

# Chapter 18. Petrological Identifications

J. Eyers

Twenty-two lithic samples from Newnham were identified, with a full description, interpretation and sourcing information applied where possible. Specimens were examined with the aid of a x20 hand lens and a binocular microscope, but not by thin section.

The summary (Table 18.1) is followed by the full description of each specimen.

RA no. ( <i>Context no.</i> )	Find type	Lithology	Source
178	Moulded edge plaque	Recrystallised limestone	Not known
308	Gaming piece/pot lid	Sandstone (glauconitic)	Lodsworth? Sussex
52	Gaming piece/counter	Sandstone (slightly micaceous)	Not known
310	Millstone	Calcareous sandstone	Not known
314	Rotary quern	Niedermendig lava	Mayen-Eifel region of Germany
315	Rotary quern	Niedermendig lava	Mayen-Eifel region of Germany
309	Upper stone rotary quern	Millstone Grit	Pennines (Derbyshire?)
316	Rotary quern	Niedermendig lava	Mayen-Eifel region of Germany
318	Rotary quern	Vesicular lava	Mayen-Eifel region of Germany?
306	Lower stone rotary quern	Puddingstone	Herts or Chilterns
307	Upper stone rotary quern	Millstone Grit	Pennines (Derbyshire?)
317	Rotary quern	Niedermendig lava	Mayen-Eifel region of Germany
0 ( <i>Trench II</i> )	Roof tile	Collyweston Slate	Northamptonshire
0 ( <i>166</i> )	Roof tile	Collyweston Slate	Northamptonshire
0 ( <i>257</i> )	Roof tile	Collyweston Slate	Northamptonshire
0 ( <i>257</i> )	Roof tile	Collyweston Slate	Northamptonshire
0 ( <i>28</i> )	Roof tile	Bioclastic limestone	Local Jurassic
10	Tessera	Fine calcareous sandstone	Beds-Northamptonshire
176	Primary whetstone	Coarse calcareous sandstone	Inferior Oolite Bedfordshire-Northamptonshire
181	Primary whetstone	Coarse calcareous sandstone	Inferior Oolite Bedfordshire-Northamptonshire
234	Whetstone	Coarse calcareous sandstone	Inferior Oolite Bedfordshire-Northamptonshire
0 ( <i>258</i> )	Stone with plaster	Bioclastic limestone	Local Jurassic

Table 18.1 Summary of petrological identifications

The assemblage is typical for this period and for Bedfordshire, with many locally sourced rocks. There remains one overriding question however, and that is why the Niedermendig lava found in Bedfordshire, and notably from Saxon levels of excavations, is commonly of such poor quality and so heavily decayed. In contrast, lava from neighbouring counties or from Roman levels commonly shows much better preservation. The potential for the lava being from another source area was considered, and hence all potential sources were checked from Mediterranean and other regions, including notably the very similar Volvic source area. The Newnham lava quern specimens are confirmed as definitely Niedermendig lava. However, the Niedermendig lava querns or millstones obtained from Roman sites are much less weathered and are often retrieved from site as strong and durable items, in larger pieces. Indeed, the Eiffel region lavas were specially selected for their strength and their vesicular (and hence good grinding) properties. There are three potential answers to this problem of poor quality Niedermendig millstones in Bedfordshire:

1. The source area was becoming worked out and poorer quality stone was being sourced during later Roman and Saxon times.
2. The stones had not been imported during the later Roman and Saxon period, but represent recycling of earlier objects.
3. Soil and hydrology conditions in Bedfordshire are adversely affecting the preservation of the lava querns (and presumably other vulnerable artefacts).

Given the poor quality of preservation, but precisely same mineralogy of the Niedermendig lava millstones from many English sites, the most likely explanation is re-use of Roman millstones. During this extended length of time of use, the vulnerable minerals within the rock (feldspars, pyroxenes and amphiboles) would have more time for exposure and impact damage, plus substantial everyday wear and tear. This could potentially lead to fractures, enhancing the rocks, susceptibility to deterioration by weathering and leading to the rock disintegrating.

