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THE LICHENS OF THE DALE PENINSULA AND OTHER NEARBY LOCALITIES

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The various cortciolous and saxicolous lichen communities of the Dale Peninsula and some other nearby localities are described, particular attention being paid to woodlands and stone walls. The more important species in these communities are included in simple field guides for their identification, while all lichens recorded in the areas covered are mentioned in the annotated species list.

Introduction

THE lichen flora of this south-west corner of Pembrokeshire is interesting and reasonably varied without being, by any means, exceptional. Perhaps the best developed communities are those inhabiting rocky shores but since these lichens were dealt with in a previous paper (Ferry and Sheard, 1969) they will only be included in the annotated species list at the end of this paper. A number of lichen records already exist for the Dale Peninsula and other nearby localities, mostly contributed by Wade (Wade, 1960) and a few by Wallace and Kershaw, but to date no reasonably comprehensive survey of the lichen flora has been made. These previous records will be incorporated into this paper unless the author believes there is reason to doubt their validity. The questionable records are mostly those of visiting parties of students to Dale Fort.

The most important lichen communities at Dale, apart from those on rocky shores, are those in woodlands and on stone walls and attention was therefore concentrated on these. Some habitats, abundant elsewhere in Wales and generally in the north and west of the British Isles, are poorly represented at Dale. For example there are few natural rock outcrops on the Peninsula comparable with those on Skomer and Skokholm Islands (Sheard and Ferry, 1965) and the only heathland is a small area in the Deer Park. Calcareous habitats are restricted to Dale Fort itself, which is built largely of Carboniferous limestone, and to concrete stonework and the mortar of stone walls. In addition the woodlands are clearly artificial, consisting of an unnatural mixture of rather evenly aged trees. The lichen flora in such a habitat is never comparable with that in a more natural woodland. Really old trees, which invariably carry the richest and most interesting lichen flora, are rare although a few isolated ones do occur outside of the woodlands, e.g. the elms in a field near Monks Haven church. There are therefore a number of fairly specific reasons for the lack of a really varied lichen flora here. In addition, as Dalby points out in his paper on the bryophytes of Dale (Dalby, 1966), the rainfall of this region is somewhat lower than that in other areas of the north and west of the British Isles, and so conditions cannot generally be very humid especially in the summer. This may be important in the woodlands in view of their rather "open" character. It is unlikely, however, that exposure to wind plays an important part in reducing the humidity levels in the woodlands because Point Wood and Castlebeach Wood lay, for the most part, on north-facing slopes and are therefore sheltered from the prevailing winds. Apart from these considerations there is the further possibility that winds laden with salt spray influence the lichen flora of the region as a whole.

A brief comment is perhaps relevant on possible pollution damage to lichens at Dale. Some damage was noticed on the thalli of a few corticolous foliose lichens but generally this was restricted to the upper fringes of the woodlands and was very slight. In the author's opinion this damage is more likely to be due to cold and wind effects. The only potential source of atmospheric pollution would seem to be the nearby oil refinery but this lies some few miles to the east and, it is hoped, does not present a serious threat to the local lichen flora.

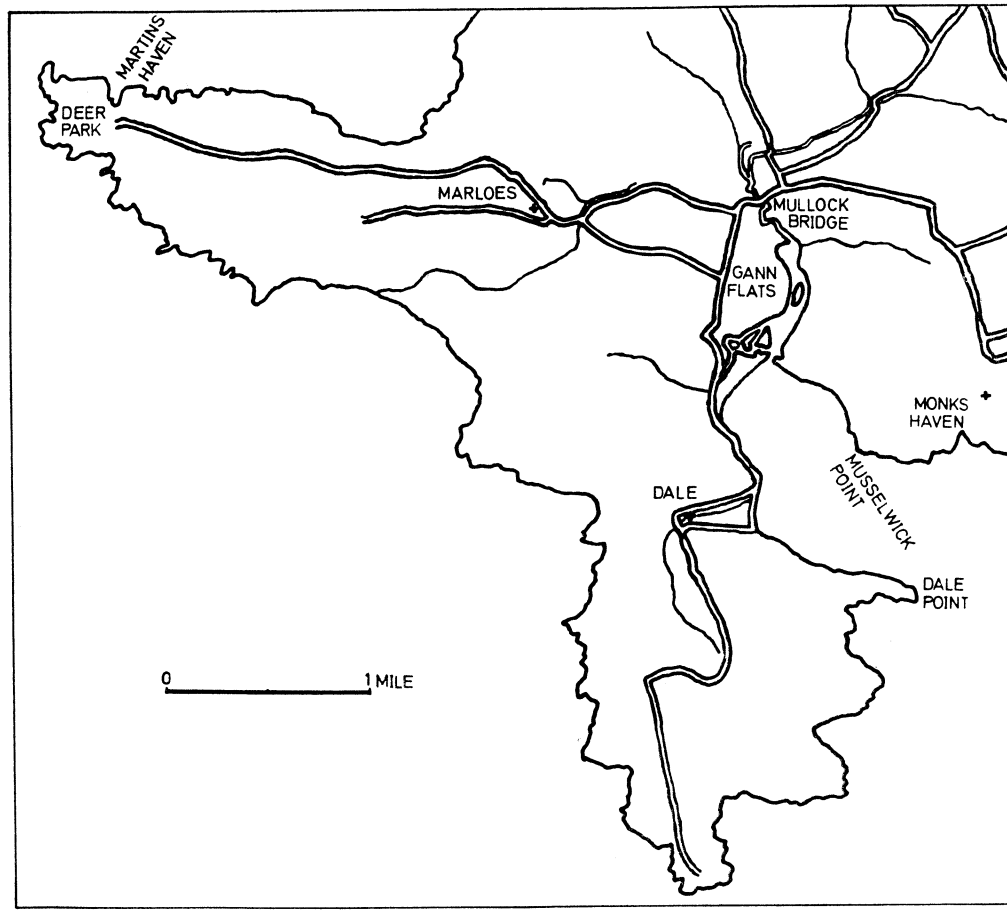


FIG. 1

HABITATS INVESTIGATED

Corticolous communities

Attention was concentrated on Point Wood and Castlebeach Wood because these are both easily accessible to visitors staying at the field centre. Both are dominated by ash and sycamore and contain scattered specimens of beech, elm and oak (the latter mainly in Point Wood) and the occasional conifer. Within the two woods the lichen cover on the trunks looks uniform with little obvious variation between the different species of trees, a fact which has been noted before in mixed woods. This is attributable according to Barkman (Barkman, 1958) to factors such as relative humidity, light intensity and shelter being the overriding ones in the closed

woodland environment. Inherent differences in tree bark are believed to be more important in isolated trees, and certainly it is the case that such trees usually carry their own distinctive floras.

