



# An historic sign, possible Mesolithic menhir, DStretch, and problems in dating rock art to the Sauveterrian in the Massif de Fontainebleau



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## ARTICLE INFO

### Article history:

Received 25 April 2013

Received in revised form

2 September 2013

Accepted 8 September 2013

### Keywords:

Image enhancement

DStretch

Mesolithic

Dating

Menhir

Megalithism

Middle Ages

Massif de Fontainebleau

## ABSTRACT

This paper uses typological analyses and image-enhancement software called DStretch to eliminate an engraved and pigmented monolith as a chronological marker for dating the largest concentration of supposed Mesolithic rock art in the world – the “classic” schematic engravings of the Massif de Fontainebleau. It shows that part of the block, which was thought to have lain undisturbed for over 7000 years and has been referred to as a “Rosetta Stone” for dating the area’s art, actually bears historic letters. The orientation of these painted letters, whose tops all point towards the block’s narrow end, and absence of both the letters and apparent medieval engravings around the other end indicate that the monolith’s broader end was planted in the soil and more tapered one was exposed when the markings were made. This means that the monolith was upright. The only candidate we could find for keeping it vertical for long on a sandy floor was an oval cluster of small rounded boulders in the Mesolithic layer underneath. If these stones were used to brace the block, its exposed section could have been marked at any time between the monolith’s erection and collapse up to 7 millennia later. But they also indicate that the monolith may be one of the oldest known menhirs in France.

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## 1. Introduction

The engravings on one side of a monolith (Fig. 1) in the “Grotte à la Peinture” (Larchant, Seine-et-Marne) have been repeatedly used as a chronological marker for ascribing much of the rock art in the Massif de Fontainebleau to the Mesolithic. This article will show how a reconsideration of the site’s stratigraphy, typological analyses of motifs, and the use of image-enhancement software led to alternative explanations, which suggest that earlier interpretations should be regarded with doubt. In doing so, it will confirm the sense of concern about the original excavation report expressed by two authors (Bénard, 1993: 44–49; Beaux, 1995: 25–36) who have noted some of its inconsistencies. We will see that two of the block’s faces, including one (A1) (Fig. 2), which was thought to have lain undisturbed for over 7000 years, bear historic letters that were probably painted through an inverted commercial stencil. Both the red letters and engraved lozenges, which match the iconography of medieval vulvas, indicate that the monolith was at least partly exposed and repeatedly adulterated until recently and that none of its surfaces can be used, for the moment, as chronological markers.

But the elimination of the block in the Grotte à la Peinture (Fig. 3 and map in [on-line appendix](#)) as a marker for the largest concentration of supposed Mesolithic petroglyphs in Europe has a silver lining. The good news is that the positions of the letters and lozenges suggest that the monolith was standing when they were created. This means that it was probably braced by an oval cluster of stones, which lies under it in the Sauveterrian layer. If this reading is correct, the fallen monolith may be one of the oldest known menhirs in western Europe.

## 2. Materials and methods

Three methodological approaches were used in our re-examination of the monolith and its context in the Grotte à la Peinture. These include a typological analysis of the cave’s imagery, a reconsideration of its stratigraphy, and the use of an image-enhancing program called DStretch to clarify pigmented areas.

The software, which was written by Jon Harman, is a plugin to another application called ImageJ and uses a technique called decorrelation stretch, which was developed by the Jet Propulsion Laboratory. Although the technique was first used to enhance remote multispectral images such as those taken by the Mars Rover, Dr. Harman modified the technique by creating options that are useful in rock art research. His software, which he has made freely available to researchers for personal use, has revolutionized the

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**Fig. 1.** The monolith was found buried about 4 m away from an engraved section of the wall, which we will call the “main panel”. These engravings on a promontory appear here directly behind the boulder in the trench. Hinout hypothesized that the cave’s last Mesolithic inhabitants moved the monolith from the ledge to the left of the main panel to its present position.

study of such art ever since Dr. Harman unveiled its capacities at the annual meeting of the American Rock Art Research Association on May 28, 2005 (Harman, 2005).

Since then, it has been widely used around the world. One of its early users outside the USA was Bernard Fouilleux (2007), who showed Saharan prehistorians how much they had been missing on panels like the famous *lotori* scene at Tin Tazarift in the Tassili n’Ajjér, Algeria. One of the first people to use it to enhance imagery from French caves was Romain Pigeaud (2012) and his team, which used it in the Grotte Margot (Monnier and Pigeaud, 2008) and even discovered that a red motif in that cave was actually lettering in 2008 (Florian Berrouet, personal communication 2013).

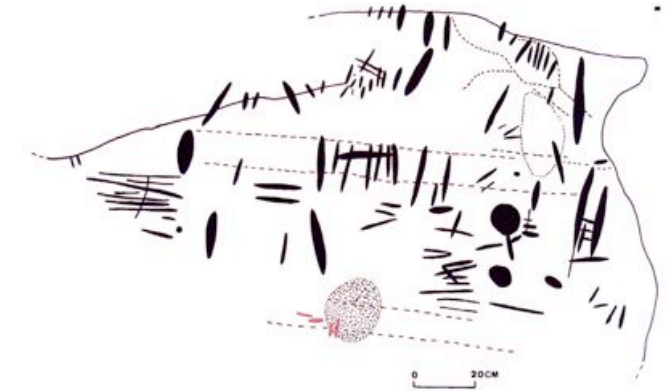
Although DStretch can be customized, we simply applied a variety of its pre-set filters (IDS, IRE, YRD, YRE, YYE), whose results were so consistent in making red zones on the monolith readable as historic letters that we were not obliged to make any further adjustments.

### 3. Background

#### 3.1. How the monolith became a chronological key

Although we will re-examine all the developed motifs that were supposedly found in or on the cave’s Mesolithic layer, we will begin with those on the “monolith”.

The first person to describe it, Jacques Hinout, hypothesized that the boulder once sat on a ledge (between squares L 35/36 and N 35/

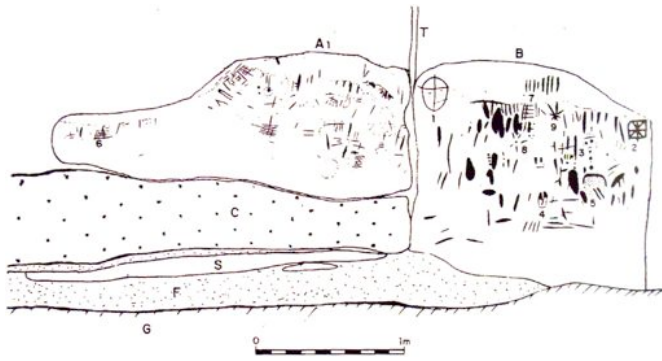


**Fig. 2.** Two views of face A1 of the monolith. In the top rendering from Bénard’s dissertation (2010:94, fig. 70), he shows four red lines (which are shown here either in pink, for the internet version, or grey, for the printed version) on the bottom left edge of an oval hollow (stippled) near the juncture with face A3. The black motifs represent engravings.

36) (Hinout, 1993: 29, Fig. 5bis) to the left of an engraved promontory of the wall (O 35/36 to Q 36) (Hinout, 1993: 45, fig. 28 B) (Figs. 1, 3 and 4) on the left side of the cave, when one is looking in, and that it was moved to its present position (Fig 1) between



**Fig. 3.** The Grotte à la Peinture or Grotte de la Peinture, as it is also called, is on the north side of a low ridge near Larchant, in the Seine-et-Marne (See the map in the [online appendix](#)), called the “la Roche au Diable”. The main panel is visible at the centre, while the ledge where Hinout thought the monolith had once lain is visible on its left. Water drips sporadically just in front of it.



