

Chapter 4 The Flora

From 'Island of Skomer'

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VISITS to Skomer are usually made at the breeding season of the seabirds in May, June and July. These are often also the months of the finest weather in the west, when the cliff flowers, the most arresting of the floral sequence of the island, are at their best, seen as they are against a background of ultramarine sea and of hosts of seabirds coming and going against the paler blue of the sky. In May the high eastern slopes are purple-blue with large strong-stemmed bluebells; and below are snow-white drifts of sea-campion, which has succeeded (and partly mingles with) the greener white of the early-flowering scurvy-grass. In June the general colour changes to a delicate pink as acres of the beautiful thrift or sea-pink come into blossom, especially on the exposed western and southern cliffs; and on the sheltered ledges of the north-east side where there is sufficient soil the luxuriant maritime variety of the red campion triumphs over the fading flowers of the primrose, bluebell and sea-campion. Towards the end of June the bracken begins to dominate completely large areas of Skomer; its crozier-like shoots have been slow to unfold in the cool Atlantic winds (a month later perhaps than in sheltered mainland situations), and the plant does not reach a great stature; it forms a dense low cover from one to three feet high which effectively banishes or limits the growth of vegetation in areas where the bracken has long been established. In July, therefore, Skomer has assumed a viridescent colouring made up of the pale grass-green of the rabbit-grazed turf and the darker green of the maturing bracken. This is relieved in August by bright yellow patches of ragwort. The first high winds of autumn quickly turn the exposed areas of the bracken a russet colour.

These general changes of colour might easily be observed by the watcher on a headland of Pembrokeshire opposite Skomer. But the lover of flowers who visits the island will find that the details hidden in this long-distance view are many and exciting. A close examination by the knowledgeable amateur will enable him to make an interesting list of the flowers, interesting not because of the great number of rare species but rather because there are few species, some of which are often individually very numerous and may form pure communities. The more serious student of plant ecology will instantly recognise the characteristic grouping of species into associations or societies peculiar to certain types of country; and the general naturalist finds that certain species of mammals, birds, insects and other creatures frequent these territories dominated by one or two typical plants. This linking up of animal and plant with terrain can be most conveniently studied on a small sub-Atlantic island, where the limitations of isolation and area seem to make possible an intensive investigation of its restricted ecology. Skomer exhibits a very considerable diversity of plant habitats, due to several factors: the topography of its high plateau with steep cliff walls, the imperviousness and acidity of much of the volcanic rock, the varying proximity of the sea, the climate with its frequent fierce winds, the alkaline and nitrogenous droppings of the seabirds, the effects of overgrazing by rabbits. We began our study by making a card-indexed list of the plants from specimens collected. But we found it difficult to place species into strict ecological communities, owing to the lack, over considerable areas, of a dominant plant. There were, however, obviously two general categories: inland and maritime. As a guide the following eleven main ecological divisions or habitats may be cited: inland - sheltered well-drained land with fairly deep soil (bracken areas), inland pasture, dry turf, heath, rock outcrops, ponds and streams, bog, and human habitation (buildings, walls, garden); maritime -

exposed cliff-tops of the south and west (favoured by thrift), less exposed cliff-tops of the north and east (favoured by sea-campion and scurvy-grass), and steep sea-cliffs. We fully recognise the inadequate nature of such a classification, and do not propose to labour it further in this chapter; since the reports we received from our botanists showed clearly that they too had failed to set up more than a very elastic system. We shall confine ourselves therefore to a general description of the plant ecology.

The plant communities were closely watched from the end of March onwards to October, and their seasonal changes followed closely upon those recorded in parallel studies at Skokholm. But Skomer has, from its greater size, its configuration, and greater diversity of soils, a richer flora than that of Skokholm.