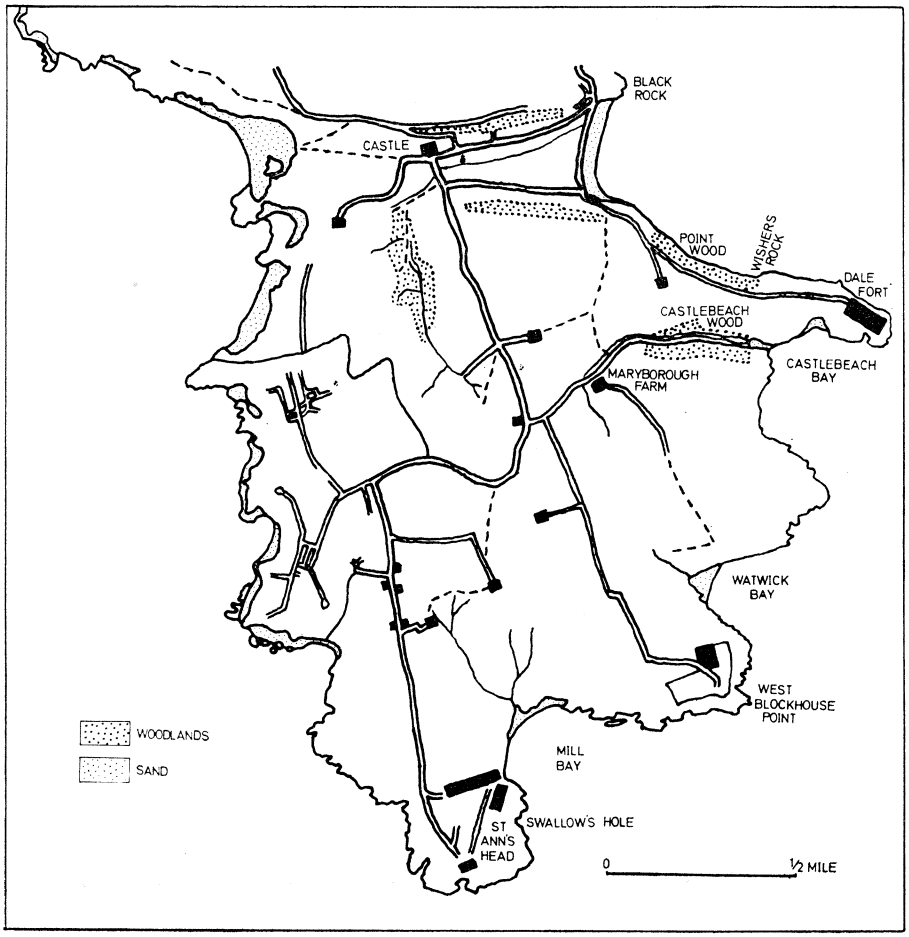


FIG. 2

Closer inspection of individual trunks does, however, reveal a few fairly distinct lichen communities. The most obvious of these is one dominated by some species of the foliose genus *Parmelia*, plus a few less obvious crustose lichens. It occupies much of the circumference of the trunks from a few feet above the ground to many feet up towards the canopy. *Parmelia caperata*, *P. perlata*, *Lecanora expallens* and *L. chlarotera* are the most important species in terms of constancy of occurrence. Other frequent species are *Parmelia sulcata*, *P. saxatilis* and *P. glabratula*. *Usnea fragilescens* occurs in both woods but is much more common at the upper (southern) margin of Castlebeach Wood where conditions are undoubtedly different from those within the wood. This species and other lichens occupying this particular ecological niche belong to another distinct community which will be discussed later. *Evernia prunastri* occurs in Point Wood where it is frequent on oak. Two crustose lichens with lirellate apothecia, *Graphina anguina* and *Opegrapha atra*, are of interest. *Graphina anguina* occurs mainly in Point Wood but was not recorded once on ash. *Opegrapha*

atra is less frequent within the woods and appears to prefer younger branches and twigs. It is certainly plentiful in this situation by the roadside leading to Dale Fort.

A second particularly distinct community is that comprising two crustose species, *Enterographa crassa* and *Pyrenula nitida*. It occurs on all tree species, with the possible exception of oak, at the same height on trunks as the previous community. The position of these two communities around the trunk circumference seems to vary somewhat although the tendency is for the community dominated by *Parmelia* species to occupy the south-west sector and the *Enterographa-Pyrenula* community the north-east sector. Obviously this is a problem worth investigating, particularly with regard to local variations of light intensity and relative humidity within the woods.

Another community, represented by *Lepraria candelaris*, occurs on the lower parts of the trunks of oak, ash and elm, all tree species with a rough bark. The lichen grows particularly in the fissures of the bark. It is often accompanied by *Calicium viride* which may well have been overlooked at Dale.

All three communities discussed so far occur on the trunks of trees. The lichens of the woodland canopy form a further distinct community. Kershaw in his studies of the vertical zonation of lichens on trees at Dale, noted that most species have a strong preference for a particular vertical zone, and it would seem possible therefore to recognize perhaps a number of communities ranging from those at ground level to those on the ultimate twigs. This number is considerably increased when aspect and local variations on trunks, e.g. the presence of rain tracks, are considered. The canopy community is worth examining not only for the interesting species it contains, but also because of the questions posed regarding the initial colonization of young twigs by lichens. Kershaw (Kershaw, 1964) gives *Parmelia subaurifera* as a colonizer of older twigs of both ash and sycamore at Dale with additionally on ash, *P. aspera* and *Rinodina sophodes*. *Lecidia limitata*, *Physcia aipolia* and *Opegrapha atra* occurred on the youngest twigs of ash and are therefore considered the first colonizers. Oak, which Kershaw examined in North Wales, seems to have a similar twig flora to sycamore.

Unfortunately the canopy of mature woodland trees is generally rather inaccessible but useful observations can often be made at the margins of woods. In Castlebeach Wood the southern boundary at the top of the wood is particularly informative. In this exposed situation, where conditions are probably fairly similar to those in the canopy of the woodland below, the trees are relatively small and the twig and small branch community is easily observed. It is composed of species of *Physcia* (*P. aipolia*, *P. leptalia*, *P. pulverulenta* and *P. orbicularis*) and *Ramalina* (*R. fastigiata* and *R. farinacea*) together with *Xanthoria parietina* and *Lecidea limitata*. *Rinodina sophodes* and *Parmelia aspera* were recorded on twigs of isolated sycamores near Castlebeach Wood and Point Wood respectively. From the author's observations, ash and sycamore would seem to be fairly similar, ash possessing perhaps a slightly richer flora. It should be emphasized, however, that twig communities of woodland canopy and woodland margin may not be strictly comparable where the woodland abuts onto cultivated or grazed land. The roadside leading to Fort Dale is also bordered by trees with an easily accessible twig flora, but conditions by roadsides are usually different from those elsewhere because of such factors as dust which influence lichen growth. Quite clearly the factors governing the distribution of these various twig communities are complex.

Usually lichen and bryophyte communities do not overlap much although they undoubtedly compete for space to some extent. A group of lichens which occupy a particular ecological niche, although they may not form a distinct community, are those growing amongst mosses on trunks. Some of the *Parmelia* community mentioned earlier fall into this category, e.g. *P. perlata*, but other constituents are more uncommon elements of the lichen flora of Dale. They include *Dimerella lutea* and *Sticta limbata* on ash, *Normandina pulchella* on ash and sycamore, *Collema furfuraceum* on elm in Castlebeach Wood and *Cladonia caespiticia* and *C. pyxidata* on the bases of trunks. More exotic lichens of this type of habitat such as *Lobaria pulmonaria* and other related foliose species are missing from the Dale woodlands because of the dearth of old trees and the lack of a sufficiently high level of relative humidity.