**Fig. 4.** Hinout's illustration (1993: 45, fig. 28) of his hypothesis that the monolith, which appears on the left, under the letters A1, originally lay on a ledge (C) next to a promontory of the wall (B), which we call the "main panel". Hinout postulated that the removal of the monolith from the ledge (C) allowed sand, which had been trapped behind and under the boulder, to flow onto the "Sauveterrian" layer (F) in a protected pocket under the platform (C), where the sand formed a lens (S). The reason he dated the hypothetical removal to the Mesolithic was because the sandy lens (S) under the cantilevering rock (C) is covered by another few centimetres of "Sauveterrian" sediment, which can be seen between C and S.

squares Q 38 and S 39 (Fig. 5) in the centre of the cave "a short time before the departure of the Sauveterrians" (Hinout, 1993: 44). He illustrated this hypothesis by portraying the monolith, before the move, on the ledge next to the promontory, which we will call the "main panel", with the decorations on one of the monolith's faces (A1) and the main panel (Hinout, 1993: 45, fig. 28 B) forming a

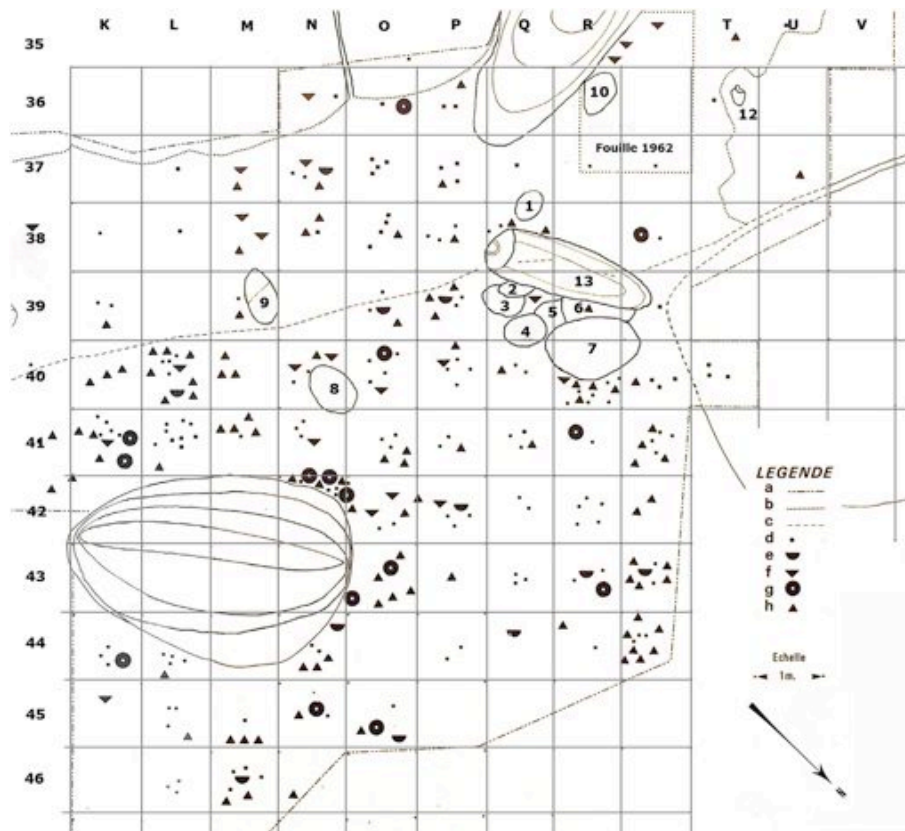
single "Mesolithic" frieze (Fig. 4) between squares L35 and Q35 of his plan (Fig. 5).

This hypothesis concerning the transportation of the monolith from the ledge to its present position, around 4 m away, during the Mesolithic was based on three observations and conclusions. The first was that "the missing part" of the frieze, in other words the monolith, "was covered by sediment", but Hinout uses the words "sédiments de remplissage", rather than describing any stratigraphy, suggesting that the sediment looked like backfill, or was, at the very least, disturbed and unlayered.

The second was that the face of the monolith (A1), which Hinout thought was engraved while the monolith lay on the ledge, "was resting on the Sauveterrian layer between squares P 38 and S 36" (Hinout, 1993: 44).

The third was that Hinout found a cavity under the ledge (and therefore several metres away from the monolith's present position), which had "a lens of pure, sterile, white sand" sandwiched between a Mesolithic layer below and a few centimetres of the same layer above it (Hinout, 1993: 45, fig. 28; 55, fig. 31) (Fig. 4). He interpreted this sequence as meaning that "loose sand located behind and under the monolith [when it was still on the ledge] flowed out and was even moved by the Sauveterrians onto the living floor (F) [when they displaced the block], forming a lens of pure, sterile, white sand (S)" protected by the ledge above. His reason for thinking the block was moved from the platform just before the Mesolithic inhabitants departed was that "the Sauveterrian layer... located under the ledge resumes above this deposit [the sand], but only for a few centimetres" (Hinout, 1993: 44).

The monolith has two other faces, A2 and A3. If Hinout is correct and one face (A3) lay facedown on the ledge next to the main panel



**Fig. 5.** A detail of Hinout's excavation map (Hinout, 1993: 29, fig. 5bis), showing features mentioned in this article. Although it is difficult to reconstruct some things using Hinout's article, it is clear that at least four small boulders, numbered 2, 3, 5 and 6 here, lay under the monolith (13), in which case they were probably encased in layer F, which was Mesolithic, even if the monolith was not. Three other small boulders, 1, 4, and 7, are associated with this cluster, even if some of the stones lay on, but not in the Mesolithic layer.

until the monolith was displaced during of the Mesolithic (Bénard, 2010: 312) (Fig. 4), then the engravings on that side cannot be older than the moment when the stone was moved and A3 was exposed. A further problem with dating the decorations on A3 is that Hinout did not record the positions of any strata vis-à-vis the sides of the boulder during its excavation (Bénard, 2010: 313–314). A final problem, which Bénard (2010: 314) noted in one publication (but not an earlier one [1993]) is that the monolith's 70-cm depth (in its present horizontal position) suggests that part of the stone was visible while the deposits accumulated from the Mesolithic onwards.

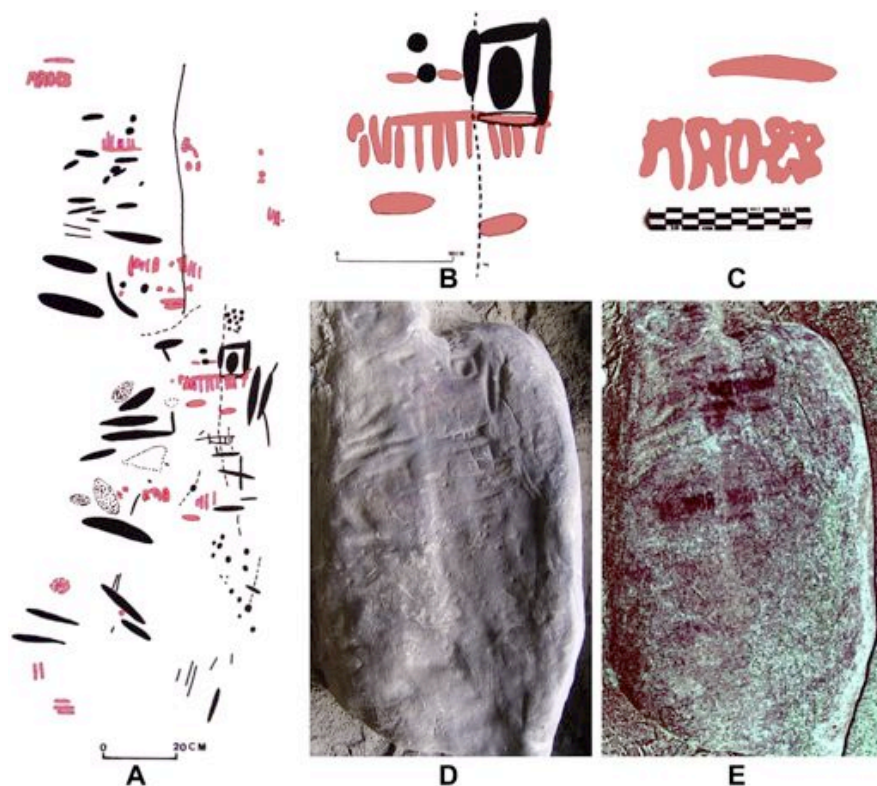
A combination of two factors led a later researcher, Alain Bénard, to the conclusion that the monolith should be re-examined (Laurent Valois, personal communication 2013). These were Hinout's conclusion that the monolith represented a "Rosetta Stone" (Hinout, 1993: 44; Beaux, 1995: 32) for dating the region's "classic" schematic art, and the fact that the only illustrations of the monolith in Hinout's article were "practically unreadable" (Bénard, 1993: 49). Given the fact that the block was no longer buried in archaeological deposits, but in sterile backfill from the 1981 excavation, Bénard decided to re-expose the monolith with the help of Laurent Valois in March 2008. It was during this process that Mr. Valois noticed pigment on the boulder and we all photographed it.

