

Building stone of Hollybush Church

- 1 The stones are likely to be either Arden Sandstone or Hollybush Sandstone
Both crop out locally and there are disused quarries.
Arden Sandstone - ancient pits around SO 778 365
Not shown on 1880s OS map
Hollybush Sandstone - Garden of Beacon Cottage (SO 756 367)
Worked in 1880s or before (full size on 1880s OS map)
Used in local buildings (Beacon Cottage)
- 2 Samples of each stone were obtained
Arden Sandstone is found on the surface of Coombegreen Common in
very limited quantities (SO 7736 3660)
Hollybush Sandstone appears by the roadside (SO 7563 3678)
A piece which had been weathered from the church was picked up from the ground.
(SO 7688 3671)
- 3 A flat surface was ground on each sample using an angle grinder
and was washed (using detergent) to remove grinding debris.
- 4 The samples were photographed together, with colour correction for the spectrum of the illumination.
i.e. the illumination was effectively white light.
(Figure 1)
- 5 Each ground surface was photographed under x20 magnification
Colour correction was applied
Intensity correction was not applied so all pictures show the same average brightness
despite the variations in sample shade
(Figure 2)
- 6 A small area of each photograph was enlarged, better to show the grain structure.
(Figure 3)
- 7 The colours of the samples were noted
Figure 1 was simply analysed by sampling the colour as red/green/blue (RGB) number at a few points and averaging
The ratios green/red and blue/red were calculated.
- 8 The approximate grain size and degree of sorting were estimated from Figure 3
- 9 Sample porosity was tested using water drops
- 10 Reaction to dilute HCl was tested
- 11 The results are shown in the table

	Arden SS	Church stone	Hollybush SS
Colour	Light brown	Greenish brown	Grey
RGB Green / Red	0.91	1.03	1.28
RGB Blue / Red	0.54	0.73	0.9
Grain size / micron	100	60	40
Grain sorting	Good	Poor	Poor
Acid reaction	None	None	None
Porosity	High	Very low or none	Very low or none

- 12 Comments on the tabled results and photographs

Arden Sandstone

Figure 3 shows it to be composed largely of uncoloured quartz crystals, well sorted and of size about 100 microns

Figure 3 shows the large voids which lead to the high porosity.

The RGB ratios show the colouration to be relatively rich in red.

Hollybush Sandstone

Figure 3 shows it to have a high proportion of dark (mafic) minerals.

The crystals are poorly sorted, with largest size about 40 microns.

Figure 3 shows the rock to be essentially free of voids.

The RGB ratios show the colouration to be generally neutral but with some excess of green.

The green component is probably due to chlorite.

The church sample

This has properties lying generally between those of the other two stones so the question of which it is related to is not straightforwardly answered.

However

It contains considerable amounts of material other than quartz and not derivable from quartz.

It has very small or no porosity, quite unlike the Arden Sandstone sample.

The high porosity of the local Arden Sandstone suggests that it is unsuitable for the construction of buildings. The freezing of internal water would presumably cause rapid deterioration of exposed parts. (But Pendock church is built of Arden Sandstone from that area and there is an old quarry at Sudeley Farm, near Ryall.)

Its visual colour is distinctly greenish, suggesting a chlorite component larger than in the Hollybush Sandstone. Chlorite is a common weathering product of mafic minerals so its presence suggests that the church is of weathered Hollybush Sandstone.

There appear to have been no active local sources of Arden Sandstone when the church was built.

It thus appears very likely that the stone of Hollybush Church is Hollybush Sandstone.