## **Roof tile**

**Specimen accession number:** RA -

**Context:** Ph 3 G43 (5b-28)

### **General description**

**Find type:** roof tile

**Specimen size (cm):** 1 large piece 513 g

**Comments:** Weathered, fissile, and with rippled surface.

### **Petrological description:**

**Colour:** Very pale brown 10YR 7/3 (fresh)

**Grain size:** Fine 187-250  $\mu\text{m}$  with larger bioclasts.

**Grain sorting:** n/a

**Grain shape:** n/a

**Grain roundness:** n/a

**Grain sphericity:** n/a

**Grain surface texture (Quartz):** n/a

**Fabric:** grain contact, preferred orientation of clasts forming laminae

### **Minerals (clasts and bioclasts) present and proportions (%):**

Bioclasts 99%

Iron oxide grains 1%

**Cement:** Micrite

**Bioclasts:** a variety of oyster, other bivalves (including whole juveniles), gastropod and echinoid.

**Interpretive comments based on observations:** Calm marine environment with intermittent gentle currents winnowing away any finer sediment, resulting in the shell hardground seen in this specimen. Movement of clasts at intervals has separated them out and formed distinct laminae in the rock, allowing it to be split.

**Rock type (general and/or specific name):** bioclastic limestone. Jurassic source area, but it is uncertain whether this belongs to the same group as the other NWH stone tile (e.g. 257 or 166) as there are significant lithological differences.

**Source area(s):** Local Jurassic source

## Roof tile

**Specimen accession number:** RA -  
**Context:** Ph 3 G51 (2-166)

### General description

**Find type:** Roof tile

**Specimen size (cm):**

**Comments:** Very similar to roof tile 257 and other Trench II sample, within natural variability, but this is sandier.

### Petrological description:

**Colour:** Weathered: 2.5Y 6/3 (light yellowish-brown); fresh: light grey 2.5Y 7/1

**Grain size:** fine 187  $\mu\text{m}$

**Grain sorting:** well sorted

**Grain shape:** Very variable (bioclasts)

**Grain roundness:** too fine

**Grain sphericity:** too fine

**Grain surface texture (Quartz):** very fine, glassy?

**Fabric:** grain contact

### **Minerals (clasts and bioclasts) present and proportions (%):**

variable, but approximately:

Quartz 83%

Bioclasts 5%

Dark lithic grains (like 'lydite' chert) 10%

Mica? 2%

**Cement:** calcite (micrite)

**Bioclasts:** fine debris, bivalves.

**Interpretive comments based on observations:** nearshore, very shallow marine environment with gentle currents re-working sand and forming ripple surface. Early cementation and/or laminae of quartz and bioclast debris allows the rock to be parted along these horizons. There are large similarities with roof tile 257, although notable differences such as the dark grains and mica.

**Rock type (general and/or specific name):** calcareous sandstone. Collyweston Slate, from the Lower Lincolnshire Limestone.

**Source area(s):** Collyweston (Weldon area), Northamptonshire

## **Roof tile**

**Specimen accession number:** RA -  
**Context:** Ph 4 G52 (2-257)

### **General description**

**Find type:** Roof tile

**Specimen size (cm):**

Sample 1: 17 x 12 x 1.1 cm (412 g) and 14.5 x 9 x 1.3 cm (328 g);

Sample 2: 27 x 17 x 1.3 cm (1125 g)

**Comments:** There is a worked nail hole in one item from sample 1, which is weathered and the clasts difficult to see. Sample 2 has more bioclasts notably echinoid fragments. All samples show a well developed rippled surface.

### **Petrological description:**

**Colour:** Weathered: 2.5Y 6/3 (light yellowish-brown); fresh: light grey 2.5Y 7/1

**Grain size:** medium 375-500 µm

**Grain sorting:** moderate

**Grain shape:** Very variable (bioclasts)

**Grain roundness:** n/a

**Grain sphericity:** n/a

**Grain surface texture (Quartz):** not visible due to fine calcite coating

**Fabric:** grain contact, distinct but subtle separation of quartz and some bioclasts into laminae creating splitting surfaces.