Despite the difficulties of dating A3's motifs, Bénard agrees with Hinout about two things based on his own observations of the stone during the re-exposure: first, that A1 lay facedown against a Sauveterrian floor until the archaeological excavation (Hinout, 1993: 44; Bénard, 2010: 91–92, 313, 319, 321), meaning that its motifs must be Mesolithic, and, secondly, that any motifs on A3

which resemble ones on A1 both technically and structurally must be Mesolithic too. This applies equally to the engravings that Hinout observed on the two faces, and the painted motifs, which Bénard reported on both A1 (Fig. 2) and A3 (Bénard, 2010: 314) (Fig. 6A–C). If their shared reasoning is correct, the red motifs must all be Mesolithic, with the ones on A3 (Fig. 6A–C) being just a bit younger than the ones with identical pigments on A1 (Fig. 2).

Before going on, we must address the fact that Hinout failed to see any pigment on the monolith, since it might make one wonder whether the pigment was applied while the rock was exposed in 1981. Two factors argue against this: the condition of the pigmented zones, which seem to have been eroded while they were exposed to intemperate conditions, and the fact that the excavators would have presumably reported any fresh graffiti, which they saw as they were re-burying the rock. The fact that the excavators did not report any painted motifs suggests that they did not see them for the same reason that Bénard did not see them at first when he re-exposed the block – because the letters were already faint and eroded, and did not fit their expectations.

The discovery of these painted "motifs", which Bénard reported in his dissertation (2010: 95–97), seemed to confirm that the faded red design on a ceiling ridge (Bénard, 2010: 89–90) – which accounts for the cave's name – was probably just as old. But Bénard went further and wrote that "this monolith makes it possible to indisputably attribute the engravings [and, by the same logic, the pigmented motifs] on face A1 of the block to the Mesolithic, because it fell [into its present position] during the late Sauveterrian according to the excavator's data. By extension, we can apply the engravings' association with the Sauveterrian to a large

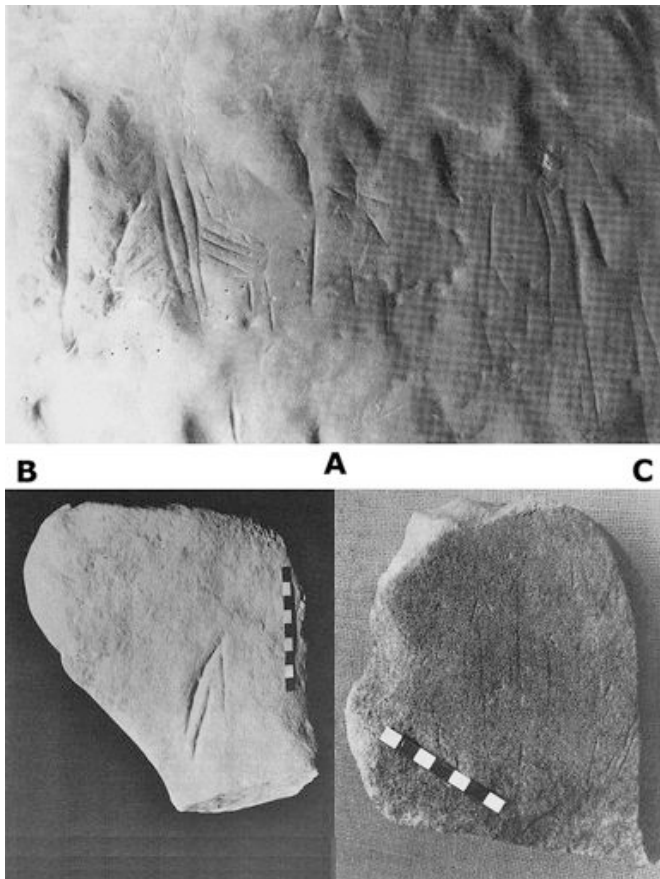


**Fig. 6.** The tracing on the left (A) is the illustration of face A3 in Bénard's doctoral thesis (2010: 96 fig. 72). The red patterns (which are shown here either in pink, for the internet version, or grey, for the printed version) represent his perception of deep red pigment, while black patterns represent engravings. Although red motifs occur on two of the monolith's sides, including one, A1, which Bénard and Hinout were convinced had lain undisturbed since the Mesolithic, the only ones that Bénard recognized as being "alphabetiform" are ones, which appear at the top left of this version of Bénard's tracing. His illustration of this detail appears here as C (Bénard 2010: 97, fig. 74). The top centre figure (B) illustrates his perception (Bénard 2010: 96, fig. 73) of the red motifs below an incised motif composed of a cupule inside a square/lozenge, which resembles another motif on Face A2 that Hinout interpreted as a recent vulva (see Fig. 11 A & C). It should be noted that the engraving is older than the pigment, since paint fills the bottom groove of the incised lozenge in our orientation. Photo D shows the broader end of A3 in natural light, while photo E, which has been treated with DStretch, highlights pigmented zones.

part of the abstract and semi-figurative representations of the rupestrian art of the southern Ile-de-France” (Bénard, 2010: 321).

Even Hinout jumped to the conclusion that the monolith was “a ‘Rosetta Stone’, because a reconstruction of the block’s original position allows one to study pure Sauveterrian pictograms on A1, without more recent motifs” (Hinout, 1993: 44). The first places where he applied his new chronological key were to the monolith’s other faces. He concluded, for example, that A2 “presents Sauveterrian engravings”, despite the fact that it also has “a lozenge-shaped vulva, which was made recently” (Hinout, 1993: 45). We will come back to this lozenge later.

In the meantime, Hinout extended the application of his “Rosetta Stone” (Hinout, 1993: 44) to face A3, which he thought presented “more Mesolithic engravings, which confirm [the hypothesis] that the block was moved at the end of the [Sauveterrian] occupation”, despite the fact that the same face has “cupules” and “large shallow grooves, distributed in every direction, which resemble traces of tool-sharpening, which can be seen on the main panel” (Hinout, 1993: 45). This is interesting because the kinds of grouped cupules (Hinout, 1993: 45, fig. 28, no 5) and “short wide incisions” (44–45), which appear on the main panel, have been associated since then (Bénard, 1993: 44) with the Mesolithic and the region’s “classic” style, even though Hinout himself thought they belonged “to more recent periods, notably to the Bronze Age” (Hinout, 1993: 44).



**Fig. 7.** The only engravings that were found embedded in – as opposed to supposedly lying on – the Mesolithic layer were two slabs with “harpoon-like” motifs. The one with a single motif (B) (Hinout 1993: 39, fig. 16) was found in square V 32. The other plaque, which has lightly incised barbed motifs on its polished side (C) (Hinout 1993: 39, fig. 17), was found in S 35. These two slabs lay at the foot of an exposed wall (A) (Hinout 1993: 40, fig. 18), which has motifs that Hinout thought looked like harpoons as well.

