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Soil Walk: St Catherine's Hill, Winchester, Hampshire

What is a soil walk

Soil is one of the most wonderful things in nature This precious material that is under our feet wherever we walk enables our food to be grown, our wonderfully diverse flowers and trees to grow, our buildings, roads and railways to be supported, and is the home of billions of different organisms. Soil is amazing.

There are an astonishing number of different soils - over 700 in the United Kingdom. In each landscape there will be several different soils. Walking through a particular landscape near your school or your home is the best way to discover interesting things about your local soils. Come and take part in this Soil-Net Soil Walk and see for yourself your local soils, how they differ from each other, and what the soils are being used for.

The Mizmaze

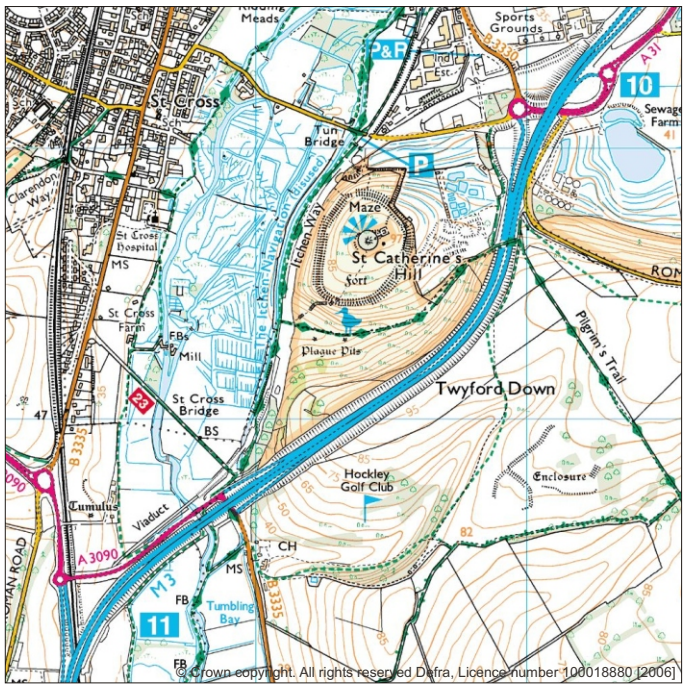
The Soil Route

This route will take you from the clayey soils of the Itchen river valley up into the chalk landscape of the Hampshire Wolds Not only is it a lovely scenic route but is also an area of outstanding archaeological importance. The Walk is circular, up and over St Catherine's Hill and back to the car park along the disused Itchen Navigation Canal, past St Cross hospital and the water meadows.

St Cross Hospital

Travelling there and starting off

Start at OS reference SU 484 280 [OS Explorer Map 132], and use the carpark beside Tun Bridge in Garnier Road, Winchester. This is easily accessed from the M3 at Junction 10.



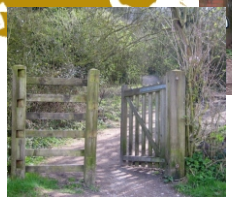
Route

From the carpark, walk under the disused railway bridge and from there the way up the hill is clearly marked. Parts of the route can be muddy, so sturdy shoes are necessary. On the summit there are many rabbit holes, so care needs to be taken not to twist an ankle! Allow an hour to an hour and a half, which will give plenty of time to look around and walk the famous 'Mizmaze'.

Soil Walk

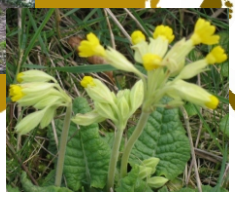
Park in the car park beside Tun bridge in Garnier Road.

To start your walk, go under the car park railway bridge and up the hill.

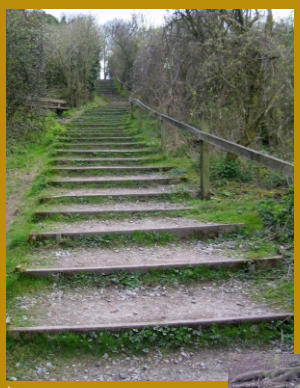


The gate marks the line of the old Winchester bypass. Soil has been bulldozed onto this site.

