The scree of the Solwaster megalith

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Preliminary remarks
1.. The entire site is under forestry regime. There is a pedestrian-only tourist trail through the scree. The recommended, signposted access is 1 km south of Solwaster, near the Bastin monument, where vehicles can be parked. Anyone wishing to deviate from the only authorized path must apply in writing for duly justified authorization to the Département de la Nature et des Forêts, Cantonnement de Spa; Ferme de Malchamps, Rue Sauvenière, 201; 4900 SPA; Tel. 087 29 90 80.
2. For a good understanding of this text, it is worth :
-. to consult the Tourist Map of the Hautes Fagnes Plateau: Plate 3, boxes D1 and E1.
-to review the meaning of the italicized expressions in the 'Stones, General' chapter of this site.

State of knowledge

The Solwaster 'dolmen' is a megalith of *Cambrian quartzite* (early Cambrian Era). Paleozoic or Primary: 542-518 Ma= Millions of years). Its size is approximately '3.8 x 2.6 x 0.8' m (fig.1).

Figure 1. The megalith in the excavation made to expose it. The white ellipse indicates the position of the 'engraving' commented on below.

A summary of the state of knowledge concerning the Solwaster dolmen is displayed on an explanatory panel at the site. Its contents can be summarized as follows. It is
Théodore Britte, a fountain-maker in Verviers, was the first to be intrigued by the exceptional size of this boulder, to the point of clearing it in March 1888.
At the time of the discovery, Elisée Harroy, director of the Ecole Normale de Verviers and a keen prehistoricist, was called to the site and observed that :
-The direction of elongation of the megalith (the length or great median) was oriented towards 'True North', which at the time was 15°E on the compass (N.B. This deviation results from the permanent displacement of the Magnetic Poles in relation to the Geographic Poles);
-The megalith rested on three 'wedges' (small blocks), which were unfortunately removed, fractured and scattered;
In the SW part of the upper face (fig.1: ellipse), a hook-shaped engraving depicted, as in Brittany, a primitive plough, a symbol of sedentary life (see below).

In conclusion, Elisée Harroy proposed that it was a dolmen, but tradition tells us that the geologists and archaeologists of the time protested against this interpretation as soon as they heard about it.

Brou W. and Brou M. (1969) included this megalith in their work devoted to the census of dolmens. They add details that sometimes contradict tradition, without citing their sources. For example, the three 'wedges' removed by the discoverers had become "several much smaller quartzite blocks (60 cm by 50 cm and 15 cm high), several of which were superimposed as if to form dry-stone pillars". More interesting would be the find of "...70 cm below the underside of this table, fragments of charcoal embedded in clay".

Useful features of a dolmen

From an architectural point of view, a dolmen consists of a tabular megalith resting on other vertical megaliths, often menhirs or sometimes panels of rocky benches that form real walls (fig.2). Other megaliths may close the edifice. They were mainly erected on subhorizontal surfaces. Once erected, they were covered with earth or stones to form tumuli. Numerous excavations of dolmens in Belgium and neighbouring countries have revealed the following demonstrated that these were burial chambers which, in our case, date back, if not to the Neolithic period (between 7000 and 4000 years BC), at least to the Metal Age (4000 to 2000 years BC). Over the millennia, run-off from the burial mounds generally evacuated the earth, freeing the buried dolmens.

Figure 2. Two dolmens: A, in Brittany, a tabular panel set on three menhirs; B, at Wéris, a tabular panel set on two panels, behind another panel of which only one corner is visible, and in front a collapsed panel.

Non-conforming features of the Solwaster dolmen

At the Solwaster site, there are several arguments against the dolmen hypothesis:
-The site is not a subhorizontal surface, but a slope with a gradient of around 25°;
-The boulders uncovered beneath the panel were neither menhirs nor rock panels, but simply small elements (three 'wedges'); they could therefore have been simply contiguous blocks in the silty-clay matrix of the soil;
-The dolmen should have been erected on the surface of the ground, and all the megaliths used should have remained in place, collapsed on the ground, or scattered a little lower down the slope, but none of these significant traces appear;

-There is no trace of the earth from the tumulus that should have surrounded the building, if not buried it;
-No artefacts indicative of human presence have been found in the area where the megalith was excavated; it is not uncommon for charcoal chips of natural origin to be preserved in clay sediments.

