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THE BOTANICAL IMPORTANCE OF ROADSIDE VERGES

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INTRODUCTION

In this paper the roadside verge will be defined as the area of grassland or tall herbage, ditch and hedge, which lies between the made-up carriageway, and some other kind of vegetation beyond the highway boundary, such as woodland, pasture or arable field. We are not concerned here with areas like moorland and heath where the roadside is a part of the general vegetation of an area.

ORIGIN

Roads and roadside verges have arisen in two ways. They have either evolved from "Natural" tracks, or they are "Man-made Roads" which have been superimposed on the landscape. Natural tracks were not made, but grew as the need arose. The earliest were probably made by animals and led from grazing area to watering-place.

Some of the first tracks used by man in Britain were tracts rather than tracks. Tracts up to 1/2 mile wide, like the Icknield Way, which ran along the dry and open country of the chalk ridge from Wiltshire to Norfolk. The passage of men and their grazing flocks over a wide area, created and then maintained an open, slightly disturbed chalk grassland throughout the varying width of this ancient route.

When first the Romans and later the Anglo-Saxons came down from the high land and made clearings for their villas and villages in the forest, the communities were connected by tracks which followed the zig-zag field boundaries near the houses, but straightened out to pass over the common grazing near the boundary of the "Parish". The courses of rural roads in England to-day are in the majority of cases, still those that originated from these natural tracks: they are extremely ancient, and so are the verges which run beside them.

Few new roads were created between Saxon times and the middle of the eighteenth century. The "Open Field" system continued, but gradually, and particularly following the Enclosure Acts of 1750-1850, hedges were planted which separated the highway and its verge from the surrounding vegetation. Until that time the verge had been a part of the original native vegetation somewhat modified by disturbance from driven cattle, galloping horses, and, from the 16th Century onwards, periodic cutting up and rutting by wheeled vehicles. After Enclosure of the neighbouring fields the verge remained but the surrounding grassland, of which it had once been a part, frequently went under the plough.

The first "Man-made Roads" in Britain of lasting significance were those built by the Romans. Their construction created local disturbance, but the main constituents of the turf which re-established itself with the passage of time and under the influence of grazing animals was derived from the grassland which stretched away on either side.

Some new roads were created by the Enclosure Acts. These "Awarded" roads were over 40 feet in width. They occur, for example, on the Cambridgeshire Chalk, where they are noteworthy for their wide verges. They were commonly laid across heath sheep-walk similar in vegetation to that found on nearby Newmarket and Royston Heaths to-day.

It is only in this century, and largely in the last 20 years, that there have been further planned roads in rural areas. The network of by-passes and motorways which is now creeping mile by mile over the landscape has not evolved from it. The verges are man-made and develop from sown grasses and herbs and a mixture of initially annual and later perennial species which have survived the upheaval of the road making operations.

The distinction between the verges of "Natural" and "Made" roads is gradually being eroded. Every widening scheme, every straightened bend destroys an old verge and replaces it with a new. Every kill by herbicides of broad-leaved herbs decreases the variety of the old verge and pushes it towards the relative monotony of the new.

IMPORTANCE

i. General

The general botanical importance of roadside verges is at its greatest in lowland arable England. In many areas the verge represents the last vestige of the grasslands which existed before the modernisation of agriculture. Permanent pasture remains only where the plough and the dragline cannot reach, and both reach further yearly. In this setting the roadside verge which crosses all the geological formations, runs up hill and down dale, is wet and dry, flat or sloping, sunny or sheltered, provides a complete picture of the native grassland vegetation of the country. Destroy this and we destroy part of our heritage, as irreplaceable as the Parish Church or the village stocks. In many parts of lowland England the rich pastures of the past, gay with Buttercups and Oxeye Daisies can only live on now along roadsides which are unploughed and unsprayed.

ii. Particular

Roadside verges have always differed somewhat from the surrounding vegetation because of the disturbance factors caused by passing traffic referred to earlier. There are in the British flora a number of restricted grassland herbaceous species which are found outside our islands mainly in central and southern Europe, where their natural habitat is dry, open grassland. They migrated to Britain after the retreat of the ice 10,000 years ago when an open, treeless, grassland was our natural vegetation, but, when the climate here changed and the land became covered in forest, these species were only able to survive naturally in open sites like cliff-faces and river-banks, which the trees could not dominate. There they remained until the advent of Neolithic man who began, by his nomadic way of life, to disturb the chalk ridges and recreate, artificially, the conditions there which these species needed for survival. Man, the road-user, allowed the species to spread further and has gone on maintaining these open conditions until the present day.