The next place where Hinout applied his chronological key was to “a series of grids, ladder-shaped motifs, ‘huts’, and more-or-less grouped grooves... in a branch between overhangs which extends to the depths of the cave”, which Hinout interpreted to be a homogeneous ensemble that was “representative of ‘the schematic art of the Mesolithic’” (Hinout, 1993: 47). One can see how the key’s interpretative potential, which was based on one face of a boulder lying against the top of the Mesolithic layer (Hinout, 1993: 44), began to expand even in Hinout’s mind, although he usually tied motifs on the cave walls more tightly to datable iconography elsewhere.

But Hinout’s analysis was based on more than the position of Face A1. The only problem with his best evidence for Mesolithic engraving in the cave, which consists of incised “harpoons” on two plaques (Hinout, 1993: 39, figs. 16 & 17) (Fig. 7B, C) that were found in the Mesolithic stratum, is that the motifs do not look like most of the engravings on the cave’s walls or elsewhere in the region, meaning that the small incised slabs have only limited use as chronological keys. The only images on the walls that Hinout attached to the motifs on these plaques, for example, was an ensemble, which includes several more “harpoons”, on the wall (Fig. 7A) above the squares (V 32 and S 35) (Fig. 5) where the plaques were found (Hinout, 1993: 40, figs. 18 & 19). It is entirely possible that this attribution is correct and that the parietal “harpoons” are about the same age as the Mesolithic deposit below, which yielded a charred hazelnut that was dated to  $7120 \pm 110$  BP (Gif: 5820) (Hinout, 1993: 25).

The last piece of evidence that Hinout found was another block with “engraved grooves” that lay facedown on “the Sauveterrian layer” in square Q 39 (Hinout, 1993: 44; 45, fig. 27) (Fig. 5, Boulder 4). Although this block has several pairs of convergent or parallel incisions, the patterns are too simple to be of much use as chronological markers.

In short, the hypothesis that the red paintings and other motifs on A1 and similar motifs on the cave walls and in the surrounding region are Mesolithic is based on a surprisingly small set of assumptions, including the notions that:

- 1) The monolith was only in two positions before it was excavated, those being on the ledge and then facedown on A1 since the Mesolithic.
- 2) The lens of sterile sand, which lay on a thick Mesolithic deposit and under a much thinner one below the protective ledge, was linked to the (hypothetical) moment when the “Sauveterrians” moved the monolith off that ledge to a position about 4 m away.

### 3.2. General acceptance of Hinout’s “Irrefutable” hypothesis

Despite the dearth of arguments concerning the antiquity of the motifs on A1, Hinout’s affirmation that he had discovered the “Rosetta Stone” for dating the region’s “classic” rock art (Hinout, 1993: 44) is widely accepted. Strangely enough, the person who did the most to encourage this acceptance was the first person to point out many of the weaknesses of Hinout’s article, Alain Bénard (1993: 44, 49), who went so far as to “confirm” the monolith’s utility as a chronological key with his own observations in such passages as this: “The observation of the general form of the monolith and in particular its lateral flank allows one to confirm J. Hinout’s hypothesis concerning its initial position” (Bénard, 2010: 91–92).

“In particular” Bénard wrote, in his first publication about the monolith,

“the discovery of the decorated block in a Sauveterrian layer provides an element of the utmost importance for confirming

that the repertoire of classic schematic petroglyphs around Fontainebleau should be attributed to the Mesolithic. Although this chronological attribution had previously been intuited, irrefutable proof was missing. We now have it.

“A decorated quartzite block, which had collapsed, was discovered in layer F of the cross-section, which is the Mesolithic level (fig. 1). The face against the soil and in contact with Mesolithic vestiges presents a set of typical schematic engravings. The two other faces of the trihedral block are also decorated. This

quartzite [block] is entirely embedded in layer F and is covered by the Neolithic level, layer E, which fossilized it into place. The block is just the fallen part of a decorated panel that remained in place above the archaeological levels (Fig. 2)” (Bénard, 1993: 44).

This passage differs from Hinout’s article because Hinout never wrote that the block was entirely included in layer F or that it lay “fossilized” under Neolithic sediment. If anything, he wrote the opposite: that the presence of “recent” motifs on the block indicated that part of the monolith must have been exposed until long after the Mesolithic (Hinout, 1993: 45).

But Hinout is ultimately responsible for the confusion – not Bénard – because Hinout showed the monolith embedded in the Mesolithic layer in a figure (1993: 27, fig. 4), in contradiction with his own words! As Bénard pointed out with some severity, Hinout’s article is full of such weaknesses. Another one can be found on page 44 of Hinout’s paper, where he uses the same shorthand term, “le grès” (the ‘sandstone’), in successive sentences to refer first to the ledge, then to the monolith.

No wonder he caused such confusion!

Despite Hinout’s obscurity, the wishful acceptance of his conclusion that he had found the “Rosetta Stone” for dating the area’s “classic” rock art style has made matters worse by ignoring an error in Hinout’s reconstruction of the monolith’s history.

#### 4. Typological comparisons and pigment enhancement with DStretch

##### 4.1. Roman letters

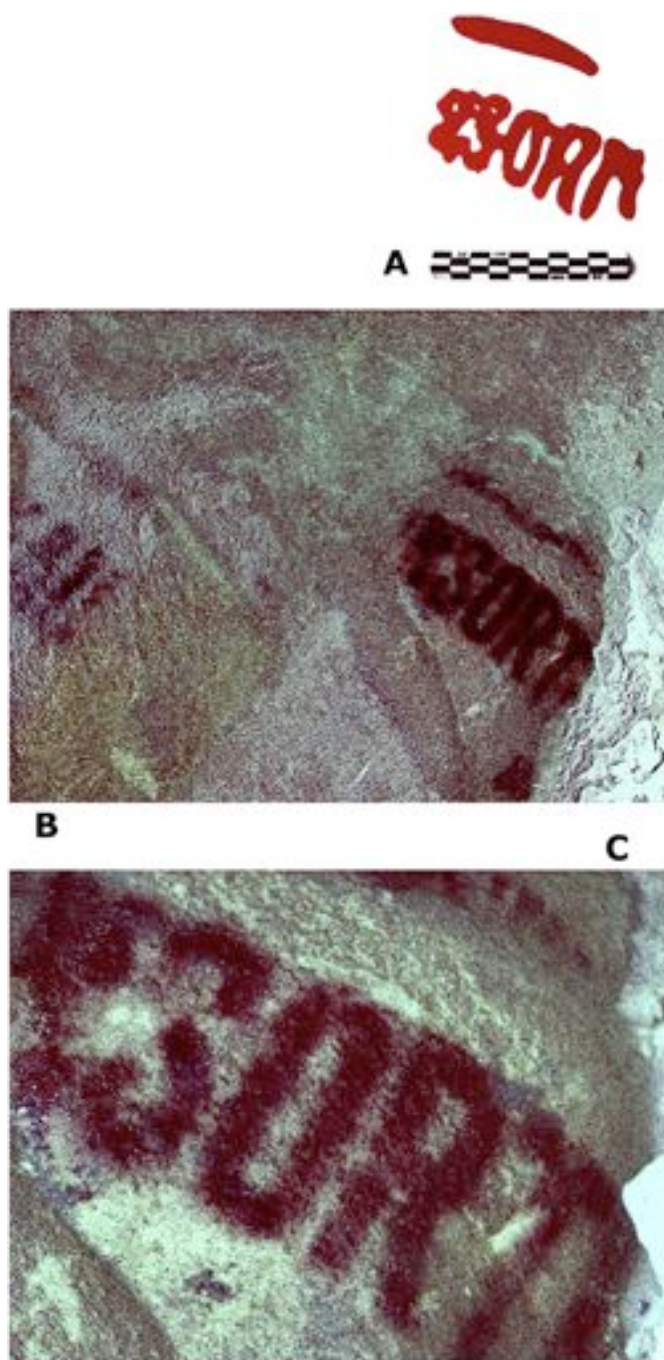
The first objective evidence that something was wrong with Hinout’s hypothesis that the monolith had lain facedown since the Mesolithic appeared when we decided to treat photographs, which we had taken during the boulder’s re-exposure, with DStretch. The results, which confirmed suspicions we had harboured about affirmations that many motifs and panels could be “indisputably” and “irrefutably” ascribed to the Mesolithic, were revelatory (Figs. 8–10).