Table 1. *The important lichens of the woodland communities*

	Canopy		
	Parmelia aspera	Lecidea limitata	
	P. subaurifera	Physcia aipolia	
	Rinodina sophodes	Opegrapha atra	
	Main Trunk		
Mossy Trunks	Parmelia perlata		*Woodland Margin*
Normandina pulchella	P. caperata		Usnea fragilescens
Dimerella lutea	P. sulcata		Ramalina fastigiata
Sticta limbata	P. saxatilis		R. farinacea
Collema furfuraceum	P. subrudecta		Physicia aipolia
	P. glabratula		P. leptalea
	Lecanora expallens		P. pulverulenta
	L. chlarotera		P. orbicularis
	Evernia prunastri		Lecidea limitata
	Usnea fragilescens		Xanthoria parietina
	Graphina anguina		Opegrapha atra
	Opegrapha atra		
	Phlyctis argena		
	Catillaria griffithii		
	Pertusaria species		
	Pyrenula nitida		
	Enterographa crassa		
Mossy Tree Bases	*Tree Bases*		
Cladonia caespiticia	Lepraria candelaris		
C. pyxidata	L. incana		

Brief mention should be made of one or two other, non-woodland, corticolous communities. As was mentioned earlier old trees away from woodlands usually carry a rich lichen flora, and this is the case with two large elms in a field near Monks Haven churchyard. The number of species recorded on these was seventeen compared with an average of less than eight on the various tree species within the woodlands. *Bacidia rubella* and *Buellia canescens* are worth particular mention, the former species also occurring on an elm in Dale churchyard. In the same locality as the two elms some alders and apples repay close scrutiny. *Graphis elegans* was recorded on one alder and is a rare species at Dale. *Usnea rubiginea*, a rather striking orange-red species, was recorded on an apple tree in the old walled orchard.

Saxicolous communities

As was mentioned in the introduction stone walls provide perhaps the best habitat for saxicolous lichens in and around Dale. A number were examined

including the church and churchyard walls and gravestones of Dale, Marloes and Monks Haven as well as various walls in Dale Village, particularly near the castle. Mullock Bridge at the head of the salt marsh proved to be another good habitat. The lichen communities of these various sites include a rather mixed array of species, many of which occur on the acid stones used in the walls, while others are restricted to mortar between the stones, concrete stonework or calcareous gravestones. This division into acid and basic habitats is perhaps the most important one together with aspect. Sites facing the prevailing winds, i.e. towards the south-west, receive most light and are drier and more exposed. The common species for these various sites are given in Table 2. The total species list for each of the sites is between fifteen and twenty except for Marloes churchyard where it exceeds thirty and in each case more than half of the species are either strict calcicoles or have a preference for basic habitats. Of these *Collema crispum*, *Toninia aromatica*, *Lecania erysibe* and *Buellia alboatra* are characteristic of mortar in old walls. Less common species recorded in this particular habitat are *Catillaria lenticularis*, *Protoblastenia monticola*, *P. rupestris* and *P. immersa*. Apart from growing on mortar and other obviously basic substrata these calcicolous species are frequent on acid stones impregnated with lime from mortar.

Table 2. *The common lichens of the stone wall communities*

	Dale church	Dale village	Marloes church	Monks Haven church	Mullock bridge
Lecanora calcarea[2]	+	+	+	+	+
L. campestris	+	+	+	+	+
L. dispersa[1]	+	+	+	+	+
Buellia canescens[1]	+	+	+	+	+
Caloplaca citrina[1]	+	+	+	+	+
Ochrolechia parella	+	+	+	+	+
Verrucaria nigrescens[1]	+	+	+	+	+
Caloplaca ferruginea	+	+	+		+
C. heppiana[1]		+	+	+	+
Collema crispum[2]		+	+	+	+
Lecanora atra	+	+	+		+
Buellia alboatra[1]		+	+		+
Catillaria chalybeia		+	+		+
Lecania erysibe[1]		+	+		+
Rhizocarpon obscuratum		+		+	+
Toninia aromatica[2]		+	+	+	
Acarospora fuscata	+	+			
Buellia stellulata		+	+		
Lecidea subincongrua	+			+	
Opegrapha saxicola			+		+
Parmelia caperata	+		+		
P. glabratula	+		+		
Physcia adscendens		+	+		
Protoblastenia monticola[2]				+	+
P. rupestris[2]				+	+
Rhizocarpon geographicum	+		+		
Rinodina subexigua	+		+		

[1]Prefer basic habitats [2]Strict calcicoles

The walls of Dale Fort itself are of Carboniferous limestone and consequently the lichen flora consists of a number of calcicolous species most of which are recorded on mortar and concrete elsewhere. *Lecanora calcarea*, *Caloplaca aurantia* and *C. heppiana* are prominent among these. *Racodium rupestre*, a species with a preference for basic rock, occurs on a shaded damp wall near the entrance to the fort. Other

noteworthy species are *Cladona rangiformis* and *C. pocillum* which grow on basic soil associated with the limestone.

The shingle of Gann Flats, lying next to the salt marsh, provides an area of natural stone which is mainly acid in nature. A total of thirty-two species, none of which are strict calcicoles, were recorded on the pebbles. A list of the common species is given in Table 3. Rock outcrops in the Deer Park provide another area of natural stone on which a number of species not recorded elsewhere occur including *Lecidea sulphurea*, *L. pantherina*, *L. fuscoatra* and *Lecanora gangaleoides*.

Table 3. *The lichens growing on pebbles, Gann Flats*

Abundant species		
	Caloplaca citrina	Parmelia saxatilis
	C. marina[1]	P. glabratula
	Lecanora campestris	Rinodina luridescens
	L. dispersa	R. subexigua
	Ochrolechia parella	Verrucaria nigrescens
	Rhizocarpon obscuratum	Xanthoria parietina
Frequent species		
	Acarospora smaragdula	Lecidea albocaerulescens
	Buellia stellulata[1]	L. macrocarpa
	Caloplaca ferruginea	L. subincongrua[1]
	C. thallincola[1]	Parmelia perlata
	Catillaria chalybeia	Ramalina siliquosa[1]
Rare to occasional species		
	Acarospora atrata[1]	Buellia verruculosa[1]
	A. veronensis	Candelariella vitellina
	Bacidia umbrina	Lecanora polytropa
	Buellia subdisciformis[1]	Physcia tenella

[1] Maritime species.

As was stated earlier the saxicolous marine and maritime lichens have been covered in a previous paper. However, an intensive search of the back of the shore below Point Wood, mostly above the supralittoral zone, revealed a number of interesting species especially in the vicinity of Wishers Rock. Two, *Nephroma laevigatum* and *Lobaria scrobiculata*, are characteristic of more moist western localities. Others characteristic of moist shaded rocks and rock crevices are *Solenopsora holophaea*, *S. vulturiensis*, *Parmeliella atlantica* and *Stereocaulon microscopicum*, the first three being maritime species.

