THE HOLLOW WAYS OF DEVIZES

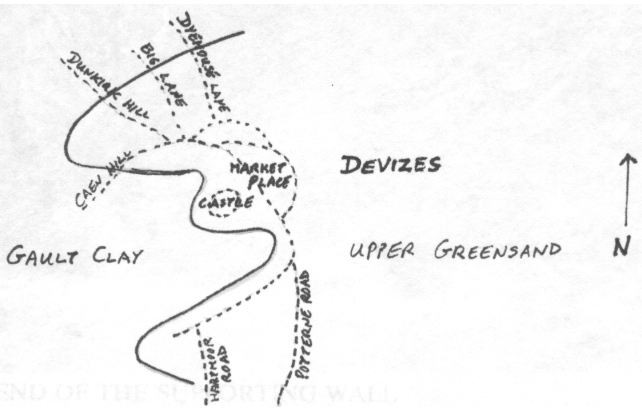
Veronica Cleverly

Hollow ways are deep cuttings through which roads and footpaths run. They occur in many places in the Upper Greensand of Wiltshire. They are not associated with any springs or streams.

Devizes is situated on a relatively consolidated level in the Upper Greensand beds, which has produced the steep slopes to the western side. The Upper Greensand is a 15 - 70m thick layer of sandstone situated below the Chalk and above the Gault Clay of the upper Cretaceous period. It contains a large amount of glauconite (hydrated potassium iron silicate) which gives it its greenish appearance when freshly exposed. It turns pale yellow on weathering, It was layed down in a shallow marine environment Broken up consolidated layers (cemented by calcium carbonate) within the Greensand produce large, hard blocks which, resisting weathering better, often jut out of the rock face and are called 'doggers' locally, *(photograph 1).*

Photograph 1: Hartmoor Road - Doggers protrude from the bank sides showing the fragmented nature of the layer. The doggers support the rock above until sufficient erosion allows the individual blocks to fall out.

All around the western half of Devizes, where the land drops away abruptly from the Upper Greensand to the Gault Clay beds, there are a series of hollow ways. They are, from the north, Dyehouse Lane, Big Lane, Dunkirk Hill, Caen Hill, Hartmoor Road *(photograph 2)* and Potterne Road.



What is now the largest, modern road, Caen Hill has been widened out to a dual carriageway and the banks sloped and stabilised producing an artificial landform with no visible geology.

Dunkirk Hill and Potterne Hill both have major roads running through them, and both have had their sides walled and stabilised, but the geology is still visible. Hartmoor Road has a tarmac road running through it, but as it becomes a footpath further on, the geology is still exposed near the bottom of the hill. Big Lane and Dyehouse Lane are both only footpaths (Dyehouse Lane has in recent years been surfaced) and are much shallower and the geology is obscured by trees and vegetation.

It is a generally held theory that the hollow ways developed by being worn down by usage as roads. Hence those that were most used are the deepest. Looking at the rocks though, shows them all to have a lot of vertical fissuring, The fossils in them also all seemed to have been fragmented. It seems much more likely, considering their soft nature with a lack of cementation, that the original tracks developed through naturally occurring fissures, *(photograph 3).* So the geology dictated the siting of the roads as well as the siting of the town on its defensible promontary.

With all the hollow ways, rock falls occur from the steep sides at frequent intervals. On the main roads these are cleared away and dumped elsewhere. On footpaths, these falls tend to be flattened down and the path is gradually raised up by them. Heavy rainfall will wash out some of the finer grade debris, but the overall tendency is a filling rather than a carving out of the hollow way. So as the sides

Photograph 2: Hartmoor Road, looking back towards the supporting wall, showing bank slippage

fall in and the base builds up, it will become shallower and wider. I suggest that originally all the hollow ways were very deep, narrow fissures through the rock, that have been widened and made shallower by use. Hartmoor Road demonstrates very well a semi-stabilisation of a hollow way. The tarmac road is regularly cleared of debris for traffic, so probably represents a fixed level for about the last 100 years. The wall was built at about the same time, and fixes the position of the side at that time. Past the wall end shows the continued widening of the hollow way.

Photograph 3: Tree roots grew down what were fissures in the rock before it was eroded away. They grow between the doggers.

CLIMATE CHANGE UNDER THE MICROSCOPE

- from a talk by Jenny Pike, Cardiff University

Dr. Pike believes that it is undeniable that human activity will have a dramatic impact on the future climate of planet Earth. However, it is equivocal whether our current climate is the result of human influence, or whether we are still experiencing natural climate variability. A big question is whether human influence in the atmosphere will perturb the natural cycle of climate in our 'icehouse world' - will planet Earth ever experience another ice age? As big as this question is, it is possible to address it with the tiniest of fossils. Microfossils are as abundant in the geological record as micro-organisms are within the modern environment, particularly within the oceans. These organisms are very sensitive to ocean and climate change - changes in temperatures, salinities, nutrients. As such, they can be used to study environmental change during past, natural warm climates, for example, the Cretaceous when the dinosaurs roamed, and the warm climate that preceded the last ice age. A look into the dynamics of past warm climates will provide indicators of how our climate could evolve into the future.

There have been three icehouse worlds since the beginning of the Cambrian - c.400Ma, 300Ma and now. It took 50Ma to move into our present icehouse world and it is associated with the uplift of the Himalayas.

In the Cretaceous there was a greenhouse world when carbon dioxide levels were very high, sea level was an average of 200m above where it is today and of course, there were no ice caps.

In her talk Dr. Pike reminded us that 125,000 years ago, in the Eemian interglacial, hippopotamus lived around Leeds. Some geologists predict another glacial in 70,000 years time. That's a very long time for climate to become much warmer than it is now.

LIFE AFTER THE SNOWBALL - LATE PROTEROZOIC FOSSILS OF NAMIBIA

- extract from an article in Geoscientist, April 2003

Ted Nield

It was a strange world in the Late Proterozoic between the last Varangian glaciation (c.600Ma) and the onset of the Cambrian (543Ma), The atmosphere contained hundreds of times the present level of carbon dioxide, and sea water was substantially enriched with calcium carbonate compared to modern seas. A runaway greenhouse effect had freed the world from the last great Proterozoic ice age but now the atmosphere was thick and turbulent. In the Zaris Basin in Namibia at the bottom of this storm-wracked sea, the areas of sea bed that were clastic free, wore a thick coat of cyanobacteria. These bacterial lawns were of two types - regularly laminated stromatolites, and more clotted-textured thrombolites. Thrombolites created kilometre-long reefs hundreds of metres thick, their surfaces a maze of pinnacles separated by deep fissures elongated in the direction of the prevailing current. These reefs were 'true' reefs, which underwent the classic 'catch-up, keep-up and give-up' phases of development known from reefs of the Phanerozoic.