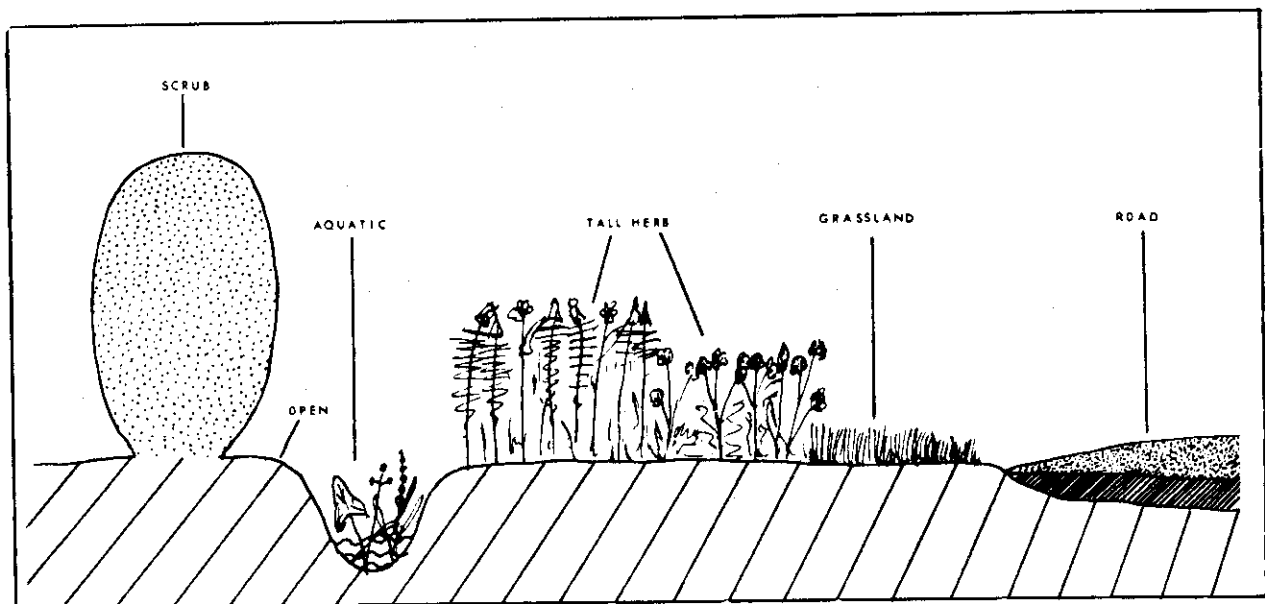
Three examples of these species occur on roadsides in Cambridgeshire. The Perennial Flax (*Linum anglicum*) reaches its southern limit on a verge of the Icknield Way near Hinxton, but it also occurs on the Gog Magog hills beside another Roman Road, the Via Devana. Further north in Lincolnshire it is entirely a roadside plant, once more associated with Roman roads.

The Spring Cinquefoil (*Potentilla tabernaemontani*) is a good example of a species which is native in dry, open, limestone grassland, and which survives in the artificially created conditions of the verge of a C road near West Wrating. This is almost certainly a very ancient Natural Road which forms a Parish boundary throughout its length.

The Spanish Catchfly (*Silene aotites*) is a rare species of sandy open habitats confined to the Breckland of East Anglia. The heaths on which it once grew abundantly in that area are being destroyed by ploughing: the only site for the plant remaining in Cambridgeshire is a roadside bank on a C road near Chippenham.

The primary importance of verges as relics of native grassland has been stressed, but this is not their only botanical interest. In a recording scheme recently devised for the Society for the Promotion of Nature Reserves, 9 major classes of habitat were recognised in lowland Britain; Forest, Scrub, Tall Herb, Reed-beds, Grassland, Moss-dominated areas, Open habitats, Aquatic habitats and Agricultural habitats: five of these (Scrub, Tall Herb, Grassland, Open habitats and Aquatic habitats, Fig 1) can occur on an ideal roadside where the verge is backed by a hedge and a ditch. Furthermore, elements of three others may frequently occur: (a) where shaded verges pass the sites of present or former woodland, elements of a forest flora, Primroses and Wood Violets, Anemones and Celandines spill out into the grassland; (b) where farm tracks cross the verge the special flora of wet ruts and trampled ground establishes itself; (c) in the Fens of eastern England the wide drainage ditches by the roadside develop into reed-beds at a late stage of their maintenance cycle.

Fig. 1. Habitats represented on an ordinary road verge.



Man as a road-user not only created habitats for existing native species to survive, but he brought species with him which have added to our flora. Many of them have been with us so long that we fail to realise their alien origin. The White Dead-nettle (Lamium album) may have been introduced by the Romans. It is a familiar plant of waysides and walls in England, but painstaking work by Miss Ann Conolly has shown that in Wales it is almost entirely confined to roadsides.

Many roadside treasures originated as plants in gardens which have long since disappeared. Thence came Elecampane (Inula helenium) and the Dusky Cranesbill (Geranium phaeum).

This great variety of native species, supplemented by species from alien sources, means that roadside verges are the richest single habitat for wild plant species in the country. In a county like Cambridgeshire with a total flora of flowering plants and ferns of 1,260 species, 520 (41%) have been recorded growing within the road verge region, in the broad sense.

