

## The Standon Stone: science, history, myth and magic

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This presentation was about Hertfordshire Puddingstone, a deposit so named because it looks like a plum pudding. It is a conglomerate with rounded pebbles cemented together with the cement and pebbles having exactly the same hardness, which was used by lapidarists in the 19th century.. In particular, it was looking at the Standon Stone, in the village of Standon, north of Ware. On 1 May, wickerwomen, Morris dancers and other new age people gather to worship the Standon Stone, which is a block of Hertfordshire Puddingstone that looks like a human figure, with head, arms, breasts and buttocks similar to those of the Palaeolithic Venus figures. The plaque describing the stone indicates wrongly that it is of glacial origin but it probably formed 55M years ago in a hot climate and not 1M years ago in a cold glacial climate. It is sometimes called the “breeding stone” because farmers found it unexpectedly in the fields (often by breaking a plough share on it) and thought that it had bred there. Its present site was possibly a prehistoric tribal meeting place and early Christians chose the same site on which to build a church. It was placed in its present position in 1904, having previously been in the wall of the churchyard. The pebbles are made of Cretaceous flint contained within the Chalk; many medieval churches were built with flint where there was a shortage of other building and many churches have later had their exteriors refurbished with a thin facing of knapped flint. Flint is almost 100% SiO<sub>2</sub> and chalk almost 100% CaCO<sub>3</sub> so how did the SiO<sub>2</sub> get there. Flint was laid down in the Chalk Sea and made from sponges, which often form fossil cores to the flints. Sponges abstract SiO<sub>2</sub> from sea water but it is uncertain where the large amounts of SiO<sub>2</sub> involved got into the ocean. It would be expected to be derived from the land but the Chalk Sea was very extensive and the nearest land was very distant. The speaker considered that a more likely source was a whole chain of undersea volcanoes along the spreading ridge where the Atlantic was opening up, which were pouring out masses of SiO<sub>2</sub> that dissolved in sea water. When sponges die and decompose, the sponge spicules dissolve quickly and form blobs of flint around fossil shells. Flint is a silica gel and tends to fill burrows, surround sponges and crystallise in sea urchins such as *Micraster* and *Hemicidaris*. 1,000 feet of Chalk was deposited and the top 300 feet have dozens of bands of flint forming about 10% of the total rock volume. The Chalk was then uplifted and eroded and the erosion products deposited as the Reading Beds – mainly sand with layers of flint pebbles, some of which were later cemented by SiO<sub>2</sub>. Those with pebbles are known as puddingstone, those with just sand as sarsens. The variation in the size of the pebbles is well shown by the puddingstone at the Kingsbury Water Mill in St Albans. These silcretes (SiO<sub>2</sub>-cemented rocks) are some of the hardest rocks around. They formed relatively rapidly and many formed around tree roots. The sand beds and pebble beds were full of water containing dissolved SiO<sub>2</sub> during the Palaeocene-Eocene Thermal Maximum (PETM) period of very hot climate, which probably only lasted about 50,000 years. The water evaporated leaving the SiO<sub>2</sub> behind and it cements the rock when near the surface, cemented beds being generally not more than about 3 feet thick with a quite flat upper surface and a lumpy botryoidal lower surface. The cementation does not form a discrete band but occurs in patches, eg around Radlett, Standon etc. If not cemented the deposits are normal Reading Beds sand and pebble beds. The Standon Stone has its back surface flat and it is the lumpy surface on the other side that gives it the appearance of a human figure. There was a similar sarsen stone at Cheshunt but this has now been removed and there are lots of sarsen stones at the top of the Chalk at the Lakeside shopping centre. Since the PETM, there has been lots of erosion and the Reading Beds have disappeared from most of Hertfordshire. However, puddingstone and sarsens are very resistant to erosion and remain, with the Standon Stone about 1 mile from the nearest outcrop of Reading Beds. The Standon Stone is very worn but 1 mile to the south, construction of the Welwyn by-pass on the A10 came across blocks of puddingstone with smooth fracture surfaces and hardly any weathering;

the blocks were moved to Dowsett's Farm. Patches of silcrete capping to the Reading Beds outcrop were broken into discrete blocks, possibly due initially to earth movement but more by glacial activity and moved down-slope due to solifluction (down-slope flow of the melting top few feet of permafrost) in Anglian times. It seems that the Standon Stone was probably derived from the Reading Beds farther north and slumped into the valley of the River Ash. While it could have been then moved by the ice, in a similar manner to the huge rafts of chalk at Royston, which have been pushed bodily by ice onto the crest of the escarpment, there is a more reasonable explanation. As the ice topped the escarpment, crevasses formed and meltwater streams go into the crevasses, descend to the base of the ice and form sub-glacial rivers that have a large head of water from the ice surface. 2 river valleys, including the River Quinn, run from the Reading Beds outcrop towards Standon, which have St Albans Gravel, containing Bruner pebbles from the Midlands. It is likely that the puddingstone was brought down to Standon under very high water pressure on a base of Bruner pebbles (quartzite), which pebbles also caused erosion of the Standon Stone. About 20,000 years ago, reindeer hunters were moving into England across Dogger Land, probably carrying only hand axes and their fertility symbol (similar to the Venus of Willendorf), one of which has been found in Britain at Grimes Grave, though this is of much later age – only 5,000 years ago. In the Standon Stone, they saw a life-size representation of their fertility symbol and it became a place of ritual, which was subsequently taken over by Christians as the site of the church. All the surfaces of the Standon Stone are smoothed off by erosion except the head, which has been relatively freshly broken – someone has decapitated it, presumably to take the magic out of it. It was originally in the old churchyard wall, moved to a mounting block outside the Star public house and then to its current location in 1904. It is mentioned as having been found in 1878 buried in the chancel of the medieval church and the damage to the Standon Stone probably dates from at least medieval times.