## B.S.B.I. DISTRIBUTION MAPS SCHEME; SURVEY OF 1955 RECORDING, AND SUGGESTIONS FOR RECORDING IN 1956

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By November 1955, about 250,000 records for 887 10-kilometre grid squares had accumulated, an average of about 280 per square covered. There remained 2,600 squares with under 50 records; from at least 300 of these, however, full information is promised, and there are therefore some 2,300 squares underworked. The map, fig. 1, shows the state of the returns.

The 1955 response in recording has been gratifying, and much useful information has been gained, which enables us to make suggestions and recommendations for 1956. Two recording excursions in particular might be used as examples of what is practicable in underworked areas. These are the B.S.B.I. meeting in Galloway in June and an excursion, organised from the Cambridge Botany School, in north Montgomery and adjoining counties in August.

During the week's recording in Galloway seventeen 10-kilometre squares were visited and a total of about 4,000 records was made; the average per square was about 230. The fewest species were found in the montane squares. Here it was difficult to reach a total of over 150. Although the highest parts of those squares were not visited, it seems unlikely that a thorough search would yield much more than another 50. In contrast the coastal squares, particularly those on the south, were relatively rich and over 300 species were recorded in a day from 25/43, the Whithorn square. During the first few days the object was to work the squares around Newton Stewart as thoroughly as possible, but later in the week new habitats were visited wherever they might occur. As a result over 630 species of flowering plants were seen during the period. Although by this method less frequent species may have been missed in some of the squares, there are records which will show relatively, though not absolutely, the pattern of distribution of a great many more species than would otherwise have been possible.

The distributions fall into six main groups:— (see fig. 2)

(a) The ubiquitous; e.g. *Bellis perennis*, *Plantago lanceolata*, *Plantago major*, *Cynosurus cristatus*, *Dactylis glomerata*, *Conopodium majus*, *Athyrium filix-femina*, *Poa annua*.

(b) The lowland; (absent from mountain squares with most land over 500′ and little arable land); e.g. *Geranium dissectum*, *Glechoma hederacea*, *Geum urbanum*, *Capsella bursa-pastoris*, *Veronica persica*.

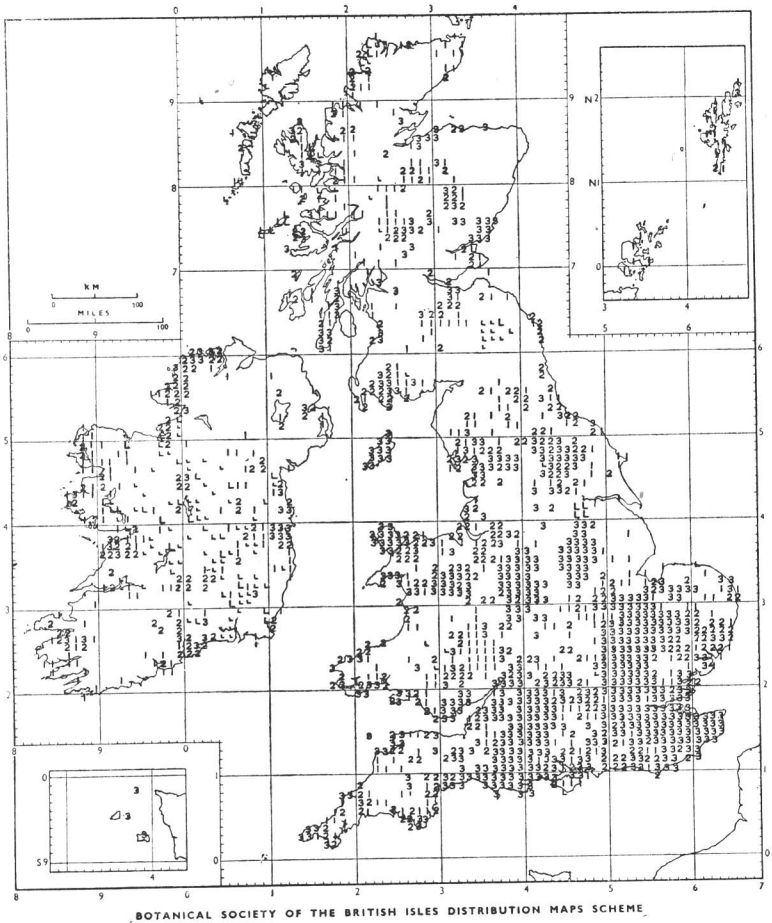


Fig. 1. State of Returns at March 1956

3 10 km. square in which >250 species are recorded
2 10 km. square in which >150 species are recorded
1 10 km. square in which >50 species are recorded
L 10 km. square in which >150 species are recorded in literature
l 10 km. square in which >50 species are recorded in literature

(c) The upland; (most frequent in the north and east though not confined to the mountains, less frequent in coastal squares because of the lower rainfall); e.g. *Carum verticillatum*, *Thelypteris oreopteris*, *Juncus kochii*, *Eriophorum vaginatum*.

