



Developed from the Earth Science Education Unit 'Will my gravestone last?', with permission

# Will My Gravestone Last?

Earth science out of doors  
for KS3 science/geography

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# Earthlearningidea online video workshops

## Purpose – ESEU background

- Most Earthlearningidea online video workshops are based, with permission, on workshops originally developed by the Earth Science Education Unit (ESEU).
- These were designed as interactive workshops for teachers and trainees, involving interaction, discussion and presentations by participants to others.
- Global research into professional development workshops shows that these aspects are critical to success.
- ESEU research shows that this workshop approach is highly successful in changing teaching in schools; evaluation feedback has also been very strong.

# Earthlearningidea online video workshops

## Purpose – Earthlearningidea development

- The Earthlearningidea Team has developed the ESEU workshops into online video workshops for those unable to take part in face to face interactive workshops
- Most workshops are led by a PowerPoint presentation and have an accompanying booklet that contains all the activity background details, resource lists, risk assessments, etc.
- The individual workshop activities have been published for open access online at the website:  
<https://www.earthlearningidea.com/>
- Each workshop activity has a question script and a video keyed into CASE principles, that can be accessed through the PowerPoint hyperlinks.
- The aim is to facilitate online Earth science learning.

## **Will my gravestone last?– using CASE**

### **Teaching Earth science using the Cognitive Acceleration through Science (CASE) approach**

- The activities in this workshop are keyed into the CASE approach – to develop thinking skills while teaching key Earth science material
- If you are unfamiliar with the case approach, you can access a video introduction at:  
<https://www.earthlearningidea.com/Video/CASE.html>
- An exemplar Earth science teaching activity with a question script using the CASE approach is at:  
[https://www.earthlearningidea.com/Video/Atmosphere\\_ocean.html](https://www.earthlearningidea.com/Video/Atmosphere_ocean.html)

# Will my gravestone last?

<b>Workshop video run times</b>	<b>m</b>	<b>s</b>	<b>m</b>	<b>s</b>
<b>CASE – Cognitive Acceleration through Science Education</b>			<b>21</b>	<b>51</b>
Using CASE:	6	24		
Atmosphere and ocean:	15	27		

<b>Will my gravestone last?</b>	<b>33</b>	<b>20</b>
1. Initial briefing	4	28
2. Recent gravestones	2	44
3. Surveying	3	13
4. Identifying rocks	3	32
5. Weathering	5	38
6. Oldest gravestones	3	32
7. Summary	6	51
8. Your choice	3	02

## Links to gravestone videos – (i)

**1. Initial briefing:**

[https://www.earthlearningidea.com/Video/V14\\_Grave\\_stones1.html](https://www.earthlearningidea.com/Video/V14_Grave_stones1.html)

**2. Recent gravestones:**

[https://www.earthlearningidea.com/Video/V14\\_Grave\\_stones2.html](https://www.earthlearningidea.com/Video/V14_Grave_stones2.html)

**3. Surveying:**

[https://www.earthlearningidea.com/Video/V14\\_Grave\\_stones3.html](https://www.earthlearningidea.com/Video/V14_Grave_stones3.html)

**4. Identifying rocks:** <https://>

[www.earthlearningidea.com/Video/V14\\_Gravestones\\_4.html](https://www.earthlearningidea.com/Video/V14_Gravestones_4.html)

**5. Weathering:**

[https://www.earthlearningidea.com/Video/V14\\_Grave\\_stones5.html](https://www.earthlearningidea.com/Video/V14_Grave_stones5.html)

## Links to gravestone videos – (ii)

### 6. Oldest gravestones:

[https://www.earthlearningidea.com/Video/V14\\_Gravestones6.html](https://www.earthlearningidea.com/Video/V14_Gravestones6.html)

### 7. Summary:

[https://www.earthlearningidea.com/Video/V14\\_Gravestones7.html](https://www.earthlearningidea.com/Video/V14_Gravestones7.html)

8. Your choice: [https://www.earthlearningidea.com/Video/V14\\_Gravestones8.html](https://www.earthlearningidea.com/Video/V14_Gravestones8.html)

**For further information on some of the rock types see Virtual Rock Kit:**

[https://www.earthlearningidea.com/virtual\\_rock\\_kit/START.htm](https://www.earthlearningidea.com/virtual_rock_kit/START.htm)

# Will my gravestone last?

## Summary

- Preparation for a 'field visit' to a local graveyard to use the wealth of opportunities available for scientific investigation, out of doors, in an Earth science context.
- Suitable sites include public cemeteries, mostly administered by Local Authorities and burial grounds attached to churches and administered by them.
- The case study videos were filmed in Ecclesall Churchyard, Sheffield, UK.