Terricolous communities

These are poorly represented at Dale. A few *Cladonia* species occur on the thin soil amongst the pebbles of Gann Flats, notably *Cladonia furcata*, *C. chlorophaea* and *C. rangiformis*. Others occur in the Deer Park in *Calluna* heath areas, including *C. tenuis*, *C. arbuscula* and two with red fruits, *C. floerkeana* and *C. coccifera*. *Peltigera polydactyla* was also recorded here.

Collection and identification

Lichens are easy to collect and to store in herbaria, and collection is often necessary to enable critical identifications to be made in the laboratory where microscopic characters and chemical tests can be used. However, it is worth stressing the importance of restricting collecting as much as possible especially in an area like Dale

where collecting pressure is great. For this reason simple field guides are provided in this paper to allow identifications to be made in the field as far as possible. These guides include only characters which can be readily checked in the field. In some instances it has to be admitted, identification based on field characters alone is virtually impossible except perhaps by experienced lichenologists. In the guide to saxicolous lichens for example, *Lecania erysibe* is bound to present problems. Any student wishing to pursue the business of lichen identification further should refer to the volume by Duncan and James, *Introduction to British Lichens*. This includes many detailed keys and much other useful information on the structure and ecology of lichens.

A glossary of terms included in the guides is given below.

GLOSSARY TO THE GUIDES

ACRID. Tasting bitter and hot.

APOTHECIUM (pl. APOTHECIA). An open disc-shaped fruiting body, if less than 1 mm. diam. then SMALL, if greater than 1 mm. diam. then LARGE.

CILIUM (pl. CILIA, adj. CILIATE). A hair on a thallus or fruit.

CONCAVE. Forming a shallow pit in a thallus (an apothecium).

CRUSTOSE. Forming a crust closely adhering to the substratum (a thallus).

CYPHELLA (pl. CYPHELLAE, adj. CYPHELLATE). A small rimmed depression in a thallus, pale in colour.

EULITTORAL ZONE. The zone of shore delimited by the upper edge of the *Laminaria* seaweeds and the upper limit of the barnacles.

FOLIOSE. Leafy and more or less prostrate (a thallus).

FRUTICOSE. Upright or pendulous, attached to the substratum at a single point (a thallus).

IMMERSED. Embedded in a thallus (apothecia or perithecia).

ISIDIUM (pl. ISIDIA, adj. ISIDIATE). A finger-like growth of a thallus, which does not interrupt the cortex of the thallus.

LEPROSE. Entirely sorediate (a thallus).

LIRELLA (pl. LIRELLAE, adj. LIRELLATE). An elongated apothecium.

LITTORAL FRINGE. A zone of shore delimited by the upper edge of the barnacles and the upper limit of *Verrucaria maura*.

PERITHECIUM. A globose fruiting body with an apical pore.

PRUINOSE. Covered with a powdery bloom.

PSEUDOCYPHELLA (pl. PSEUDOCYPHELLAE, adj. PSEUDOCYPHELLATE). In *Parmelia* and *Physcia* species it takes the form of a tiny whitish dot on the thallus.

PYCNIDIUM. A similar structure to a perithecium but containing pycnidiospores instead of ascospores in asci.

RHIZINA (pl. RHIZINAE). A root-like strand.

SERPENTINE. Wavy (a lirella).

SORALIUM (pl. SORALIA). A cluster of soredia forming a plaque.

SQUAMULE. A small leaf-like piece of thallus.

SUPERFICIAL. On the surface of a thallus (an apothecium).

SUPRALITTORAL ZONE. The zone of shore above the upper limit of *Verrucaria maura*.

THALLINE MARGIN. An apothecial margin the same consistency and colour as the thallus.

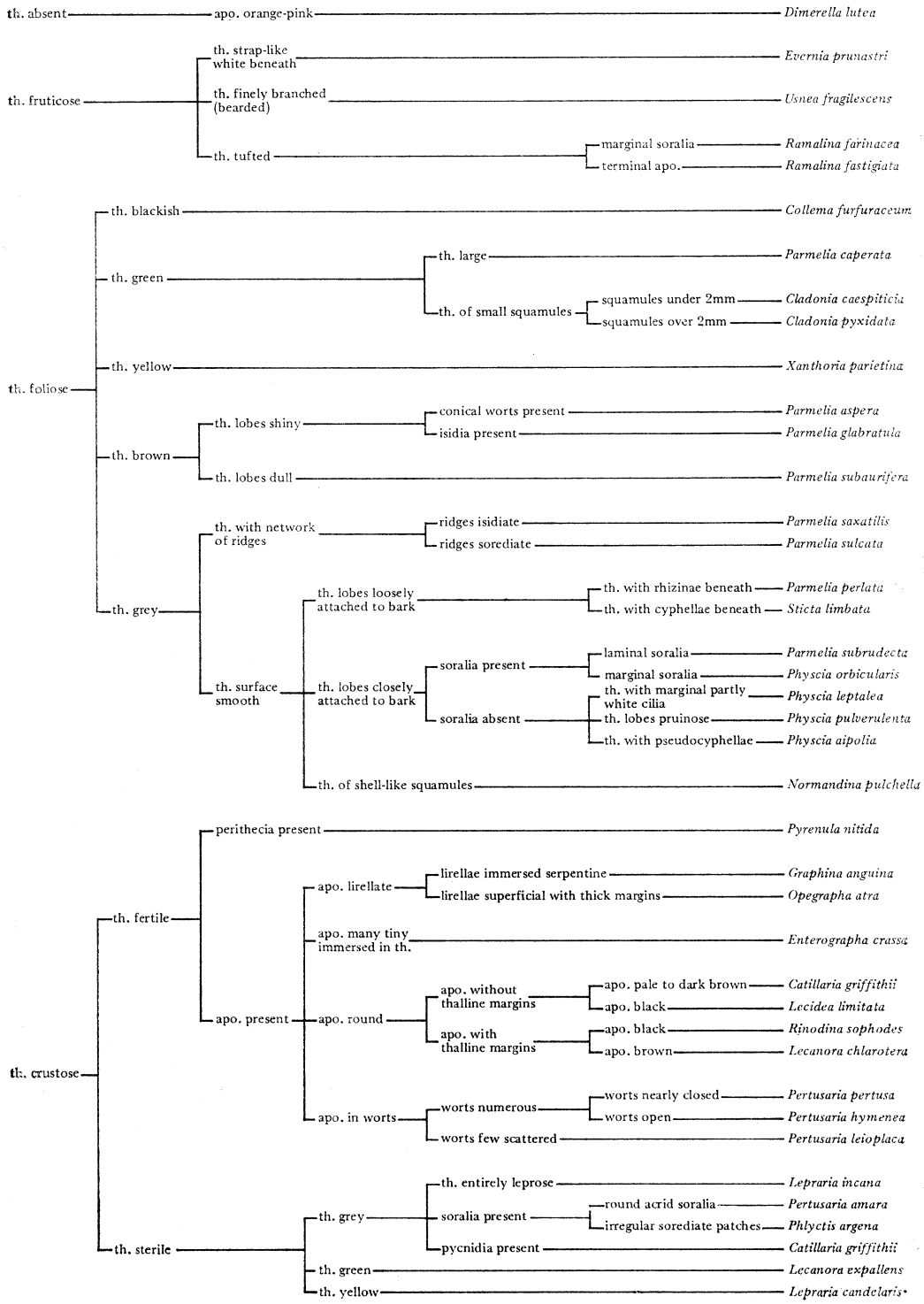
THALLUS (pl. THALLI). The vegetative part of a lichen.

