

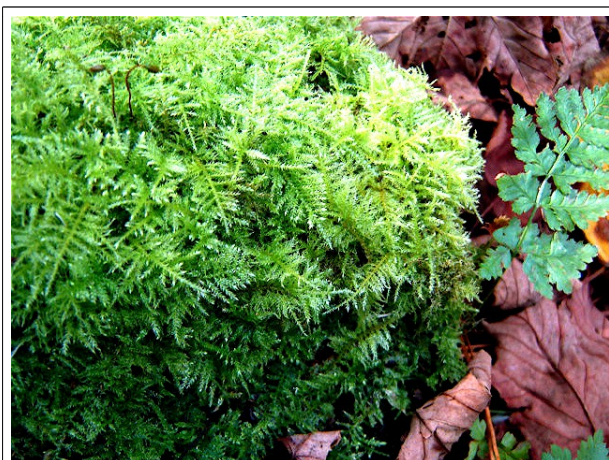


# MOSSES, LICHENS, FUNGI AND FERNS IN CORNISH HEDGES

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*Mosses under threat / underwear stripped off / Cornish hedges a haven / flail damage to mosses / shady hedge mosses and liverworts / ferny fans and fairy hats / silver stars, swans and survivors / lichens in Cornish hedges / dogs' fangs, crabs' eyes and burnt jam tarts / ancient beards and tiny egg-cups / fungi in Cornish hedges / black buns, golden frills, brown ears and dripping ink / ferns in Cornish hedges / squeakers, wigs, shuttlecocks and fish-bones / Conclusion - flowerless plants and the climate crisis.*

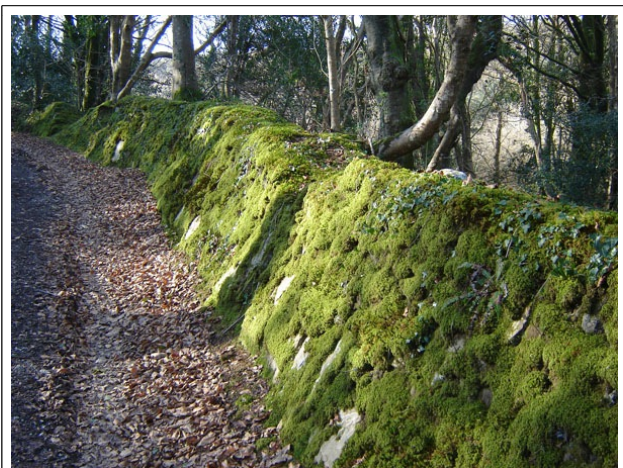
Probably most people take mosses for granted, and some, encouraged by the chemical industry, may actively wage war on them. Even those who like the soft greenness of moss may only notice three basic kinds - the feathery ones, the furry ones and the little cushions - and leave it at that; yet there may be an estimated 1,000 species in Britain, with unknown species still to be discovered. Besides the well-publicised and disastrous plunder of peat bogs, mosses are under stress. They are in difficulties in the modern farmer's fields, are cleaned from towns and literally hard pressed in the visited countryside by the trampling of feet and the friction of tyres. Like the wild flowers, they rapidly disappear under the modern curse of inappropriate soil enrichment.



*Kindbergia praelonga, a very common moss that will survive where others have disappeared.*

The wholesale replacement of old slates, tiles and thatch with new, less moss-friendly roofing has wiped out untold acres of old colonies and their vast populations of insects for the birds and bats - a widespread habitat loss which is generally unrecognised. Commercial firms now exist to remove moss from the roof, while gardeners get rid of it unnecessarily. Mosses are stripped from the wild for the floral trade, recklessly destroying ancient ecosystems. At the least level, people idly pick and peel moss with their fingers for no reason at all.

There are two main causes of this ignorance and persecution. Firstly, the most



An undisturbed woodland Cornish hedge thickly coated with mosses.

we can see with the naked eye is that some of the feathers, furs and cushions look a little different from others, which doesn't make them seem particularly interesting. With the aid of a magnifying lens, a whole new world of exquisite little gems opens to our view. Secondly, the mosses' lack of common names has condemned them to obscurity. A recent directive has belatedly tried to make up this lack, but a long list of this or that feather-moss is not very helpful. They do have wonderful proper names; *Rhytidiadelphus* and *Pseudoscleropodium*, for instance, roll magnificently off the tongue, and many of the full names, such as *Dicranella heteromalla*

and *Campylostelium saxicola* sound like music. The thing is not to be afraid of them, take them a syllable at a time, and remember that 'ch' is pronounced 'k', as in "headache" - which you may think the effort of understanding them will give you, but take it steadily and it won't.

## UNDERWEAR STRIPPED OFF

Mosses are the first noticeable layer in the green clothing of nature, the earth's vest and underpants as it were. They are an ancient heritage, one of the early 'fossil' life forms still in existence, among the first visible colonisers of any bare place, and if undisturbed may live almost indefinitely. Their spores are so light they are blown by the four winds all around the globe, and as soon as they alight on something suitable they will grow if the climate is right. If there is a concrete gatepost in a Cornish hedge in an acidic granite area, the mosses on it will be more lime tolerant, and may differ in species or growth from those on the stones of the hedge alongside.

This spore reproduction gives mosses a big advantage, yet habitats are losing diversity and quantity (as with so many other wild species) due to our altering the conditions in which they thrive. By draining land, enriching soils, polluting air, planting or felling trees, renewing roofs, spreading concrete, continuously-cropping fields, flailing hedges, watering gardens with moss-killer, cleaning with pressure hoses, and tearing up moss to make compost to grow plants that are no use for bees, and decorations that go into the dustbin after Christmas, the green velvet underwear is stripped off. With it go the primitive creatures it shelters, a busy base in the food chain. Mosses are a forest - miniature in height, but designed to be vast in extent. They hold many times their own weight of water and are as much a part of the earth's sponging, cooling and humidifying system as are the trees overhead. The only thing that they require from us is to be left alone. They are at the same time incredibly persistent, and incredibly vulnerable.