**Minerals (clasts and bioclasts) present and proportions (%):**

variable, but approximately:

Quartz 25%

Bioclasts 10%

Carbonate (including reworked debris) 65%

**Cement:** calcite (micrite, with sparry patches?)

**Bioclasts:** fine debris of mostly bivalves for sample 1, bivalves and echinoid spines and plates for sample 2.

**Interpretive comments based on observations:** nearshore, very shallow marine environment with gentle to moderate currents re-working sand and carbonate, and forming ripples. Early cementation and/or laminae of quartz and bioclast debris allows the rock to be parted along these horizons.

**Rock type (general and/or specific name):** sandy limestone. Collyweston Slate, from the Lower Lincolnshire Limestone.

**Source area(s):** Collyweston (Weldon area), Northamptonshire

**Stone with plaster**

**Specimen accession number:** RA -

**Context:** Ph 4 G52 (2-258)

**General description**

**Find type:** Stone with plaster adhering

**Specimen size (cm):** 18 x 12 x 2.5 cm (top section); 26 x 12 x 5 cm (bottom)

**Comments:** In two pieces with pink, pebbly plaster inbetween.

**Petrological description:**

**Colour:** very pale brown 10YR 7/3

**Grain size:** bioclasts up to 10 mm

**Grain sorting:** n/a

**Grain shape:** n/a

**Grain roundness:** n/a

**Grain sphericity:** n/a

**Grain surface texture (Quartz):** n/a

**Fabric:** grain contact, with preferred alignment of elongate clasts.

**Minerals (clasts and bioclasts) present and proportions (%):**

Bioclasts 100%

(too weathered to see if there were any other minor clasts amongst the bioclasts)

**Cement:** Calcite (micrite)

**Bioclasts:** Oyster and other bivalve fragments, plates and spines of echinoids.

**Interpretive comments based on observations:** Very similar to the roof tile from context 28, but this specimen is less fissile.

**Rock type (general and/or specific name):** Bioclastic limestone

**Source area(s):** local Jurassic

## Roof tile

**Specimen accession number:** RA -

**Context:** Unphased (2-0)

### General description

**Find type:** Roof tile

**Specimen size (cm):** 22 x 18 x ?cm (1644 g)

**Comments:** Nail hole present. Rippled surface and burrowed other surface. Very similar to roof tile 257 and 166, within natural variability.

### Petrological description:

**Colour:** Weathered: 2.5Y 6/3 (light yellowish-brown); fresh: light grey 2.5Y 7/1

**Grain size:** medium 375-500 µm

**Grain sorting:** moderate

**Grain shape:** Very variable (bioclasts)

**Grain roundness:** n/a

**Grain sphericity:** n/a

**Grain surface texture (Quartz):** not visible due to fine calcite coating

**Fabric:** grain contact, distinct but subtle separation of quartz and some bioclasts into laminae creating splitting surfaces.

### **Minerals (clasts and bioclasts) present and proportions (%):**

variable, but approximately:

Quartz 25%

Bioclasts 10%

Carbonate (including reworked debris) 65%

**Cement:** calcite (micrite, with sparry patches?)

**Bioclasts:** fine debris of some bivalves and numerous sea urchin spines and plates.

**Interpretive comments based on observations:** nearshore, very shallow marine environment with gentle to moderate currents re-working sand and carbonate, and forming ripples. Early cementation and/or laminae of quartz and bioclast debris allows the rock to be parted along these horizons.

**Rock type (general and/or specific name):** sandy limestone. Collyweston Slate, from the Lower Lincolnshire Limestone.

**Source area(s):** Collyweston (Weldon area), Northamptonshire

## Tessera

**Specimen accession number:** RA 10

**Context:** Unphased (2-0)

### General description

**Find type:** Tessera

**Specimen size (mm):** 15 x 15 x 4 mm

**Comments:** Small, thin square tessera, slightly weathered, with one very pale highly weathered side, and slight but patchy iron-staining. Moderate cement, a little friable.

### Petrological description:

**Colour:** Fresh surface: light brown 7.5YR 6/3; moderate weathering: greyish brown 10 YR 5/2; highly weathered: light grey 10YR 7/2.