(d) The intermediate; (excluded from both mountain and coast); e.g. *Alchemilla vulgaris* agg., *Geum rivale*, *Carex curta*, *Antennaria dioica*.

(e) The coastal; (this comprises species not confined to maritime habitats, but to cliffs and dry places near the sea); e.g. *Helianthemum chamaecistus*, *Astragalus danicus*, *Vicia bithynica*, *Vicia lutea*, *Leontodon leysseri*, *festuca arundinacea*, *Trisetum flavescens*, *Helictotrichon pubescens*, *Humulus lupulus*, *Koeleria gracilis*.

(f) The montane; (found only in north and east squares with high rainfall and altitude); *Lycopodium selago*, *Hymenophyllum wilsoni*, *Hieracium diaphanoides*, *Meum athamanticum*, *Cryptogramma crispa*, *Salix herbacea*.

Further investigation might show that these groups are not valid. *Geum rivale*, group (d), is generally regarded as a hill plant associated with *Trollius europaeus* in Scotland and might therefore be expected to have an upland distribution. *Carum verticillatum*, group (c), we understand, does grow in damp pastures close to the shore, but under the lower rainfall conditions

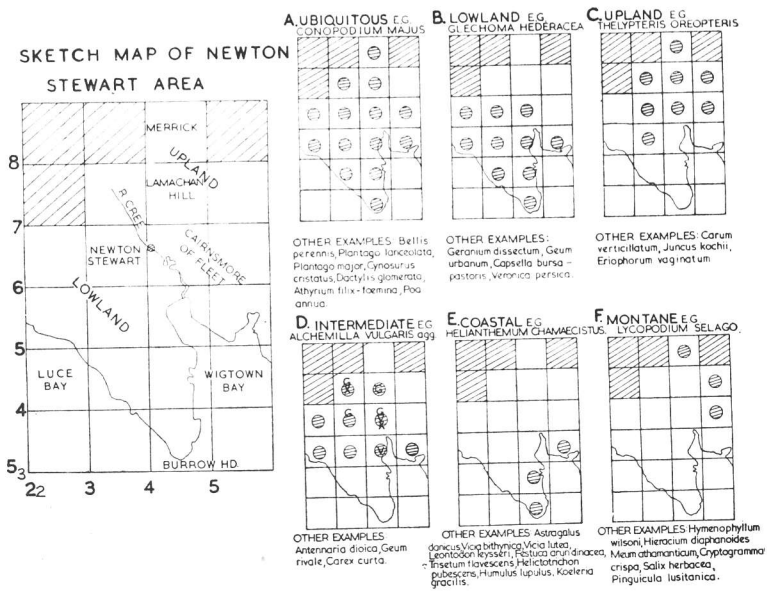


Fig. 2. Distribution patterns from Galloway data (explanation in text).

there are fewer damp pastures, *Carum verticillatum* is correspondingly rarer, and whereas in the uplands it was recorded constantly, a party of six did not see it once during a whole day in the Whithorn square, in the extreme south.

The student excursion to Montgomery did not concentrate exclusively on recording. Nevertheless, in the fortnight August 13th-27th, thirteen squares round Llanrhaiadr-ym-Mochnant (on the Montgomery-Denbigh border, to the south east of the Berwyn range) were more or less adequately sampled, and a total of over 600 vascular plants recorded.

Distribution patterns were revealed by the recording (fig. 3) which it is interesting and instructive to compare with those derived from the Galloway meeting. The following points emerge from a comparison of the data (a selection of which is represented in figs. 2 and 3):—

(a) In both areas *Poa annua*, *Plantago lanceolata*, *Cynosurus cristatus*, *Dactylis glomerata*, *Athyrium filix-femina*, are ubiquitous, though *Conopodium majus*, ubiquitous in Newton Stewart, has an intermediate distribution in Wales. This probably reflects the relatively greater gradient of altitude in the Welsh area in which the most western square, 23/92, has little or no ground below 1,000 ft., whereas in the Merrick square, 25/48, north of Newton Stewart, the altitude on the shores of Lake Trool is only 250 ft.

(b) *Glechoma*, *Capsella* and *Veronica persica* have a lowland distribution in both areas—the last two, weeds of cultivation, excluded from the highlands for obvious reasons. *Glechoma* may be restricted by climate.

(c) In both areas *Thelypteris oreopteris* shows a very similar pattern, but the absence of other species with similar patterns in both areas emphasises the suggestion that this upland group may not be valid.

(d) There is no overlap of species in the intermediate group but if *Alchemilla vulgaris* agg. is broken down into its segregates, then in both areas *Alchemilla xanthochlora* has an intermediate distribution.