Engraving or sedimentary deformations

The upper face of the megalith features nipple-shaped sedimentary deformations (fig.3A) that are well known to have been shaped on the Cambrian sea bed when the sediments were still soft (Boulvain, 2007).

Figure 3: Three types of sedimentary deformation acquired on the Cambrian sea bed. Shapes A and B are on the upper face of the megalith, and shape C on the lower face. In both cases, they correspond to *stratification joints*: A, concentric circular forms corresponding to mamelonated structures from the Cambrian sea bed, and scaled on the site by meteoric alteration; B, mold of a phyllade pocket in quartzite (localized on fig.1); according to Harroy, engraving representing a plough (see above); C, on the underside of the Solwaster megalith, a quartzite bead that must have left its imprint in the underlying marine layer. The small broken block at the base is one of the 'wedges' placed in 2001, when the megalith was raised.

As for the hook shape (fig.3B), if it were an engraving (Harroy, see above), due to its rounded forms, it would have to be attributed to the Neolithic polished stone industry. However, these pockets reveal a relief of sedimentary laminae of varying strength, attesting to the fact that there was no anthropic polishing. Moreover, the engraving technique used in Brittany was limited to hollowing out the outline of the object to be depicted (fig.4). Finally, the hook shape bears no resemblance whatsoever to the Breton plough engravings cited as a reference document by Halloy *(op. cit.)*.

Figure 4: Axe-charrue engraving on a megalith from the Locmariaquer dolmen in Brittany.

The hooked shape of the Solwaster megalith cannot therefore be an engraving. In fact, it is an intra-sedimentary deformation contemporaneous with that of the megaliths. To understand it, you need to know that quartzite and phyllite beds occur alternately in the Cambrian. At the bottom of the Cambrian sea, a clay layer was deposited on top of the silt layer. A small subaquatic slide caused some of the clay to sink into the silt. Similarly, at the base of the silt layer, some of this sediment sank into the underlying clay. Subsequently, over hundreds of millions of years, these rocks became phyllite (the clay) and quartzite (the silt) respectively. In conclusion, the hook shape is simply a mold of a pocket of phyllade in quartzite.

Hypothesis of a megalith in a natural position

First of all, it should be noted that this megalith is part of a scree slope whose blocks and panels outcrop all over the surrounding part of the slope, whose gradient (20 to 25°) is steeper than upstream and downstream (fig.5A&B). This slope is probably lithological and should correspond to a series of quartzite benches, whereas the upstream and downstream surfaces are dominated by phyllite benches. This would allow us to attribute the origin of most of the boulders in the scree to the slope itself, in which case the megalith would have been displaced only a few metres after being detached from its outcrop. However, we can't rule out the possibility that it may have come from a bench a little further upstream, along the line of steepest slope descending from the 'Les Arsins' ridge.

