



Discovery of a second Roman quarry in Hertfordshire for manufacture of querns from Paleogene Hertfordshire Puddingstone siliceous concretions



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ABSTRACT

The discovery of a Roman quarry for recovery of Hertfordshire Puddingstone was first reported by Lovell and Tubb (2006), from the Colliers End Paleogene outlier in the east of the county. Hundreds of querns are known to have been manufactured from the distinctive pebbly siliceous concretions renowned as Hertfordshire Puddingstone. The existence of further sources of the raw material has been obvious (Green, 2016), but quarries have proved elusive, and surface extraction from isolated boulders has been a possibility. However a further concentration of Roman pits has now been discovered in the west of the county, in the Paleogene outlier at Great Gaddesden. The evidence for quarrying is introduced in a regional geological and archaeological context. Plans for more detailed work are summarised.

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1. Introduction

The use of grain to make flour and bread in the Roman world made the production of millstones and querns (hand mills) a literally vital economic concern. The respective pebbly silcretes (puddingstones) found in Normandy and south-east England were particularly attractive rocks for this purpose, in their own right and because they occurred in areas without alternative supplies of hard rock (Green, 2016).

Quarrying in Roman (and later) times was not always concentrated in excavated 'quarries' or 'pits', since surface material will often have been easier to obtain; indeed the Romans had a very limited geological appreciation, and could not predict the presence of rocks unless they were exposed at the surface. This was surely especially true of the puddingstones since they do not form a continuous layer but resist weathering and so are likely to become surface boulders. Nonetheless ancient production sites in the Anglo-Paris Basin may now only reveal themselves if they have been excavated quarries/pits. All those so far known in Britain and Normandy are preserved in old woodland, at Colliers End,

Hertfordshire (Lovell and Tubb, 2006), at Worms Heath (Surrey), Saint-Saëns, and Bois des Hogues (both Seine Maritime) (Green, 2016). However it will be seen from Green (2016, his Fig. 4), that Hertfordshire Puddingstone boulders are far commoner in west Hertfordshire (north and west of St Albans) than in the east, and that the scant evidence of production is similarly located (it has consisted of débitage, a handful of unfinished querns, and even fewer finishing 'hammers'). There has therefore been a prima facie case that most Hertfordshire Puddingstone querns were made in west Hertfordshire, but that archaeological survival was better in the east of the county where the pressures of development have been less.

Impetus was given to the search for a second quarry by the conference and field meeting on *Puddingstone and related silcretes of the Anglo-Paris Basin* held in May 2014, organised jointly by the Geologists' Association, the Geological Society of London and the Society of Antiquaries. Following contacts made then, the four co-authors of this paper were pleased to accept an invitation to visit Great Gaddesden in west Hertfordshire in July 2015 to examine a large and freshly exposed specimen of Hertfordshire Puddingstone (Fig. 1). This had recently been unearthed by our host, the landowner, in the Paleogene outlier that caps the higher ground east of the village.

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Fig. 1. Specimen of Hertfordshire Puddingstone recovered by the landowner from just below surface level in the Paleogene outlier at Great Gaddesden, viewed in its correct geological orientation with the older deposits at the base, and somewhat irregular bedding planes dipping at a shallow angle to the left. Depth c. 0.9 m, and since the base is broken away, a minimum thickness of c. 1.0 m is suggested for the sandy pebble bed in which this siliceous concretion was formed. (The boulder is c. 1.2 m in length.)

This large concretion in itself provides evidence of the position and potential availability of the rock in antiquity. Following our arrival, our host also drew our attention to the existence elsewhere in the outlier of many pits containing other, smaller, fragments of puddingstone which proved in every case to have been humanly broken: these are angular fragments with flat unweathered faces (Fig. 2). Similarities with the known pits at Colliers End and in Normandy (Lovell and Tubb, 2006; Green, 2016) were immediately obvious, and further débris previously noted in the parish church could now be associated, as will be described in Section 3.

Our discovery was made on private land, part of a working estate to which we were given access by kind invitation of the landowner. We hope with permission to carry out and publish further studies. In line with earlier practice in similar circumstances (Lovell and Tubb, 2006) we are not at this stage specific about the location of the Roman quarries at Great Gaddesden. We wish to protect the landowner from any uninvited incursions, and we do not wish the pits to be disturbed in any way before full surveys are carried out.

We should emphasise that almost certainly nothing of value remains to be found, as the finishing of Roman querns and millstones was invariably carried out away from the extraction site itself, where only the rough waste was trimmed off. Furthermore



Fig. 2. Humanly broken fragment of Hertfordshire Puddingstone from the surface of the pit shown in Fig. 4. Specimen is 0.15 m long.

an abundant sample of the puddingstone, more than can be anticipated from investigation of the production site itself, can be freely viewed in the tower of St John the Baptist Church, Great Gaddesden, at NGR [TL 028112].

2. Geological setting of the Roman quarry

The present-day height of the unconformity of Paleogene on Cretaceous at Great Gaddesden is 155–160 m OD. British Geological Survey maps show Lambeth Group deposits (Aldiss, 2012) resting on Chalk that flanks this higher ground. Fossiliferous early Eocene mudstones, which cap some of the other Hertfordshire Paleogene outliers to the east (Fig. 3), are not present at Great Gaddesden.

One of the Paleogene outliers to the east is that at Colliers End (Fig. 3), some 35 km east of Great Gaddesden. On the western flank of the Colliers End outlier the unconformity of Paleogene on Cretaceous can be mapped in an old chalk pit at Sacombe [TL 336196] at c. 90 m OD, with up to 2 m relief on the eroded Chalk surface. Some 4 km east of Sacombe, the unconformity is recorded in the Dowsett's Farm borehole (TL32SE38 [TL 38062079]) at 85 m OD (Hopson et al., 1996). Fossiliferous early Eocene mudstones of the Thames Group, proved in the Dowsett's Farm borehole, constrain the age of the Lambeth Group Hertfordshire Puddingstone in the Colliers End outlier (Lovell, 2016).

The difference in present-day height of the unconformity between the Great Gaddesden outlier at 155–160 m OD and the Colliers End outlier at 85–90 m OD is therefore of the order of 70 m,

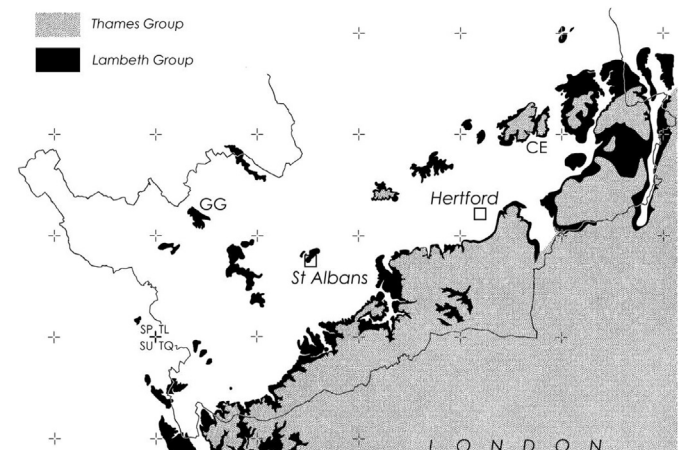


Fig. 3. Paleogene outliers of Hertfordshire, after Catt and Doyle (2010, their Fig. 4.1), and BGS data. The outliers at Great Gaddesden and Colliers End are highlighted: these are the locations of the two known Roman quarries.

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