Start at High Elms Nature Garden

1 You are in the kitchen garden of the mansion which belonged to the Lubbocks, and where John Lubbock IV found many species of springtails. In July look for dark mullein here.

Dark Mullein

Yellow Rattle

Leave garden via the double wooden gates, turn left (L) and walk up the tarmac path, past the Eton 5s Court on the left put in by Sir John William Lubbock III for his son. Continue for about 300m to the site of the old mansion which had a view across the valley.

Yew

2 Walk down through the yew walk planted by John Lubbock IV, Lord Avebury, which originally led from the dining room to ponds, in one of which he kept water fleas which he studied.

Cross the Golf Course car park with care, cross High Elms Road and turn L through Clockhouse Orchard.

Ash flowers (male)

3 In the 19th century there were orchards at High Elms. In summer this is a good place to look for butterflies sunning themselves. You may see comma butterflies which are brightly coloured when their wings are open but Darwin remarked how when these butterflies rest, their wings are closed together and the underside which then shows resembles a dead leaf. Look for an ash tree covered in ivy on your right. He examined ash flowers and found some trees had only male flowers, some only females, and some trees had flowers with both male and female parts.

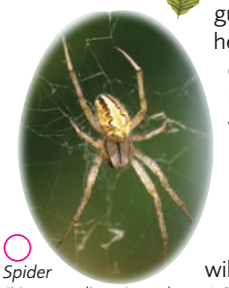
Comma butterfly (open wings)

Comma butterfly drinking nectar from ivy flowers (closed wings)

Opposite The Clock House, turn right (R) by nature trail post 5

Guelder Rose flowers

4 See if you can spot guelder rose in the hedge. Darwin noted how the outer flowers were sterile but made the flower head easily visible for insects.



Spider (Neosco adianta) makes webs to catch small flies

Thick-legged flower beetle (Oedemera nobilis): the males have large 'thighs'. Larvae feed and develop within plant stems

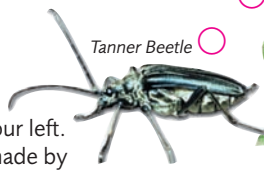
5 The chalk grassland supports a great variety of wild flowers and therefore many different small animals which rely on them for food and shelter. Lubbock wrote popular books about natural history and was particularly interested in the interactions between plants and insects. Keep to the path but on a warm summer day see how many different plants and minibeasts you can spot on this sunny chalk bank.

Meadow Brown butterfly on Marjoram

Cross fairway and continue on London LOOP footpath.

6 On your left, the meadow is yellow with cowslips in spring and yellow rattle in summer. On summer's evenings the locally rare serotine bat, one of Britain's biggest bats, may be seen flying along the woodland edge.

Cowslip



Tanner Beetle

7 As you walk through the woodland, look for hart's tongue fern and a dead tree on your left. The holes in the tree have been made by emerging adult beetles whose larvae have eaten their way through the wood. In the UK there are over 4000 beetle species and while a student at Cambridge University, Darwin became fascinated by their variety.

Hart's Tongue Fern

Cross Path

Common Dog Violet spring flowers

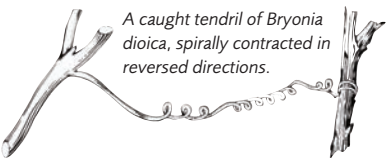
8 As you approach the road look for violets on the right. In spring they have purple flowers which attract insects for cross pollination. In summer and autumn, look for cleistogamous flowers. These are very small flowers which look like buds but never open. Inside them the petals are tiny scales and only the 2 lower stamens have anthers, which produce few pollen grains. Darwin noted how tubes grew from the pollen grains down into the stigma to fertilise the ova and produce seeds. This mechanism helps the violets survive and spread when cold spring weather means there are less bees for cross pollination.

Dog Violet: cleistogamous flowers

9 Look for Traveller's Joy, an indicator of chalk soil; Darwin reported that he had *'seen many proofs that the petioles (leaf stalks)….are excited to movement by very slight pressure'*.

Traveller's Joy leaf stalk

When you reach road, cross and turn L. Turn R up Bogey Lane: pass steps on the left which lead down to the site of the old wash house for High Elms Estate.



A caught tendril of Bryonia dioica, spirally contracted in reversed directions.

10 Continue along sunken lane looking for climbing plants. Darwin described how young shoots of black bryony followed the sun, taking an average 2 hours 48 minutes to make 1 complete circle, while tendrils of the unrelated white bryony are stimulated by touch to twine, first in one direction, then the same number of turns in the opposite direction. The resulting spirals attached to hedge plants act as shock absorbers. Darwin wrote, *'I have more than once gone on purpose during a gale to watch a Bryony growing in an exposed hedge, with its tendrils attached to the surrounding bushes; and as the thick and thin branches were tossed to and fro by the wind, the tendrils, had they not been excessively elastic, would instantly have been torn off and the plant thrown prostrate'*.

White Bryony (with tendrils)

Black Bryony