

**PLANTS OF THE SILURIAN LIMESTONES ON THE WEST OF THE
MALVERN HILLS**

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Mr. Lousley's recent book *Wild Flowers of the Chalk and Limestone* has emphasised the great wealth of plants in such districts, and it may be of interest to consider the flora of a small area of limestone west of the Malvern Hills and compare it with the general flora of other limestone districts of Britain.

The area to be considered here is now situated entirely within the limits of the administrative county of Herefordshire in the parishes of Eastnor, Colwall and Mathon, on the eastern border of the county. Mathon was still in Worcestershire when H. C. Watson defined his vice-counties, and so must be included in v.-c. 37. Eastnor and Colwall are in v.-c. 36 (Herefordshire).

In the parishes of Mathon and Colwall the Silurian rocks lie along the eastern border, forming a strip about a mile wide, running from north to south, on the western side of the Malvern Hills. In Eastnor, the southermost of the three, they are separated from the granite of the Malvern Hills by a mile or more of Cambrian shales and sandstones; and in Colwall there is an additional Silurian area on the west of the parish, which joins the Eastnor section in the south. There are three parallel ridges, Woolhope limestone abutting on the Malvern granite, Wenlock limestone, and Aymestry limestone on the west. They are separated by valleys of Wenlock Shale, and Lower Ludlow Shale, with Upper Ludlow Shale on the western slope of the Aymestry Limestone ridge. These ridges are usually wooded along the top, and the shale valleys are under plough or pasture. The limestones are not rich, being often of a shaley nature, and the Wenlock Limestone is the only one which has in the past been much quarried for burning, and even that is now worked in only one or two places. The soil of the ridges is not as rich in calcium as it is on the Chalk Downs and Derbyshire hills, and although in some places the slopes have a distinct look of calcareous pasture, many typical calcicoles are absent, and flowers lack the intense blue found on the Chalk and the Cotswolds.

Some plants which might be expected here are absent, but are found within a few miles on other geological formations. *Helleborus viridis* L. was recorded by Mr. R. F. Towndrow at Madresfield on the Keuper about four miles to the east; *Hypericum montanum* L. on the Cambrian Rocks of the Gullet Pass through the Malvern Hills in Eastnor; *Geranium pratense* L. just over the border of Eastnor in West Glos. at Bromsberrow; *Echium vulgare* L., in a very stunted form, on a boss of Ordovician trap intruded into the Cambrian Shale at the head of the Valley of the Whiteleafed Oak at Eastnor, its only station in this neighbourhood; *Verbascum nigrum* L. on the granite or Keuper on the east slope of the Malvern Hills; *Spiranthes spiralis* (L.) Chevall. in small numbers on Castlemorton Common, a little further to the east;

Iris foetidissima L. at Wall Hills, Ledbury, on the Old Red Sandstone, and on an outlier of Lias limestone on Berrow Hill in Worcestershire.

There are a number of plants which might well be expected, but seem to be completely absent from the district. Probably their absence may be explained by lack of sufficient lime due to the depth of the soil. These absentees are:—

<i>Thalictrum minus</i> L.	<i>Linum bienne</i> Mill.
<i>Anemone Pulsatilla</i> L.	<i>Campanula glomerata</i> L.
<i>Arabis hirsuta</i> (L.) Scop.	<i>Atropa Bella-donna</i> L.
<i>Erigeron acris</i> L.	<i>Thesium humifusum</i> L.
<i>Senecio integrifolius</i> (L.) Clairv.	<i>Ophrys insectifera</i> L.
<i>Cerastium arvense</i> L.	<i>Cephalanthera Damasonium</i> (Mill.) Druce
<i>Polygala calcarea</i> F. Schultz	<i>C. longifolia</i> (Huds.) Fritsch
<i>Astragalus danicus</i> Retz.	<i>Convallaria majalis</i> L.
<i>Filipendula vulgaris</i> Moench	<i>Helictotrichon pratense</i> (L.) Pilger
<i>Sorbus Aria</i> (L.) Crantz	
<i>Asperula cynanchica</i> L.	