The earliest flowers noted were those of the lesser celandine (*Ranunculus Ficaria*), ground-ivy (*Glechoma hederacea*), primrose (*Primula vulgaris*), and scurvy-grass (*Cochlearia officinalis*); all, except the last, forming part of the bracken (*Pteridium aquilinum*) society though they are not confined to it. The bracken society forms the most extensive plant community on the island. Ground-ivy is the most regular member of this community, being most abundant where the bracken, after midsummer, provides dense aerial cover. This it does in sheltered parts of the north and east of the island and in dry valleys, and along the borders of the field-walls. Bracken is an encroaching and invading plant on Skomer. During the years of high farming of the island in the last century it was confined to the waste land and the uncultivable foot of the hedge walls. Today the underground extension of its rhizomes goes on apace towards the centre of each field (except in certain fields which we ploughed in 1946, and in some which were ploughed by the owner in 1948).

Bracken cannot thrive where it is exposed to the severest winds, and therefore, as on Skokholm, the western and southern part of the island is almost free from this plant, or when it is present there it is sparse and stunted. Bracken must have a fairly well-drained and deep soil, and is absent from the wet hollows and the rocky outcrops. As, however, it is late in leafing, lesser celandines and ground-ivy are able to flower and seed in the spring sunshine; so also does the bluebell (*Scilla non-scripta*) which follows late in April and May, and is seen to be closely attached to the bracken association wherever its blooms are thickest. The bluebell, normally a woodland plant, enjoys the moisture present in the soil protected from summer drought by the bracken, and its bulbs mature below ground as its spear-like leaves wither under the spreading fronds. This shade in summer and the mat of dead bracken foliage in winter is said to have a toxic effect on other plants in sheltered areas of the mainland, but this is evidently not so pronounced on the islands where the bracken never grows so tall, and where severe gales in winter disperse or flatten the withered foliage; we find, therefore, that many other and later-flowering plants survive (though they may not thrive) in the shade of a dense bracken community. These are especially: wood-sage (*Teucrium Scorodonia*), Yorkshire fog (*Holcus lanatus*), and the fescue grasses (*Festuca ovina* and *F. rubra*).

Along its perimeter the bracken forms much less than full aerial cover, and shares the ground with the last-mentioned species, which constitute a rough turf before the truer open grassland is reached. Mingled with them, and at times dominating them, are the two sorrels (*Rumex Acetosa* and *R. Acetosella*). Patches of nettle (*Urtica dioica*), ragwort (*Senecio Jacobaea*), and some buttercup (*Ranunculus repens*) are usually found here close to the entrances of the numerous rabbit- and bird-burrows which fringe the bracken, and evidently provide in the excavated soil mingled with animal droppings sufficient nitrogen to satisfy the food requirements of these rank-growing plants.

From time to time Skomer has of late years been grazed by a few cattle and sheep, but not sufficiently to cause any changes in the grassland, and in the

year of our survey this was agriculturally very degenerate, and overgrazed by rabbits. Apart from the changes wrought by the steady encroachment of the bracken, it appeared to have reached a stable and mature (or climax) condition, i.e. in equilibrium with the rabbit-grazing. The more level inland pasture is composed principally of grasses: fescue (*F. ovina* and *F. rubra*) with *Poa annua*, *P. pratensis* and *P. trivialis*, and *Agrostis tenuis*. Widely dispersed colonies of ragwort and thistles (*Cirsium arvense* and *C. vulgare*) frequently appear. There are in fact few square yards of this pasture which have not some taller plant interrupting the level-grazed sward. Yarrow (*Achillea Millefolium*) is not uncommon, and small and sometimes pure concentrations of sheep's sorrel (*Rumex Acetosella*) occur. In the spring dog violets (*Viola Riviniana*) brighten the degenerate sward before the grass shoots appear through the winter cushion of moss and withered herbage.

The nature of Skomer's pasture changes where the land rises to a dry wind-swept slope or where it covers thinly the underlying rock. Here we find a springy turf of sheep's fescue, with plants of wild white clover (*Trifolium repens*), and strong colonies of bird's-foot trefoil (*Lotus corniculatus*). Associated with the well-drained pasture are the scorpion-grasses (*Myosotis collina* and *M. versicolor*), and as summer advances, a host of other dwarf plants come into flower here: we find eyebright (*Euphrasia officinalis*), two bedstraws (*Galium saxatile* and *G. verum*), tormentil (*Potentilla erecta* common, and *P. procumbens*), centaury (*Centaureum umbellatum*), milkworts (*Polygala vulgaris*, *P. serpyllifolia*), pearlwrts (*Sagina subulata*, *S. procumbens*), and speedwells (*Veronica officinalis*, *V. arvensis*, *V. Chamaedrys*). These make a mosaic of tiny low and trailing flowers from late May to the end of July, by which time most of them have seeded, and the area, much dried as a rule by the summer sun and wind, is a brown-green relieved by the yellow discs of the hawkbit (*Leontodon Leysseri*).

