

SOME WOODLAND PLANT ASSOCIATIONS OF THE CHILTERN HILLS

by
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During a few weeks' stay in Hertfordshire and Buckinghamshire I was able to study some woods in the Chiltern Hills. These hills which extend from Henley on Thames in the South-west to Hitchin in the North-east consist mainly of chalk. The greater portion belongs to the Upper-Chalk formation which is almost entirely covered by „clay with flints”, sometimes by gravel. Lower- and Middle-Chalk usually come to the surface on the highest tops of the Chilterns (250-300 M.) where abrasion and denudation have been stronger so that the Upper-Chalk has disappeared.

The country originally formed an inclined plane sloping downwards from the North-west to the South-east, to the valley of the Thames. In this plane valleys have been cut gradually by the action of ice and water. The hills are not ridges elevated above the general level of the surface although they appear to be, if viewed from the valleys. Dissolution of CaCO_3 by water containing carbonic acid left the flints and the insoluble clay which form the top layer of so called „clay with flints”. This layer is often not thicker than 1 M., sometimes even less.

Originally the country was covered with woods, apart from the valleys where the climate and the water condition of the soil were favourable to the growth of peat. But as early as in the days of King Alfred (900 A.C.) drainage of the soil began, mainly for military reasons and the peat-formation stopped 1).

Owing to the porous nature of the soil rainwater filters through quickly and many valleys now have brooks in spring only. Rivulets called „bournes” are extreme instances of this phenomenon; they only flow occasionally in spring after a period of heavy winterrains or of much snow. The flow begins as soon as the water has had time to percolate through the chalk, thereby raising the plane of saturation above the level of the valley.

The woods have mostly been cleared away; it is on the tops of the hills only and on some rather steep slopes that they are still to be found.

The question arises whether it is possible to get an idea of the sociological character of the woods which in the early Middle-Ages covered these Chiltern Hills. I believe the following vegetation records will give us a conception of this, at least for the woods of

the centre of Hertfordshire and the north of Buckinghamshire.

The plant association called *Fagetum calcareum* by M. SCHWICKERATH²⁾, *Fagetum boreo-atlanticum* by R. TÜXEN³⁾ is found on a soil where the chalk is quite near the surface and where the roots are in contact with it. This *Fagetum calcareum*, belonging to the alliance, called *Fagion silvaticae*⁴⁾, was observed by me in a beechwood near Wendover (Buckinghamshire) situated in one of the highest parts of the Chilterns, 50 km. to the North-west of London (Vegetation Record I). Also in a beechwood near Hitchin 50 km to the north of London (Vegetation Record II).

Vegetation Records	I	II
<i>Characteristic species of Fagetum calcareum</i>		
<i>Fagus silvatica</i>	4 à 5	4 à 5
<i>Cardamine (Dentaria) bulbifera</i>	I	
<i>Cephalanthera Damasonium (pallens)</i>		I à 2
<i>Characteristic species of Fagion silvaticae</i>		
<i>Mercurialis perennis</i>	3 à 4	
<i>Sanicula europaea</i>	I à 2	+
<i>Asperula odorata</i>	I à 2	
<i>Melica uniflora</i>	I	+
<i>Euphorbia amygdaloides</i>	+	
<i>Conopodium majus</i>	+	
<i>Characteristic species of the Fagetalia</i>		
<i>Lamium Galeobdolon</i>	I à 2	
<i>Circaea lutetiana</i>	+	
<i>Arum maculatum</i>	+	
<i>Acer pseudo-Platanus</i>	+	+
<i>Carpinus Betulus</i>	+	
<i>Accompanying species</i>		
<i>Hedera Helix</i>		3 à 4
<i>Luzula silvatica</i>	+	
<i>Milium effusum</i>		+
<i>Primula veris (officinalis)</i>	+	
<i>Viburnum Lantana</i>		+
<i>Ligustrum vulgare</i>		+

As I remarked above, the top-layer, usually called „clay with flints” which covers the greater part of the Chilterns, has more or less lost its chalk. On the whole the pH is 5 à 6. So the real calcicoles, the characteristics of the *Bromion erecti* e.g. *Helianthemum nummularium*, *Sanguisorba minor* and *Onobrychis sativa* are rare and only found near chalk-pits or on artificial steep slopes where the layer containing chalk is quite near the surface and the pH is ± 8 .

The following records were made in the neighbourhood of Harpenden in the northern part of Hertfordshire. Records III and IV are from Mackerye End; record V from Ayre's End; record VI and VII from Turnershall Farm; Record IX and X from Wandon Wood.