Campanula glomerata L. has been recorded on the Wenlock Limestone in Eastnor Park once by Towndrow, but not since.

Scabiosa columbaria L., "In a wood at Old Colwall, 1885" (Purchas & Ley, 1889, 169). This sounds an unlikely spot.

Galium tricorne Stokes, "In a field in Cowleigh Park" (Towndrow in Purchas & Ley, 1889, 165); "above Croft Farm, Mathon" (Lees, 1868, 46).

Echium vulgare L., "On the abandoned Croft Wenlock Limestone quarries, Mathon, 1866" (Lees, 1868, 47).

Hippocrepis comosa L., "Vicinity of the Malvern Hills" (Duncumb, 1804).

Pimpinella major (L.) Huds., rare "about Cradley" (Lees, 1868, 52); and "near Cradley," by R. C. Alexander in *New Botanist's Guide* (1835) (Purchas & Ley, 1889, 148). Although Cradley is a neighbouring parish to the north of Mathon, the vagueness of these records might bring them into our area.

The limestone ridges have a gentle slope along most of their length, and in consequence a moderate or good depth of soil, so that it is likely to be less calcareous in content than in districts where the shallowness of the soil brings it all into closer contact with the underlying limestone. While the shale valleys are often used for arable purposes, the slopes, where not clothed with trees, are left as open, fairly dry pasture. Though the flora is not often markedly calcareous in character, it is often possible in these fields roughly to trace the junction of the limestone and shale by the occurrence of certain plants such as *Helianthemum Chamaecistus* Mill., *Poterium Sanguisorba* L. and *Plantago media* L., which seldom grow on the shales, while *Cirsium palustre* (L.) Scop. is only found in the wetter soil of the valleys. *Luzula campestris* (L.) DC. is plentiful on the ridges, and these pastures contain a number of small herbs; *Linum catharticum* L. is general along with

Trifolium dubium Sibth., *T. micranthum* Viv. is very occasional on shallow soil, but occurs more plentifully in short turf on the Malvern granite and on the commons on the east side of the Hills. *Cirsium acaulon* (L.) Scop. sometimes monopolises small areas in the fields, but never to the great extent in which it is found in the Cotswolds. Dry, ungrazed banks are apt to be covered with *Zerna erecta* (Huds.) Panz., *Brachypodium pinnatum* (L.) Beauv. and *Festuca rubra* L. The Thyme of these banks and of the Malvern Hills is presumably *Thymus Drucei* Ronn. emend. Jalas, but has not been critically determined. *Viola hirta* L. with its varieties *propera* Jord. and *Foudrasii* Jord. are abundant in these habitats, especially at Croft Bank in Mathon. *Crepis taraxacifolia* Thuill. is generally found on these banks and along farm tracks and little used roads. Thirty years ago it was rapidly increasing in quantity and in range. It now seems to be stationary or has possibly slightly decreased during the last 15 years. *Carduus nutans* L. is frequent both here and on the granite, being favoured probably by the dryness rather than by the calcareous nature of the soil.

Several of the common Orchids are to be found, *Orchis morio* L. and *O. Fuchsii* Druce being the most plentiful in the meadows. *Coeloglossum viride* (L.) Hartm. is rather local, but occasionally very plentiful. *Gymnadenia conopsea* (L.) R. Br. is not common and is irregular in occurrence, both on and off the Silurian formations. In recent years it has become very rare. The same must be said of *Ophrys apifera* Huds. It has two stations on the Wenlock Limestone and two on the Aymestry, but has been seen in only one of them regularly for the last ten years, and only in small numbers there.

The woods are mostly oak standards with a shrub layer of hazel and brambles, and a ground flora dominated by Dog's Mercury, Bluebells and Garlic (*Allium ursinum* L.), with *Melica uniflora* Retz., *Poa nemoralis* L. and *Zerna ramosa* (Huds.) Lindm. as the principal grasses. The herb layer is one associated rather with damp than with especially calcareous oakwood. Both species of oak, *Quercus robur* L. and *Q. petraea* (Mattuschka) Liebl. occur. The subordinate trees include *Prunus avium* (L.) L., *Euonymus europaeus* L. and Hawthorn, nearly always *Crataegus monogyna* Jacq. Holly and Yew are in every wood, and ash is sometimes nearly as plentiful as oak. *Clematis Vitalba* L. festoons the hedges and bushes, and *Lonicera Periclymenum* L. twines up the trunks of small trees and along their branches.