In 1883 naturalist Henry Marquand reported in *Science Gossip* on all the mosses he found in one day's walk in West Cornwall, taking in bog, heath and woodland, along with the hedges and streams on the way. Following in his footsteps a hundred and ten years later, nearly all his mosses were found in the same places, but now hemmed in to tiny fragments by the things people have been doing in the last fifty years. The sphagnum bogs have been destroyed by the growth of dropwort following enrichment by agricultural run-off, and by the spread of willow, bamboo and gunnera planted there. Only the few remaining ancient sphagnum tussocks at one of his locations still support some charming little mosses and liverworts, enduring to the last. The heathland has been utterly ruined by heavy cattle-grazing, accidental burning and the rampant

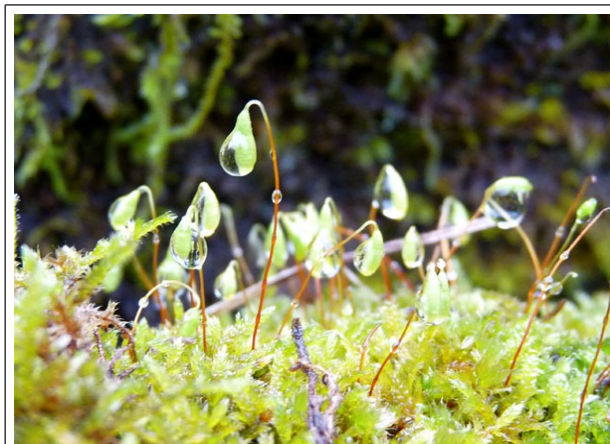
spread of rhododendron and bracken. On the grazed area the rapid carpeting of one moss, the nitrogen-loving lawn pest *Rhytidiadelphus squarrosus*, is a classic case of diversity loss by the removal of competition and enrichment of soil. Marquand's 'air cushions' of spectacular heath mosses, still seen there by the author in the 1950s-60s, have now all gone. On the rocky hilltop the small survivals are only where livestock and sightseers cannot tread.

Fifty years ago Marquand's wood was still a British rain forest - again, witnessed by the author; one narrow path wound its way through, along which occasional people carefully walked in single file, thrilled by the beauty all around; the tree-trunks heavily bearded with moss, the whole woodland floor a mass of bluebells, ferns and luxuriant mosses, the stream-side rocks thick with moss, the tree canopy an echoing choir of birdsong. Today that exotic tree-bark moss flora is shrivelled and the whole floor is of hard-beaten earth, the tree-roots exposed and worn, the rocks scraped, the birds flown, as the noisy public races around trampling all over the place with children, dogs and mountain bikes. Incredibly this blatant loss of respect for nature has eliminated ancient ferns with six-foot fronds and roots the size of tree stumps, and feathery mosses like great green embroidered pillows. Sparse whiskers of half-dead moss, the odd stunted bluebell and occasional small ferns now survive only where the clambered-over banks are stepped with little vertical faces where a human foot cannot tread.

### CORNISH HEDGES ARE A HAVEN

This is where Cornish hedges with their near-vertical faces come in, a much needed haven for mosses. Nearly all grow on stone, earth, living tree bark or dead wood, the basic constituents of a Cornish hedge. Here rooftop mosses, marsh and bog mosses, arable mosses, woodland mosses and heath mosses can grow literally side by side, or above and below each other, a wonderful example of the Cornish hedge's versatility. Many grow unexpectedly, as the hedge mimics their preferred habitat. Mosses which 'by the book' are found on occasionally-wetted riverside rocks will happily thrive on top of a stone hedge, washed by the rain and mist, while ephemeral arable mosses will appear in hedge-side rabbit or badger digs. Cornwall's climate, too, is beloved by mosses. Most of the two or three hundred common moss species and fifty or so of the common liverworts that have been recorded in Cornwall will grow in Cornish hedges, and nobody knows how many of the less common.

The quality of recording in Cornish hedges is typified by the Cornwall database entries in the year 2001 for *Polytrichum* mosses.



*Mosses love the damp, rainy Cornish climate.*

<i>Polytrichum commune</i>	128 records,	1 in hedges
<i>P. formosum</i>	157	2
<i>P. juniperinum</i>	163	1
<i>P. piliferum</i>	101	1
<i>Polytrichum</i> species unidentified	53	25



The startling contrast between 50% of unidentified and only 1% of identified species noted in hedges clearly shows that the more expert botanists have not studied Cornish hedges; a conclusion backed by a breakdown of the available figures for mosses and liverworts as a whole. It does seem incredible that a treasure-house of mosses such as the Cornish hedge has been so disregarded, except occasionally by the interested amateur naturalist. The irony is that even here in the hedges where they should have been safe, the beleaguered mosses have been under attack and no one seems to have noticed.

### FLAIL DAMAGE TO MOSSES

Mosses, unlike many other forms of life, only have to be offered the landfall and they will arrive. A front-garden Cornish hedge seen by the author to have been annually treated with weed-killer until all herbaceous growth ended, produced a surprising number of moss species after the spraying ceased. Where hedges have been left alone or traditionally managed, mosses still grow in variety and profusion. Where the flail has raged, losses and imbalance are the result. The smothering and enriching effect of the flail-mulch is the prime offender, wiping out many of the tiny mosses of the stone and earth, as well as the beautiful



*Thick covering of ivy induced by the flail has done away with many pretty heath mosses on this Cornish hedge.*

heathland kinds. The thick spread of ivy that follows the flail eliminates and prevents mosses except where stones have been torn out of the hedge, leaving a deep earthy cavity in which a few common light-shunning species may grow. Flail-induced mats of gorse and blackthorn on the face of the hedgebank, together with rank growth of weeds from the mulch-enriched hedge-bottom soil, discourage nearly all but the tolerant and very common kinds such as *Kindbergia praelonga*, a pretty filigree fern-like green moss. This moss grows on the soil and detritus in shady corners of gardens, and on miles of spoiled Cornish hedge nowadays where used to be many other, rarer mosses.