# Will my gravestone last?

## Workshop outcomes

The churchyard visit provides the following outcomes:

- identification of a range of rock types;
- knowledge and understanding about weathering processes;
- the opportunity for pupils to test their own hypotheses regarding rates of weathering;
- ability to sample data from a wide range of different rock types and environments within the churchyard;
- experience of bridging school-based learning with the outside environment.

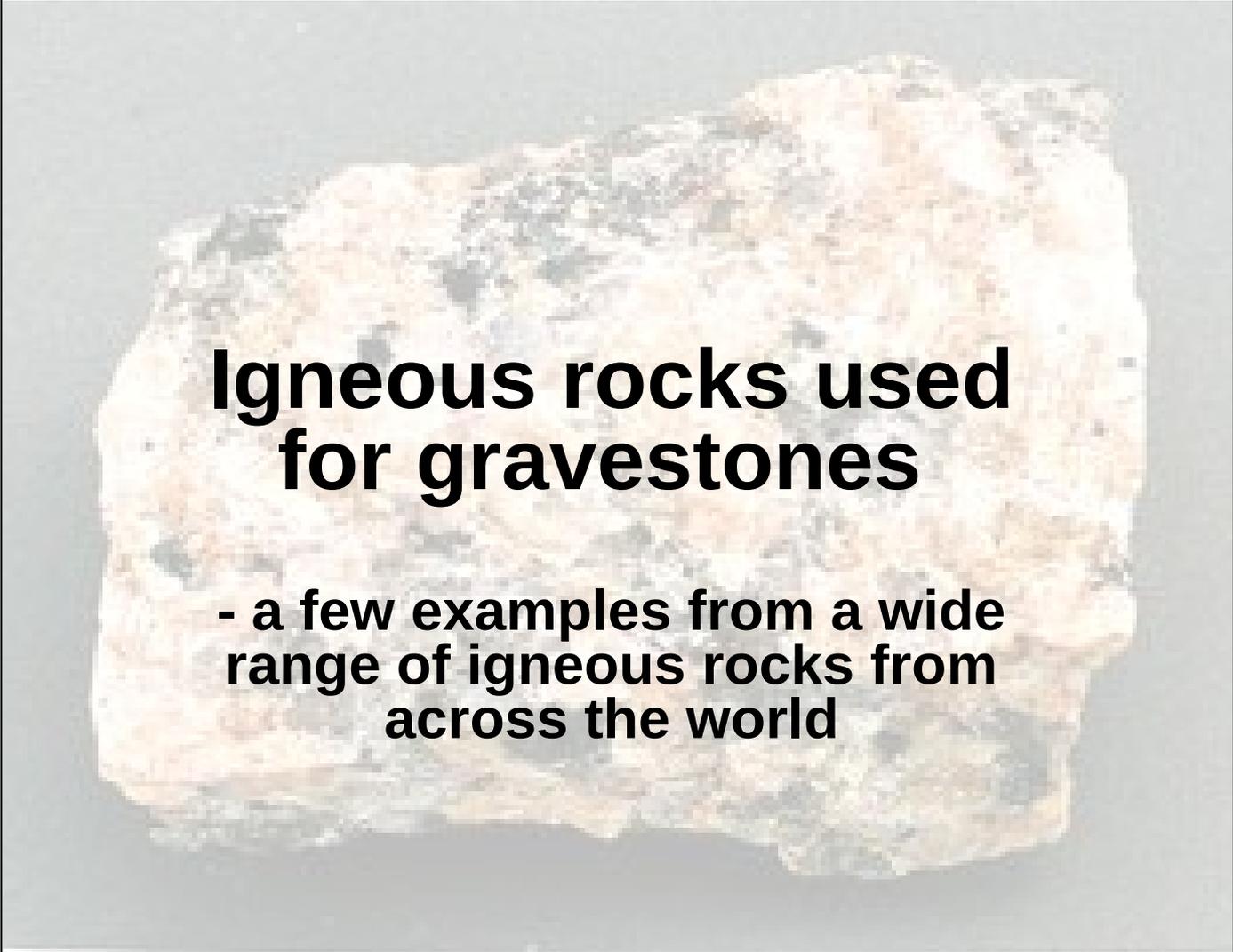
