteen skeletons and one foetus had been found! On the other hand, E. Cartailhac (1886, p. 401; 1889, pp. 105-108), who visited the Abri de Cro-Magnon in 1869, correctly states that five skeletons were discovered there, while Gabriel de Mortillet (1868, p. 460) records the interesting fact that seven skeletons were found of which only three were saved. The figures given by le Marquis de Nadaillac (1891, pp. 177-181) are likewise inconsistent with those of the original excavator; he states that the workmen actually found five burials, but that Louis Lartet could only preserve three of them.

ments of hematite, or red ochre, occurred, and superficial red stains were noted on one of the male skulls and femora. Not far from the skeletons, oval-shaped pendant, or amulet of ivory that was flat and pierced with two holes; two other even smaller examples, one found by M. Laganne and one found by a local schoolboy, were recovered in the same general area of the deposits. Also near the skeletons there were several perforated teeth, at least one of which is the incisor of a Bovid, and a large block of gneiss that presented a smooth surface due to the fact that it had been split. In addition, there were numerous worked flints, as well as several cut Reindeer antlers.

The fauna recovered during the excavations was studied by M. Édouard Lartet (1868-a; 1868-b; 1865-1875, pp. 93-96 and 182). He lists the following fifteen species of Mammals:

<i>Ursus</i> (of large size).	<i>Elephas primigenius</i> .
<i>Felis spelaea</i> .	<i>Sus scrofa</i> .
<i>Canis lupus</i> .	<i>Equus caballus</i> (very abundant).
<i>Canis vulpes</i> .	<i>Cervus elaphus</i> .
<i>Canis</i> sp.	<i>Rangifer tarandus</i> (abundant).
<i>Spermophilus</i> sp.	<i>Bovidae</i> (<i>Bos</i> or <i>Bison</i>).
<i>Lepus</i> sp. <i>timidus</i> .	<i>Capra ibex</i> ⁵ .
<i>Lepus</i> sp. <i>cuniculus</i> .	and one species of <i>Bird</i> .

Very few details are available concerning the flint implements found during the original excavations at the Abri de Cro-Magnon (compare T. Rupert Jones, 1865-1875, pp. 82-88: A-Pls. XIX and XX). They are stated to resemble those from the Abri Lartet in the nearby Gorge d'Enfer, an Aurignacian I locality (de Sonnevile-Bordes and Perrot, 1953, pp. 328 and 330; de Sonnevile-Bordes, 1960, pp. 68-70), and this is further confirmed by the fact that a typical cleft-base bone point was recovered at the Abri de Cro-Magnon by Louis Lartet (*Reliquiae Aquitanicae*, 1865-1875, B-Pl. XII, Figs. 2a and 2b). There is also one flattish segment of antler (*Ibid.*, B-Pl. XII, Fig. 10) with numerous notches along both

⁵ In addition to the above, Dr. Jean Bouchud (1965, p. 32) states that remains of the Blue Fox (*Vulpes lagopus*) were very probably found in Couche K, the level which contained the human burials.

sides ("marques de chasse") which recalls specimens found in Couche 8 (Intermediate Aurignacian) at the Abri Pataud (unpublished). But not a single art object⁶ came to light.