TURGID. Swollen (squamules or a thallus).

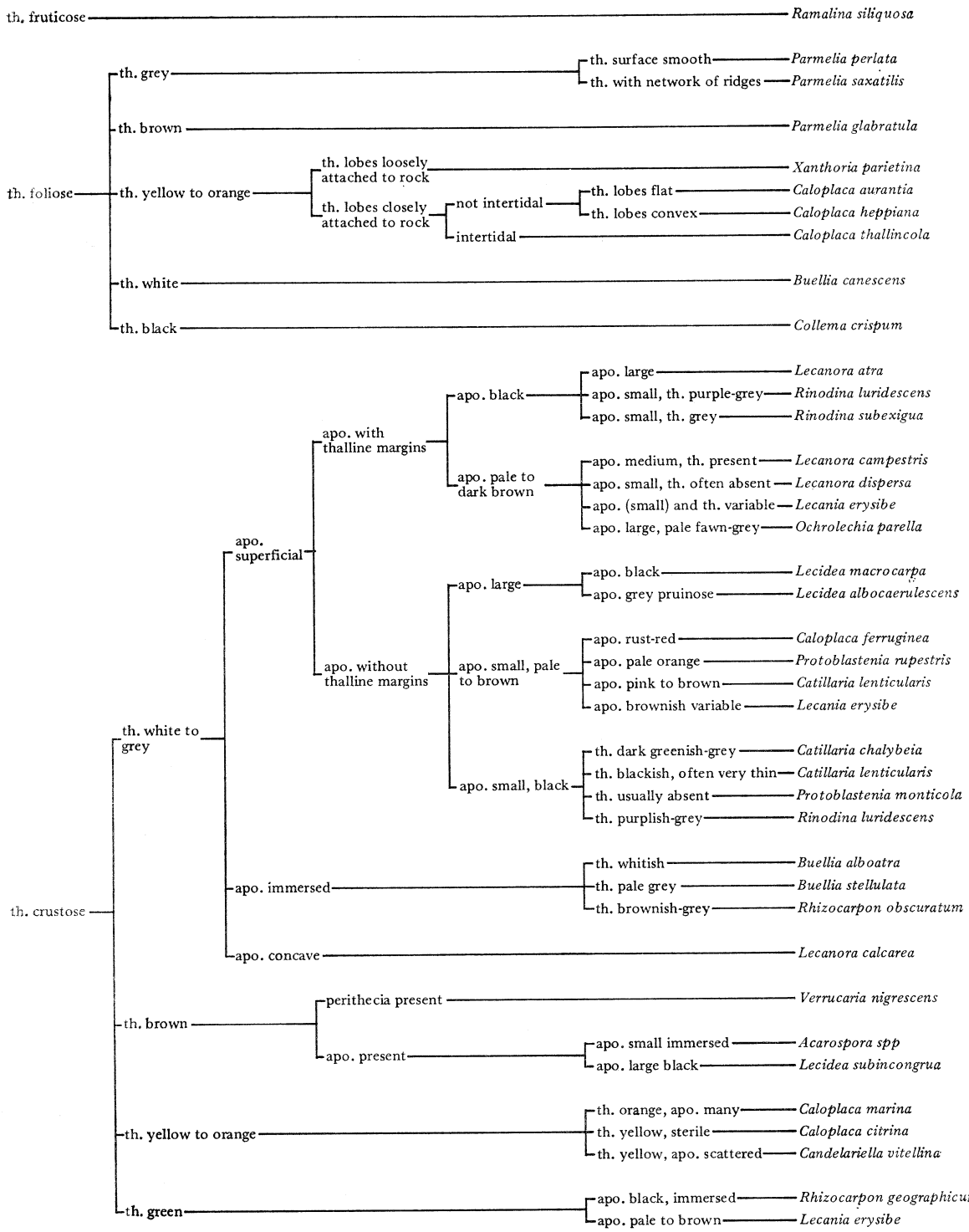
ANNOTATED SPECIES LIST

The list contains all of the species, including those of rocky shores, recorded by the author plus a few records made by other visitors to the area. Species are arranged according to the latest check list (James, 1965). The following abbreviations are used:

A.E.W.	Mr. A. E. Wade
K.A.K.	Dr. K. A. Kershaw
N.W.	Miss Nancy Wallace
C.D.P.	Dr. C. D. Pigott



Guide to the Common Corticolous Species at Dale



Guide to the Common Saxicolous (excluding most maritime) Species at Dale

Acarospora atrata Hue. Single record on pebble, Gann Flats.
A. fuscata (Nyl.) Arnold. On walls, Dale churchyard and near Dale Castle.
A. opaca Magnusson. On rock, Dale Fort (A.E.W.).
A. smaragdula (Wahlenb. ex Ach.) Massal. Occasional, perhaps frequent, on pebbles, Gann Flats. On small rock outcrop, St. Ann's Head.
A. veronensis Massal. Occasional on pebbles, Gann Flats. On small rock outcrop, St. Ann's Head.
Anaptychia fusca (Huds.) Vain. Frequent on rocks in the supralittoral zone. On rock outcrops, Deer Park. On ash by Dale Fort road.
Arthonia lapidicola (T. Tayl.) Deichm. Br. & Rostr. Doubtful single record on wall, Marloes churchyard.
A. radiata (Pers.) Ach. Single record on sycamore near Monks Haven beach. On apple in same locality (A.E.W.)
Arthopyrenia alba (Schrad.) Zahlbr. Rare on ash and sycamore, Castlebeach Wood. On ash by Dale Fort road. On elm near Monks Haven churchyard.
A. biformis (Borr.) Massal. Monks Haven Wood (A.E.W.).
A. halodytes (Nyl.) Arnold. Common in the eulittoral zone on barnacle and limpet shells and also on rocks.

Bacidia endoleuca (Nyl.) Kickx. Single record on elderberry, Castlebeach Wood.
B. rubella (Hoffm.) Massal. On trunks of old elms, Dale churchyard and field near Monks Haven church.
B. scopulicola (Nyl.) A.L.Sm. Single record on Wishers Rock below Point Wood.
B. umbrina (Ach.) Bausch. Rare. On pebbles, Gann Flats and on Wishers Rock.
Bacidia sp. An unidentified species with a blue-grey thallus was recorded on rocks in the supralittoral zone, Castlebeach Bay, south shore.
Buellia alboatra (Hoffm.) Deichm. Br. & Rostr. On walls, near Dale Castle, Marloes churchyard and Mullock Bridge, usually on mortar. On rocks in the supralittoral zone, Musselwick Point.
B. canescens (Dicks.) DNot. Common on walls. Occasional on rocks in the supralittoral zone below Point Wood and Dale Point. On elm in field near Monks Haven church.
B. chlorophaea (Hepp ex Leight.) Lett. Frequent in the supralittoral zone on sunlit rocky shores. On wall, Marloes churchyard. On small rock outcrop, St. Ann's Head.
B. stellulata (T.Tayl.) Mudd. On walls, Marloes churchyard and near Dale Castle. On pebbles, Gann Flats. On rocks in the supralittoral zone, Dale Point.
B. subdisciformis (Leight.) Vain. On rocks in the supralittoral zone, Watwick Bay, Mill Bay and Martin's Haven. Also Dale Point (C.D.P.).
B. verruculosa (Sm.) Mudd. Rare on pebbles, Gann Flats.

