

About the trail

This trail leads you around places familiar and important to the work of Charles Darwin and his neighbour, Sir John Lubbock, who as a child, learnt much about natural history from Darwin and grew up to be an important scientist in his own right, whose work Darwin referred to in many of his publications. Lubbock, later Lord Avebury, was also an anthropologist and became a politician in 1870. He remained a lifelong friend and supporter of Darwin who wrote about Lubbock's decision to go into politics, 'any fair man can be a politician but so few can work in science like him'. Some of the species they studied locally are indicated as you follow the trail, others are more difficult to spot or may be anywhere along the route and are shown in the pictures opposite. Tick the circles and see how many you can find. ☑

Places you'll pass

The trail begins and ends at High Elms, the home of the Lubbock family from 1808-1938 and where Sir John Lubbock investigated springtails and bristletails. These primitive little insects are closely related to crustaceans and when Lubbock started working on them only one species was known in Britain. By 1869 Lubbock had recorded nearly 60 species in Britain, many from High Elms and nearby, of which 18 appeared new to science (some since combined into other species). Lubbock also investigated ants, bees and wasps, keeping ants nests between sheets of plate glass so he could more easily examine their social organisation. Some of his queen ants lived 13-15 years. He showed that bees could see in colour and preferred the colour blue, and he kept a wasp for 9 months which would feed from his hand and allow him to stroke it. When it died the wasp was mentioned in 'The Times' and its body was donated to the Natural History Museum.

The trail also passes the Rookery, in Darwin's time the home of George Turnbull a racehorse trainer whose head gardener, John Horwood, kept tropical orchids in his greenhouse for Darwin and gave him advice on the building of greenhouses at Down House.

How to get around

The complete trail (shown on the map inside in black) is 4½ miles (6.7 kms) long, but can be shortened using the footpaths shown on the map. The golf club near the end of the trail has a public bar and serves food. There are 2 pubs and a café in Downe and a café at High Elm's new centre. The trail involves a small amount of road walking: please take great care and face oncoming traffic. Paths may be muddy and slippery at times with some gradients of >20%. There are 6 kissing gates as shown on the map. Please follow the Country Code, keep to the footpaths and remove your dog waste.

Some of the Minibeasts important to Lubbock

A Lubbock

Springtails (Collembola) Mostly 0.5-6mm long these tiny creatures may live in densities of 20,000 per square metre, and are important for nutrient recycling, most of them eating fungal hyphae and dead plant and animal material.

B Tomocerus longicornis: about 6mm long, it is one of the largest common springtails at High Elms.

C Orchesella cincta: (4-6mm long) a springtail found by Lubbock 'under logs of wood'.

D Mayfly nymph:

Mayflies live under water as nymphs for 6 months or more (varying according to species) but the flying adult only lives one day. Lubbock investigated how in *Cloeon*, a genus of small species, it takes at least 20 moults before the larvae emerge as adults.

E Black wood ant:

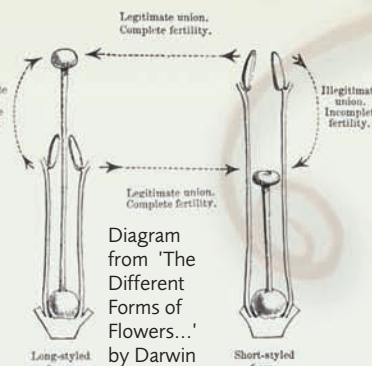
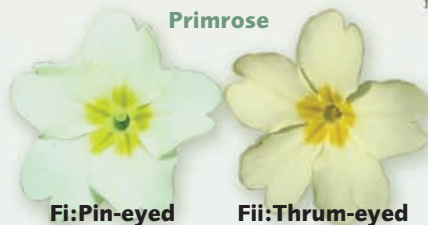
kept and studied by Lubbock at High Elms. Illustration from 'Ants, Bees and Wasps, by John Lubbock

Some of the Species important to Darwin

Spring

F Primroses and cowslips:

Darwin investigated why their flowers were of 2 types, called pin and thrum-eyed, and found that the most viable seed was produced when cross pollination occurred between the 2 different flower types.

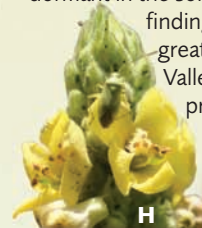


Note how in pin-eyed flowers, the stigma (female part) shows above the stamens, while in thrum-eyed flowers, the pollen bearing stamens (male) show above the stigma



Summer:

Mulleins: 3 species of mullein can be found near the trail and hybrids between them. Early colonizers of disturbed ground, their seeds can remain dormant in the soil for many years. Darwin reported finding 33 hybrids between white and great mullein in a field in the Cudham Valley and noted how the hybrids produced little or no seeds.



G White Mullein
H Great Mullein



I Roman snails with eggs: first brought to this area by the Romans, Charles Darwin found that when hibernating they could be immersed in sea-water for 20 days and completely recover; he calculated that in this time they could be transported 660 miles on an ocean current.

Autumn:

As plants lose their leaves, look for birds feeding on the ripening fruits in hedgerows, laying down stores of fat to help them survive the winter. In 'The Origin of Species,' Darwin estimated, 'chiefly from the greatly reduced numbers of nests in the spring, that the winter of 1854-5 destroyed four-fifths of the birds in my own grounds': evidence of the way evolution worked since the implication from this is that only the fittest are able to survive and breed.

J Goldcrest: during hard winters numbers can fall dramatically.



Winter:

K Mistletoe: Darwin marvelled at the co-adaptations of this plant and the animals it relies on. For these to occur he realised how features occur randomly, but if they aid survival (or do not inhibit it) they may be inherited by offspring and passed on. A semi-parasite, it relies on a host tree (often apple, sometimes lime, hawthorn or poplar) for water and mineral salts, needs birds to disperse its seeds and has flowers in February and March with separate sexes on separate plants and therefore needs insects to pollinate it very early in the year.