Several people have conducted excavations of unequal interest at the Abri de Cro-Magnon on various occasions in different sectors of the deposits. In 1869 and again in 1873 M. Élie Massénat, who was a confirmed supporter of M. Gabriel de Mortillet's classificatory system (Massénat, 1869; 1877), dug in the eastern sector of the deposits in front of the site and claimed to have found a Solutrean laurel-leaf point there underlying the Aurignacian deposits. Subsequent to Massénat's death, Dr. Paul Girod, also a believer in the de Mortillet "system", published a full description of Massénat's collection (Girod, 1906, pp. 21-25 & 66-68 and Pls. 35-48 & 99-100) in connection with his false claim that the Solutrean was older than the Aurignacian at this and other classic sites in Southwestern France. Later in 1893 M. Émile Rivière (1894, pp. 717-718; 1897, 1906, p. 777) opened a trench in the western portion of the shelter, and he found blades with heavy marginal ("Aurignacian"-type) retouch, carinate scrapers, two cleft-base bone points, a fragment of a bone awl, a bone with lateral notches ("marques de chasse") and various other bone objects, the most interesting of which was a Horse incisor pierced with a hole for suspension near the end of the root and covered over its entire length on the lingual surface and most of its lateral and exterior surfaces as far as the enamel by regularly spaced, parallel cuts (Rivière, 1894, p. 718, Pl. X, Fig. 30). In 1894 and in 1897 M. Gaston Berthoumeyrou (dit Pagès), a cousin of the discoverer, who

⁶ Actually two pieces were subsequently found, both allegedly at the Abri de Cro-Magnon. One of these, called "La Femme de Cro-Magnon", was recovered in 1897 by M. Gaston Berthoumeyrou and acquired by MM. Féaux and Feyolle soon afterwards for the Musée du Périgord in Périgueux (Rivière, 1897, p. 507; Féaux, 1902, p. 416). The second example, a bone with an outline drawing of a Bison on it, was acquired by Émile Rivière (1906, pp. 777-778) and recently sold to a Dr. Molle, who comes from Neuchâtel, Switzerland (*cf.* Pittard, 1962). Both of these objects are regarded as suspect (compare Rivière, 1906; Reinach, 1913, p. 62); certainly neither of them can be considered as being of Aurignacian age. Possibly they could have come from some sort of an Upper Périgordian horizon in the vicinity.

was the proprietor of the site, also dug in this same area, but the results of his work were never published. Later, according to M. le Capitaine Bourlon (1907, p. 262), M. Berthoumeyrou undertook new excavations in the remaining upper levels of this celebrated locality. In addition to a series of retouched blades and carinate scrapers, he found several burins busqués (*cf.* Bourlon, 1911, Fig. 2, no. 15 and Fig. 4, no. 9) and a thick fragment of long bone with a shallow depression at one end, which had resulted from intense and continued hammering made at or near the same spot. He states that there were traces of "shock marks" around the depression and concludes that this bone had served as a hammer rather than as an anvil, as in the case of those discovered by Dr. Henri-Martin at the well-known Mousterian site of La Quina (Charente). This was also the conclusion arrived at by M. Louis Giraux (1907), who also found similar pieces during his brief excavations at about this same time at the Abri de Cro-Magnon.

In 1897 with the authorization of the Berthoumeyrou family the Abbé Henri Breuil (1907, pp. 209-219) conducted a small excavation at the site. These investigations apparently continued on an intermittent basis for several years, and in 1905 Breuil was joined by M. Denis Peyrony, who states he continued digging there after Breuil had left (Peyrony, 1907). This work was located several meters from the trench dug by Émile Rivière some years before and near the area where the famous skeletons were discovered. Actually the trench was between the pillar constructed by M. Louis Lartet and the rear wall of the shelter. Here the *couche supérieure* (Lartet's Couche J) had virtually disappeared, and the *couche inférieure* (Lartet's Couche B), which extended the entire length of the abri (even stated to follow the undulations of the terrain), was between 5 cm. and 20 cm. thick (Breuil, 1907, p. 214; Peyrony, 1907, p. 183). The tools recovered included no Solutrean forms, notwithstanding the fantastic claims of Massénat (1869; 1877) and Girod (1906) mentioned above. Only Aurignacian types were found, as Breuil (1909, pp. 245-248) has clearly stated. The assemblage brought to light consisted of strangled (or notched) blades, a large number of carinate scrapers, blades with heavy marginal ("Aurignacian"-type) retouch on one or both sides, single