*Brachythecium rutabulum* is another vigorous species that, like nettles, 'follows man', enjoying soil enrichment. Wherever there is lightly dappled shade the thick shaggy pelt of this large-leaved yellowish-green moss covers stones and earth, trunks of bushes and damp dead branches impartially. *Bryum capillare* and *Mnium hornum* are other very common mosses which revel in the flail's over-enrichment of earthy pockets in the hedge. This imbalance puts paid to diverse moss communities, those mingled tapestries of fronds and velvety mats and cushions, often embroidered with little dots of their hair-stemmed fruits, like tiny bells or vases or birds' beaks or gnomes' hats, that so prettily arrange themselves over the stones and earth when allowed to do so. Bejewelled with the diamonds and pearls of a Cornish mist they are lovely to see. Take a good strong magnifying glass in your pocket next time you walk along a path beside a stone hedge on a damp spring day, and you will wonder why people take mosses for granted.

### SHADY HEDGE MOSSES AND LIVERWORTS

The differing sites and aspects of Cornish hedges ensure a wide range of moss species,

from the damp and shady to the dry stone hedge, with those in between harbouring an astonishing mixture of mosses. In the valley hedge will be found the typical woodland-floor and tree-bark species of *Kindbergia*, *Brachythecium*, *Mnium* and *Isoetecium*. In the very damp shady hedge along with the shining foil-like *Isopterygium elegans* may be found the tall slender female stems of *Plagiomnium undulatum* with the shorter, more flamboyant male, and more unusual species such as *Hookeria lucens* with translucent leaves so large it may be mistaken for a liverwort. Magnified, the leaves appear to be cut out of pale green net, and the fruit stems are glossy scarlet. Another that looks rather like a liverwort is *Homalia trichomanoides*, its flat transparent fronds hanging on damp tree-boles low down in the wetter hedge.



*Plagiomnium undulatum* couple - female (left) and male stems.

Liverworts, too, are abundant in the Cornish hedge, not all looking like those slightly repulsive objects the word liverwort suggests, that grow on the soil in ill-drained gardens. Many such as *Scapania* and *Diplophyllum* species have a frilly moss-like appearance, while the purplish brown *Frullania* encrusts the granite rocks and ivy stems with its delicate clinging fronds, or makes dark circular patches on the smooth bark of hedge-top sycamores. The dainty *Lophocolea* look like pale ice-green fairy necklaces in the mosses at the hedge's foot. Where there is a ditch the frosty fronds of *L. bidentata* contrast exquisitely with the glittering bright-green mosses *Brachythecium rivulare* or the yellow *Calliergonella cuspidata*.

In hedges with a shady stream alongside, the more robust wet-loving mosses may be found. One that has long been known by its English name is Catherine's Moss, *Atrichum undulatum*; the tall stems arise from an underground rhizome and are topped with long wavy leaves, sharply-toothed. Its elegant fruit capsule has a long-beaked lid often turned up like an avocet's beak. *Thamnobryum alopecurum* also arises on woody stalks from a horizontal creeping stem and looks like a forest of little trees. Here too in the mud may be found the tiny flat sheathed fronds of *Fissidens* all bending in one direction as if windblown. *Fissidens curnovii*, as its name shows, is special to Cornwall. Similarly rare elsewhere in Britain, *Fontinalis squamosa* var. *curnovii* may attach itself under water to the hedge grounders where these stand along a stream. Other specialist "mountain mosses" grow where spring water drips between hedge stones.

## FERNY FANS AND FAIRY HATS

Easily seen are the beautiful hedgebank mosses like fronds of miniature ferns. *Thuidium tamariscinum* is particularly noticeable with its stiff arching light-green fern-shaped fans like tamarisk sprays from which it is named. Another, *Homalothecium sericeum*, with the pretty English name of silky wall feather moss, has a bright satiny sheen on the yellowish regularly-shaped feathery tips. It grows tightly stuck down to the surface; a favourite site is a concrete gatepost, where it will make a roughly circular patch as big as a dinner plate. Also commonly seen in hedges is *Hypnum cupressiforme*, with its neatly groomed and plaited appearance, the smooth leaves with their tips curling inward, giving a blunt rounded outline to the fronds like its namesake cupressus and appearing as a mat of little pigtails or braids. This moss has a wide variation of colour and size in the branching growth, from the thread-like *H. cupressiforme* var. *filiforme* and the pale yellow var. *ericetorum*, through the green type to the strong bronze-tinted var. *tectorum* and





*Hypnum cupressiforme*, a common moss of the Cornish hedge, looks like a mat of small neatly-plaited braids.

even chunkier var. *lacunosum*; in fact the difference has caused some bryologists to place the first two under separate species. New research with DNA analysis may confirm or reverse many such changes of name, but the appearance of the moss in the hedges remains the same.

A conspicuous moss is the mouthful, *Pseudoscleropodium purum*, a giant that thrusts its long branching smooth yellowy-green fingers through the short turf and around the bramble or gorse roots on the hedge. Less frequently the pale yellow, red-stemmed soft filigree fronds of *Hylocomium splendens* may be found in heath hedges, or the stout branches,

dishevelled and spiky like a wet dog's coat, of *Rhytidiadelphus triquetrus*, now dubbed Big Shaggy-moss. All the *Rhytidiadelphus* species look as if they have been pulled through a hedge backwards.

Bare stones and earth on the hedgebank are home for characteristic little mosses of stone and soil, notably *Tortula* and *Bryum* species. *Orthotrichum*, *Ulota* and *Zygodon* grow on both rock and the branches of hedge-top trees and bushes, a favourite being the wrinkled bark of elder. Some of these mosses have fruits like a group of tiny Cornish piskies in pointed hats, perhaps actually tipped and trimmed with bright red as in *Orthotrichum pulchellum*; while *Bartramia*, which will grow either on rock or soil, has fruits like little green apples. Among other mosses of the earth between the stones of a Cornish hedge are *Barbula*, *Didymodon* and *Weissia*.