**Will my gravestone last?**

**What gravestones in  
unweathered conditions  
can look like  
(slides 9 to 19)**

**For further information on some of  
these rock types see Virtual Rock Kit**

[https://  
www.earthlearningkit.com/virtual-rock-kit/STAR.htm](https://www.earthlearningkit.com/virtual-rock-kit/STAR.htm)

# Will my gravestone last?



## **Igneous rocks used for gravestones**

**- a few examples from a wide  
range of igneous rocks from  
across the world**

# Will my gravestone last?



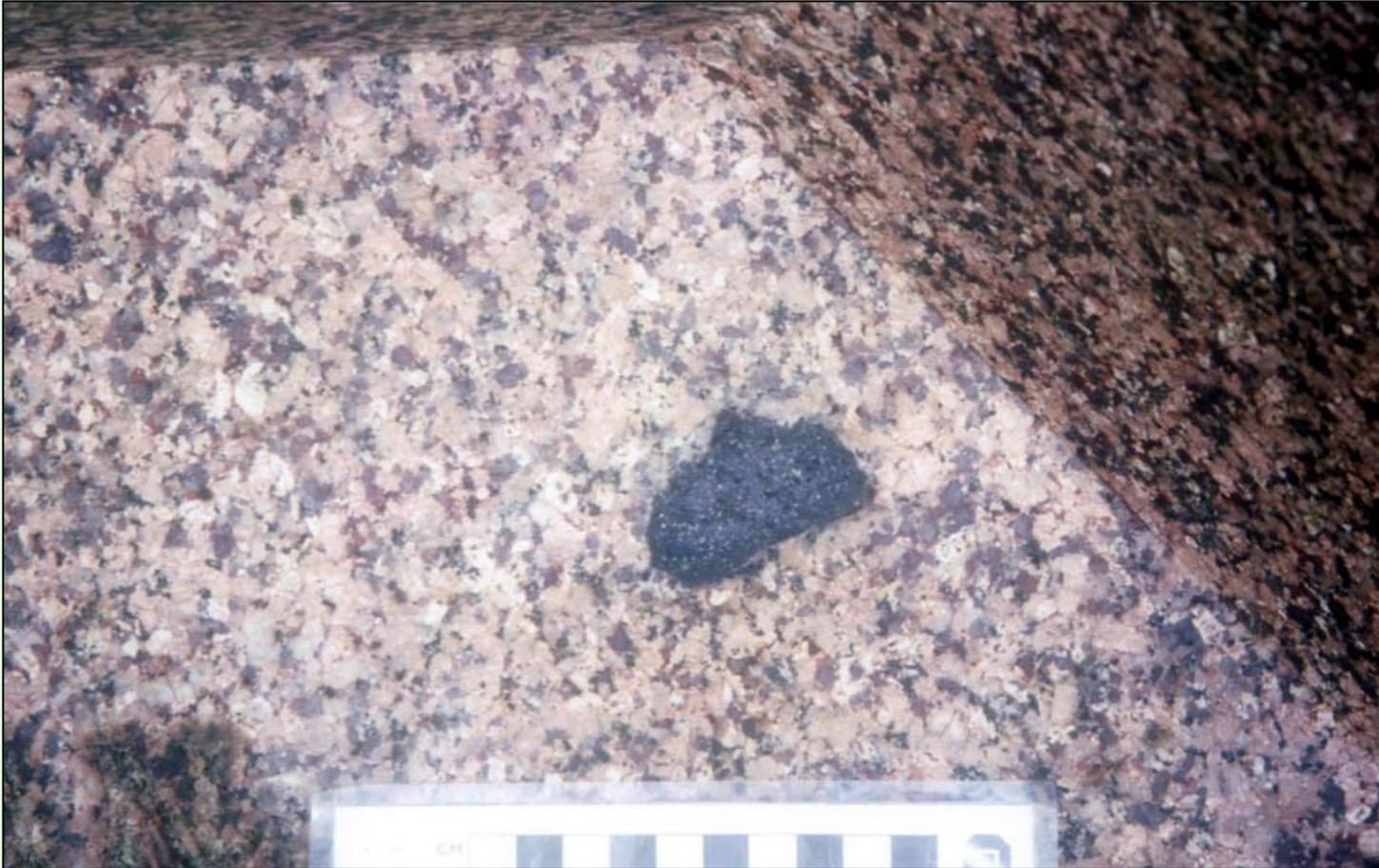
**“Balmoral Red”  
Granite, from  
Scandinavia**