Figure 1

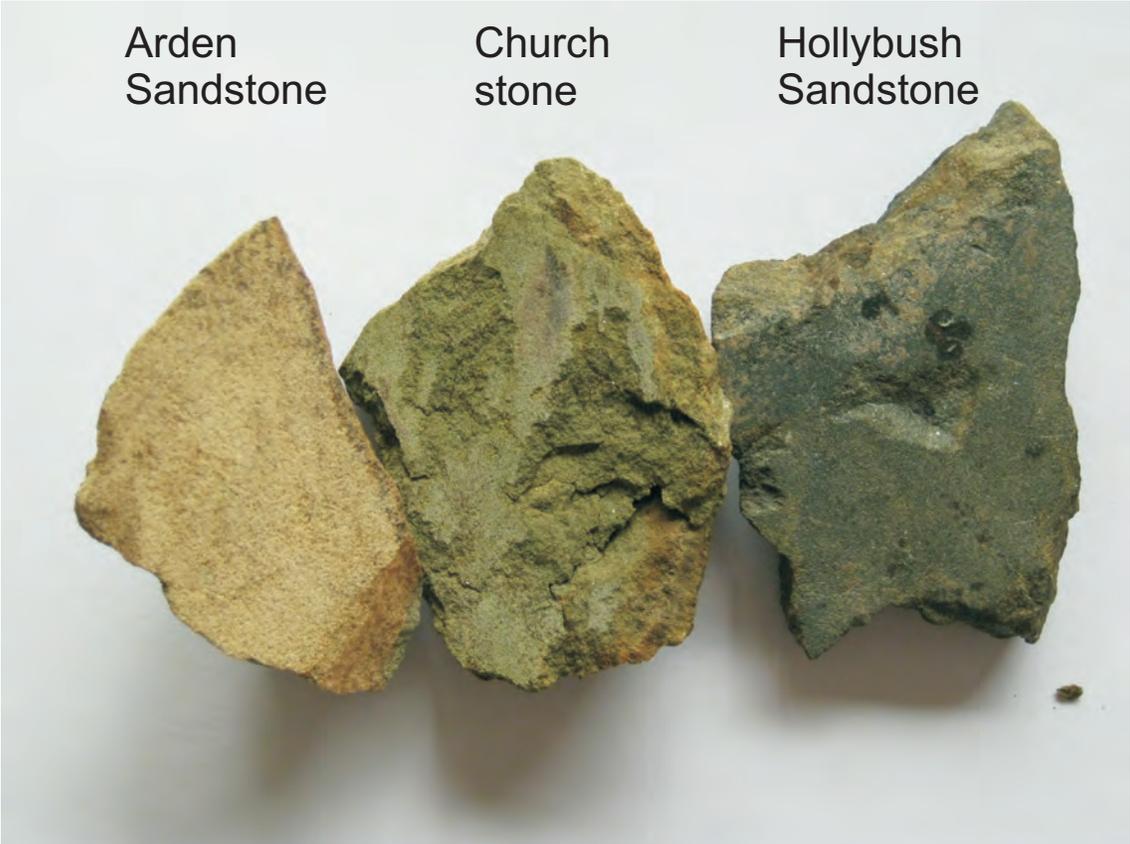
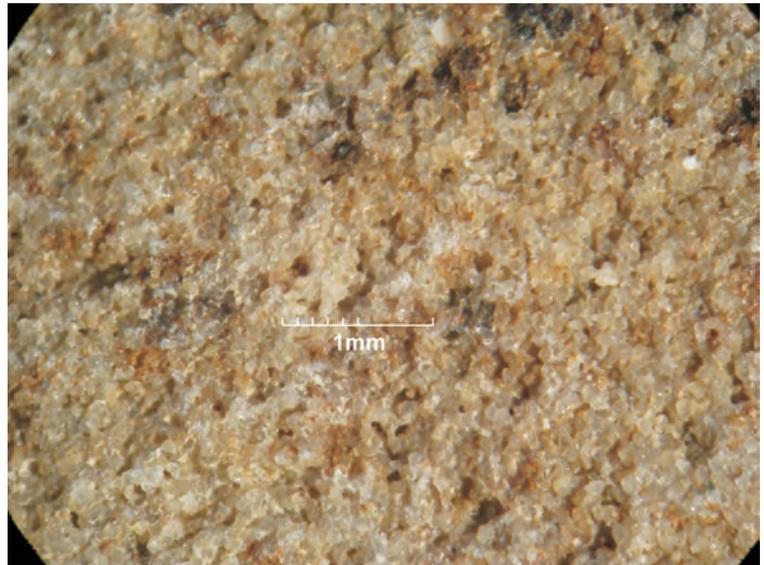
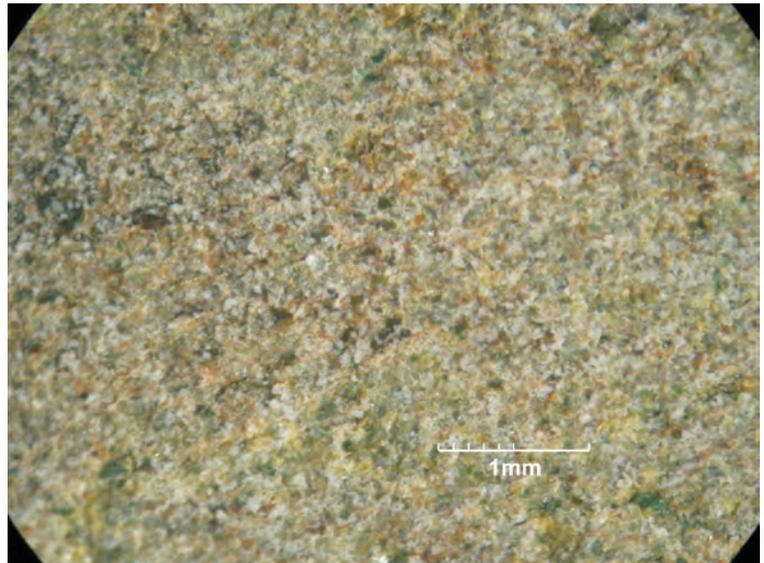