and double endscrapers, many of which were on retouched blades, a few rare burins, parallel grooves, nuclei, hammer-stones, etc. Two years later, D. Peyrony (1909, p. 161, Ftn. 1) recalled having found a fragment of a *bâton-de-commandement* in the *couche inférieure* at the Abri de Cro-Magnon similar to the ones from the Aurignacian I levels at the Abri du Poisson (Peyrony, 1932, p. 252, Fig. 4, no. 4), the Abri Castanet I (Peyrony, 1935, p. 430, Fig. 11, nos. 1-3), the Abri Blanchard (Didon, 1911, pp. 253-254 and Pls. III & IV), and elsewhere in the Dordogne. Although no cleft-base bone points were collected by either Breuil⁷ or Peyrony during the course of their research at the Abri de Cro-Magnon, M. Peyrony (1949, p. 27) assigns the site to the Aurignacian I, a conclusion with which the present writer is in complete agreement in so far as the middle and lower levels are concerned. But what about the upper levels?

The Bourlon Collection, which was acquired from M. Gaston Berthoumeyrou, is now in the Institut de Paléontologie Humaine in Paris, and the bulk of this material was found in what has been described as the *couche supérieure*, or the "grand foyer" (Couche H). It was studied by Mme. de Sonnevile-Bordes (1960, pp. 72-73 and Fig. 34). On the basis of the occurrence of very typical *burins busqués* (*op. cit.*, Fig. 34, nos. 7, 8 and 9) and *grattoirs à museau* (*op. cit.*, Fig. 34, no. 6), she concludes that the assemblage in question corresponds to an Aurignacian II, a fact which she had previously suspected (de Sonnevile-Bordes, 1959, p. 26). On this basis, the *couches inférieures* (Couches B, D and F) can with reasonable confidence be attributed to the Aurignacian I, whereas the "grand foyer" (Couche H) almost certainly belongs to the Aurignacian II. Therefore, we agree that Couche J, the level with which the skeletons correspond, cannot be attributed to an early phase of the Aurignacian (I *sensu lato*), but very definitely rather to an "evolved" Aurignacian (a late phase of Aurignacian II), or perhaps even to an Aurignacian III in view of its stratigraphic position overlying four other Aurignacian horizons.

⁷ Peyrony (1907, p. 183) records the interesting fact that, in a crate of unwashed archaeological material recovered by M. Berthoumeyrou at the Abri de Cro-Magnon, Breuil found the base of a lozenge-shaped bone point.

DATING EVIDENCE

No longer is it necessary to turn to the Grand Abri de la Ferrassie (Commune de Savignac-le-Bugue) *ca.* 6 km. west of Les Eyzies and 3.5 km. northwest of Le Bugue, excavated by Dr. L. Capitan and M. Denis Peyrony (Peyrony, 1934), to find a site that has yielded a long sequence of Aurignacian occupations to compare with the Cro-Magnon deposits. For at the Abri Pataud, less than 200 meters on Departmental Route D-47 immediately south of the railway crossing in front of the Hôtel Cro-Magnon one finds that a sequence consisting of nine successive Aurignacian occupations has been recorded (Movius, 1965; 1966). In so far as the latter are concerned, the stratigraphy of that vast site is as follows:

Couche 6	10 cm. to 20 cm.	"Evolved" Aurignacian (Possibly III or IV).
Éboulis 6-7	35 cm. to 40 cm.	
Couche 7	25 cm. to 30 cm.	Intermediate Aurignacian (b) (Level with flattened, lozenge-shaped, uncleft bone points; Burins busqués are abundant).
Éboulis 7-8	10 cm. up to 30 cm.	
Couche 8	35 cm. to 40 cm.	Intermediate Aurignacian (a) (Lamelles Dufour; Burins busqués very rare).
Éboulis 8-9	<i>ca.</i> 10 cm.	
Couche 9	5 cm. to 10 cm.	Early Aurignacian (?). A very temporary occupation, only 32 catalogued pieces.
Éboulis 9-10	10 cm. to 12 cm.	
Couche 10	8 cm. to 10 cm.	Early Aurignacian (?). A very temporary occupation, only 50 catalogued pieces.
Éboulis 10-11	30 cm. (average).	
Couche 11	15 cm. to 35 cm.	Early Aurignacian (Level with cleft-base bone points).
Éboulis 11-12	30 cm. (maximum thickness).	