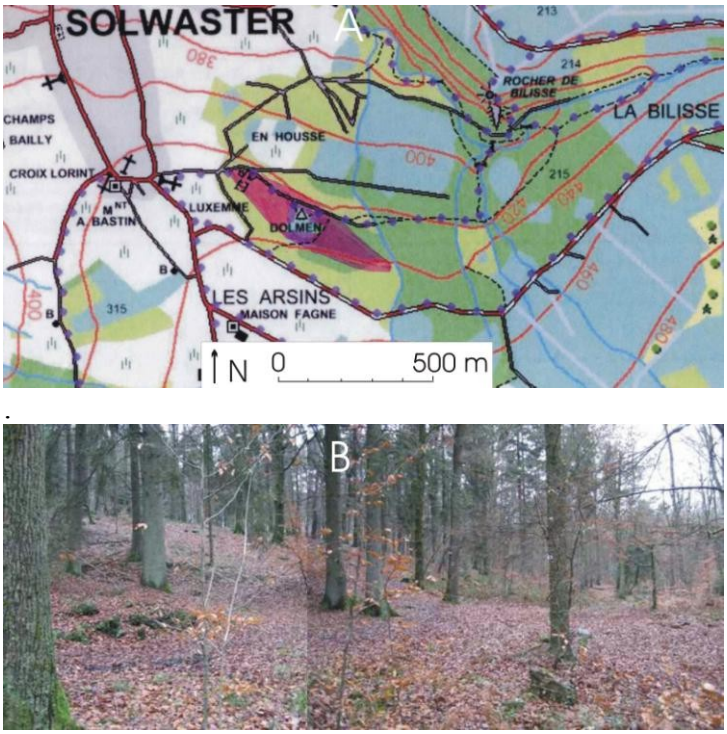

Figure 5. A, the extension of the scree (red beach) of which the megalith is a part. B, the slope that bears the bulk of the scree; boulders are visible on the slope and on the lower flat that extends it.

Up the slope, the gradient is gentler (5° to 7°) and boulders are rare, if not virtually non-existent, in the 'Les Arsins' meadows beyond the forest road. At the foot of the slope, on the flat area that extends it, a few boulders are also present.

In the scree (fig.6A), other boulders are at least as large as the dolmen (fig.6B).

Figure 6. Two aspects of the scree of which the megalith is a part: A, a few boulders outcropping nearby; B, another megalith, perhaps even larger than that of the 'dolmen', as the volume of its buried part is unknown. It lies a hundred metres to the east of the 'dolmen'.

In the abandoned quarry on the western side of the scree (between 'En Housse' and 'Luxemme'), the heads of the quartzite benches can be seen dislocated into blocks and panels beneath a thin covering of soil (fig.7), which is probably the case throughout the slope.

Figure 7. Former working face of the abandoned quarry between 'En Housse' and 'Luxemme'; the exposed rock consists of quartzite bedheads fractured into blocks.

It is well known that in *periglacial climates*, pebbles and boulders buried in the slice of ground that freezes and thaws each year rise slowly to the surface where they eventually spread out. This process has occurred in the Ardennes during all the planet's *ice ages*, and in these circumstances, the megalith was able to emerge from a buried bench head at an undetermined point, but located on the line of greatest slope between the crest of 'Les Arsins' and the site where it stands. The *annual frost heave first* allowed it to rise to the surface. Subsequently, it may have been carried down the slope by *slow creep and/or solifluction*, particularly during periods of ground thaw. In this type of movement, it is well known that the long axis of pebbles and elongated boulders runs parallel to the slope, thus satisfying minimum friction conditions. However, the 15°N orientation measured by Harroy for the 'dolmen' and several other boulders corresponds precisely to that of the slope's steepest line, so there's no need to invoke any human intervention to explain it.

Conclusion

The menhirs or wall panels that could have supported the Solwaster megalith are missing. It was largely buried in the ground, whereas dolmen megaliths are generally either still standing or have collapsed onto the surface. The building would have been erected on an unusually steep slope (25°).
On the other hand, three processes active in a periglacial climate are sufficient to explain the megalith's position on the slope*: frost heave, slow creep and solifluction*. As for the hook-shaped imprint, it is necessarily of sedimentary origin.
We therefore propose to abandon the 'dolmen' hypothesis, and present this rock as a simple megalith erected by natural processes in a periglacial climate.
Of course, we can't rule out the fact that this megalith has intrigued mankind since the Neolithic (and perhaps even before), to the point of being a recurring gathering place for various reasons, today a tourist attraction.
Those who could not accept this new interpretation would have to make deeper excavations beneath the block, in search of artifacts such as bones or objects previously associated with burial sites.

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