No matter what filter we used (IDS, IRE, YRD, YRE, YYE), all the red motifs that Bénard had linked to face A1 and the Sauveterrians, including ones which he described as being “alphabetiform” (2010: 97) (Fig. 6C), were legible as lines of horizontally reversed Roman letters, which look like they were painted through stencils. The resemblance was so consistent (Figs. 8–10), with every un-smearred motif in section after section being easily interpretable as a block letter, that probability dictated that the motifs must be just that: letters arranged in registers. This was true for every pigmented area we examined, even when the original patterns look like frames around more obvious writing (Fig. 9C).

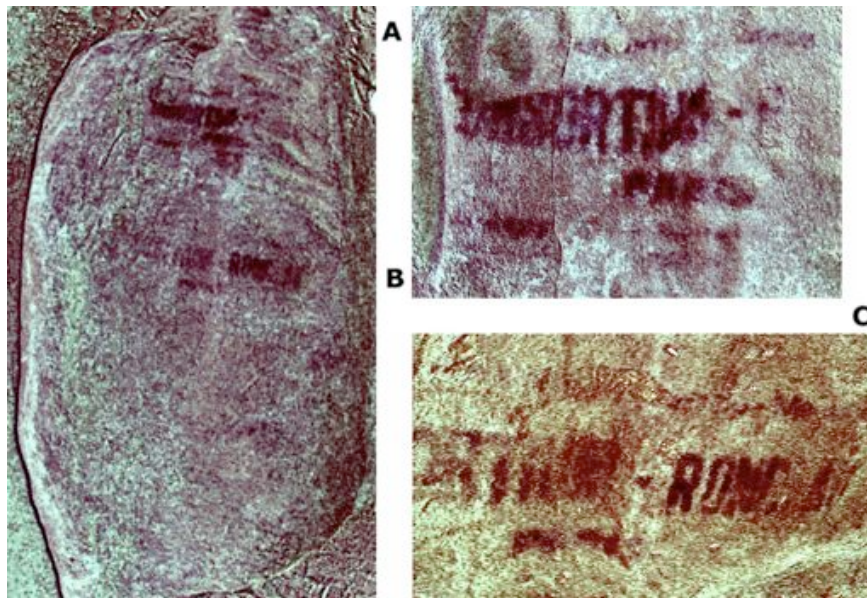
But how was this possible? And, if the letters look modern, how old can they be?

##### 4.2. Typological comparisons between motifs on the monolith and cave walls

Like Hinout, we looked for unrecognized links between the cave’s vestiges. We have seen how Hinout’s efforts to find such links led him to speculate that cupules and “short wide incisions” on both the boulder (A3) and main panel belonged to the Bronze Age (Hinout, 1993: 44–45). Hinout also concluded that abrasions on the edges of Bronze Age shards were caused by their use as etching tools (Hinout, 1993: 48, 51 fig. 40). He even hypothesized that these shards could have been used to incise two rayed motifs and an equid on the ceiling, which resemble the iconography on late Bronze Age pottery (Hinout, 1993: 48).



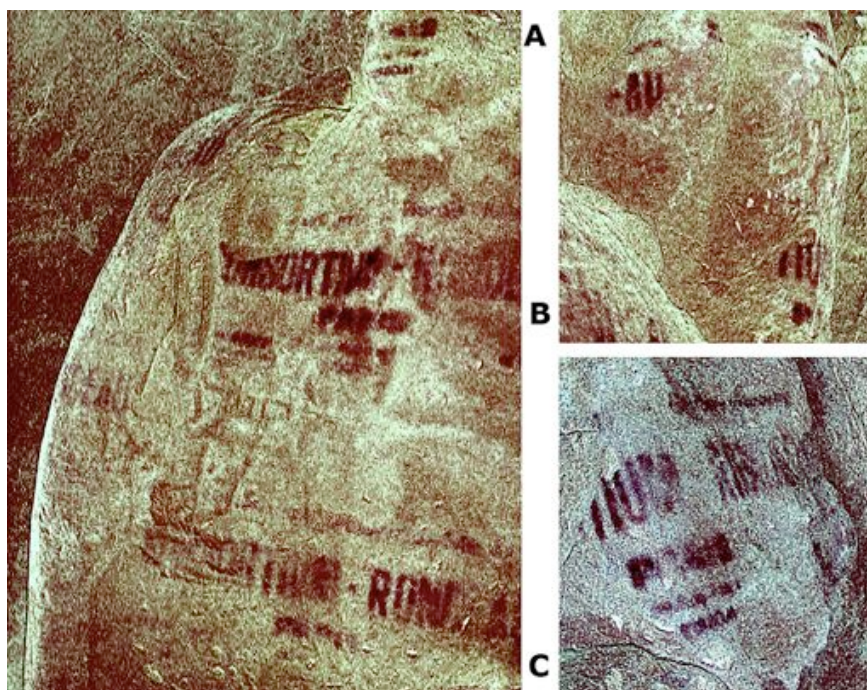
**Fig. 8.** The top illustration (A) is what Bénard’s rendition of the “alphabetiform” sequence at the top of Fig. 6A (Bénard 2010: 96, fig. 73) looks like when it is horizontally reversed and tilted to match the orientation of the same motif in the bottom photos (B & C), which have been treated with DStretch. The fact that the pigmented areas are modern letters becomes increasingly obvious as one zooms in.



**Fig. 9.** All three photos have been horizontally reversed and treated with DStretch. Photo A shows two sets of red motifs on face A3. Photo B is a close-up of the large mirrored letters at the top of photo A. Compare this detail to B nard's non-reversed rendition of the zone in Fig. 6B (B nard 2010: 96, fig. 73). He thought that all the pigmented areas on the monolith could be dated to the Mesolithic because of the existence of identically pigmented marks on face A1, which he and Hinout thought had lain undisturbed against a Sauveterrian living floor for over 7000 years. But the so-called "motifs" are clearly letters, which means that both faces A1 and A3 have been exposed recently and that very little on the monolith can be used as a key for dating the region's schematic art to the Mesolithic. C shows a close-up of the lowest register of large letters in photo A. Although the pigmented bands, which frame the large letters, are almost illegible, it is clear that they were also composed of letters, with an M, R, P and A being visible. (For interpretation of the references to colour in this figure, the reader is referred to the web version of this article.)

We have also seen how he interpreted a lozenge-shaped "vulva" on Face A2 as being "made recently" (Hinout, 1993: 45). It is interesting to note, in passing, that B nard rejected this interpretation in the following terms, because it contradicted his insistence (based on fig. 4 of Hinout's article, but in contradiction with Hinout's words) that the block was found "entirely" sealed in a Mesolithic deposit (F):

"[C]oncerning face A2 of the monolith (fig. 5), we note the following passage [in Hinout's paper]: 'However, the face not only bears ancient engravings, but a recently made lozenge-shaped vulva, since the face was still visible after the block was moved.' We do not understand this. The cross-section shown in fig. 4 (fig. 1) seems to show that the monolith was entirely located in layer F, which is Mesolithic, and was covered



**Fig. 10.** Three more photos of writing on face A3 as it appears after being flipped horizontally and treated with DStretch. It is likely that the letters were made with a reversed stencil. The repetitions and overlaps in the sequences, which appear in several cases to be identical, suggest that it read: "CONSORTIUM—RON.../PARIS".