Figure 2

Arden Sandstone



Hollybush Church
stone



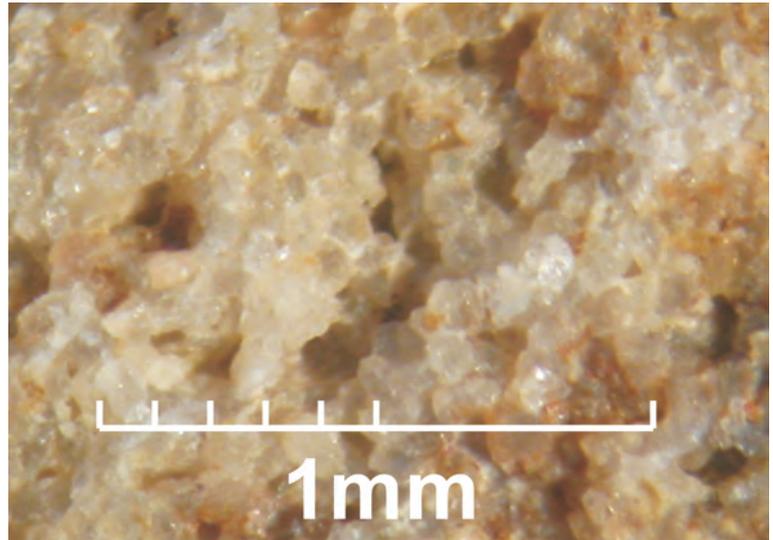
Hollybush
Sandstone

(all frames
are 5mm wide)

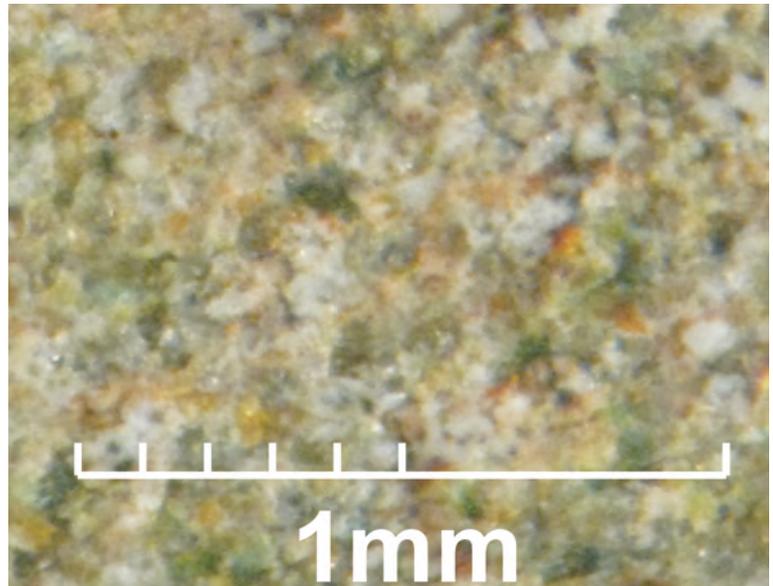


Figure 3

Arden Sandstone



Hollybush Church
stone



Hollybush
Sandstone