Couche 12	5 cm. to 15 cm.	Basal Aurignacian, 160 catalogued pieces.
Eboulis 12-13	25 cm. (average).	
Couche 13	6 cm. to over 20 cm.	Basal Aurignacian, 57 catalogued pieces.
Eboulis 13-14	10 cm. to 18 cm.	
Couche 14	12 cm. to 25 cm.	Basal Aurignacian, 290 catalogued pieces.
Basal Eboulis	1.80 meters.	
Bed-Rock	Upper Cretaceous (Conician) limestone.	

The archaeological assemblages from the nine (9) occupation levels listed above is now (*i. e.* as of the summer of 1969) being studied by Miss Alison Brooks, who is preparing her Ph. D. dissertation on the materials in question. In the meantime, radiocarbon dates for four of them, with the exception of Couches 13, 10, 9, 8 and 6, have been published by Drs. J. C. Vogel and H. T. Waterbolk (1967, pp. 114-116), and their results may be summarized as follows from the base of the deposits (Couche 14) upward to Couche 7.

COUCHE 14: *Basal Aurignacian*.—For this horizon, the oldest occupation at the Abri Pataud, there are three dates from two samples, one of burnt and one of unburnt bone:

GrN-4610: 33,300 B. P. \pm 760 B. P. (31,350 B. C.)
 GrN-4507: 34,250 B. P. \pm 675 B. P. (32,300 B. C.)
 GrN-4720: 33,330 B. P. \pm 410 B. P. (31,380 B. C.)

Certainly these dates are very close to each other, in fact they are within the limits of the statistical error. Vogel and Waterbolk (1967, p. 116) accept a central value of 34,000 B. P. (= 32,050 B. C.) as the approximate age of this, the earliest, level at the Abri Pataud.

COUCHE 12: *Basal Aurignacian*.—There are again three dates for this horizon, and they are based on two samples, one of burnt and one of unburnt bone. One of the dates —GrN-4310: 31,000

± 500 B. P. (= 29,050 B. C.)— is obviously too young and need not be considered further. This leaves the following two figures:

GrN-4327: 33,000 B. P. ± 500 (31,050 B. C.), burnt bone
GrN-4719: 33,260 B. P. ± 425 (31,310 B. C.), unburnt bone

These figures are in very satisfactory agreement with each other and may be considered reliable.

COUCHE 11: *Early Aurignacian* (= Aurignacian I of Peyrony). Here only one of a number of samples of burnt bone has been measured, and it gave the following dates for both fractions, the extract and the residue:

GrN-4326: 32,000 B. P. ± 800 (30,050 B. C.)
GrN-4309: 32,600 B. P. ± 550 (30,650 B. C.)

Although Vogel and Waterbolk (1967, p. 116) accept a central figure of *ca.* 33,000 B. P. (= 31,050 B. C.) for both Couche 12 and Couche 11, it is evident on the basis of the stratigraphy that Couche 12 must be slightly older than 33,000 and Couche 11 must be slightly younger. The conclusion is that the two occupations in question were close together in time, and that C-14 was unable to separate them successfully.

COUCHE 7: *Intermediate Aurignacian (b)* (= Aurignacian II of Peyrony).—Two series of dates are available for this level, and the contradictory evidence presented by them has been discussed elsewhere (Movius, 1963, pp. 134-135). The final corrected dates as published by Vogel and Waterbolk (1967, pp. 114-115) are given below. All three of them are from the same sample, a lump of fine homogeneous charcoal:

GrN-3105: 29,300 B. P. ± 450 (27,350 B. C.)
GrN-3117: 32,800 B. P. ± 450 (30,850 B. C.)
GrN-3116: 32,900 B. P. ± 700 (30,950 B. C.)