Many of the short cushion or mat-forming mosses look much alike until viewed under strong magnification, when surprising features spring into view. The *Tortulas* are among those mosses where the mid-rib, or nerve, of the leaf is extended, so they

appear to have a hair or spike emerging from each leaf-tip; and so does the very common *Bryum capillare*, a mass of little

bright green rosettes with its pear-shaped capsules green with orange round the mouth, each hanging like a bell on its red stem arising from among them. *Tortula truncata*'s capsules are tiny goblets with a knobbed lid that lifts up to let the spores escape. *Orthotrichum* and *Ulota* may have hairy hats on capsules like elegantly fluted urns, or they may have clusters of brown gemmae like minute fir cones. Some have curly leaves when dry; *Ulota phyllantha*, very common in Cornish hedges on stones or bushes, now has the picturesque name of Frizzled Pincushion. *Weissia controversa* likes to grow where a telegraph pole's metal stay is fixed into the hedge. With the rain-drip down the wire stay, and perhaps influenced by metal salts, it can make vivid green velvety clots of moss here, a curious instance of Cornish hedge opportunity.



*Pseudoscleropodium purum*



*Weissia controversa* growing around a telegraph pole stay in a Cornish hedge.

These low-growing mosses have an important place in the hedge's ecosystem, as is evident on a winter's day when birds are seen pecking into thick beds of *Bryum* or *Barbula* to get at the insects living in it. Wrens, tits and goldcrests tirelessly pick mites among the tiny mosses,



*Orthotrichum pulchellum* wears scarlet-edged pisky hats.

liverworts and algae on hedge-top branches. Blackbirds often tear the *Brachythecium* carpet to pieces for its rich haul of little snails and grubs. Some micro-moth and lace-bug larvae feed only on mosses, and many other insect families feed on the rotting matter they contain, or hunt among them for prey. Some of these families each have more than 200 species, for instance the soldier-flies, scuttle-flies and springtails. Groundhoppers, like small grasshoppers, feed and breed in moss, and so does the snowflea *Boreus hyemalis*, a tiny creature that may occasionally be seen hopping about in snow.

### SILVER STARS, SWANS AND SURVIVORS



Gossamer effect of silver stars on *Campylopus introflexus* makes it easily recognised in the dry heathland hedge.

As the hedges climb on to the hills the acid-tolerant heathland mosses appear, and typically on any hedge from about 100 metres above sea level they will happily co-exist with woodlanders such as the common *Mnium hornum* and the ever-present *Kindbergia praelonga*. Common heathland mosses are the ones that look like shaggy little prairie grasses blowing in the wind, principally *Dicranum*, *Dicranella*, *Ditrichum* and *Campylopus*. These can grow in quite large patches on the soil capping of the hedge as long as they are not shaded out, or smothered by flail-debris. Easily recognised is the very common *Campylopus introflexus*, an incomer which

has gone native since the second world war. The stems grow as little bunches of grass-like leaves, and at the top of each tuft is a silver star formed by long hairs at the leaf-tips.

As the hills rise and the hedge is drier, the noticeable mosses are the *Polytrichums*, which look like forests of small dark green bottle-brushes, often extensive on the earth top of the hedge. When fruiting they look like a crowd of tiny people in pale brown or whitish woolly hats, which fall off to reveal little square lanterns. Male plants in spring appear as a mass of tiny upward-facing white, red or orange and yellowish flowers. *Polytrichum juniperinum* often grows where hedges have been burnt in heathland fires. So does *Ceratodon purpureus* which makes purplish patches in spring as the massed wine-coloured stems of the fruiting body appear. Another common moss that follows fire is *Funaria hygrometrica*, also abundantly fertile, its arched stems and drooping pear-shaped capsules with their long beaks as elegant as little green swans.



*Funaria hygrometrica*.



On the stone hedges exposed to the elements are the real survivors of the moss world, little grizzled hunchbacks scratching a living from the bare rock. Typical of these are *Schistidium* and *Grimmia* species, grey, dark green, brown or blackish in colour, often silvery-looking from the hoary hair-tips of the leaves, and harsh to the touch when dry. *Andraea rothii*, now aptly named Dusky Rock-moss, is another that grows on bare granite and looks black when dry. They may be accompanied by the silky golden-green fronds of *Homalothecium sericeum* and the tiny silver tassels of *Bryum argenteum*, the more drought-tolerant of the feathery and the furry mosses, or the filigree brown liverwort *Frullania tamarisci*. Here, too, the mosses become well mixed with lichens. Just one stone of such a hedge may host half-a-dozen each of moss and lichen species, growing on the stone or its earthy cap.

## LICHENS IN CORNISH HEDGES

Lichens are the product of a symbiotic relationship between a fungus and an alga. Their means of reproduction, by vegetative structures which detach to form a new plant or by spores from the fungal partner, is still somewhat mysterious; but it is quite clear that however they do it, they find it easy in Cornwall. They are very happy with the damp Atlantic climate and the clean Cornish air, and our hedges may be looked upon as a tailor-made setting for a 'national collection' of lichens. The Cornish hedge provides a perfect home for lichens as it offers stone, bark and undisturbed earth, their preferred bases. The hedges host the whole spectrum from the woodland-loving tree-bark 'beards' to the smooth flat crusts like paint on stone that resist extreme exposure, salty gales, downpours of rain and blistering sun alike.



Scree garden of *Cladonia* lichens, *Polytrichum* mosses and *Polypody* ferns on the capping of a Cornish hedge near the sea.

Many forms of lichen appear among the stones and bushes of the typical Cornish hedge, while the drier hedges, especially those near the sea, can be so thickly furred and encrusted with lichens of many species that the surface of the stone itself is no longer visible. Along the rab or peat topping of stone hedges an ancient scree garden of lichens and mosses often makes a subtly coloured tapestry as it has grown together there for centuries. Newly-built hedges will soon acquire their characteristic lichens, becoming more luxuriant and diverse as years pass.



Typical rosette formation of the *Parmeliaceae*, growing with mosses and other lichens on a granite hedge-stone.