# Will my gravestone last?



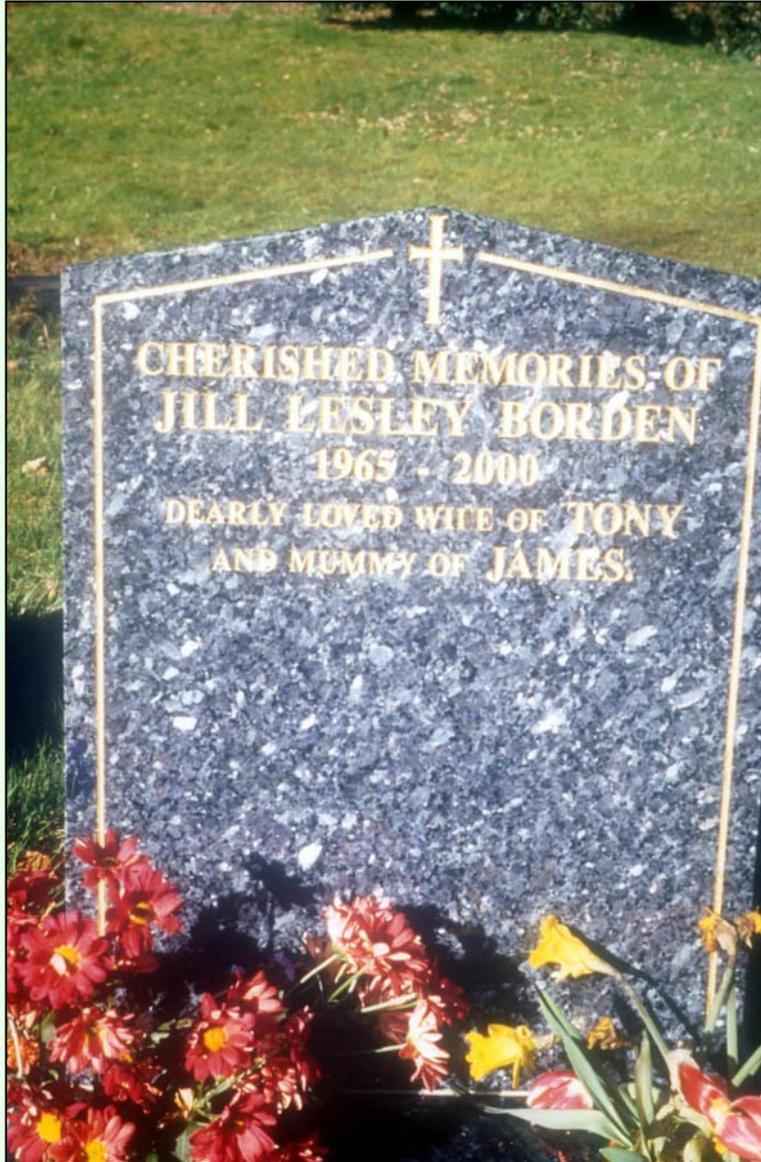
**Red granite detail. Coin is 2cm diameter**