Notice the Itchen Navigation Canal close by and the flat, wet soils alongside.

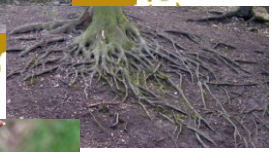


Notice the white chalk rock as you climb the hill.



It's a steep climb - keep to the path.

There's not much soil over the chalk rock - brown not black soil means less organic matter.



Notice the roots sitting on top of the thin eroded soils.

Approaching the summit and the Mizmaze. See how long it takes to walk the whole length!

Soil Walk

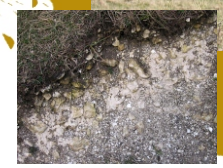
View of St Cross Hospital from the summit.

The flat Itchen valley below is full of water meadows, the hills beyond, towards Badger Farm, are on the chalk.

This is near the site of a Norman chapel.

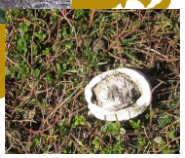
Beech coppice

Notice the darker soils on the hilltop - with more organic matter.



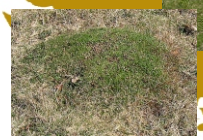
Outer ramparts and valley to South

Double outer ramparts of the hillfort.



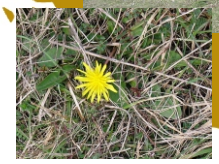
Chalk nodule

We can see signs of erosion and wear along the paths. Rain has also washed away the thin soils revealing the chalk.

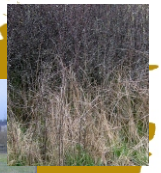


Paths in turf to East looking towards the M3 motorway

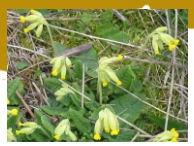
Soil Walk



Descending down towards the canal.



Approach the river path through the gate. The path is more muddy here as the soils are wetter and more clayey near the canal and river.



The canal path.

Flint knapped wall by pathway. Flint is common in chalk.

View across water meadows to St Cross Hospital.

Historic points of interest

The hill is encircled by an Iron Age hillfort covering some nine hectares. The path crosses its clearly-defined rampart which has a ditch outside it and a shallower outer bank. Archaeologists have discovered evidence of settlement here from as early as the sixth century BC. Also of interest is Plague Pits Valley immediately to the south of St Catherine's Hill. Here the map marks the site of two plague pits, where victims were buried well away from the settlement of Winchester.

The summit is a large open area with a clump of beeches marking the highest point. Here the turf, especially on the southern slope, is home for many wild flowers and also butterflies, including the chalk hill blue and marbled white.

The Soils

On this walk through this small part of Hampshire you will have the possibility of seeing a few of the nation's soil types

The Coombe Soils:
This is the main soil type on chalky drift (1) and chalk at the foot of the Chalk scarps of the Downs. The soil is formed in the large amounts of sediment that have come down from the slopes above over many years, rather than directly from the chalk rock itself The Coombe soil (2) is a brown earth soil, one of the two most common and important soil types of the United Kingdom. There are several subtypes of the brown earth and here on the St Catherine's Hill walk we have the typical brown calcareous earth with a dark brown topsoil (A horizon) over a dark brown or yellowish brown fine silty subsoil (B horizon) which merges into variably flinty chalky drift (C horizon). The soils are calcareous and have a high pH. They are generally permeable and well drained. Surplus winter rain passes easily downwards though the soil and to the chalk below. There are large reserves of available water in deep Coombe soils. All the soils are easy to cultivate, though the number of rock fragments may be a hindrance.