**Grain size:** Fine to medium sand c. 250µm

**Grain sorting:** well sorted

**Grain shape:** circular, oval and elongate with very minor triangular (ironstone)

**Grain roundness:** rounded

**Grain sphericity:** moderate

**Grain surface texture (Quartz):** glassy, but obscured by calcite coating

**Fabric:** grain support, with some preferred orientation of elongate clasts. Elongate voids associated with bioclasts.

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 91%

Mica 2%

Ironstone <1%

Bioclasts 6%

**Cement:** calcite (sparite). (There is some decay of the rock due to weathering giving a dusty coating appearing to be micrite.)

**Bioclasts:** shell – oyster plus other bivalve occurring as broken fragments in distinct laminae.

**Interpretive comments based on observations:** nearshore, marine environment with constant, moderate current action. The lithology, together with the minute ironstone fragments and slight iron-staining, indicates a local Jurassic source.

This specimen is similar to whetstone RA234, but finer.

**Rock type (general and/or specific name):** fine calcareous sandstone.

Most likely one of the Inferior Oolite Group sandstones, ?potentially Northamptonshire Sand Formation, but possibly insufficient iron content?

**Source area(s):** local Jurassic source. If an Inferior Oolite source then the nearest (and most likely) sites would be located in a line from Blisworth to Northampton to Kettering, all to the west of Bedford.

**Gaming piece or counter**

**Specimen accession number:** RA 52

**Context:** Ph 4 G44 (5b-8)

**General description**

**Find type:** Gaming piece or counter

**Specimen size (cm):** 3.4 x 3.0 x 3.2 cm

**Comments:** Good condition but weathered surface with a broken corner for good lithological observations. A hard rock although a little friable with some loose grains easily dislodging.

**Petrological description:**

**Colour:** Fresh: white 10YR 8/1; weathered: light brownish grey 10YR 6/2

**Grain size:** Medium sand 250-375 µm

**Grain sorting:** well sorted

**Grain shape:** circular to oval

**Grain roundness:** well rounded

**Grain sphericity:** moderate

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation of clasts

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 92%

Mica 8%

**Cement:** Quartz

**Bioclasts:** None

**Interpretive comments based on observations:** a high energy environment with a constant current which is most likely fluvial (river or delta channel).

**Rock type (general and/or specific name):** sandstone (slightly micaceous)

**Source area(s):** not known



## **Primary whetstone**

**Specimen accession number:** RA 176

**Context:** Ph 3 G67 (5b-18)

### **General description**

**Find type:** Primary whetstone

**Specimen size (cm):** 6.5 x 1.7 x 1.93cm (l x w x d)

**Comments:** Broken, good condition, with weathered surfaces. Similar lithology to tessera RA10, but coarser and less shell, and the same as RA234 and 181 whetstones.

### **Petrological description:**

**Colour:** Grey 5R 5/1 fresh)

**Grain size:** medium-coarse sand *c.* 500 µm

**Grain sorting:** very well sorted

**Grain shape:** round to oval (quartz), some elongate (shell) and triangular (ironstone)

**Grain roundness:** well rounded

**Grain sphericity:** moderate to high

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation of clasts

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 94%

Ironstone 5%

Bioclasts 1%

**Cement:** calcite (sparite, with some micritic patches)

**Bioclasts:** oyster and other bivalves (fragmented)

**Interpretive comments based on observations:** Moderate to high energy nearshore, marine deposit with constant current activity. Ironstone fragments indicate a local Jurassic source similar to RA10, same as RA234 and RA181.

**Rock type (general and/or specific name):** medium calcareous sandstone.

Most likely one of the Inferior Oolite Group sandstones. ?potentially Northamptonshire Sand Formation, but possibly insufficient iron content?

**Source area(s):** local Jurassic source. If an Inferior Oolite source then the nearest (and most likely) sites would be located in a line from Blisworth to Northampton to Kettering, all to the west of Bedford.

## **Moulded plaque?**

**Specimen accession number:** RA 178

**Context:** Unphased (1-0)

### **General description**

**Find type:** Raised edge of moulded plaque?

**Specimen size (cm):** 7.8 x 5.0 x 1.4 cm (max. dimensions)

**Comments:** Good condition, broken fragment, clearly moulded. Surfaces irregularly coloured by white or yellow recrystallisation patches of calcite.

### **Petrological description:**

**Colour:** light brownish-grey 10YR 6/2 (weathered); white 10YR 8/1 (fresh); recrystallisation patches yellow/brownish-yellow 10YR 7/6 to 6/6.