## Will my gravestone last?



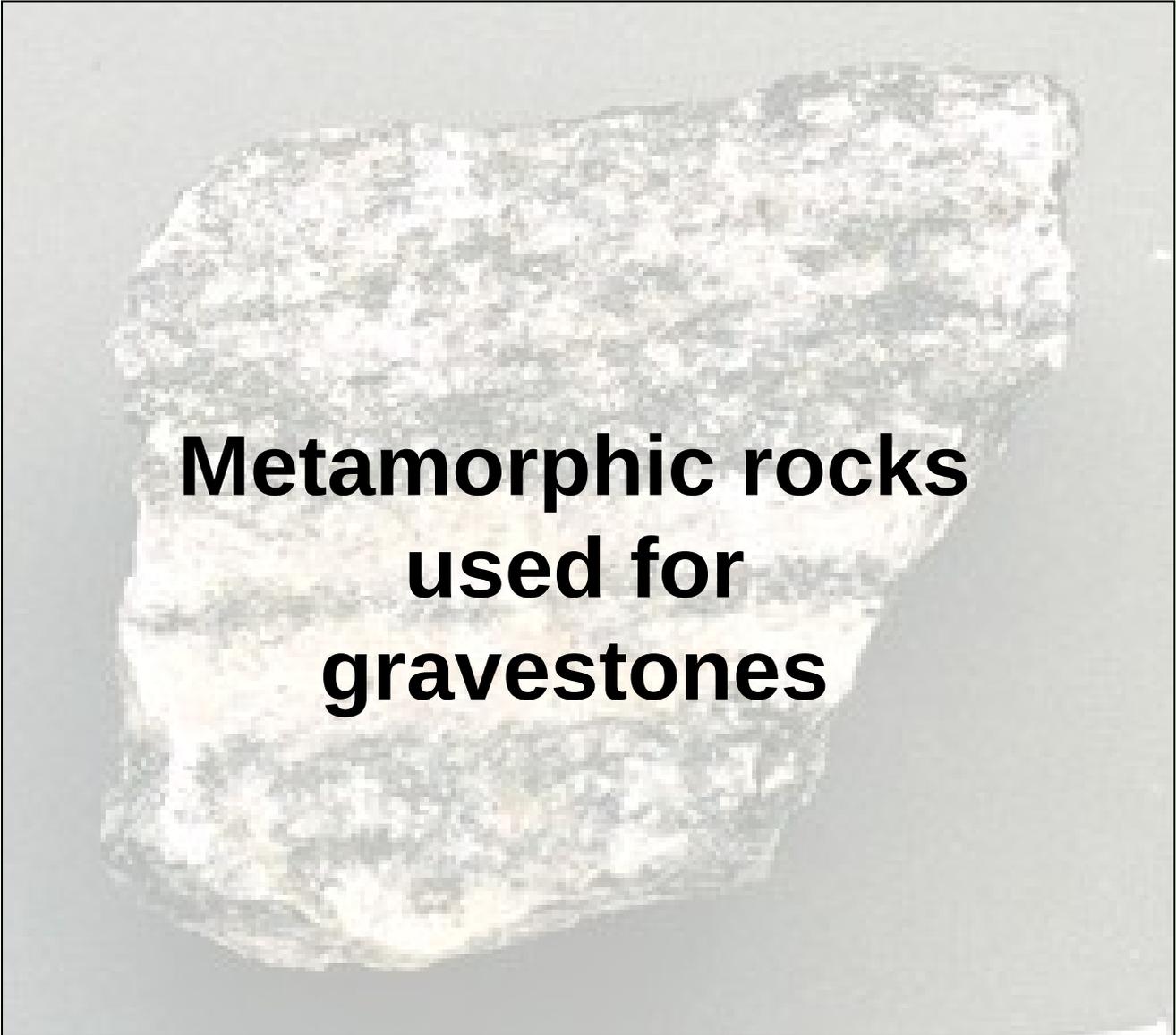
**Peterhead Granite, from Scotland, UK,  
containing a metamorphosed fragment of  
an older rock**