The dry, short, rabbit-nibbled pastures, so springy and pleasant to walk over, even on mornings of heavy dew, are broken up by the protrusions of rock on higher ground, and only drought-resisting plants survive here. This is a region largely dominated by ling (*Calluna vulgaris*) and heather (*Erica cinerea*), but only in very few areas is this heath partnership a pure one. Usually it is shared with other plants of dry situations. Patches of sweet-smelling wild thyme (*Thymus Serpyllum*) delight the strolling botanist, who observes that it is associated with such other low-growing sun-loving species as English stonecrop (*Sedum anglicum*), scarlet pimpernel (*Anagallis arvensis*), lesser skullcap (*Scutellaria minor*), pearlwort (*Sagina procumbens*), rock-spurrey (*Spergularia rupicola*) and occasional colonies of bird's-foot trefoil. But the region of heath is so mixed in topographical character that any attempt to classify the whole into strict ecological communities breaks down; rather it is, like so much of Skomer, a patchwork of minute consociations in which, here and there, the observer finds the same pattern appearing. Thus in a few slightly damper parts of the heath some of the species of the drier ground exist side by side with louse-wort (*Pedicularis sylvatica*), wood-sage, Yorkshire fog (*Holcus lanatus*), red fescue (*Festuca rubra*), and the sorrels. And again, where the rock thrusts clear to the surface, with only shallow pockets of earth to give roothold to the ling and heather, we find wall pennywort (*Cotyledon Umbilicus-veneth*) (also in damp sites), buck's-horn plantain (*Plantago Coronopus*), sea stork's bill (*Erodium maritimum*), and in the autumn the sheep's bit scabious (*Jasione montana*). Some of the heath extends almost into the marshy areas of the central valleys; some merges into the grassy plateaux above and towards the cliffs, where the fescue grasses fringe the areas of thrift (*Armeria maritima*). This high ground has few showy plants except in spring, when the charming vernal squill (*Scilla verna*), a species sufficiently rare in England to make it a special object for English visitors to see, is a common flower on Skomer in such situations.

As the south and west cliffs are approached the typical fescue sward gives way to the thrift, which dominates the cliff-top for a wide distance here in an area covering the burrows of the vast colonies of the puffins. Along the cliff edge the thrift covers this ground frequently in pure huge cushions as much as a yard in diameter and ten to fifteen inches in height. Often these soft masses form a roof of green thatch to the entrances to the homes of the puffins; and they delight the observer with their delicately coloured large blooms in May and June, and at all times provide a most comfortable couch. The dry, windy, salty conditions of the cliff-top are too exacting for most other plants; thrift thrives in spite of the salt rather than, as has been suggested by some botanists, because of it. Thrift grows on the edge of sheltered inland saltings in Pembrokeshire, where it is frequently submerged for short periods by high tides. But it also grows on mountain tops far from salt spray.

Associated with thrift but unable to thrive in dry ground, the sea-campion (*Silene maritima*) occupies the depressions between the sea-pink's cushions. It stands exposure well provided there is sufficient soil and moisture, such as that provided in depressions, crevices, and slopes with a northerly aspect. On Skomer, therefore, it grows most luxuriantly on the Neck and on the eastern and northern slopes, cliff-tops and ledges, often in association with scurvy-grass (*Cochlearia officinalis*).