Vogel and Waterbolk emphatically state that GrN-3105 is obviously too young and need not be considered further. This

means that the age of Couche 7 on the basis of C-14 determinations is 32,800 B. P. or 30,850 B. C.

Such an early dating for the Intermediate Aurignacian is somewhat at variance with the C-14 dates for other Early and Intermediate Aurignacian sites in France, among which one may cite the following:

1. *La Quina* (Gardes, Charente), one date (Vogel and Waterbolk, 1963, p. 165) for an horizon referred to the "Aurignacian I":

GrN-1493: 31,400 B. P. \pm 350 (29,450 B. C.)

2. *Les Cottés* (Saint-Pierre-de-Maillé, Vienne), three dates (Vogel and Waterbolk, 1967, p. 111) for an "Aurignacian I" level:

GrN-4258: 30,800 B. P. \pm 500 (28,850 B. C.)

GrN-4509: 31,200 B. P. \pm 410 (29,250 B. C.)

GrN-4296: 31,000 B. P. \pm 320 (29,050 B. C.)

3. *Grotte du Renne* (Arcy-sur-Cure, Yonne), one date (Vogel and Waterbolk, 1963, p. 166) for an "evolved Aurignacian I" (or ? an Aurignacian II) level:

GrN-1717: 30,800 B. P. \pm 250 (28,850 B. C.)

4. *Abri Caminade* (La Canéda, Dordogne), one date (Vogel and Waterbolk, 1963, p. 166) for an "evolved Aurignacian I" horizon:

GrN-1491: 29,100 B. P. \pm 300 (27,150 B. C.)

Unfortunately this sample was small and contained only sufficient carbon for a single measurement.

Other dates for La Rochette (Saint-Léon-sur-Vézère, Dordogne) and the Abri du Facteur (Tursac, Dordogne) have been published by Vogel and Waterbolk (1967, p. 113) and by Coursaget and Le Run (1966, p. 131), both for Aurignacian I levels, but they have given such low figures that one can only conclude that they are too young and should not be considered further.

COUCHE 6: "Evolved" Aurignacian (Possibly Aurignacian III or IV of Peyrony).—No samples from this horizon have yet been measured. It is the uppermost unit of the so-called Cycle I deposits at the Abri Pataud, which were all accumulated rapidly under the conditions of a cold and fairly rigorous climate. On the basis of the figures given above, however, it is very unlikely that this occupation is younger than *ca.* 30,000 B. P. (= 28,050 B. C.).

CONCLUSIONS

It is obviously very regrettable that not a single reliably documented collection of archaeological material from any single one of the five hearth levels recorded by Louis Lartet at the Abri de Cro-Magnon has been preserved, but until the late 1920's no one ever suspected that the Aurignacian actually consisted of a series of developmental stages rather than a single discrete unit. One assumes that the collection acquired by Boursin from M. Gaston Berthoumeyrou, which is now preserved at the Institut de Paléontologie Humaine, was collected in the "*grand foyer*" (Couche H) and that Mme. de Sonnevile Bordes' conclusion that it apparently belongs to an Aurignacian II is substantially correct. In any case, by analogy with the nearby Abri Pataud sequence this suggests correlation with Couche 7 for which a C-14 date of *ca.* 32,800 P. P. \pm 450 (= 30,850 B. C.) has been determined. If one accepts our estimate of *ca.* 30,000 B. P. (= 28,050 B. C.) for Couche 6 ("Evolved" Aurignacian), this should also be the approximate date of the Cro-Magnon burials within reasonable limits. But this is not the most surprising result of the Abri Pataud C-14 determinations: the fact that the total time-span of the Aurignacian development in France is only of the order of 4,000 years seems to the present writer to be totally unexpected.

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