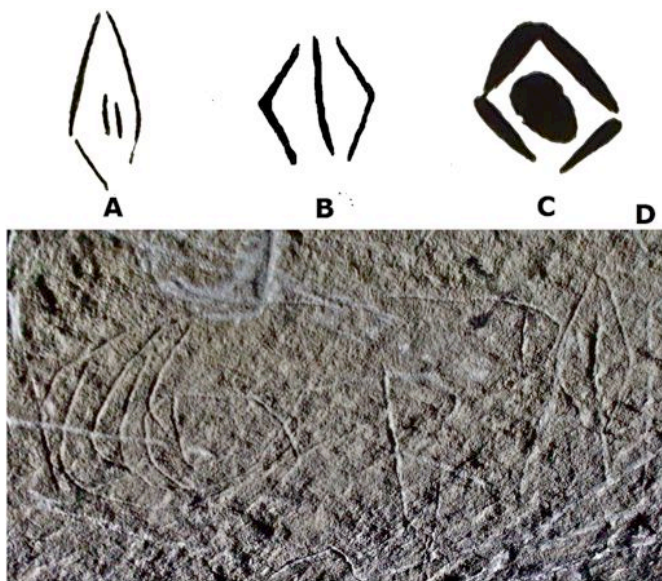
by that layer. Layer E, which is Neolithic, lies above layer F, so the block must have been invisible already by that period. So why date the vulva and only that motif to a ‘recent’ period (the historic epoch, p. 51)?” (Bénard, 1993: 47).

#### 4.3. Typological comparisons between lozenges on the monolith and cave walls

Let us take a moment to consider the motif on face A2 that Hinout interpreted as a vulva (1993: 46, fig. 29 A2, #1) (Fig. 11A), since it resembles both the motifs he cited on the back left wall (1993: 48 fig. 38) (Fig. 11B for an example, plus on-line appendix), and another motif on the monolith itself – this time on the face, which Hinout thought had been exposed until recently, A3 (1993: 46, Fig. 29 A3, #2) (Fig. 11C). All of these motifs are lozenges or lenses with a focal point, which may be a single vertical line (back wall), pair of vertical lines (A2) or cupule (A3).

Two things are intriguing about using a lozenge or lens with convex sides to illustrate a vulva – if that is what these motifs are. The first is that conventions for making vulvas differ from period to period, allowing them to be dated typologically. The conventions for making vulvas vary across western and central Europe during the Upper Paleolithic, for example (Bourrillon et al., 2012: 92–93, fig. 5), but even the variations created by many Paleolithic cultures over a vast area tend to have commonalities such as pointed bases, a line or cleft rising from the bottom, and round, flat or concave tops. None of them are lenses or lozenges. The vulvas of the Chauvet “Venus”, “Trois Grâces” at Roc-aux-Sorciers, and Ségognole 3 are representative of such Paleolithic vulvas, which often used natural relief (Bourrillon et al., 2012: 88; Airvaux, 2001: 127; Caldwell, 2012: CD 444–449).

The second reason that the Grotte à la Peinture’s lenses and lozenges are intriguing is that the same shapes were used to illustrate vulvas faced with phalluses nearby in an unpublished cave called Château Renard 2 (Le Vaudoué, Seine-et-Marne)



**Fig. 11.** Four lozenges with central focal points. A) The motif on face A2 of the monolith, which Hinout thought was a “recent” vulva. B) One of the motifs on the back left wall of the Grotte à la Peinture, which Hinout also thought was a relatively recent vulva. C) A motif on face A3 of the monolith. D) A phallus pointing at a lozenge with a single vertical line in Château Renard 2 (Le Vaudoué, Seine-et-Marne). The two motifs occur with such medieval iconography as flags, shields, men wearing helmets and Latin inscriptions.

(Fig. 11D), where all the engravings appear to be historic (although they could have been made at different historic times) and the genitalia appear with flags, shields, Latin inscriptions, and men wearing helmets. It turns out that this specific convention for making vulvas is linked to practices associated with a being whose cult spread from France to the British Isles in the 11th century (Andersen, 1977). The most famous example of this entity, who is typically shown stretching her vulva from the sides with her hands (explaining the convex edges), is at the church of St. Mary and David in Kilpeck, Herefordshire (see on-line appendix). While it is impossible (for the moment) to state with certainty that the lenses and lozenges in the French caves were related to this being, who is known in England as *Sheela na Gig*, or even to say if the engravings in the two caves are exactly contemporaneous with one another, the fact that the motifs all fit known medieval conventions for presenting vulvas suggests that they date to approximately the same period.

Finally, Hinout thought a square, shields, masks, and apparent traces of sharpening with metal tools on the main panel were also medieval (Hinout, 1993: 45). The presence of so many motifs, which Hinout himself thought were from recent millennia, made it necessary for us to consider the possibility that the “alphabetiform” motifs might be relatively recent too, especially since they look like mirror images of French letters.

#### 4.4. The letter sequences

So let us examine these motifs closely. The lettering, which has been erased in some areas, leaving traces of pigment, and blurred in others, still forms clear sequences. The reason we think the writing is horizontally reversed, despite the presence of some letters, such as A, which look the same in a mirror, is there is not even one normally oriented letter, while there are at least three identifiable types of reversals (Ns, Rs, and Ss). The accumulation of so many kinds of reversals, as opposed to just one type in such nearby cavities as Château Renard 2 and the Abri de la Feuillardière (Arbonne-la-Forêt, Seine-et-Marne), which each have reversed Ns, or two (S and N, with both right-side up and upside down As) in Beaumont 2 (Oncy sur Ecole, Essonne), makes it likely that the script is mirrored. All the evidence goes in one direction, so to speak, rather than the other. If we therefore reverse the sequences into normal script, they read as follows:

- 1) A sequence of large letters (Figs. 6A, C and 8B, C) at the top of our figures’ orientation, which disappear around the edge of the block into the soil: ...NSORT(I?)...
  - 2) Faded large letters near the tapered top of the monolith, if the top is taken to be the direction above the tops of the letters (Figs. 6A and 10B): ...AU
  - 3) A long, large-lettered sequence (framed top and bottom by smaller letters) (Fig. 9B) next to an incised lozenge containing a cupule (Fig. 9A, B): ...(C?)O(N or H)SORT(A, I or H) (I or U?)(M?)–R(O?)...
  - 4) A short sequence of medium-size letters (Fig. 9B) below the hyphen of the above sequence: (F or P)AR(I?)(S?)
  - 5) A long sequence of large letters (framed top and bottom by smaller letters) (Fig. 9C) in the middle of the monolith (Fig. 9A): ...ORT(I, H or A)(U?)(M or N?)...–RON(C or D?)(?)A(?.)...
- It should be noted that there is an **O–M** among the smaller letters above the C or D in this sequence.

If we admit that these sequences are letters, then we must also admit that they could have been painted when the face that we photographed (A3) was oriented in a way that made the sequences easier to read – that is with the letters upright. It turns out that all

the legible motifs (Figs. 8–10) only look like recognisable letters at the same time when the block is in one position (Fig. 6D, E) – that is standing with the broader end (at the bottom of our orientation) in the ground. This interpretation is supported by the fact that neither Face A1 nor A3 have much if any pigment in our orientation from their “waists” (when standing in this position) downwards. The probability that all the readable motifs would make sense simultaneously as letters oriented in the same directions, if they were anything else, is so low, given that there are at least 23 legible letters in sequence, that it can be discounted. This means that the block probably stood erect, in which case it would have been unstable and would have eventually fallen, probably into the position where Hinout found it.

## 5. Evidence that the monolith was erected during the Mesolithic

We have seen how the presence of lozenges, which are probably medieval vulvas, on faces A2 and A3, and red motifs (Bénard, 2010: 314), which are historic letters, on faces A1 and A3 indicate that the part of the boulder, where these markings occur from the “waist” up, must have projected from the soil when they were made. But this raises questions about when the monolith was erected, how it was kept upright on a sandy floor, and how long it remained in that position.