Most of the woodland plants call for little comment. They include *Ranunculus auricomus* L., *Fragaria vesca* L., *Galium Cruciatum* (L.) Scop., *Asperula odorata* L., *Galeobdolon luteum* Huds. and *Euphorbia amygdaloides* L. *Luzula pilosa* (L.) Willd. is more common than *L. Forsteri* (Sm.) DC., and there is one patch of *L. luzuloides* (Lam.) Dandy and Wilmott, which has persisted for over 30 years. *Paris quadrifolia* L. grows in damp woods. *Daphne Laureola* L. gives the first signs of approaching spring, opening its flowers early in February and in mild seasons soon after New Year.

Violets are common both in and out of the woods. *V. odorata* L. is usually in the var. *dumetorum* Jord., and the var. *subcarnea* Jord. in a few stations. In several gardens in Colwall the var. *sulfurea* (Car.) Rouy & Fouc. grows as a weed. It is probably native, as there is no record of its having been planted, and the best living local authority goes back in her memory nearly 90 years. *V. Reichenbachiana* Jord. is so plentiful as to form a carpet in the woods in early April, and in one wood is a small patch of forma *pallida* Neum. with beautiful pale bluish mauve flowers. *V. Riviniana* Reichb. is plentiful in the more open parts. In more shady places it often occurs as forma *nemorosa* Neum., and in exposed places and dry banks the smaller growth of subsp. *minor* (Murbeck) Valentine. Both these species are common in hedgebanks.

There are a few notable calcicoles. *Helleborus foetidus* L. has two stations in Colwall, one on the Aymestry Limestone at Chance's Pitch near the Herefordshire Beacon, the other on the Wenlock in a plantation by the road leading from Colwall to the Wyche Cutting. It has been known in both places for many years and there is every reason to suppose that it is native. *Astragalus glycyphyllos* L. grows in small quantity in Brock Hill Wood on the Aymestry Limestone and in Colwall Coppice on the Wenlock; and in 1922 I found several plants on the Wenlock on Croft Bank, where it remained for only two or three years. *Vicia silvatica* L. occurs in several places often covering the bushes over a large area.

As in the meadows there are few of the rarer Orchids. *Orchis mascula* L. and *O. Fuchsii* Druce are common, and *Platanthera chlorantha* (Cust.) Reichb., especially in Brock Hill Wood. *Listera ovata* (L.) R. Br. is fairly plentiful in shady spots and *Neottia* amongst the decaying leaves of hazel and oak. In late July and August there are scattered patches of *Epipactis Helleborine* (L.) Crantz and occasionally its rarer cousin *E. purpurata* Sm.

The following plants associated with limestone grow on two or more of the limestones, though many are found on other formations also:

<i>Aquilegia vulgaris</i> L.	<i>Hypericum hirsutum</i> L.
<i>Clematis Vitalba</i> L.	<i>H. pulchrum</i> L.
<i>Anemone nemorosa</i> L.	<i>Linum catharticum</i> L.
<i>Ranunculus auricomus</i> L.	<i>Geranium molle</i> L.
<i>Helleborus foetidus</i> L.	<i>G. pusillum</i> L.
<i>Erophila verna</i> (L.) Chevall.	<i>G. dissectum</i> L.
<i>Reseda lutea</i> L.	<i>Euonymus europaeus</i> L.
<i>R. luteola</i> L.	<i>Trifolium striatum</i> L.
<i>Helianthemum Chamaecistus</i> Mill.	<i>T. campestre</i> Schreb.
<i>Viola odorata</i> L.	<i>T. dubium</i> Sibth.
<i>V. hirta</i> L.	<i>Anthyllis Vulneraria</i> L.
<i>V. Reichenbachiana</i> Jord.	<i>Lotus corniculatus</i> L.
<i>V. Riviniana</i> Reichb.	<i>Astragalus glycyphyllos</i> L.
<i>Cerastium viscosum</i> L.	<i>Vicia silvatica</i> L.