The ubiquitous pale greyish- or yellowish-green leafy lichens which encrust the stones or the hedge-top trees and branches, their crinkled lobes usually arranged in a roughly circular shape, are of the *Parmeliaceae* family. *Flavoparmelia caperata* is among the more common, forming patches with rounded lobes and the wrinkled centre looking granular and yellowish-green. A number of



species of these foliaceous (leaf-like) lichens including crottle, *Parmelia saxatilis*, traditionally used as a wool dye, make neatly circular rosettes with their dry leafy lobes on the granite in Cornish and stone hedges. Closely related are *Hypotrachyna* species, making formless patches of divided, wavy lobes, greenish- or bluish-grey on the upper surface and dark, some quite black, on the reverse, which grow impartially all over bark and twigs, rocks and soil, so find the Cornish hedge a congenial home.

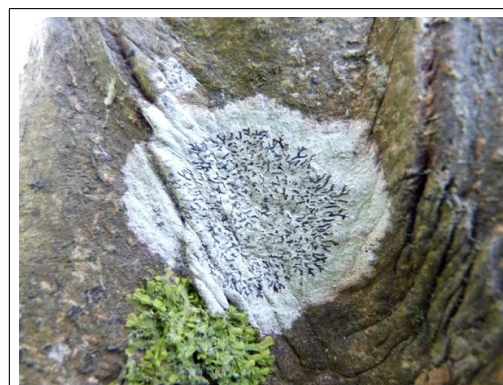
## DOGS' FANGS, CRABS' EYES AND BURNT JAM TARTS



The powdery pale grey-green *Lepraria* growing on shaded soil where stones have fallen from an old Cornish hedge.

Some of the smooth lichens have what looks like scribble writing or hieroglyphic symbols, usually in the centre of the roughly circular crust. One is actually named *Graphis scripta* and with others such as *Opegrapha vulgata* grows on the smooth bark of hedgetop trees.

The fruiting bodies of many species look like a lot of tiny jam tarts on a plate; burnt ones in the case of *Tephromela atra*, called black shields, which grows on granite hedge stones, particularly those very near the sea. Another lichen of the granite hedge is *Ochrolechia parella*, known as crab's eye lichen, which has a mass of these fruiting bodies like buttons tipped out of a tin.



A young patch of *Opegrapha vulgata* growing with a fine specimen of the liverwort *Metzgeria* on bark of hedge-top sycamore.



Dog lichen *Peltigera canina* on a dry Cornish hedge.

## ANCIENT BEARDS AND TINY EGG - CUPS

Often intermingled with the frilly lobes of *Flavoparmelia* and *Hypotrachyna* are the shaggy lichens that hang from the hedge-top trees like beards, so the whole of the twigs and branches are covered with the hoary effect that is a familiar part of the character of Cornwall; it enhances the ancient appearance of the hedges, their arthritic-looking trees like aged men in conclave 'where the beards wag all'. One of these is the common





Sea ivory *Ramalina siliquosa* bearding the chin of a stone in a dry Cornish hedge near the sea.

*Evernia prunastri*, which forms hanging tufts two inches long. Its branches fork like antlers, and it has a whitish powdery appearance. Other 'beards' are *Ramalina* species, of which sea ivory, *R. siliquosa*, liberally tufts the rocks in hedges near the sea. Very luxuriant 'beards' are *Usnea* species like bunches of tangled hair or rootlets, hanging down as much as three inches long; they grow on hedge-top trees and sometimes on the stones.

Another lichen that seems to breathe the very spirit of Cornwall is the brilliant orange-yellow *Xanthoria parietina* which covers old roofs and walls and gives a beautiful golden look to Cornish

villages when the sun shines. It likes to grow on cement and rocks enriched by seabird droppings, but will accept most Cornish hedge stone and in the hedges can give the effect of clusters of deep yellow flowers clinging to the stones. Then there is the strangely seaweed-looking *Anaptychia* which can often be found growing with these other lichens on coastal hedges.

The rab tops of stone hedges and the drier, heathy Cornish hedges are the best places to see *Cladonia* species, which enjoy the open aspect and acid soil and form intricate communities with mosses, heath plants and other lichens. *Cladonia* consist of a mat of small scales from which arise the reproductive bodies. Some, for example *C. portentosa*, look like a little forest of bare twiggy trees, or tiny fine stags' antlers. Others, of which the mealy pixie-cup lichen *C. chlorophaea* is probably the most common, stand up like tiny trumpets or egg-cups. These support the spore-producing structures, usually around the rim, which may be brown or red, looking very pretty with the floury-grey cups. *C. floerkeana* has little scarlet knobs on the stalks, a bit like the egg in the egg-cup; also known as devil's matchsticks.



The lichen *Anaptychia runcinata* looks like a very small seaweed.

There are around 1400 recognised British lichens, and it appears that Cornish hedges have not yet been properly investigated to discover how many of these they harbour. As with mosses, lichens require non-interference and a damp climate to reproduce, and their preferred



*Tephromela atra* (left) and (right) *Ochrolechia parella* on neighbouring stones in a long-established lichen community in a Cornish hedge.



Wide open cups of *Cladonia* on a dry Cornish hedge near St Just, a little past the egg-cup stage.



hosts are embodied in the structure and plant life of the hedges; hence Cornwall's hedges are a rich habitat for these fascinating life forms. Concentrated on bare stone and hedge top trees, they are probably less vulnerable to flail effects than herbaceous plants are, and though not able to combat ivy-smother may survive in reasonable strength. They are cheerful opportunists, as the six species growing on a fibreglass Dutton kit car, habitually parked next to a lichen-hosting Cornish hedge, can testify.

Yet, as with mosses, the flail is a terrible enemy of lichens in Cornish hedges. As its mulch enriches the soil, tall weeds grow up from the foot of the hedge, while gorse and ivy spread sideways in a thick mat covering the stones. Deprived of light and air by this heavy growth, the lichens immediately die. Even dry heath and maritime hedges, where the most ancient and diverse lichen communities flourish on the open stones, have been gradually overtaken by this tragic curse after years of unnecessary flailing.