The best place to look for rocks that could have been used to brace the monolith is immediately below and adjacent to it, so let's look back at Hinout's plan, which shows the block (Hinout, 1993: 29 fig. 5bis #36) stretched between squares P 38 and S 36 (1993: 44, 28–29) (Fig. 5 Boulder 13). The monolith is lying upon a cluster of seven smaller, stacked boulders in the rectangle formed by Q through S and 38 through 41 (Fig. 5 Boulders 1–7). These stones, which include one mentioned above with paired incisions (Fig. 5 Boulder 4) that Hinout said was lying on the Mesolithic level (Hinout, 1993: 44), form a loose vertical oval around a gap (Hinout, 1993: 29 fig. 5bis). If both the monolith (Boulder 13) and Boulder 4 were found in contact with the Mesolithic deposit, then at least four of the other stones in the cluster (Fig. 5 Boulders 2, 3, 5, 6), which are shown below them, must have been encased in the Sauveterrian layer. The stones' roundness and precarious positions in relation to one another, in the absence of soil, suggests that they were not arranged in a cairn, wall or hearth. But the same configuration makes sense if one considers that they may have been dropped into a pit to buttress a post or stone standing in the gap – in this case the monolith (Fig. 5 Boulder 13) that has fallen across them.

So Hinout was probably half right: the monolith probably was displaced from the ledge next to the main panel, which stands above a Sauveterrian inhumation consisting of “a mandibular symphysis” in square P 36 (Auboire, 1993: 83) (Fig. 5), during the Mesolithic, but it was not placed on its side – it was braced so it would remain erect, perhaps as a visible mortuary monument. Regardless of its purpose, the configuration of the stones beneath the monolith suggests that it is one of the oldest menhirs or stelamenhirs known in western Europe.

The monolith's position while it was still buttressed, which may have shifted gradually as it began to lean against the largest of the supporting stones (7) (Fig. 5), probably exposed faces A1, A2, and A3 to varying degrees, until the monolith finally slid (or was pushed) off boulder 7. This means that the parts of all three faces, which are marked at the pointed end, could have been adulterated in later periods – with the most heavily painted face (A3), being exposed the most and longest. But it also means that the broader part of the block, which must have been fixed in the soil, could have markage

that really was made by Sauveterrians while the monolith was still on the ledge.

The only way to tell if this is true and part of the block can still be used as a chronological key to Mesolithic rock art is to subject it to exhaustive tests, including OSL sampling and the use of IR Raman lasers. We would be glad to participate in such analyses if invited.

## 6. Discussion

### 6.1. Overlapping hypotheses concerning the letters' age

While the circle of stones suggests that the monolith was erected in the Mesolithic, the presence of the apparent medieval vulvas and indisputable historic letters suggests that the block remained at least partly erect until the last few centuries. We can imagine various scenarios for the painting, dating from the appearance of the first letters in France during the Gallo-Roman period to the present. We will focus on a medieval hypothesis based on the mirrored writing, and a more recent one based on the letters' similarity to typefaces. Although we will use such expressions as “it is possible” while describing these two hypotheses, we must reiterate our conclusion that the pigmented areas are simply historic letters – not Mesolithic “alphabetiform motifs”.

### 6.2. The medieval scenario

The reversal of the lettering (Figs. 8–10) reminded us of medieval beliefs, which associated mirrors and mirrored writing with women, menstrual cycles, and witchcraft. Such beliefs were first recorded in Aristotle's treatise on dreams, where he discussed the effect of a menstrual woman's gaze upon a mirror. In the late thirteenth or early fourteenth century, a disciple of Albertus Magnus wrote a clerical tome called *De secretis mulierum*, in which he discussed the effect of menstrual blood on mirrors and equated the feminine gaze to a basilisk's (Owens, 2012). Larchant's associations during the Middle Ages with the excommunicated Templars and third century healer, Saint Mathurin, and his miracle-working spring, gave the place both sacred and heretical connotations. It was a place where learned clerics were aware of the thinking about mirror images and their associations with women, which were incorporated in works by Dhuoda (ca. 800–843 AD), Alain de Lille (d. 1202), Wolfram von Eschenbach (early 13th century), Guillaume de Lorris and Jean de Meun (13th century), and Marguerite de Porete (d. 1310 AD). Its more erudite inhabitants would have known of discussions of language as the mirror image of nature, women as the mirror images of men, and the material world as the mirror image of a higher plane of reality.

But this obsession with mirroring in medieval high culture would have been an actual matter of life and death for everybody else in Larchant, since beliefs concerning women and the distortions they were supposedly capable of wreaking on mirrors and texts were also incorporated into a guide for witch hunters called the *Malleus Maleficarum* in 1486 (Owens, 2012). It might not be a coincidence, therefore, that two of the passages that can be read with great clarity on the monolith duplicate the first four letters of the medieval Latin term “sortilegium” or French word “sortilège” (Figs. 8B, C and 9B), which refer to witchcraft.

These reflections concerning medieval mirror writing, which, as we will see, will be partially replaced by another hypothesis, remind us of the cave's second set of human remains – a double reinhumation of two skulls and a few post-cranial bones in a trench (Hinout, 1993: 31, fig. 9) to bedrock at N 45 (Hinout, 1993: 30; Auboire, 1993: 83) (Fig. 5). One of these two skulls was carbon-dated to 930 cal BP (1024–1196 AD, Gif: 8594) (Hinout, 1993: 25, 30; Auboire, 1993: 83).

The re-inhumation, which is in front of the posited position of the “menhir” (in the gap between the underlying stones in squares Q 39 and R 39), does not conform to the medieval practice of burying the dead in sanctified cemeteries. It is possible that the location of the double re-burial was chosen because of its alignment with the standing stone and cave behind it. There is considerable evidence, as we have seen, in the form of the vulvas on the left wall and monolith (Fig. 11 and on-line appendix) that the cave was associated during the Middle Ages with heretical practices involving sexuality. The presence of a standing stone in the centre of the chamber adorned with vulvas could have provided a complementary reason for such associations.

If the cave was associated with sexuality during part(s) of the historic period, then it probably resembled some of the shelters where girls have been traditionally initiated into practices associated with their sex. In Africa, for example, the Dogon have menstrual huts (Strassmann, 1996), whose precincts, as one of the authors (DC) can attest from personal experience, are forbidden to males. In Australia, some painted rock shelters are only used by women, who go to them for “women’s business” (Drew and Wardaman Aboriginal Corporation, 2005).

In France, female supernaturals including *la Dame Blanche* have been associated with caves and springs, with their often irregular flows, like the one that drips from the roof of la Grotte à la Peinture, since at least Gallo-Roman times (De Marliave and Pertuzé, 1990: 177–182). The evidence for the association of such cavities with sterility, sexuality, and illness (De Marliave and Pertuzé, 1990: 180) in France, and motifs found in this cave in particular, suggests that the cave was the site of rituals linked to such beliefs until they were finally suppressed, perhaps with the expansion of literacy among women as recently as the 19th century.

If this reading is correct, then the re-burials of two individuals outside hallowed ground in a cave with heretical associations (if only because of its location on a ridge called “la Roche au Diable” [Devil’s Rock]) may have been one of the earliest acts in a long campaign to suppress such practices. The blood red lettering may have been added in a much later act, in which case it might have been meant as a warning, memorial or attempt to control supernatural forces. It is even possible that the stone, which was probably leaning, after so many millennia, was finally toppled, because of its associations with heretical beliefs.

### 6.3. The possibility that the monolith was toppled into a pit

This brings us to the possibility that the block might have been pushed into a pre-prepared pit sometime after it was painted in the last few centuries. Although Hinout’s figures are contradictory and schematic, one of them (1993: 27, fig. 4) clearly shows, with dotted and fading lines, that the sediment lacked stratigraphy towards the left of the boulder (the outside of the cave). Based on Hinout’s own conclusions that two of the boulder’s three faces were exposed until recently, we can also eliminate the firm lines that he drew between layers above the block. Finally, we must dismiss the illustration of the block in the Mesolithic deposit (layer F) (Hinout, 1993: 27, fig. 4), since Hinout wrote elsewhere (1993: 44) that the monolith lay on top of, not at the bottom of, the Mesolithic stratum, which must have been thick enough to contain the four smaller boulders (2, 3, 5, 6) that he shows under the monolith in another figure (Hinout, 1993: 29, fig. 5bis) (Fig. 5 #13).