The difference in the wealth and luxuriance of the plant life of the north-east and the south-west cliffs of the island is, in fact, remarkable. The wind- and sun-dried south-west was beautiful while the flowering of the sea-pinks lasted; but afterwards there was little to be seen. An examination of the ground honeycombed by bird-burrows revealed islands of dry turf composed of minute plants of buck's-horn plantain, sea stork's bill and pearlwort (*Sagina procumbens* and *subulata*) growing at the landward frontier of the pure societies of thrift. Contrast this with the flora of the broad ledges, about one hundred feet above the sea, which, sheltered by the high castellations of rocks above, run between the Garland Stone and North Haven on the north-east coast. Protected from all but the rare north-east winds, and only receiving the sun's rays early on summer mornings or late in the evening, and much visited by nesting seabirds whose droppings have helped to provide rich plant food, these moist and fertile ledges support in spring a luxuriant concentration of red campion (*Melandrium dioicum*) and sea-campion (*Silene maritima*), bluebells, scurvy-grass (*Cochlearia officinalis*) and chickweed (*Siellaria media*), the last-named selecting the bare nitrogenous patches trodden by gulls and other birds. These are followed by flowering orpine (*Sedum telephium*), honeysuckle (*Lonicera Periclymenum*), sea-beet (*Beta maritima*), buck's-horn plantain (*Plantago Coronopus* var. *maritima*) and sea plantain (*P. maritima*). Ivy (*Hedera helix*), blackthorn (*Prunus spinosa*), and blackberry (*Rubus fruticosus*), with some elder (*Sambucus nigra*), cover part of the steeper faults or chimneys in the walls of these ledges, and among plants of rank growth noted here we recorded woody nightshade (*Solanum Dulcamara*), hogweed (*Heracleum Sphondylium*), hemp agrimony (*Eupatorium cannabinum*), figwort (*Scrophularia nodosa*), foxglove (*Digitalis purpurea*), and ferns: lady fern (*Athyrium Filix-femina*) and male fern (*Dryopteris Filix-mas*). The rock-walls were covered with lichens, especially *Usnea* sp. whose greenish-grey beard-like strands quite disguise the true colour of the basalt.

These delightful cliff-gardens of Skomer were the frequent resort of observers who sought to escape for a while from the blustering south-westerly gales; the ornithologist who wandered there in the spring found himself looking up at the grey rock face where gull, raven, chough, peregrine falcon and fulmar petrel patrolled; and below him the sheer cliffs were filled with the cries and flighting of nesting kittiwakes, guillemots and razorbills. The spongy turf itself contained the burrows of puffin and shearwater, although the entrances to these underground nests were partly or wholly concealed by the vigorous growth of the plant community.

These ledges, too, had been discovered by the cattle which in 1946 were pastured on Skomer; and their owner had great difficulty in preventing the descent of the beasts to this shelter and rich grazing. He had experienced several losses due to the heavy animals slipping or jostling each other when turning on the unfenced edges of the precipice. The effect of the trampling and dunging by the cattle was plain in the virile growth of the vegetation; the nitrogen content had been increased in a soil already well supplied with seabird guano, and with the moisture and humus provided by layers of decaying vegetation laid down each winter.

Another cliff plant association is to be found between the extremes of the luxuriant flora of the north-east and the xeromorphic vegetation of the exposed south-west. In partly sheltered situations such as those offered by breaks in the cliffs (usually occurring on the exposed west and south coasts), wherever there is sufficient moisture conserved by some shade and by natural water collecting in the rocky soil of declivities, there appears in spring a community which temporarily covers a surface that had been swept bare of living vegetation by salt storms and perhaps by surface water in winter: chickweeds (*Cerastium viscosum* and *Stellaria media*), mayweed (*Matricaria inodora* fleshy form), shoreweed (*Littorella uniflora*), *Poa annua* and the cliff-loving orache (*Atriplex hastata* and *A. Portulacoides*). Each of these species may occur as pure societies in such a terrain. They are also found as members of other plant communities elsewhere on the island. *Stellaria media* occurred in a great variety of situations, but usually where the soil had been bared and enriched by vertebrate droppings. Darling found that *Stellaria media* exhibited 'a refulgent growth of about twenty acres growing to a foot in height' on North Rona where Atlantic seals had trampled and bred in previous autumns. In situations with sufficient soil mantle over the rocks where seabirds breed on Skomer (notably also on Middleholm where there is a large colony of breeding gulls) this chickweed grows with a like abundance, especially during and after a spell of wet weather.