# Will my gravestone last?



**Larvikite**  
– an iridescent  
igneous rock  
from Oslofjord  
in Norway

“Iridescent =  
crystals glitter  
with rainbow-like  
colours



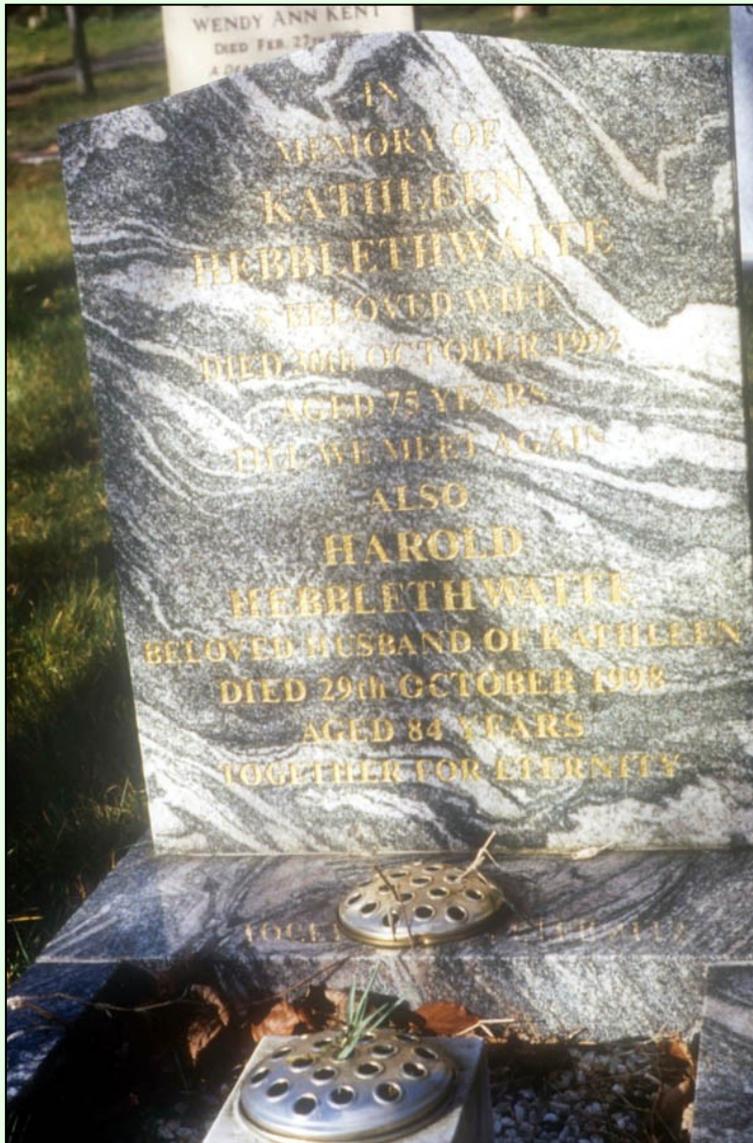
**Metamorphic rocks  
used for  
gravestones**