Caloplaca aurantia (Pers.) Hellb. On walls, Dale Fort. On gravestone, Dale churchyard.
C. caesiorufa (Wibel.) Flag. On Black Rock (N.W.)
C. citrina (Hoffm.) Th. Fr. Common on walls and on pebbles, Gann Flats.
C. cerina var. *chlorina* (Flot.) Mull. Arg. Rare on rocks in the supralittoral zone.
C. ferruginea (Huds.) Th. Fr. Common on walls. On pebbles, Gann Flats. Frequent on rocks in the supralittoral zone.
C. granulosa (Mull. Arg.) Jatta. Occasional on rocks in the supralittoral zone, Dale Point, Black Rock and St. Ann's Head. A nitrogenous species.
C. heppiana (Mull. Arg.) Zahlbr. Common on walls. On limestone walls, Dale Fort.
C. holocarpa (Hoffm.) Wade. On rocks, Castlebeach Bay (N.W.). On limestone walls, Dale Fort (A.E.W.).
C. marina (Wedd.) Zahlbr. Common in the lower supralittoral zone on all sunlit rocky shores. On pebbles, Gann Flats.
C. thallincola (Wedd.) Du Rietz. Frequent in the lower supralittoral zone on rocky shores.
Candelariella vitellina (Hoffm.) Mull. Arg. Frequent on walls. On pebbles, Gann Flats. Frequent lining cracks in rocks of the supralittoral zone.
Catillaria chalybeia (Borr.) Massal. Common on walls and rocks near Dale Castle and on Mullock Bridge. On pebbles, Gann Flats. Occasional on rocks in the supralittoral zone.
C. griffithii (Sm.) Malme. Occasional on ash, sycamore and oak, Castlebeach Wood and Point Wood. On willow near Maryborough Farm.
C. lenticularis (Ach.) Th. Fr. On mortar, Marloes churchyard and on limestone walls, Dale Fort. Rare on pebbles, Gann Flats. Rare on rocks in the supralittoral zone.

C. littorella (Nyl.) Zahlbr. On rock by roadside opposite Dale Cemetery.
C. nigroclavata (Nyl.) Schul. Doubtful record for Wishers Rock.
Cetraria glauca (L.) Ach. Single record on ash by Dale Fort road.
Cladonia arbuscula (Wallr.) Rabenh. Amongst *Calluna*, Deer Park.
C. caespiticia (Pers.) Florke. Occasional amongst mosses on the lower trunks of trees, Castlebeach Wood and Point Wood.
C. cervicornis (Ach.) Flot. On soil, Dale Fort.
C. chlorophaea (Florke ex Sommerf.) Spreng. On soil, Dale Fort and amongst pebbles, Gann Flats.
C. coccifera (L.) Willd. Amongst *Calluna*, Deer Park.
C. coniocraea (Florke) Spreng. On soil, Dale Fort and amongst *Calluna*, Deer Park.
C. floerkeana (Fr.) Sommerf. Amongst *Calluna*, Deer Park.
C. furcata (Huds.) Schrad. On soil amongst pebbles, Gann Flats. On soil, Dale Fort (A.E.W.).
C. impexa Harm. Amongst *Calluna*, Deer Park (A.E.W.).
C. pityrea (Florke) Fr. On soil, Dale Fort (A.E.W.).
C. pocillum (Ach.) O.J.Rich. On soil, Dale Fort.
C. pyxidata (L.) Hoffm. Occasional amongst mosses on lower trunks of trees, Castlebeach Wood and Point Wood. Mill Bay (A.E.W.). Cliff edge, Dale Point (N.W.).
C. rangiformis Hoffm. Frequent on soil amongst pebbles, Gann Flats. On soil, Dale Fort.
C. tenuis (Florke) Harm. Amongst *Calluna*, Deer Park.
Collema crispum (Huds.) Web. Frequent on mortar of walls.
C. furfuraceum (Arnold) Du Rietz. On elm, Castlebeach Wood.
C. nigrescens (Huds.) DC. On gravelly ground, Dale Fort (A.E.W.).
Dermatocarpon miniatum (L.) Mann. Rare on rocks in the supralittoral zone, Watwick Bay and Castlebeach Bay (N.W.) In shaded gully, Monks Haven (A.E.W.).
Dimerella lutea (Dicks.) Trevis. Occasional amongst mosses on ash, Castlebeach Wood and Point Wood.
Enterographa crassa (DC.) Fee. Common on trunks, Castlebeach Wood and Point Wood, invariably associated with *Pyrenula nitida*.
Evernia prunastri (L.) Ach. Frequent on trees, Castlebeach Wood, less so in Point Wood except on oak on which it is common. On elm, alder and apple near Monks Haven church. Occasional on and among pebbles, Gann Flats.
Graphina anguina (Mont.) Mull. Arg. Frequent on trees, Castlebeach Wood and Point Wood, but not recorded on ash. On alder near Monks Haven church.
Graphis elegans (Borr. ex Sm.) Ach. Rare on beach, Point Wood. On alder near Monks Haven church. On apple in same locality (A.E.W.).
Graphis scripta (L.) Ach. Single record on ash, Castlebeach Wood (A.E.W.).
Haematomma coccineum (Dicks.) Korb. On rock outcrops, Deer Park. On vertical rock face by path, Watwick Bay.
Lecanactis abietina (Ach.) Korb. Rare on ash and oak, Point Wood.
Lecania aipospila (Wahlenb. ex Ach.) Th. Fr. On rocks, Castlebeach Bay and below Point Wood near Wishers Rock.
L. erysibe (Ach.) Mudd. On walls, Marloes churchyard, Mullock Bridge and near Dale Castle, usually on mortar. On rocks in the supralittoral zone, Castlebeach Bay and below Point Wood.
L. ralfsii (Salwey) A.L.Sm. Rare on rocks in the supralittoral zone.
Leanora actophila Wedd. Common in the supralittoral zone on sunlit rocky shores.
L. atra (Huds.) Ach. Common on walls. Common on rocks in the supralittoral zone.
L. caesiocinerea Nyl. ex Malbr. On rocks in the supralittoral zone, Dale Point. On wall, Mullock Bridge. On roadside rocks near Monks Haven church (A.E.W.).
L. calcarea (L.) Sommerf. On walls where stone is sufficiently basic including those of Dale Fort.
L. campestris (Schaer.) Hue. Common on walls and on pebbles, Gann Flats.
L. chlarotera Nyl. Common on trees.
L. cinerea (L.) Sommerf. Rare on rocks in the upper supralittoral zone.
L. confusa Almb. On blackthorn twigs by Dale Fort road.
L. dispersa (Pers.) Sommerf. Common on walls and on pebbles, Gann Flats. Occasional on rocks in the supralittoral zone, Black Rock and below Point Wood.
L. expallens Ach. Common on trees. On willow near Maryborough Farm.
L. fugiens Nyl. On rocks in the upper supralittoral zone, West Blockhouse Point. Dale Fort (A.E.W.).