- Prunus avium* (L.) L.
Poterium Sanguisorba L.
Daucus Carota L.
Galium Cruciatum (L.) Scop.
Asperula odorata L.
Sherardia arvensis L.
Knautia arvensis (L.) Coult.
Inula Conyza DC.
Carlina vulgaris L.
Carduus nutans L.
Cirsium acaulon (L.) Scop.
Centaurea Scabiosa L.
Crepis taraxacifolia Thuill.
Hieracium Pilosella L.
Monotropa Hypopithys L., agg.
Blackstonia perfoliata (L.) Huds.
Centaureum minus Moench
Lithospermum officinale Gilib.
Linaria Cymbalaria (L.) Mill.
Euphrasia spp.
Lathraea Squamaria L.
Origanum vulgare L.
Thymus Drucei Ronn.
Clinopodium vulgare L.
Galeobdolon luteum Huds.
Plantago media L.
Euphorbia amygdaloides L.
Parietaria diffusa Mert. & Koch
Daphne Laureola L.
Neottia Nidus-avis (L.) L. C. Rich.
Listera ovata (L.) R. Br.
Epipactis Helleborine (L.) Crantz
E. purpurata Sm.
- Orchis morio* L.
O. Fuchsii Druce
O. mascula L.
Anacamptis pyramidalis (L.) L.
 C. Rich.
Ophrys apifera Huds.
Gymnadenia conopsea (L.) R. Br.
Coeloglossum viride (L.) Hartm.
Platanthera chlorantha (Cust.)
 Rich.
Paris quadrifolia L.
Galanthus nivalis L.
Luzula pilosa (L.) Willd.
L. Forsteri (Sm.) DC.
Carex lepidocarpa Tausch
Milium effusum L.
Trisetum flavescens (L.) Beauv.
Helictotrichon pubescens (Huds.)
 Pilger
Koeleria gracilis Pers.
Melica uniflora Retz.
Briza media L.
Poa nemoralis L.
Festuca rubra L.
F. ovina L.
Vulpia bromoides (L.) S. F. Gray
V. myuros (L.) C. C. Gmel.
Brachypodium silvaticum (Huds.)
 Beauv.
B. pinnatum (L.) Beauv.
Zerna ramosa (Huds.) Lindm.
Z. erecta (Huds.) Panz.

WOOLHOPE LIMESTONE.

This is the least distinctive of the three limestones, in fact the general appearance of the flora is that of neutral grassland, and in the woods it resembles normal oakwood. The rock is composed mostly of alternate bands of shale and limestone, and the slope is usually gentle with a good depth of soil. There are a few steep, dry pitches, and on these the vegetation is usually composed of *Festuca rubra* L. and *F. ovina* L., *Trifolium dubium* Sibth., *Origanum vulgare* L., *Thymus*, *Clinopodium vulgare* L. and *Plantago media* L. There is only one notable plant peculiar to this formation. *Aquilegia vulgaris* L. is recorded "in a coppice near Brand Lodge", Colwall (Purchas & Ley, 1889, 11), and I have found it in small quantity in Neues Wood, Eastnor, at the S.W. base of the Herefordshire Beacon. But since it also occurs on the Wenlock Limestone in a wood at Ledbury just over the border from

Eastnor, even this is not a good example. Snowdrops have grown for many years near the northern base of the Herefordshire Beacon, probably survivors from the gardens of cottages now demolished.

WENLOCK LIMESTONE.