## Will my gravestone last?



**Carrara Marble, from Italy, with lead lettering,  
inset to the marble surface**

# Will my gravestone last?



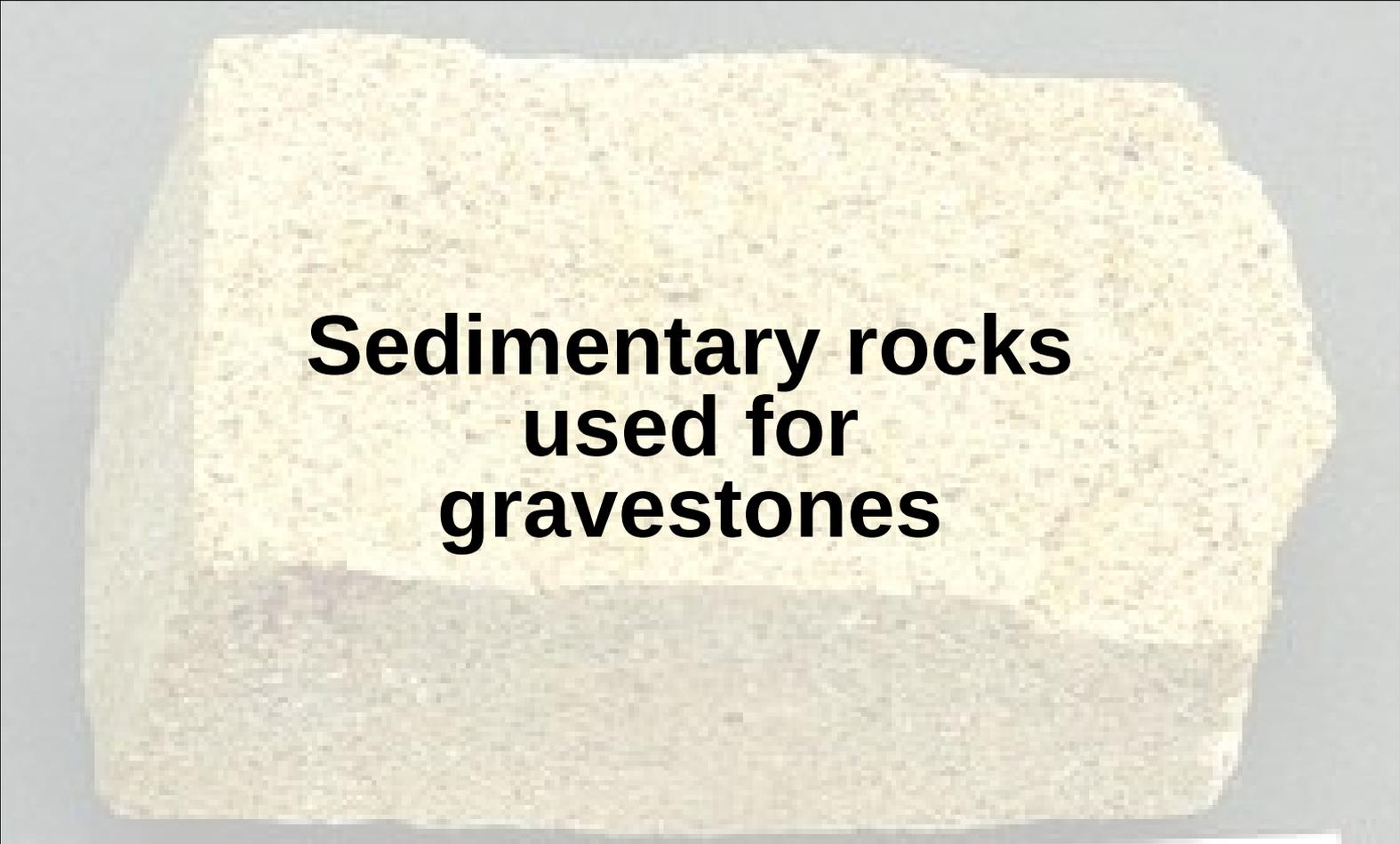
**Gneiss, from India**

**Will my gravestone last?**



**Red gneiss detail showing mineral banding**

**Will my gravestone last?**



**Sedimentary rocks  
used for  
gravestones**

# Will my gravestone last?



**Sandstone,  
from the  
Millstone Grit  
Series rocks of  
Derbyshire,  
central  
England, UK**

**Will my gravestone last?**



**Some different  
environments  
within a churchyard**

# Will my gravestone last?



**The newest, unvegetated part,  
still used for burials**

# Will my gravestone last?



**The part used between the 1880s and the 1950s, with planted trees**

# Will my gravestone last?



**The overgrown Victorian part**

**Will my gravestone last?**



**The response of  
gravestones to  
weathering**

## Will my gravestone last?



**Chemical (oxidation) weathering, shown by orange discolouration on the edges of a broken Cornish granite**

# Will my gravestone last?



**Tree roots forcing apart gravestones**

## Will my gravestone last?



The mason adding a new name to a weathered marble slab

## Will my gravestone last?



**Marble, showing more weathering by carbonation-solution on the top surface than on the vertical surface, (shown by the lead letters standing further out from the marble on the top)**