**Grain size:** sparite crystals up to 500-750  $\mu\text{m}$

**Grain sorting:** n/a

**Grain shape:** n/a

**Grain roundness:** n/a

**Grain sphericity:** n/a

**Grain surface texture (Quartz):** n/a

**Fabric:** recrystallised

**Minerals (clasts and bioclasts) present and proportions (%):**

Calcite (as sparite) 100%

**Cement:** calcite (sparite)

**Bioclasts:** None

**Interpretive comments based on observations:** Heavily recrystallised pure limestone. The recrystallisation has obliterated all previous lithological and environmental clues.

**Rock type (general and/or specific name):** Recrystallised limestone

**Source area(s):** not known, probably Jurassic

## **Primary whetstone**

**Specimen accession number:** RA 181

**Context:** Ph 3 G43 (5b-28)

### **General description**

**Find type:** Primary whetstone

**Specimen size (cm):** 5.2 x 2.0 x 1.8 cm (l x w x d)

**Comments:** Broken, good condition, with fresh surfaces for accurate observations of lithology. Similar lithology to tessera RA10, but coarser and less shell, same as RA176 and 234 primary whetstone.

### **Petrological description:**

**Colour:** Grey 5R 5/1 fresh)

**Grain size:** fine to medium sand *c.* 250 µm

**Grain sorting:** very well sorted

**Grain shape:** round to oval (quartz), some elongate (shell) and triangular (ironstone)

**Grain roundness:** well rounded

**Grain sphericity:** moderate to high

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation of clasts

### **Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 94%

Ironstone 5%

Bioclasts 1%

**Cement:** calcite (sparite, with some micritic patches)

**Bioclasts:** oyster and other bivalves (fragmented)

**Interpretive comments based on observations:** Moderate to high energy nearshore, marine deposit with constant current activity. Ironstone fragments indicate a local Jurassic source similar to RA10, same as RA176 and 234.

**Rock type (general and/or specific name):** fine calcareous sandstone.

Most likely one of the Inferior Oolite Group sandstones, ?potentially Northamptonshire Sand Formation, but possibly insufficient iron content?

**Source area(s):** local Jurassic source. If an Inferior Oolite source then the nearest (and most likely) sites would be located in a line from Blisworth to Northampton to Kettering, all to the west of Bedford.

## Whetstone

**Specimen accession number:** RA 234

**Context:** Ph 5 G77 (5b-76)

### General description

**Find type:** whetstone

**Specimen size (cm):** 6.2 x 2.3 x 1.9 cm (l x w x d)

**Comments:** Broken, good condition, a well-cemented and hard stone. Lithological features are well defined. Similar lithology to tessera RA10, but coarser and less shell, same as RA176 and 181 primary whetstones.

### Petrological description:

**Colour:** Grey 5R 5/1 fresh)

**Grain size:** medium-coarse sand c. 500 µm

**Grain sorting:** very well sorted

**Grain shape:** round to oval (quartz), some elongate (shell) and triangular (ironstone)

**Grain roundness:** well rounded

**Grain sphericity:** moderate to high

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation of clasts

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 94%

Ironstone 5%

Bioclasts 1%

**Cement:** calcite (sparite, with some micritic patches)

**Bioclasts:** oyster and other bivalves (fragmented)

**Interpretive comments based on observations:** Moderate to high energy nearshore, marine deposit with constant current activity. Ironstone fragments indicate a local Jurassic source similar to RA10, same as RA176 and 181.

**Rock type (general and/or specific name):** medium calcareous sandstone.

Most likely one of the Inferior Oolite Group sandstones, ?potentially Northamptonshire Sand Formation, but possibly insufficient iron content?

**Source area(s):** local Jurassic source. If an Inferior Oolite source then the nearest (and most likely) sites would be located in a line from Blisworth to Northampton to Kettering, all to the west of Bedford.