The Andover Soils
These belong to the rendzina (3) group of soils. Andover soils (4), unlike the Coombe soils, they have just two distinct horizons, a dark A horizon overlying white chalk rock. Large areas of the Hampshire Downs are composed of these soils. The soils are well drained and rest on permeable chalk. Winter rain is absorbed and there is very little runoff. Roots can extract water from deep within the chalk. Andover soils are Permeable and well structured and can be cultivated in all seasons. Most agricultural soils crops will grow well, as will beech trees.

Typical Andover soil profile

The Adventurers' Soils
The top metre of these soils is strongly influenced by peat, with significant deposits of calcareous tufa and marl in some places. They are earthy eutro-amorphous soils, developed in black, often Calcareous humified peat with neutral to alkaline pH. The soil pattern is often influenced by water meadows constructed from the 17th -19th centuries (5). The steady supply of groundwater from the chalk keeps the water level high throughout the year. The soils are severely waterlogged through the year, hence of limited use for agriculture. The Itchen floodplain with these soils provides a mosaic of plant habitats with the most extensive areas of species rich neutral grassland in England.

The Willingham Soils
These soils have developed in extremely calcareous alluvium up to 45 cm thick over peat in the Itchen valley. Willingham soils (6) have silty clay loam textures. Locally the topsoil and subsoil layer are waterlogged only occasionally, but the deep soil is waterlogged all year round.

1. Drift: material on top of the solid rock left by ice or river, or moved down hill by water.
2. Named because the soils are common in the dry valleys or coombes of the chalk downs.
3. Rendzina is the Polish name for a shallow, very stony soil on limestone or chalk.
4. Similar soils are found all round the town of Andover, 25 km to the North West of Winchester.
5. They are named after Adventurers' Fen near Ely in Cambridgeshire which was drained in the 17th. century.
6. They are named after Willingham on the edge of the Fens north of Cambridge.

The History and Development of the Soils

Most of the soils you will see date back over 10,000 years. It takes over 500 years for just one centimetre of soil` to develop from chalk rock. This is because chalk is so pure and when it dissolves there not much left with which to build up the soil.

When the Ice Age was here many thousands of years ago, pretty well all soils were scraped away and mixed up and the materials transported to various parts of the landscape. The cold weather associated with the Ice Age led to freezing and thawing and mixing of soil materials. Whereas some of the soils that you see are formed directly from the chalk rock below, others are formed on mixed materials (known as drift) that were left when the ice melted. The Carstens soil on the top of the St Catherine's Hill is an example of a soil which is formed in drift.

On the steeper slopes of St Catherine's Hill are soils called rendzinas. These are shallow soils with the topsoil lying directly on the chalk rock. The soils are shallow because on the steeper slopes there is always some erosion of the soil and particles are constantly being moved to the bottom of the slope So on the steeper slopes the soil materials are subject to regular movement and replenishment.

The youngest soils are probably those in the bottom of the Itchen valley. The soils here are formed in sediment deposited by the river together with materials that have been washed off the valley sides.

There are five main influences that govern what soils form in a particular spot. On this walk, the main influences are the underlying rock and the geological history. A particularly important point is that pretty well all the soils are derived from chalk rock or sediments from it and are therefore calcareous and suitable for plants that like lime and a high pH.

A second important influence on the soil is the landscape. The deepest soils will be in the bottom of the river valley, the thinnest soils will be on the steeper slopes of the hill. On the top of the hill will be moderately deep soils. The soils on the slopes will be well drained whereas those in the valley bottom will have a high water table and hence will be poorly drained.

Human influence on our soils is also important here. Man has adapted many of the soils in the local area to suit his needs and that of raising crops and livestock. Farmed soils will generally have a different soil profile to those that are under natural vegetation such as woodland.

Within the chalk soils there will be a wide range of organisms. These are particularly important in recycling the nutrients by breaking down dead plant remains. Underneath your feet when you stand on the ground will be millions, even billions, of organisms all busy making the soil the magical substance it is.

To find out more about soil, visit **www.soil-net.com**