*This beautiful old Cornish hedge near Cape Cornwall, built by a master craftsman and encrusted with many lichens, mosses and small ferns, is being destroyed by a thick mat of gorse as the flail forces it to spread across the face of the stones. This eliminates the lichens and in time loosens and dislodges the stones.*

## FUNGI IN CORNISH HEDGES

Fungi are another generally neglected class, again probably because they are odd little things and don't have pretty flowers. Their random and sporadic appearances are a discouragement to studying them, but they do give an element of thrill; suddenly fungi will materialise in a hedge where they have not been noticed before. Discounting that silent majority invisible to the naked eye, the larger kinds of fungus have a fascination of their own, even for the amateur naturalist. They are cheeky little chaps, popping up from nowhere and as quickly vanishing again, as if to cock a snook at the world; but even so they deserve better than the regrettable fashion for "fungus forays" whereby perfectly well-fed people go out to rob them for "fun" and a "gourmet feast", and no doubt think it all very clever as long as they don't eat the wrong kind by mistake. Fungal victims' revenge tends to be unpleasant and sometimes fatal. Better to enjoy a higher and more civilised pleasure by simply marvelling at their quaint forms and mysterious, necessary life with respect - and stick to eating farmed mushrooms. It is better to bring your trophy home in the form of a photograph, which does no harm.



*Tubaria furfuracea, a common little fungus of the "toadstool" type, growing among the hedge-bottom debris.*

Little enough is yet known of the purpose and action of fungi in nature's scheme, but that they are fundamental to the life process is well-established, with their intimate web-like involvement in

growth and decay. As with its other forms of life, the Cornish hedge can uniquely conserve a wide spectrum of types and species. There is an estimate bandied around (as with other statistics passing current, of obscure and hopefully not doubtful origin) that all the fungi in a hectare of typical meadow would come to about 3,000 kilograms in weight. Whatever interest applies to meadowland often applies to a Cornish hedge, and more so; here are plenty of the substances on which fungi like to grow, and the hedge provides a variety of undisturbed niches. If the hedge is properly managed, there will also be the essential periods of non-interference. Most fungi have the height of their season from July to November, so will thrive in a hedge that is correctly trimmed in January or February.

In traditional Cornish hedges there has always been a rich pageant of different kinds of fungi, from classic clusters of big woodland toadstools in shady hedges to the strange little black "earth tongues" emerging from the peaty capping of exposed stone hedges. Fungi are clever opportunists with the advantage of universality given to all spore-producing bodies, but they usually need a currently undisturbed habitat in which to grow and fruit. Their brief time and physical frailty make them vulnerable to human activity. Today they are disadvantaged in the hedges by ill-timed trimming and flail-induced habitat degradation, though some robust species may be able to survive on the detritus and damaged wood left by the flail. Fungi need three basic amenities:- dampness, a root-hold in decay, and air-space around their heads. The heavy flail-induced competition from coarse weeds and ivy is their worst enemy in the degraded hedge, while many died out in the dehydration of the hedgebank caused by years of summer flailing.

## BLACK BUNS, GOLDEN FRILLS, BROWN EARS AND DRIPPING INK

(not to mention in polite society, dogs' willies)

While the Cornish pisky's toadstool is familiar to everybody, there are many and various shapes and colours of fungi. Some are evident to the most casual glance, such as the bright orange-yellow *Tremella*, with its suitably Cornish-sounding name (though it actually means jelly-like), that bubbles out along decaying gorse branches on the hedge-top. Many of the fungi of dead or dying wood are to be found in the hedges, opportunely feeding on the flail's legacy of damage and die-back; it even kills the smaller hedge trees if



*Tremella mesenterica*, as golden as the locally-grown daffodils, flourishes on dying branches along the Cornish hedge.



The strange blue-black tongues of *Xylaria polymorpha* sticking out of an old stump in a Cornish hedge.

trimmed too hard and too often, and the vultures of the fungus world home in.

Easily-recognised characters along dead branches are the black *Daldinia concentrica* which looks like burnt buns and is aptly known as King Arthur's Cakes, and the rubbery red-brown ear fungus, *Auricularia auricula*. The species of trees growing on the hedge-top will affect the kinds of fungi present; *Daldinia* prefers to grow on dead branches of ash, *Auricularia* on elder, while the

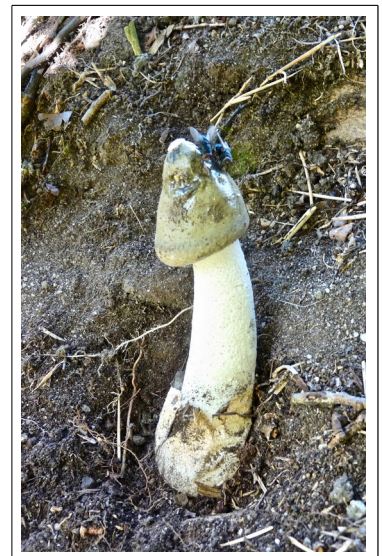




Bracket fungus *Polyporus squamosus*, the dryad's saddle, on a sycamore stump in a Cornish hedge.

common bracket fungus is *Polyporus squamosus*, more poetically named Dryad's Saddle, which frequently grows on sycamore in Cornish hedges instead of its preferred elms since so many died of the Dutch elm disease.

In the hedge bottom near woods and gardens where earth has been disturbed may occasionally arise the infamous Stinkhorn, *Phallus impudicus*, or the smaller Dog Stinkhorn *Muticus caninus*, which so offended Victorian sensibilities by their suggestive appearance. One of Charles Darwin's daughters, as a somewhat eccentric old lady, thought them so immoral and liable to corrupt the minds of the maids, she conducted a personal extermination campaign, hunting them down by their smell in the woods like a gleeful truffle-hound. [Gwen Raverat 1952, "Period Piece".] Perhaps Aunt Etty was not alone in enjoying the sport and this, as well as the flail-induced weed-smother, may be why they are not more often seen today. The Dog Stinkhorn illustrated here appeared from the soil overnight during rebuilding of a hedge where it had not been seen for at least forty years.



*Muticus caninus* with blue-bottle attracted by the scent.

On the damp side of a Cornish hedge, in the rich earthy humus at its base or around the stumps or roots of trees, may spring masses of the various ink-cap fungi, such as *Coprinellus micaceus* or less commonly *C. truncorum*, which is very similar but never has hairs on the stem. These can be quite spectacular as they rise in tiers up the side of the hedge. All the ink-caps have the peculiarity that as they age they deliquesce into a drippy black fluid. The hedges are also home to the common woodland fungi such as sulphur tuft and brittle cap, while in the drier hedges many meadow or heathland species may appear. As with the flowering plants, Cornish hedges with their widely differing ecological characteristics give opportunity to a great diversity of fungal life.