## **Rotary quern**

**Find site:** Newnham Marina, Bedford (NWM) 1975/70

**Specimen accession number:** RA 306

**Context:** Unphased (5b-0)

### **General description**

**Find type:** Rotary Quern, lower stone

**Specimen size (cm):** 13.5 x 26 x 4.7 cm (original diameter at least 34 cm).

**Comments:** good condition. From post hole.

### **Petrological description:**

**Colour:** Matrix is a light grey to very pale brown (10YR 7/2 to 7/3) with multi-coloured clasts (grey, brown, red-brown, white and white rimmed).

**Grain size:** Pebbles up to 5 cm, the majority c. 2 cm, although 1 cm diameter pebbles are common. Matrix: sand of varying grain size.

**Grain sorting:** Very poorly sorted

**Grain shape:** Round to elongate

**Grain roundness:** well rounded

**Grain sphericity:** low to moderate

**Grain surface texture (Quartz):** glassy

**Fabric:** matrix supported

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 100%

(as flint and chert pebbles, and quartz sand)

**Cement:** quartz

**Bioclasts:** none

**Interpretive comments based on observations:** turbulent, fast-flowing current in a river system. Deposit dried out to acquire quartz cement and form silcrete.

**Rock type (general and/or specific name):** Silcrete. Common name 'Puddingstone'. This rock type is often lumped as 'Hertfordshire Puddingstone', but is more widely spread than just Herts.

**Source area(s):** Hertfordshire or Chiltern Hills of Bedfordshire and Buckinghamshire

## **Quern fragment**

**Specimen accession number:** RA 307

**Context:** Ph 4 G72 (5b-11)

### **General description**

**Find type:** Quern fragment

**Specimen size (cm):** 5.9 x 5.1 x 3.9 cm (max. dimensions)

**Comments:** Weathered outer surfaces, but with fresh broken edge for ID observations.

### **Petrological description:**

**Colour:** Fresh: white 7.5 YR 8/1; slightly weathered: light brown 7.5YR 6/4; highly weathered: yellowish brown 10YR 5/3.

**Grain size:** coarse 500-750 µm

**Grain sorting:** well sorted

**Grain shape:** round to slightly oval to flattened spheres.

**Grain roundness:** very well rounded

**Grain sphericity:** moderate to high

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation of clasts

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz with feldspar 100% (difficult to distinguish)

**Cement:**

Quartz as overgrowth cement

**Bioclasts:** None

**Interpretive comments based on observations:** high and consistent energy current in fluvial environment (river of delta channel)

**Rock type (general and/or specific name):** Coarse sandstone, Millstone Grit

**Source area(s):** Pennines (Derbyshire northwards)

## **Gaming piece or pot lid**

**Specimen accession number:** RA 308

**Context:** Unphased (5a-0)

### **General description**

**Find type:** Gaming piece or pot lid

**Specimen size (cm):** 4.6 x 3.5 x 1.3 cm, original diameter c. 7 cm

**Comments:** Broken with weathered surfaces, but with a fresh surface for accurate observations.

### **Petrological description:**

**Colour:** Weathered: pale brown 10YR 6/3; fresh: very pale brown 10YR 8/3

**Grain size:** fine to medium sand c. 200-250 µm

**Grain sorting:** very well sorted

**Grain shape:** spherical to slightly oval (quartz); oval to slightly elongate (dark lithic clasts)

**Grain roundness:** well rounded

**Grain sphericity:** moderate

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation

### **Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 99%

Dark lithic fragments 1% (phosphate/glaucinite?)

**Cement:** Quartz, mostly as overgrowth

**Bioclasts:** None

### **Interpretive comments based on observations:**

Moderate and consistent current in a nearshore or fluvial environment.

**Rock type (general and/or specific name):** fine sandstone (quartz arenite).

Lower Greensand (Lower Cretaceous, most like Lodsworth Stone?)