L. gangaleoides Nyl. On rock outcrops, Deer Park.
L. helicopis (Wahlenb. ex. Ach.) Ach. Common on rocks in the lower supralittoral zone.
L. intricata (Ach.) Ach. Doubtful record on wall, Marloes churchyard.
L. leprosescens Sandst. Occasional on rocks in the supralittoral zone. On small rock outcrop, St. Ann's Head.
L. poliophaea (Wahlenb. ex Ach.) Ach. On rocks of the supralittoral zone (N.W.).
L. polytropa (Hoffm.) Rabenh. Rare on rocks in the upper supralittoral zone.
L. rupicola (L.) Zahlbr. Frequent on rock outcrops, Deer Park.
Lecidea albocaerulescens (Wulf.) Ach. Frequent on rocks in the supralittoral zone. On walls near Dale Castle. Occasional on pebbles, Gann Flats.
L. erratica Korb. Castlebeach Bay (A.E.W.).
L. fuscoatra (L.) Ach. Frequent on rock outcrops, Deer Park.
L. granulosa (Hoffm.) Ach. On soil, Dale Fort and Marloes churchyard.
L. lapicida (Ach.) Ach. On rocks below Dale Fort (C.D.P.).
L. limitata (Scop.) Gray. Common on twigs and young branches of ash and sycamore, Castlebeach Wood and Point Wood. On apple, Monks Haven.
L. lithophila (Ach.) Ach. Doubtful record on cliffs, Dale Fort.
L. lucida (Ach.) Ach. On shaded rocks, Monks Haven (A.E.W.).
L. macrocarpa (DC.) Stend. On rocks, Watwick Bay and Castlebeach Bay (N.W.). On rocks, Dale Fort (A.E.W.) Occasional on pebbles, Gann Flats.
L. pantherina (Hoffm.) Th. Fr. Occasional on rock outcrops, Deer Park.
L. percontigua Nyl. On rocks by Dale Fort road (A.E.W.).
L. subincongrua Nyl. Common on rocks in the supralittoral zone. On walls, Dale churchyard and Monks Haven churchyard. On pebbles, Gann Flats.
L. sulphurea (Hoffm.) Wahlenb. Frequent on rock outcrops, Deer Park.
L. scabra T.Tayl. On rock, Dale Point (A.E.W.).
L. tumida Massal. On small rock outcrop, St. Ann's Head.
Lepraria candelaris (L.) Fr. Occasional on lower trunks of trees, Castlebeach Wood and Point Wood.
L. incana (L.) Ach. On trees, Castlebeach Wood and Point Wood. On willow near Maryborough Farm. On elm and alder near Monks Haven churchyard. On wall, Marloes churchyard.
L. membranacea (Dicks.) Vain. On shaded vertical rock faces, Dale Fort.
Leptogium tremelloides (L. fil.) Gray. Doubtful record on Wishers Rock.
Lichina confinis (O.F.Mull.) C.Ag. Frequent on rocks at the top of the littoral fringe.
L. pygmaea (Lightf.) C.Ag. In the eulittoral zone on exposed rocky shores.
Lobaria scrobiculata (Scop.) DC. On Wishers Rock.
Nephroma laevigatum Ach. On Wishers Rock.
Normandina pulchella (Borr.) Nyl. Occasional on ash and sycamore, Castlebeach Wood and Point Wood. On willow near Maryborough Farm.
Ochrolechia parella (L). Massal. Common on walls. Common on rocks in the supralittoral zone.
O. tartarea (L.) Massal. On rock, Deer Park (A.E.W.)
Opegrapha atra Pers. On ash and sycamore, particularly on twigs and small branches, Castlebeach Wood and Point Wood.
O. calcarea Turn. ex Sm. On rocks, Dale Fort and below Point Wood.
O. cesariensis Nyl. On rocks in the supralittoral zone, below Point Wood.
O. chevallieri Leight. On rocks, Watwick Bay (N.W.) and below Dale Fort (C.D.P.).
O. confluens (Ach.) Stiz. On rocks in the supralittoral zone below Point Wood. On rocks, Castlebeach Bay (N.W.).
O. saxatilis DC. On rock by roadside near Dale Castle.
O. saxicola Ach. Common on shaded rocks in the supralittoral zone. On walls, Marloes churchyard and Mullock Bridge.
O. vulgata (Ach.) Ach. Occasional on sycamore and elm, Point Wood. On alder near Monks Haven church.
O. zonata Korb. On Wishers Rock.
Pannaria microphylla (Sw.) Massal. On cliffs of Swallows Hole, Mill Bay (A.E.W.). On soil in rock crevices, Mill Bay (A.E.W.).
Parmelia aspera Massal. On twigs and small branches of trees, Castlebeach Wood and Point Wood.
P. borreri (Sm.) Turn. Single record on ash, Castlebeach Wood.