Ink cap *Coprinellus truncorum* growing on the north side of a Cornish hedge.

## FERNS IN CORNISH HEDGES

Taking mosses to be Mother Earth's vest and pants, then ferns are the frills on her petticoat. They are designed to be worn beneath her floral frock and shrubby overcoat, and kept modestly in the shade. The traditional Cornish hedge, however, is such an exhilarating situation that here she dances a can-can, showing the green frills exuberantly high among her skirts - but only as long as the petticoat itself is hidden in the floral folds. The fern roots need always to be damp, deep in the stony crevices among the mosses and leaf-litter beneath the herbage. In this way they can thrive uncharacteristically on the exposed, sunny hedgebank. Summer trimming soon discourages even the drought-tolerant *Polypody* as the hedge's earth core dries out completely. The flails, if taken too close to the hedgebank side, contact-kill all but the very small



*Common polypody fern growing with lichens on a dry Cornish hedge.*

specimens, tearing the whole fern bodily out of the hedge or smashing off its top. Ferns, like palms, are not designed to branch readily, and if the growing tip of the crown is damaged or removed they find it easier to die.

Fortunately, like all spore-producing subjects, they do find it easier to re-colonise, too, once (if) the murder ceases. On much-flailed hedges, if eased, the fern species can reappear quite soon, whereas more than half of the herbaceous species may be lost. Like mosses, lichens and fungi, ferns require only a suitable landfall and climate, as the spores are so numerous and lightly airborne that they are generally present on

the soil. The main reason Cornwall, with its damp climate, is not one huge mass of mosses, fungi and ferns is that in order to grow, most of them need three things: a constantly damp soil, not too much competition and no interference. They have no chance to establish on most of the land utilised by people, but the Cornish hedge is an ideal home for them as long as it is not flailed or closely trimmed at wrong times of the year.

Because the spores land from the ambient air, newly-built Cornish hedges may sooner acquire a normal fern population than a diverse herbaceous flora, which latter relies heavily on the seed-stocks already contained in the soil with which the hedge is topped when built. If the land on which the hedge is constructed has been depleted of its native seed by cultivation, the floral count will be poor and probably consist of docks, thistles, willowherb, chickweed and suchlike arable opportunists. It may be some years before the fertility falls and the less aggressive herbaceous species present in the soil or brought by natural seed-dispersal manage to colonise the hedge. Conversely the moss, lichen and fern count can be quite soon established, as if by magic, from the invisible drift of airborne spores.

The most obvious ferny fronds to be seen in Cornish hedges belong to the ubiquitous bracken (*Pteridium aquilinum*), which although known as "fern" to country people is of a



*Black spleenwort growing between the stones of a Cornish hedge in granite country.*



different family from the botanists' favourite ferns and can be recognised by its branching frond. Bracken is a sore point in association with Cornish hedges as it is one of the species turned rampant by flailing and has overwhelmed many a Cornish hedge where once, before the flail was introduced, it took its proper balanced place in the hedge flora.

## SQUEAKERS, WIGS, SHUTTLECOCKS AND FISH-BONES



*Hart's-tongue unrolls like carnival squeakers in spring.*

Among the flower-less plants, ferns receive the most notice with around 35 species recorded as having been found in Cornish hedges. Hart's-tongue has the greater number of hedge records for any one fern, as given for the year 2001. Taking the proportion of its hedge records (1097) to its non-hedge records (4484) and considering how few hedge records are usually taken - often only about 1% of the total number of records even for species commonly to be seen in the hedges - the hart's-tongue fern's score of 20% hedge records is noticeable. This locally abundant and well-loved fern, which unrolls its shining green leaves like carnival squeakers in spring, is surprisingly scarce in global terms, being mainly found in the old Celtic nations of the Atlantic seaboard; so Cornwall holds a significant proportion of the world's population, and probably the majority of those are homed in the hedges. This alone would seem to put an important obligation on the county to take proper care of them.

Sharing the hart's-tongue's eminence for abundance and easy recognition in Cornish hedges is the male fern, *Dryopteris filix-mas*, whose big green fronds grow in a circular, arching fan shape. The lady fern, *Athyrium filix-femina*, is of similar size and habit, but the lighter green, more finely-cut fronds give a daintier, lacy appearance. These two ferns, along with the broad buckler fern, *Dryopteris austriaca*, and the soft shield fern, *Polystichum setiferum*, are the soonest destroyed by the flail as they are the bigger and more prominent of the common Cornish hedge ferns. The smaller mountain male fern *Dryopteris oreades* is not quite so soon discouraged by being hit by the flails, as its crown is usually more protected between the hedge stones, but it is sooner overwhelmed by the thick mat of ivy and gorse induced by the flailing.

Even more handsome, and commonly found in acidic hedges, is the scaly male fern, *Dryopteris affinis*. With its large orangey scales and yellowish young fronds it appears gloriously golden among the pink, blue and white hedge flowers as it unfurls in the May sunshine. The soft shield fern prefers a basic soil, so more often appears in hedges in the less acidic parts of Cornwall. It can be distinguished easily from the male fern in spring as it unfurls differently, reflexing the frond-tip with its pale-backed curls as it opens out, and looking like a lawyer's wig. The



*The lady fern is daintier than the male.*

broad buckler fern can be distinguished as, instead of the frond growing closely all the way up its stem like a ladder, there is a much longer bare length of stem before the green frond begins, and the papery brown scales along the stem have a very dark brown blotch in the middle. Fern scales viewed under high magnification show fascinating differences in their patterns of cells. Another large fern which will grow in Cornish hedges, despite being supposed to need very boggy ground, is the ostrich fern, *Matteuccia struthiopteris*. The upright sterile green fronds grow around the crown in a perfect ring, another of its descriptive names being shuttlecock fern, and as the young fronds unfurl they curl like ostrich feathers.