Next we may consider the region of boggy heath and wet land which is a marked feature of the two chief valleys or declivities in the central plateau of the island, which we called the north and the south valleys. In each there is a headwater pond, feeding a small stream flowing in an easterly direction, that of the north valley being the greater, and never drying completely in years of drought. This north pond has some of the commoner plants usually found on exposed waters: yellow flag (*Iris Pseudacorus*), a water crowfoot (*Ranunculus* sp.), amphibious persicaria (*Polygonum amphibium*), floating pond-weed (*Potamogeton polygonifolius*), water purslane (*Peplis portuld*), marsh-worts (*Apium nodiflorum* and var. *ochreatum*), and floating club-rush (*Scirpus fluitans*). The water of this pond was much disturbed by constant wind and by great numbers of gulls which visited it all day long for the purpose of washing their plumage; its shore was a well-trampled mud during the breeding season of the gulls in 1946 as the water receded in summer. On both sides of the little stream flowing from this pond, however, there was a region of wet spongy ground full of varied plant life. Here mosses and rushes dominated: *Juncus articulatus*, an extremely variable species, seemed to be as numerous as the common rush (*J. communis*) of which the closely related *J. conglomerate* and *J. effusus* were collected by Dr. W. J. L. Sladen.

Associated with the rushes were the delicate pink bog pimpernel (*Anagallis tenellid*), marsh St. John's-wort (*Hypericum elodes*), cuckoo-flower (*Cardamine pratensis*), marsh bedstraw (*Galium palustre*), marsh pennywort (*Hydrocotyle vulgaris*), water-mint (*Mentha aquatica*) bog stitchwort (*Stellaria alsine*), water-pepper (*Polygonum Hydro-piper*), skullcaps (*Scutellaria galericulata* and *S. minor*), and some club-rushes listed in Appendix 2. There were patches of moor-grass (*Molinia caerulea*) in this community of the stream-side rushes, but in general *Molinia* seems to prefer land which is slightly less waterlogged (at least in summer); near the south pond there was a large region dominated by the *Molinia*, with other plants of the rush community much less in evidence.

The land occupied by the rush community drained into the stream which had, during winter rains, cut for itself a track over the bedrock, and nearer the sea the valley assumed the appearance of a miniature gorge, complete with waterfalls. Tall vegetation existed in the shelter of the gorge; where moisture was abundant hemlock dropwort (*Oenanthe crocata*), hogweed (*Heracleum Sphondylium*), wild angelica (*Angelica sylvestris*), meadowsweet (*Filipendula Ulmaria*), and marsh thistle (*Cirsium palustre*) flourished, together with many ferns and some purple loosestrife (*Lythrum Salicaria*). The slopes above the stream were well drained, dry and sheltered, and here grew the tallest vegetation on the island: stunted elder and blackthorn bushes, mingled with trailing bramble, tall bracken, and a few ancient furze bushes (*Ulex europaeus*). There were many foxgloves (*Digitalis purpurea*) in both the north and south valleys, and about the rocky outcrops.

In the stream itself watercress (*Nasturtium officinale*), brookweed (*Samolus Valerandi*), water-starwort (*Callitriche* sp.) and water-blinks (*Montia chondrosperma*) were found in suitable sites. Many small plants grew among mosses on the banks overhanging parts of the island streams. The eye was pleased with showy masses of primroses from early spring until well into June. Water forget-me-not (*Myosotis caespitosa*) mingled with lesser spearwort (*Ranunculus Flammula*) in a harmonious blue and yellow pattern. There were ragged robin (*Lychnis Flos-cuculi*), and cross-leaved heath (*Erica Tetralix*) to be found, but not abundantly. Where the ground was moist but not saturated, even far from streams, silverweed (*Potentilla anserina*) was locally dominant. The common yellow sedge (*Carex flava*) and the carnation sedge (*C. panicea*), together with the field wood-rush (*Lunula campestris*), were found here in spring.