The vegetation of the Wenlock Limestone is the most distinctly calcareous of all three of these formations. The slope is often steeper and the rock crops out at the surface in many places. The fact that it has been, and still is, quarried, both for burning and as building stone, is a sign of its greater content of lime and less shaley nature. There is still one large quarry in work until recently at Vinesend, on Croft Bank, just outside Mathon, in Cradley. A single look at Croft Bank shows that we are here on limestone, and the colours of the flowers have the characteristic bright hues. These banks are dominated by *Festuca rubra* L., *F. ovina* L., *Brachypodium pinnatum* (L.) Beauv. and *Zerna erecta* (Huds.) Panz. Besides the common species such as *Thymus*, *Origanum*, *Carlina*, *Blackstonia*, etc., there are a few of special interest. *Acinos arvensis* (Lam.) Dandy can sometimes be seen in an old quarry at the foot of the bank, but it is often swamped by the taller grasses. It is here that Towndrow recorded *Platanthera bifolia* (L.) L. C. Rich. in small quantity; not having been found now for 25 years at least, it is feared that it is extinct. *Anthyllis Vulneraria* L. is fairly plentiful, and there is a large area of *Cirsium eriophorum* (L.) Scop., which is found also on the same formation at Evendine in Colwall. Fortunately it survives frequent cutting. This is one of the few stations where *Ophrys apifera* Huds. flowers regularly every year. *Coeloglossum viride* (L.) Hartm. is common and nearly all the other Orchids are plentiful.

Further south, in Colwall, another bank on the Wenlock Limestone, between the Downs School and the Mathon boundary at Purlieu Lane, produces calcareous conditions and typical calcicole plants. Of recent years some of this has been put under the plough, which has reduced the large quantity of *Brachypodium pinnatum* (L.) Beauv., or Badger Grass. Here *Trifolium campestre* Schreb., *Centaurium minus* Moench and *Blackstonia* are common, and there is a small quantity of *Onobrychis*, perhaps a relic of cultivation. A disused quarry provides a home for *Gentiana amarella* L., which occurs near Evendine also, but otherwise is not common. One field has a quantity of *Anacamptis pyramidalis* (L.) L. C. Rich., and used to have many plants of *Ophrys apifera* Huds., but this has seldom appeared for the last 12 years, and then only in small numbers. *Reseda lutea* L. is occasional, especially as a casual in disturbed ground; *Cynoglossum officinale* L. is rare, its only permanent station being near Evendine.

In the wood on the crest of the ridge at Croft Bank is the single station in these parishes for *Melampyrum pratense* L., and in the more open parts a few Bee Orchids appear each year. It is rich in the commoner Orchids, *O. mascula* L., *O. Fuchsii* and *Listera ovata* (L.) R. Br., as well as *Neottia*, and *Platanthera chlorantha* (Cust.) Rich. *Lathyrus Nissolia* L. produces a few plants each year on the outskirts of this wood.

Further south Colwall Coppice has most of these plants and is interesting as containing *Astragalus glycyphyllos* L. and the uncommon grass *Hordelymus europaeus* (L.) Harz. In Park wood just across the boundary in Mathon, a marshy spot on the Wenlock shale is a station for *Carex lepidocarpa* Tausch. The water from the limestone slopes drains into this hollow and probably contains lime in solution, thus accounting for the presence of this plant.

In Eastnor woods we are reaching the well-known daffodil district which extends beyond Ledbury to Newent in W. Glos. The wood along the Ridgeway is largely yew and contains an oak with many clusters of mistletoe. Here both among the trees and in the open ground of Eastnor Park *Helictotrichon pubescens* (Huds.) Pilger was recorded by Lees (Lees, 1868, 106) and is still growing there, accompanied, in the Park, by *Koeleria gracilis* Pers., very rare in the east of v.-c. 36.

The following plants are confined to the Wenlock Limestone:—

<i>Lathyrus Nissolia</i> L.	<i>Melampyrum pratense</i> L.
<i>Onobrychis vicifolia</i> Scop.	<i>Cymoglossum officinale</i> L.
<i>Cirsium eriophorum</i> (L.) Scop.	<i>Platanthera bifolia</i> (L.) L. C. Rich.
<i>Gentiana amarella</i> L.	<i>Hordelymus europaeus</i> (L.) Harz.

AYMESTRY LIMESTONE.