Vegetation Records	III	IV	V	VI	VII	VIII	IX	X
<i>Characteristic species of Querceto-Carpinetum</i>								
<i>Carpinus Betulus</i>	5	5	5	5	5	4 à 5	+	+
<i>Endymion nutans</i> (<i>Scilla non-scripta</i>)	5	3 à 4	4	3	3	3 à 4	+	
<i>Prunus avium</i>	+	+	+	+	+	+	+	
<i>Stellaria holostea</i>			+	+	+			
<i>Primula acaulis</i>					+			
<i>Characteristic species of the Fagetalia</i>								
<i>Mercurialis perennis</i>	3	3 à 4	3	3	3	3	+	3
<i>Lamium Galeobdolon</i>	1	1 à 2	2	3	3 à 4	+		+
<i>Anemone nemorosa</i>	2	+	+			+		
<i>Viola Riviniana</i>			1 à 2	+			2 à 3	
<i>Moehringia trinervia</i>	+	+			1	1		
<i>Corylus Avellana</i>		+					4	4
<i>Asperula odorata</i>							4	2
<i>Arum maculatum</i>		+	+					+
<i>Tamus communis</i>		+	+			+		
<i>Melica uniflora</i>	1			+				
<i>Conopodium vulgare</i>				+	+			
<i>Carex silvatica</i>							+	
<i>Fagus silvatica</i>	+							
<i>Ajuga reptans</i>		+						
<i>Accompanying species</i>								
<i>Quercus Robur</i>	+	+	+	+	+	+	1	1
<i>Hedera Helix</i>					+			
<i>Rubus species</i>					+	+		
<i>Milium effusum</i>				+	+			
<i>Oxalis Acetosella</i>							4	2 à 3
<i>Lonicera Periclymenum</i>							1	+
<i>Helleborus viridis</i>	+							

The greater part of the woods, especially those in the basin of the river Lea belong to the association called *Querceto-Carpinetum*. They consist mostly of coppiced hornbeams, *Carpinus Betulus*, height 4-8 m., with some old oaks ⁵⁾ and occasional cherry trees, *Prunus avium*. In spring the soil is covered with blue bells, *Scilla non-scripta* (*Endymion nutans*), sometimes with anemones, *Anemone nemorosa*. Later in summer dog's mercury, *Mercurialis perennis*

and yellow archangel, *Lamium Galeobdolon* cover the soil nearly everywhere. The edge of these woods differs widely; here we find among other species: maple, *Acer campestre*; blackthorn, *Prunus spinosa*; *Ulmus glabra*, the wych elm; ash, *Fraxinus excelsior*; hazel, *Corylus Avellana*; dogwood, *Cornus sanguinea*; elder, *Sambucus nigra*; old man's beard, *Clematis Vitalba*; white bryony, *Bryonia dioica*; hawthorn, *Crataegus Oxyacantha* and *monogyna*; and also the black bryony, *Tamus communis*.

Such species as *Tamus communis* and *Conopodium majus* give an atlantic character to this *Querceto-carpinetum*.

Records IX and X show a marked difference with III-VIII; *Carpinus Betulus* and *Scilla* are nearly lacking in the former, whilst *Corylus Avellana*, *Lonicera Periclymenum* are present as well as *Oxalis Acetosella*. This might be an indication of a more neutral soil.

It was especially the presence of *Scilla non-scripta* (*Endymion nutans*) that caught and held my attention because the sociological position of this species in the Netherlands is not quite clear. Here in the Chilterns it is evident that *Scilla* is a species belonging to the *Querceto-Carpinetum*, especially to the subassociation in which *Carpinus Betulus* predominates. In woods where the thicket consists of *Corylus Avellana* and where the hornbeam is nearly or entirely lacking *Scilla* is also absent. *Scilla* is generally held to be a british native, a real indigene, not an alien, and more especially diffused throughout the southern part of the United Kingdom.

Apart from the question whether *Scilla non-scripta* (*Endymion nutans*) is a native in our country we can say that its presence in the woods along the dunes of Holland, e.g. in the now devastated part of the old „Haagse Bos” fits in fairly well with the facts observed by me in the Chiltern woods, seeing that the plant association found in that part of the „Haagse Bos” was likewise a *Querceto-Carpinetum*.

Harpenden June 1949.

1) A. R. PRYOR. Flora of Hertfordshire 1887.

2) M. SCHWICKERATH. Die Vegetation des Landkreises Aachen und ihre Stellung im nördlichen Westdeutschland. Aachener Beiträge zur Heimatkunde 1933.

3) R. TÜXEN. Die Pflanzengesellschaften Nordwestdeutschlands. Mitteilungen der floristisch-soziologischen Arbeitsgemeinschaft in Niedersachsen. 1937.

4) V. WESTHOFF, J. W. DIJK, H. PASSCHIER, G. SISSINGH. Overzicht der plantengemeenschappen in Nederland. (Survey of plantassociations in the Netherlands.) Amsterdam 1946.

5) PRYOR l.c. mentions the presence of *Quercus petraea* (*Q. sessiliflora* Salisb.) in the hornbeam woods of Hertfordshire, but only on the highest and most heathy ground. The material of the oaks in my records belonged to *Quercus Robur*.