**Source area(s):** Not certain. Not local Lower Greensand. Sussex if Lodsworth.

## Quern fragments

**Specimen accession number:** RA 309

**Context:** Unphased

### General description

**Find type:** Quern fragments

**Specimen size (cm):** 2 fragments: (1) 6.2 x 5.1 x 2.5 cm; (2) 5.7 x 4.4 x 2.5 cm (max)

**Comments:** poor cement as quartz clasts are easily dislodged.

### Petrological description:

**Colour:** light brown 7.5YR 6/4 (weathered); pinkish-brown 7.5 YR 7/4 (fresh).

**Grain size:** coarse sand 750-1000 µm

**Grain sorting:** moderate sorting

**Grain shape:** spherical, oval and minor elongate

**Grain roundness:** well rounded

**Grain sphericity:** moderate

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact, no preferred orientation to clasts

### **Minerals (clasts and bioclasts) present and proportions (%):**

Quartz and feldspar 93% (difficult to distinguish in hand specimen)

Clay (decayed feldspar?) 5%

Rock fragments (chert?) 1%

Iron oxide (hematite) <1%

**Cement:** Quartz (as overgrowth)

**Bioclasts:** None

**Interpretive comments based on observations:** High energy, consistent but turbulent current in a fluvial environment (river or delta channel). Some minerals have decayed to a whitish clay.

**Rock type (general and/or specific name):** Coarse sandstone, Millstone Grit.

**Source area(s):** Pennines (Derbyshire northwards)



## **Millstone**

**Specimen accession number:** RA 310

**Context:** Ph 3 G67 (5b-18)

### **General description**

**Find type:** Millstone

**Specimen size (cm):** 20 x 12.5 x 11.5 cm (max dimensions).

**Comments:** good condition, some weathering, with worked indents to roughen the surface.

### **Petrological description:**

**Colour:** Light grey 10YR 7/2 (fresh); weathers to pale brown 10YR 6/3

**Grain size:** very coarse c. 1000-1500  $\mu\text{m}$  (1 to 1.5 mm) with the occasional clast up to 6 mm.

**Grain sorting:** moderate to poor

**Grain shape:** spherical to oval

**Grain roundness:** well rounded

**Grain sphericity:** moderate

**Grain surface texture (Quartz):** glassy

**Fabric:** grain contact

**Minerals (clasts and bioclasts) present and proportions (%):**

Quartz 100%

**Cement:** calcite (micrite)

**Bioclasts:** none

**Interpretive comments based on observations:** high energy, slightly turbulent current depositing sand with the calcite cement being acquired at a later date. There are no indicators of palaeo-environment and hence a lack of information to be able to deduce a potential source area.

**Rock type (general and/or specific name):** calcareous sandstone

**Source area(s):** not known

## Rotary quern

**Specimen accession or other number:** RA314

**Context:** Ph 3 G81 (2b-22)

**Igneous (I) or metamorphic (M)?** ..... I .....

### General description

**Find type:** Rotary quern fragments

**Specimen size (m, cm, mm):** 5 fragments (35 g)

**Comments:** Small fragments, fairly weathered. Same as RA 315, 316 and 317. There are similarities with RA318, but the latter has fewer phenocrysts.

### Petrological description:

**Colour:** Mid-grey N6 to N5

**Texture:** Vesicular and porphyritic, with occasional amygdale (white mineral, not calcite).

**Grain size:** very fine, much less than 200  $\mu\text{m}$

### **Minerals present and proportions (%):**

Groundmass includes: feldspar (plagioclase and some alkali feldspar)

Amphibole

Pyroxene

Phenocrysts:

Amphibole

Feldspar laths (smaller)

(Not possible to estimate proportions of minerals without thin section.)

### **Interpretive comments based on observations:**

The rock is paler than 'average' basalt, and it is at the felsic end of the basalt range or just into the intermediate category (e.g. basaltic-andesite).

**Rock type (general and/or specific name):** vesicular lava, Niedermendig lava.

**Source area(s):** Mayen-Eifel region of Germany

## Rotary quern

**Specimen accession or other number:** RA315

**Context:** Unphased G53 (2c-7)

**Igneous (I) or metamorphic (M)?** ..... I .....

### General description

**Find type:** Rotary quern fragments

**Specimen size (m, cm, mm):** 307 g

**Comments:** Small fragments, fairly weathered. Same as RA314, 316 and 317. There are similarities with RA318, but the latter has fewer phenocrysts.

### Petrological description:

**Colour:** Mid-grey N6 to N5

**Texture:** Vesicular and porphyritic, with occasional amygdale (white mineral, not calcite).

**Grain size:** very fine, much less than 200  $\mu\text{m}$

### **Minerals present and proportions (%):**

Groundmass includes: feldspar (plagioclase and some alkali feldspar

Amphibole

Pyroxene

Phenocrysts:

Amphibole

Feldspar laths (smaller)

(Not possible to estimate proportions of minerals without thin section.)