## Will my gravestone last?



**“Spalling”  
on the east-facing  
side of a sandstone  
slab**

**Spalling = the  
breaking away of  
weakened flakes**

## Will my gravestone last?



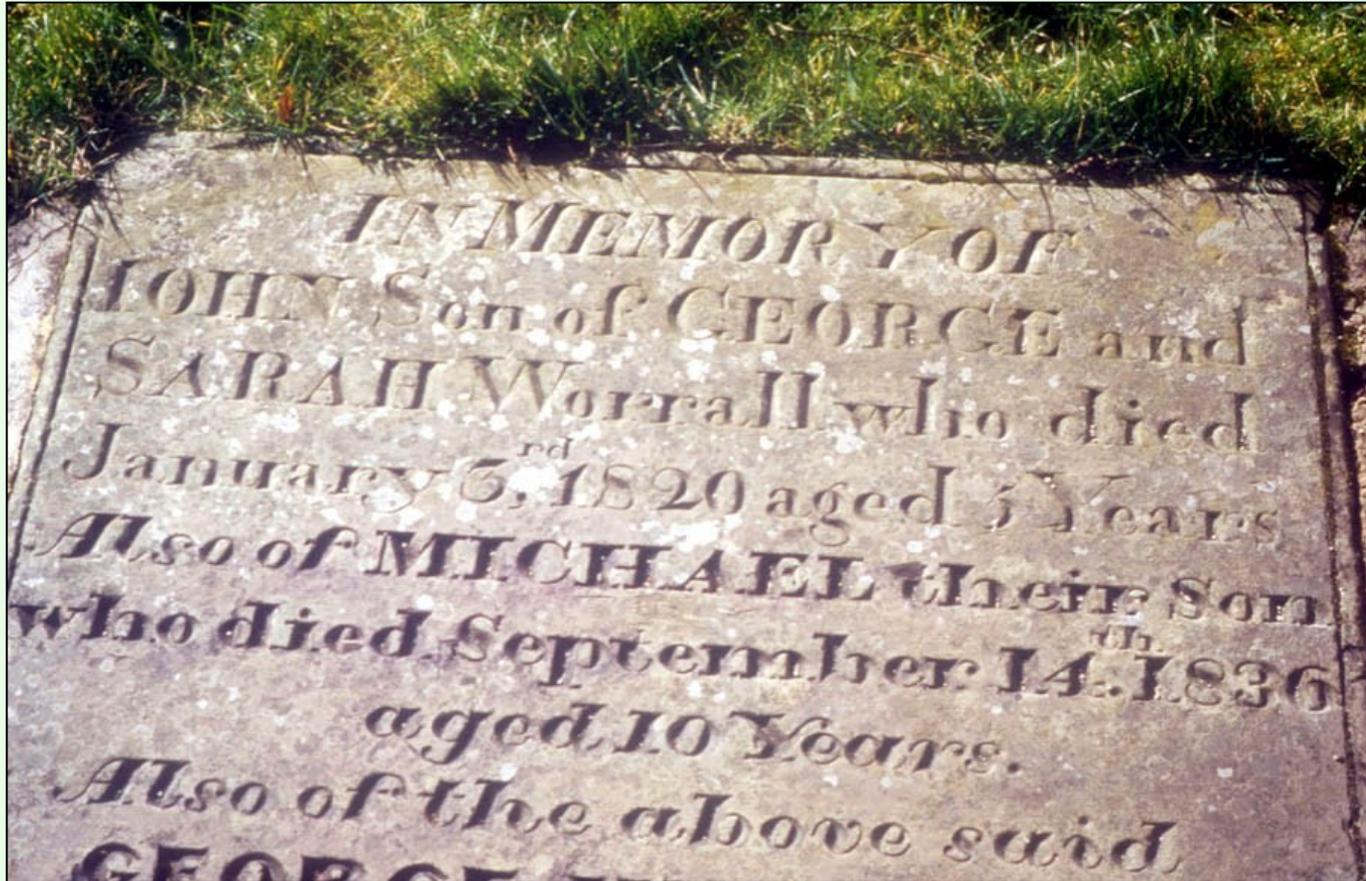
**The undamaged  
west-facing side of  
the same slab**

## Will my gravestone last?



**Henry Clifton Sorby, a famous Victorian geologist – spot the different rock types!**

## Will my gravestone last?



**A local sandstone tells of family tragedy in earlier eras – discuss!**

**Will my gravestone last?**

**All photographs © Peter  
Kennett, Earthlearningidea**

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