If the pit scenario is correct, despite the probability that the underlying stones were all that kept the monolith vertical, we suspect that the pit’s diggers may have stopped when they hit the Mesolithic layer because of its firmness, and that the sediment closest to the boulder above that layer on at least one side lacked stratigraphy (Hinout, 1993: 44) because it was back fill. But the fact

remains that the enormously heavy monolith could have simply disturbed sandy deposits as it ploughed through them while settling.

### 6.4. The most probable explanation for the letters

Regardless of whether the monolith worked its way down through loose sand to the top of the Mesolithic layer naturally, after slumping from a vertical position, or was toppled into a pit, which we doubt, the orientation and form of the letters make it nearly certain that parts of faces A3 and, to a lesser extent, A1, at the monolith’s narrower end, were exposed for a few centuries beyond the Middle Ages, since they resemble typefaces, which were only invented with printing.

The reason for this contention is that the letters have the blockiness and serifs of lettering modelled on *old style* or *humanist* fonts, which only date back to 1465. The existence of names from the 17th through 19th centuries with similar serifs in the Grotte “Moreau”, which is on the same ridge, proves that such conventions have been used in Larchant for several hundred years.

But there are two more reasons to think that the letters are relatively recent. The first is that many of the repeated letter sequences appear to be identical (Figs. 8B, 9B, C and 10C), suggesting that they were painted through reversed stencils. Despite the erosion of every register, the overlaps and identical dimensions of three sequences (1, 3 and 5) suggest that they were all made from one template. This makes it possible to reconstruct a longer sequence than can be found in any one line, which reads: ...NSORT(?)U?)(M?)-RON(C or D)....

Another reason to believe that the regular and conventionalized letters were made since 1465 is that the sequences include hyphens, which are often used in French commercial names. If this scenario is correct, then the signage can be construed as reading “CONSORTIUM—RON.../PARIS”.

The only way to determine whether the letters were made just after the invention of printing or far more recently is to see if the pigment corresponds to a datable paint – something we would like to do after receiving authorization. Although our demonstration that the red “motifs” are at least 7000 years younger than was supposed and could only have been made during a few centuries would normally be satisfactory on an archaeological timescale, it would be interesting to establish the paint’s age more precisely. This won’t compensate for the failure of the excavation report to record what was found in the top layer (A), let alone anything recent in the compromised level below it, but it will allow us to clarify at least one aspect of the cave’s recent history.

In the meantime, we lean towards dating the lozenges to the Middle Ages and letters to the last two centuries while seeing medieval practices as being important for understanding the relationship between the monolith, some of its engravings, and the double inhumation.

Regardless, though, of the exact date that the letters were made in recent centuries, they prove that the stone was not only exposed but probably more-or-less erect until a relatively short time, given the site’s age, before it was excavated in 1981 (Hinout, 1993). That being the case, most of Hinout’s reflections considering the monolith and its utility as a chronological key may be considered worthless.

## 7. Conclusions

To sum up, the existence of engraved motifs, which match known medieval vulvas, on two sides (A2 and A3) of the monolith’s tapered end, and red motifs (on sides A1 and A3), whose tops are consistently oriented towards the same end, suggests that the stone

was exposed until recently. If that was the case, then its other end must have been buttressed by supporting rocks, since the cave floor is largely sandy. The only ones which are anywhere nearby or properly arranged for keeping the monolith in a vertical to inclined position until it was engraved and painted are the cluster of small boulders (1–7), which were found around and under the monolith (13). The existence of four of these foundation stones in the Sauveterrian layer (and the rest of them on it) seems to indicate that the monolith was erected at the end of that period. We further propose that the Mesolithic “menhir” began to slip and lean upon the largest of the supporting stones (7), exposing face A3 more than A1, until the monolith finally slid (or was pushed) off 7 and fell into the position where Hinout found it.

In conclusion, it would be wise to abandon the use of the monolith as a chronological key for dating the area’s rock art and to consider the implications of signs, which have been accumulating for several years, that much of the schematic art in the region can not be reliably attributed to the Mesolithic. Some of these anomalies, like the discovery of heavily engraved figures with pronounced vulvas and abstract motifs in a historically made tunnel-system called the Cave Duguet (Valois, 2009: 13–62; Valois 2011: 49–57), could be brushed aside, because they come from just outside the region – in this case from the Yonne. But the realization that some motifs and conventions, like ones seen in lozenge-shaped vulvas and spear points with median lines, could be dated to metallurgical periods has made it increasingly difficult to believe that many “classic” rock art sites are really Mesolithic.

The main reason why Hinout’s article became the foundation for a dating doctrine is that so many researchers had tried so long to find datable vestiges in contact with engravings (Beaux, 1995: 25–36), that many of them greeted the news that Hinout had solved the problem, despite the fact that at least two recognized shortcomings in his work (Bénard, 1993; Beaux, 1995: 30–33). In an article chronicling the frustrations of these inconclusive excavations, François Beaux (1995: 25–36) described how the work of one of the excavators, James Baudet, was filled with so many “peremptory and abusive affirmations, when they are not frankly false” that it was a “complete loss of information representing almost half of the number of decorated shelters in the Massif de Fontainebleau” (Beaux, 1995: 27). Moving on to Hinout’s excavation report, Beaux wondered why the archaeologist asked his readers to take so much on faith in these prescient words: “Once again, an author ‘jumps’ immediately to conclusions while asking us to accept them on faith, when we were awaiting a demonstration. Is he emulating James Baudet?” (Beaux, 1995: 31).

The discovery that the “alphabetiform” motifs were simply letters suggests that Hinout’s conclusions were even more suspect than Beaux imagined. The problems with Hinout’s conclusions are so serious that none of the engravings on the monolith can be considered of any use as chronological markers until the monolith is re-examined centimetre by centimetre using IR Raman lasers, optically stimulated luminescence (OSL) or other technologies that might help to identify a section at the block’s broader end that has not been exposed since the Mesolithic. Our findings also suggest that it would be wise to apply similar analyses to other contentious rock-art panels, particularly where there may be later additions.

In the meantime, our doubts about the block’s utility as a “Rosetta Stone” for ascribing the area’s “classic” rock art to the Sauveterrian should not come as a shock for a simple reason. One of the strangest things about the large number of purported Mesolithic sites, compared with more recent ones in the Massif de Fontainebleau, has always been that the number of sites for the various periods was almost in inverse proportion to the size of the periods’ populations. Thus, the region contained more art sites from a period when the population was relatively small, due to its

subsistence system, compared to the agricultural and metallurgical periods since then, when populations have been much bigger. We suspect that this distribution is partly based on false assumptions and wishful thinking, and that research will eventually prove that many of the supposed Mesolithic sites were actually created from the Neolithic onwards.

Although the virtual elimination of the block as a marker for Fontainebleau’s “classic” rock art style may seem disappointing, the indication, which the apparent historic letters and medieval vulvas have provided, that the monolith was standing when these markings were made around its narrower end, and complementary realization that the stone was lying on top of a more-or-less oval cluster of small rounded boulders, which were encased in the Mesolithic layer, suggests that the monolith may have been held upright, which would make it one of the oldest known menhirs in France. If this is the case, then it partly compensates for the loss of a major chronological key.

### Acknowledgements

We are grateful to Jean-Loïc Le Quellec and Bernard Fougère for bringing DStretch to our attention in 2007 and to Laurent Valois for years of companionship and discussion in the field. Finally we would like to dedicate this article to Nancy Caldwell, who has always encouraged us in our efforts to unravel such complexities.

### Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jas.2013.09.023>.

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