This limestone passes gradually into the overlying Upper Ludlow shale and it is difficult to trace an exact junction. Much of this shale is itself calcareous and contains large nodules of limestone, and the upper strata have been included in this section along with the Aymestry Limestone, as they produce dry and often calcareous conditions. The limestone contains a number of shaley bands and is not so rich as the Wenlock. It has been dug in a few places, and a disused quarry at Evendine is the only station for *Calamintha ascendens* Jord., and contains a few aliens from the garden of the cottage above; *Erigeron speciosus* (Lindl.) DC., and, along with *Sedum acre* L., there is *S. album* L., *S. Telephium* L. and *Cerastium tomentosum* L., all of which seem to be well established.

Brock Hill Wood in Colwall contains *Astragalus glycyphyllos* L., *Cardamine impatiens* L., and *Epipactis purpurata* Sm. *Gagea lutea* (L.) Ker-Gawl. was first recorded on the edge of this wood in 1855 and has been growing on its present site nearby since 1899 (Amphlett and Rea, 1909, 358). About 20 plants or more appear each year, but seldom more than 5 or 6 have flowers. Five years ago another small patch was discovered further in the wood about 100 yards away. These stations are probably not on the limestone, but just below, and the soil is rather heavy humus.

There are two interesting small pieces of real calcareous vegetation, one in Colwall on Chance's Pitch by the road from the Herefordshire Beacon to Ledbury, the other at Upper Mitchell Farm on the Eastnor-Ledbury boundary. The Chance's Pitch station is an outcrop of limestone about 150 yards long where *Erophila verna* (L.) Chevall. flowers in February in the crevices of the rock where they get the full spring sun.

Later in the summer *Helictotrichon pubescens* (Huds.) Pilger and *Koeleria gracilis* Pers. are fairly plentiful. The latter is found in the east of v.-c. 36 only here and in Eastnor Park about a mile away. This station also has *Scleropoa rigida* (L.) Griseb., rare in this neighbourhood, and *Nepeta Cataria* L.; here and on the Upper Ludlow shale is *Geranium lucidum* L., which is only occasional elsewhere, and *Potentilla verna* L. The last used to grow on the western slope of Brock Hill, but seems to be lost through ploughing. *Plantago Coronopus* L. grows on these rocks; elsewhere only in one or two places on the Malvern granite.

On the other side of the road is a south-facing bank rich in Violets, especially *V. odorata* L. var. *subcarnea* Jord., mostly as a beardless form, very occasionally a few spikes of *Ophrys apifera* Huds., and an old established station of *Dianthus Armeria* L., recorded by Duncumb in 1804. At the present time it is uncertain in appearance owing to the growth of bushes and coarse grass, but a few plants can usually be found. Nearby in a plantation *Heleborus foetidus* L. can be seen from the road, this year (1952) in very great quantity.

At Upper Mitchell Farm is a smaller outcrop, which is rather overgrown with *Zerna erecta* (Huds.) Panz., but it also has *Geranium columbinum* L. and *Potentilla argentea* L. The latter is also plentiful in the field just over the wall. Along the roadside are scattered plants of *Nepeta Cataria* L.

In the three parishes there appears to be only one, or possibly two, stations for *Orchis praetermissa* Druce. It grows in great profusion in a marshy field behind Mathon Post Office, fine plants with spikes sometimes six inches or more long. This is not on the Silurian rocks, but the water drains to it from the Aymestry strata further up the slope, and probably contains much lime; an idea supported by the fact that in a neighbouring field *Carex lepidocarpa* is found.

The following plants are found only on the Aymestry Limestone:—

<i>Dianthus Armeria</i> L.	<i>Potentilla argentea</i> L.
<i>Cardamine impatiens</i> L.	<i>Calamintha ascendens</i> L.
<i>Geranium lucidum</i> L.	<i>Nepeta Cataria</i> L.
<i>G. columbinum</i> L.	<i>Plantago Coronopus</i> L.
<i>Potentilla verna</i> L.	<i>Scleropoa rigida</i> (L.) Griseb.

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 TOWNDROW: Mr. R. F. Towndrow's (1845-1937) notes and records for this district. Many of these are included in Purchas & Ley, and Amphlett & Rea.

Where no reference is given the writer has seen the plant himself.