During the period 1954-1962 the Botanical Society of the British Isles (B.S.B.I.) carried out a scheme to map the flora of the British Isles. The basis of the work was the presence or absence of each of our 1,700 British species of higher plants in the 10 km squares of the national grid. The results were published in The Atlas of the British Flora (Perring and Walters, 1962). The work was so complete that, particularly for the less common species, it is possible to state in objective terms which are the rarest species in Great Britain. During the last 2 years the staff of the Biological Records Centre at Monks Wood, with the assistance of the County recorders of the B.S.B.I., have been carrying out a more detailed study of the rarest 300 species so that we know their exact localities, the sizes of their populations and the nature of the habitat where they are to be found in the majority of cases.

The study has revealed that at least 27 of the 300 rarest species occur on roadside verges (Table 1).

TABLE 1

Very rare plants occurring on roadside verges. For species underlined verges are the main, and in some cases the only, habitat.

Allium babingtonii	Hypochaeris maculata
Aristolochia clematitis	<u>Linum anglicum</u>
Artemisia campestris	<u>Melampyrum arvense</u>
Asarum europaeum	<u>Muscari atlanticum</u>
<u>Beta trigyna</u>	<u>Orobanche caryophyllacea</u>
<u>(Bupleurum falcatum)</u>	Phleum phleoides
Carex filiformis	<u>Phyteuma spicatum</u>
Carex montana	<u>Pyrus cordata</u>
Cynoglossum germanicum	Salvia pratensis
Epipogium aphyllum	Scrophularia scorodonia
Erica ciliaris	Silene otites
Herniaria glabra	Stachys germanica
Himantoglossum hircinum	Tetragonolobus maritimus
	Verbascum pulverulentum

Each of these species occurs, on the average, in only 10 localities throughout the British Isles. Thus it can be seen that even if only one of the roadside verge populations of one of these species were lost, it would represent a high percentage of the total population of that species in Great Britain. In the case of Bupleurum falcatum it WAS the only habitat, for this plant which grew on one roadside in Essex, became extinct in Britain after road works in 1955. We must hope that the knowledge of the whereabouts of the sites of particular rarities on the part of responsible authorities will ensure that no similar losses occur in the future.

THE POTENTIAL IMPORTANCE OF MADE ROADS

The 'Made Roads' of the past have already been mentioned: the Roman Roads and the Enclosure Roads, particularly the former, now have verges of considerable importance. But there are other roadside verges which have not yet been mentioned which were made little over a hundred and twenty years ago; these were the verges of the iron roads, the railways. Their embankments were the greatest earthworks built in Britain since the Early Iron Age. Naturalists have long appreciated the importance of prehistoric earthworks; in Cambridgeshire, for example, the pre-Saxon Devil's and Fleam Dykes are the most important sites for chalk grassland plants in the county, both are designated as Sites of Special Scientific Interest. In the last few years naturalists have begun to appreciate the value of the railway embankments and cuttings, and are acquiring stretches of abandoned railway lines as Nature Reserves, because of their rich variety of plant and animal life. As Dony (1953) wrote about a Bedfordshire cutting "The large railway cutting known as Stanbrook Summit and the baulk covering the tunnel adjacent to it provide plant associations not to be found elsewhere in the county". Will another author 100 years hence be writing in the same terms about the banks of the M1 which runs parallel to Stanbrook Summit only a dozen miles to the south-west? Not unless we can reproduce the conditions which prevailed in creating such variety on railway banks. Some of these conditions were:

1. At the time of their construction the railways passed through a landscape in which natural vegetation was more frequent than it is today. There was ample opportunity for the spread of propagules of wild plants to new habitats.
2. Seed mixtures for sowing embankments, if they were used at all, were of native grasses and were adulterated by the seeds of many wild species of broadleaved plants.
3. The embankments were fenced from cattle but were grazed by rabbits, which maintained a short sward and created disturbance by burrowing, until their populations were severely reduced by myxomatosis.
4. The embankments were periodically burned either by design, or by chance sparks from passing steam locomotives. The burning was uneven and thereby produced variety in the development of the vegetation.

In sum, these conditions allowed the establishment of a native flora and, by variety of treatment (accident) produced the richness in species which made them most interesting and diverse today.

The conditions prevailing in the establishment of motorway verges cannot be the same as far as the landscape is concerned, neither can we, nor would we wish to, bring back the rabbit as an uncontrolled grazing machine, but we can surely do something about the mixtures we sow and the management which follows. We should seek sources of natural seed and, when it has been sown, ensure a variety of treatment with the machinery available by varying the timing and frequency of operation. Above all we must get away from the idea of a roadside verge as a lawn: that way lies monotony and botanical purgatory. If we wish to make the most of our opportunities for the verges of the future we must seek the right seed mixtures and the right management now.

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