The last but not the least variable environment which there is space to describe here is that of the human habitation - the island farmhouse, buildings and yards. When we lived on Skomer these had been abandoned completely for five years and there was little trace left of the 'artificial' flora which springs up wherever man and his domestic animals settle. One fuchsia bush (*Fuchsia* sp.) and one black poplar (*Populus* sp.) were the only surviving trees in the courtyard facing the house, but a great number of cultivated narcissi (*Narcissus pseudo-narcissus*) nourished exceedingly, and gladdened our hearts on our arrival in March "when all else about these buildings was a scene of neglect and decay, and armies of rank weeds were springing up everywhere. Hemlock (*Conium maculatum*), hogweed (*Heracleum Sphondylium*), burdock (*Arctium* sp.), great dock (*Rumex crispus*), ragwort (*Senecio Jacobaea*), and nettle (*Urtica dioica*) would have choked the entrances and exits to the yards and buildings if we had not cut down much of this growth during the summer.

The garden at the back of the house was taken in hand and tractor-ploughed by the chief warden, supported by two keen farmer-gardeners in Joan Keighley and the skipper. It was harrowed with a wooden 'scrubber' made out of driftwood planks, cleaned, and planted with potatoes, lettuces, cabbages, etc. But throughout the summer an interesting if exasperating struggle ensued with two aggressive plants which had persisted since the last cultivations years before: false oat-grass (*Arrhenatherum elatius*) and lesser swine-cress (*Coronopus didymus*). The cultivations in fact brought them to light and life just when they were on the point of being overpowered by the thickening tussocks of cock's foot grass (*Dactylis glomerata*) and Yorkshire fog (*Holcus lanatus*). As summer advanced, a few plants of groundsel (*Senecio vulgaris*), petty spurge (*Euphorbia Peplus*), charlock (*Brassica* sp.) and red dead-nettle (*Lamium purpureum*), appeared, together with quite a representative collection of the mouse-ear duckweeds (*Cerastium viscosum*, *C. semidecandrum*, *C. tetrandrum* and *C. vulgatum*).

On the yard walls, both tops and sides, inaccessible to rabbits and grazing animals, in the cracks between the stones and the lime mortar, nourished a typical dry, rock-loving flora. This consisted of English stonecrop (*Sedum*

anglicum), rock-spurrey (*Spergularia rupicola*), long-rooted cat's-ear (*Hypochaeris radicata*), dandelion (*Taraxacum officinale*), buck's-horn plantain (*Plantago coronopus*), ribwort plantain (*P. lanceolata*), Danish scurvy-grass (*Cochlearia danica*), pennywort (*Cotyledon Umbilicus-veneris*), wild thyme (*Thymus Serpyllum*) and lesser clover (*Trifolium dubiurn*) - these last two probably benefit from the lime content of the mortar. Two grasses were common on these walls - *Poa annua* and sweet vernal grass (*Anthoxanthum odoratum*), and some spleenworts: maiden-hair spleenwort (*Asplenium Tricho-manes*) and wall-rue (*A. Ruta-muraria*).

It is difficult in the compass of a single chapter to describe adequately the island plant communities. Nor as we have shown is it possible to divide and subdivide the flora into strict ecological compartments. The work which our survey accomplished is seen to be no more than preliminary; only many years of close study of the dynamics of the vegetation, by the use of maps, quadrats and transects of typical plant communities, would yield a natural classification. This work has now begun close to Skomer; at Skokholm Bird Observatory the mapping of permanent quadrats or representative sections of the vegetation was accomplished in 1948 and regular observation has now started. The vegetation of these sub-Atlantic islands can perhaps best be described in general terms as an intricate series or pattern of interlocking plant associations, and we have attempted to describe only the main features of this pattern on Skomer in this chapter.

There are two footnotes. Specimens of the very large variety of the buck's-horn plantain (*Plantago Coronopus*) with almost entire leaves attracted the attention of several of the amateur botanists who visited the Centre in 1946, including Mr. Stephen Potter and Dr. Julian Huxley. Specimens and seeds were sent to Kew where they were grown in the experimental ground there. Dr. W. B. Turrill, Keeper of the Herbarium at Kew, reported on June 3rd, 1949, that these specimens retained their characters under cultivation and the essential ones reappeared in plants grown from seed to at least the third generation. He considers that the plant is var. *maritima* Gren. et Godr.