P. caperata (L.) Ach. Common on trees, Castlebeach Wood and Point Wood. On alder near Monks Haven churchyard.
P. conspersa (Ehrh. ex Ach.) Ach. On rocks, Castlebeach Bay. Watwick Bay (N.W.).
P. glabratula (Lamy) Nyl. Frequent on trees, Castlebeach Wood and Point Wood. On willow near Maryborough Farm, On alder and apple near Monks Haven churchyard.
P. glabratula subsp. *fuliginosa* (Fr. ex Duby) Laund. Frequent on walls and on pebbles, Gann Flats.
P. perlata (Huds.) Ach. Common on trees, Castlebeach Wood and Point Wood. On elm, alder and apple near Monks Haven churchyard.
P. physodes (L.) Ach. Rare on ash, Castlebeach Wood. On alder near Monks Haven churchyard.
P. reddenda Stirt. Single record on sycamore, Castlebeach Wood.
P. revoluta Florke. Frequent on upper trunks of sycamore, Point Wood (K.A.K.).
P. saxatilis (L.) Ach. Frequent on trees, Castlebeach Wood and Point Wood. On wall, Dale churchyard. On rocks, Dale Point and on pebbles, Gann Flats.
P. subaurifera Nyl. On twigs and small branches of trees, Castlebeach Wood and Point Wood.
P. subrudecta Nyl. Frequent on ash and sycamore, Castlebeach Wood. On alder near Monks Haven churchyard.
P. sulcata T.Tayl. Frequent on trees, Castlebeach Wood and Point Wood, but not recorded on oak and elm.
P. taylorensis Mitch. Single record on beech, Castlebeach Wood.
Parmeliella atlantica Degel. On rocks below Point Wood.
P. plumbea (Lightf.) Vain. On cliffs of Swallow Hole, Mill Bay (A.E.W.).
Peltigera canina (L.) Willd. Amongst *Calluna*, Deer Park.
P. polydactyla (Neck.) Hoffm. By path leading to Slip Beach, Dale Fort. By cliff path, St. Ann's Head (A.E.W.). Amongst *Calluna*, Deer Park.
P. rufescens (Weiss) Humb. Amongst *Calluna*, Deer Park.
Pertusaria amara (Ach.) Nyl. Occasional on trees, Castlebeach Wood and Point Wood.
P. hymenea (Ach.) Schaer. Rare on ash and sycamore, Castlebeach Wood.
P. leioplaca (Ach.) DC. Occasional on sycamore, Castlebeach Wood. On alder near Monks Haven churchyard.
P. multipuncta (Turn.) Nyl. Single record on beech, Castlebeach Wood.
P. pertusa (L.) Tuck. Single records on ash, Castlebeach Wood and on sycamore near Castlebeach Wood.
P. pseudocorallina (Liljebl.) Arnold. Frequent on rocks in the upper supralittoral zone.
Phlyctis argena (Ach.) Flot. Occasional on ash, sycamore and beech, Castlebeach Wood. On ash by Dale Fort road.
Physcia adscendens (Th. Fr.) Oliv. em Bitt. Occasional on rocks in the supralittoral zone. Occasional on walls.
P. aipolia (Ehrh. ex. Humb.) Hampe. On branches of ash and sycamore, upper (southern) edge of Castlebeach Wood. On ash by Dale Fort road.
P. caesia (Hoffm.) Hampe. On elm, Castlebeach Wood. On wall, Dale Fort.
P. leptalea (Ach.) DC. On branches of ash, upper (southern) edge of Castlebeach Wood. On ash by Dale Fort road.
P. orbicularis (Neck.) Poetsch. On branches of ash and sycamore, upper (southern) edge of Castlebeach Wood. On elm near Monks Haven churchyard. On walls, Marloes churchyard and Dale Fort.
P. pulverulenta (Schreb.) Hampe. On branches of ash, upper (southern) edge of Castlebeach Wood. On ash, Point Wood (K.A.K).
P. tenella (Scop.) DC. em Bitt. On pebbles, Gann Flats. On Wishers Rock.
Placynthium nigrum (Huds.) Gray. On mortar of wall, Castlebeach Bay.
Porina chlorotica (Ach.) Mull. Arg. On rock by Dale Fort road.
Protoblastenia immersa (Hoffm.) Steiner. On mortar and concrete stonework, Marloes churchyard and Monks Haven churchyard.
P. monticola (Ach.) Steiner. On mortar and concrete stonework, Monks Haven churchyard and Mullock Bridge.
P. rupestris (Scop.) Steiner. On mortar and concrete stonework, Monks Haven churchyard and Mullock Bridge.
Pyrenula nitida (Weig.) Ach. Common on trees, Castlebeach Wood and Point Wood.

Racodium rupestre Pers. On shaded wall by entrance to Dale Fort.
Ramalina calicaris (L.) Fr. On ash, Point Wood (K.A.K.).
R. farinacea (L.) Ach. Common on trees, upper (southern) edge of Castlebeach Wood. On willow near Maryborough Farm. On elm, alder and apple near Monks Haven churchyard.
R. fastigiata (Pers.) Ach. Common on trees, upper (southern) edge of Castlebeach Wood. On alder and apple near Monks Haven churchyard.
R. fraxinea (L.) Ach. Upper trunk of sycamore, Point Wood (K.A.K.).
R. obtusata (Arnold) Bitt. Occasional on ash, Castlebeach Wood. On elm, Dale churchyard. On young branches of ash, Point Wood (K.A.K.).
R. siliquosa (Huds.) A.L.Sm. Common on rocks in the supralittoral zone.
R. subfarinacea (Nyl. ex Cromb.) Nyl. Single record on ash, upper (southern) edge of Castlebeach Wood. Possibly overlooked on rocky shores.
Rhizocarpon constrictum Malme. Frequent in the supralittoral zone on sunlit shores.
R. geographicum (L.) DC. On walls, Dale churchyard and Marloes churchyard. On rock outcrops, Deer Park. Occasional on rocks in the supralittoral zone.
R. obscuratum (Ach.) Massal. On walls near Dale Castle and of Monks Haven churchyard. On rock outcrops, Deer Park. On pebbles, Gann Flats (including var. *reductum*).
R. petraeum (Wulf.) Massal. On rocks and steps above the supralittoral zone, St. Ann's Head (A.E.W.).
Rinodina luridescens (Anzi) Arnold. On wall, Marloes churchyard. On pebbles, Gann Flats.
R. sophodes (Ach.) Massal. On branches of sycamore near Castlebeach Wood. On twigs of ash, Point Wood (K.A.K.).
R. subexigua (Nyl.) Oliv. On walls, Dale churchyard and Marloes churchyard. Frequent on pebbles, Gann Flats. Occasional on rocks in the supralittoral zone.
Roccella phycopsis (Ach.) Ach. On rock in the upper supralittoral zone, Monks Haven.
Sclerophyton circumscriptum (T.Tayl.) Zahlbr. On dry, overhanging rock, Castlebeach Bay.
Solenopsora holophaea (Mont.) Samp. On soil in rock crevices, Castlebeach Bay and below Point Wood.
S. vulturiensis Massal. On soil overlying rock, below Point Wood.
Squamarina crassa (Huds.) Poelt. On wall, Mullock Bridge.
Stereocaulon microscopicum (Vill.) Frey. On soil in rock crevices, Castlebeach Bay and Wishers Rock. Dale Fort (A.E.W.).
Sticta fuliginosa (Dicks.) Ach. Castlebeach Wood (A.E.W.).
S. limbata (Sm.) Ach. On ash, Castlebeach Wood, and by Dale Fort road.
Thelotrema lepadinum (Ach.) Ach. Single record on alder near Monks Haven churchyard.
Toninia aromatica (Sm.) Massal. Frequent on mortar of walls. In similar habitat of upper supralittoral zone, St. Ann's Head (A.E.W.).
Usnea fragilescens Hav. ex lynge. Frequent on trees, Castlebeach Wood, less so in Point Wood. On apple near Monks Haven churchyard.
U. rubiginea (Michaux) Massal. On apple, walled orchard, Monks Haven.
U. subfloridana Stirt. On willow near Maryborough Farm. On elm near Monks Haven churchyard.
Verrucaria aethiobola Wahlenb. ex Ach. On walls and on rock near Dale Castle.
V. maura Wahlenb. ex Ach. Dominant on rocks in the littoral fringe.
V. microspora Nyl. Common on rocks in the eulittoral zone.
V. mucosa Nyl. On rocks in the eulittoral zone.
V. nigrescens Pers. Common on walls and on pebbles, Gann Flats. On rocks in the supralittoral zone, Castlebeach Bay.
V. pratermissa (Trevis). Anzi. On walls and on rock near Dale Castle.
V. prominula Nyl. On rocks in the supralittoral zone, St. Ann's Head. Castlebeach Bay (N.W.).
V. pseudomemnonia Zsch. On rock in the littoral fringe below Point Wood (A.E.W.).
V. striatula Wahlenb. ex Ach. On rocks in the eulittoral zone.
V. viridula (Schrad.) Ach. Castlebeach Bay (A.E.W.).
Xanthoria parietina (L.) Th. Fr. Common on rocks in the supralittoral zone. Occasional on walls. On pebbles, Gann Flats. On young branches of ash and sycamore, upper (southern) edge of Castlebeach Wood.

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