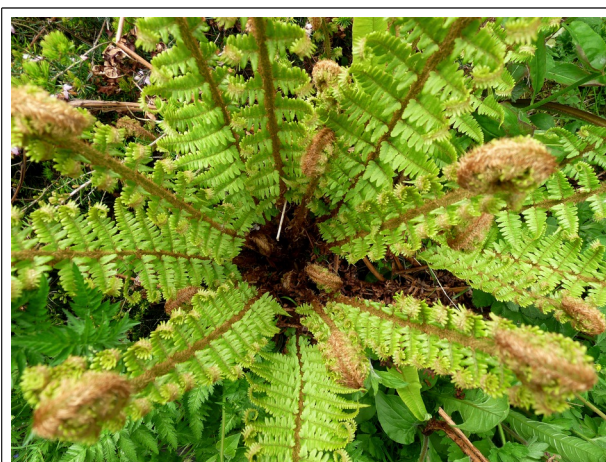
The soft shield fern uncurls in reverse, looking something like a lawyer's wig.



The big golden scaly male fern uncurling in a Cornish hedge in May.

Abundant along the upper half of many Cornish hedges and on the rab capping of stone hedges is the common polypody, *Polypodium vulgare*. It is the fern least vulnerable to flail-damage as it prefers a drier situation and it creeps laterally into many small crowns tight to the rocks rather than forming a protruding stump. Also once very common in Cornish and stone hedges is the black spleenwort, *Asplenium adiantum-nigrum*, whose small shiny emerald fronds with their dark stems are seen among the stones of the hedge where competition is less; though this pretty little fern has disappeared from so many hedges where the flail has induced a rank growth of coarse weeds, ivy and gorse. Where the hedge is deeply shaded by trees, usually growing with the hart's-tongue will be found the hard fern, *Blechnum spicant*, with its ladder-like sterile fronds lying flat and the fertile ones like a fish's backbone standing up. Less easily found are two fragrant ferns, the hay-scented buckler fern, *Dryopteris aemula*, and the lemon-scented fern, *Oreopteris limbosperma*.

Lime-loving ferns such as the spleenwort *Asplenium trichomanes*, which has each small frond a double row of tiny round leaves along the wiry black stem, and the rusty-back fern, *A. ceterach*, might occasionally be found in some Cornish hedges but certainly not in the abundance with which they colonise the lime-mortar in old walls and farm buildings. In hedges very near the coast the sea spleenwort, *Asplenium marinum*, may be found. Another less common one is the lanceolate spleenwort, *A. obovatum* ssp *lanceolatum*, with about 10% of its records given as found in hedges. The author personally, many years ago, saw the forked

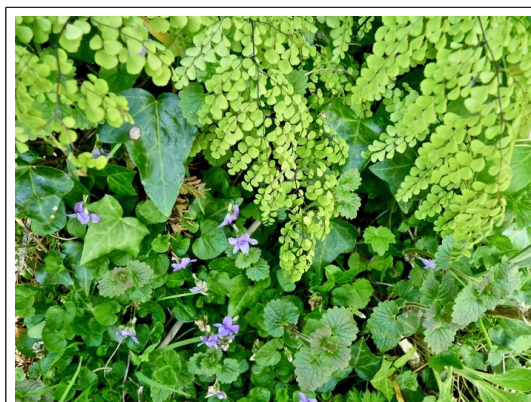


Looking down into the shuttlecock formation of *Matteuccia* with the fronds curling like ostrich feathers.



spleenwort, *A. septentrionale*, in a hedge near the cliffs, though this species was not believed to grow in Cornwall.

One of the interesting characteristics of ferns is that occasionally they produce variations, and as they have been for several thousand years established in Cornish hedges there is always the chance that these differences may have evolved there; frilly-edged versions of the hart's-tongue fern, for example, are sometimes to be found in hedges. The enthusiast must be warned against uprooting. It is a criminal offence to dig up wild-growing species, even common ones, without the land-owner's permission. Even if permission is gained, plants taken out of Cornish hedges are like wild animals torn from their native home and are distressingly likely to die. It should not be necessary to say this, but enthusiasts have been known to be one of nature's enemies, as the Victorians showed by collecting many plants to near-extinction. The then wildly popular maidenhair fern, for instance, which still grows in inaccessible niches on the cliffs, would be unlikely to be found growing wild in a Cornish hedge today.



*Maidenhair fern growing in a Cornish hedge in a garden with common violet and ground ivy.*

Had it not been for the depredations of fern-mania and the more recent slaughter by flail, our hedges would doubtless today contain many more interesting fern varieties. Those that are left must be cherished with respect in their long-established habitat, the Cornish hedge.

## CONCLUSION - THE CLIMATE CRISIS

The flowerless plants are among the more vital indicators of planet health, and the more important factors in recovering and maintaining it. All need, and conserve, moisture. Mosses, in particular, hold massive amounts of water, cool the atmosphere, sequester carbon and methane and reduce run-off and flooding. It is time to stop thinking only in terms of restoring peat bogs, and consider the disruption to natural distribution of ordinary moss. There is not so much virtue in buying peat-free compost, if you go home and hoe all the moss off the sides of your garden path. Walking will keep the middle part clear for you, as efficiently as the trampling to death of Marquand's rain forest. Don't pay to have the moss cleaned from your roof. It won't do any harm there. The urgent need is to leave Nature alone to get on with her now thankless task of trying to repair her systems. One good way to start is to fall out of love with the strimmer, the flail and the chemicals, to be out with bald tidiness, and fall in love with moss.

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With thanks to Colin French for kindly taking time and trouble to extract hedge records from his database. Other source material is from personal observation, using standard field and laboratory textbooks for identification, as follows:-

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The following websites have been helpful and are gratefully acknowledged:

[www.britishlichens.co.uk](http://www.britishlichens.co.uk)

[www.commanster.eu](http://www.commanster.eu)

[www.irishlichens.ie](http://www.irishlichens.ie)

[www.lichens.lastdragon.org](http://www.lichens.lastdragon.org)

[www.stridvall.se](http://www.stridvall.se)

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