### **Interpretive comments based on observations:**

The rock is paler than 'average' basalt, and it is at the felsic end of the basalt range or just into the intermediate category (e.g. basaltic-andesite).

**Rock type (general and/or specific name):** vesicular lava, Niedermendig lava.

**Source area(s):** Mayen-Eifel region of Germany

## Rotary quern

**Specimen accession or other number:** RA316

**Context:** Unphased (5a-58)

**Igneous (I) or metamorphic (M)?** ..... I .....

### General description

**Find type:** Rotary quern fragments

**Specimen size (m, cm, mm):** 192 g

**Comments:** Small fragments, fairly weathered. Same as RA314, 315 and 317. There are similarities with RA318, but the latter has fewer phenocrysts.

### Petrological description:

**Colour:** Mid-grey N6 to N5

**Texture:** Vesicular and porphyritic, with occasional amygdale (white mineral, not calcite).

**Grain size:** very fine, much less than 200  $\mu\text{m}$

### **Minerals present and proportions (%):**

Groundmass includes: feldspar (plagioclase and some alkali feldspar)

Amphibole

Pyroxene

Phenocrysts:

Amphibole

Feldspar laths (smaller)

(Not possible to estimate proportions of minerals without thin section.)

### **Interpretive comments based on observations:**

The rock is paler than 'average' basalt, and it is at the felsic end of the basalt range or just into the intermediate category (e.g. basaltic-andesite).

**Rock type (general and/or specific name):** vesicular lava, Niedermendig lava.

**Source area(s):** Mayen-Eifel region of Germany

## Rotary quern

**Specimen accession or other number:** RA317

**Context:** Ph 4 G44 (5b-15)

**Igneous (I) or metamorphic (M)?** ..... I .....

### General description

**Find type:** Rotary quern fragments

**Specimen size (m, cm, mm):** 15 g

**Comments:** Small fragments, fairly weathered. Same as RA314, 315 and 316. There are similarities with RA318, but the latter has fewer phenocrysts.

### Petrological description:

**Colour:** Mid-grey N6 to N5

**Texture:** Vesicular and porphyritic, with occasional amygdale (white mineral, not calcite).

**Grain size:** very fine, much less than 200  $\mu\text{m}$

### **Minerals present and proportions (%):**

Groundmass includes: feldspar (plagioclase and some alkali feldspar)

Amphibole

Pyroxene

Phenocrysts:

Amphibole

Feldspar laths

(Not possible to estimate proportions of minerals without thin section.)

### **Interpretive comments based on observations:**

The rock is paler than 'average' basalt, and it is at the felsic end of the basalt range or just into the intermediate category (e.g. basaltic-andesite).

**Rock type (general and/or specific name):** vesicular lava, Niedermendig lava.

**Source area(s):** Mayen-Eifel region of Germany

## Rotary quern

**Specimen accession or other number:** RA318

**Context:** Unphased (5b-0).

**Igneous (I) or metamorphic (M)?** ..... I .....

### General description

**Find type:** Rotary quern fragments

**Specimen size (m, cm, mm):** 756 g

**Comments:** Several pieces fit together. Similar to RA314, 315, 316 and 317, but this specimen has fewer phenocrysts.

### Petrological description:

**Colour:** Grey N5

**Texture:** Vesicular.

**Grain size:** very fine, much less than 200  $\mu\text{m}$

### **Minerals present and proportions (%):**

Groundmass includes: feldspar (plagioclase and some alkali feldspar)

Amphibole

Pyroxene?

Mica

(Not possible to estimate proportions of minerals without thin section.)

### **Interpretive comments based on observations:**

Lava eruption and flow in an area with basaltic to intermediate magmatic activity.

**Rock type (general and/or specific name):** vesicular lava. Similar to, but this is not, Niedermendig lava. This sample is very likely to be the same source area as the other Niedermendig lava quern finds, as it is not like other potential lava sources in the Mediterranean or elsewhere.

**Source area(s):** Mayen-Eifel region of Germany