The second footnote concerns the collection of pollen at Skomer. Slides were daily exposed to the air on the highest point of Skomer, the rock immediately south of the buildings (242 feet above sea-level). The apparatus, which consisted of a slide-holder protected from rain and sun by two horizontal sheets of asbestos supported on iron rods, was erected by Mr. H. A. Hyde, of the Department of Botany, National Museum of Wales, with the object of collecting information in connection with asthma research. Skomer, from its isolation, was expected to be comparatively free from grass pollen, the irritant sometimes inducing asthma. We are grateful to Mr. Hyde for the following report.

POLLEN INCIDENCE ON SKOMER

{Contributed by H. A. Hyde, Department of Botany, National Museum of Wales}

Skomer is one of fourteen stations in Great Britain at which pollen has been trapped systematically during the period 1942-50. Slides were exposed for us by Mr. Lockley and his colleagues from April nth until October 8th inclusive. Nine slides (June 10th-18th) were unfortunately lost on the return trip to Marloes but the remainder were analysed at Cardiff by us for pollen. 5,369 grains were counted on 5 sq. cm. and 4,890 of these were identified as belonging to one or another of 38 types. During the earlier part of the time the principal kinds caught were tree pollens, viz. ash, birch and beech (mainly in April), and oak and pine (mainly in May). All these had drifted across from the mainland, favoured by the easterly winds then prevalent. (Weather records kept at St. Ann's Head have been made available by courtesy of the Meteorological Office (Air Ministry).

As compared with catches made at the same time at Cardiff (our principal lowland station) the total Skomer catch of ash pollen was 25 per cent., of birch also 25 per cent., of beech and oak each 10 per cent, and of pine 7 per cent.

Herbaceous types were caught in some quantity from early May onwards. Some of these were certainly derived from local sources on the island. Thus the 37 grains of Cruciferae caught during April and May can be traced to the scurvy grass (*Cochlearia*) and the 41 Cyper-aceae also caught in May (more than twice as many as at Cardiff) probably came from the sedges on the island, including *Carex caryo-phylka*. Similarly in July the considerable numbers of Umbelliferae may be attributed mainly to the hemlock referred to on page 44 (though some were recognised as hogweed, which possesses a distinct type of pollen), and much of the *Rutnex* and *Urtica* pollen caught in July certainly came from the docks and nettles close at hand. The outstanding feature of the August and September catches as compared with those from any of our other stations was the large amount of ragwort pollen, derived from the plants around the farm.

None of the pollen types so far mentioned was as abundant as that of the grasses. This type was caught in quantity from late May until the end of July and formed 26 per cent, of the whole season's pollen catch on the island. (The proportion would have been distinctly higher but for the loss of the nine slides referred to.) On certain days during the two months relatively large quantities of grass pollen occurred on the slides, notwithstanding the fact that winds were blowing from the Atlantic. Occasionally this (obviously local) pollen was reinforced by the wind with supplies from the mainland and on one such day (July 10th) the catch rose to its maximum. The daily catches of grass pollen were on the average about one-tenth of those made at Cardiff during the same period.

Grass pollen is the principal though not the only type associated with hay fever and pollen asthma in this country. It is not known with certainty what size of pollen catch corresponds with the minimum concentration likely to cause symptoms. However, the actual catch on Skomer during the grass pollen season only a few times exceeded 100 per day on 5 sq. cm. (a figure which has been suggested as an effective minimum); so, if this may be taken as a guide, it would seem that the amount of grass pollen present in the air on Skomer is as a rule much below the probable threshold. Grass pollen of local origin could probably be reduced to a negligible level by more intensive grazing and cutting, but if east winds occurred at the critical time they could easily bring in an uncomfortable though temporary influx from the mainland. In the present state of our knowledge the use of Skomer as a hay-fever resort, though it would require safeguards, should provide results of great interest.