(e) There is a strong relationship between the calcicole flora in Wales and the coastal flora in Scotland. *Helianthemum chamaecistus* is only one example, but there are many others which are not illustrated in the figures, e.g. *Koeleria gracilis*, *Festuca arundinacea*. In both areas these were the only dry base-rich habitats.

(f) The montane distribution is well marked in both areas but there are only a few species in common, e.g. *Lycopodium selago*, *Cryptogramma crispa*.

Experience on these and other recording trips in 1955 has shown that a day's visit to a 10-kilometre square by one or two competent botanists at any time in the summer season (June to September inclusive) can yield between 150 and 300 species depending on the richness of the flora; most lowland squares

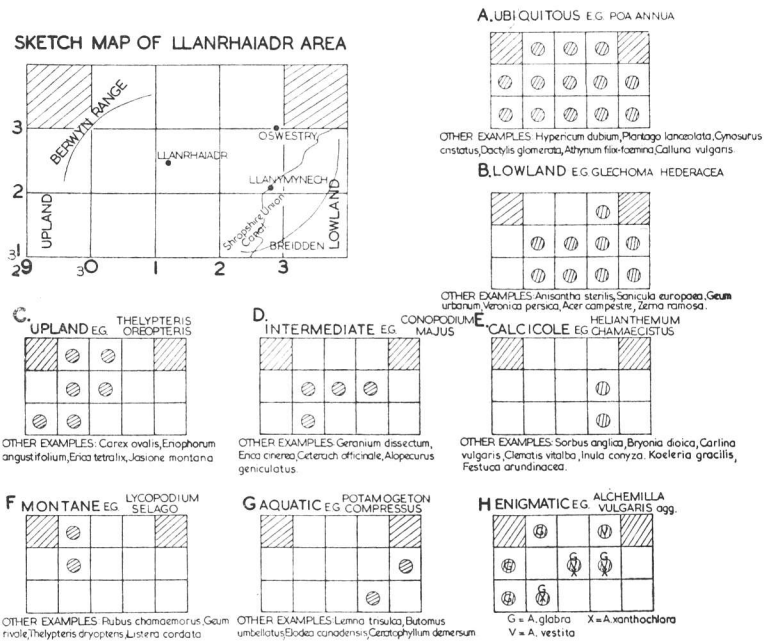


Fig. 3. Distribution patterns from Llanrhaiadr data (explanation in text).

will give 250 without much difficulty if all the obvious habitats are sampled. (The richest square so far, incidentally, is 52/03, Ampthill square, with a total of 828; in contrast, 28/61, one of a group of squares in the Monadhliath mountains surveyed this season, could be made to yield only 115). It seems likely that for most of lowland Britain, the first 250 species recorded in any square contain most of the really common plants (for the Highlands and islands this figure should probably be 150 or even 100); and that the failure to record a reputedly common species probably—though by no means certainly—indicates that even if it is really present it is relatively infrequent.

These considerations lead us to suggest that for 1956, recorders should concentrate on covering to the extent of 250 species (or fewer for upland and other floristically relatively poor squares) one or more of the 'blank' or 'category 1 and 2' squares shown on the map, and that the production of a basic list of common species for every square should be the aim for 1956. In addition, of course, we need more complete information from most squares already at the 250 species level, and naturally residents in a particular square will be able to continue to add to lists already submitted. Volunteers who already have records for their squares but have not sent them in are asked to do so, in order that an up to date 'situation map' can be maintained.

At the present rate of returns, the office is able to deal with all the records received without difficulty. This should not be the case, as in the early stages of the scheme the vast bulk of the records should be received, and it is desirable that there should be an accumulation of these records awaiting incorporation in the punched-card system.

The collection of information on individual species (mainly rarities) from herbaria and literature is going ahead. Altogether 71 species (a list of which is appended) are now reasonably complete. Fig. 4 gives the known distribution of *Viola stagnina* Kit., one of these completed species. The base map here used is that designed for the final mapping.

Offers to supply the basic 'common species' data for underworked squares in 1956, or any other information, will be gratefully received at:—

B.S.B.I. Distribution Maps Scheme,
University Botanic Garden,
1 Brookside,
Cambridge. Tel. 58144.

## SPECIES COMPLETE OR ALMOST COMPLETE ON AVAILABLE INFORMATION*

*Aconitum anglicum*
*Actaea spicata*
*Alchemilla acutiloba*
*conjuncta*
*filicaulis*
*glomerulans*
*minor*
*monticola*
*subcrenata*
*vestita*
*wichurae*
*Anemone pulsatilla*
*Arabis stricta*
*Arctous alpinus*
*Arenaria balearica*
*Astragalus alpinus*
*Avena ludoviciana*
*Bartsia alpina*
*Bunias erucago*
*orientalis*
*Cardaminopsis petraea*
*Carex rariflora*
*Cuscuta europaea*
*Draba aizoides*
*Erica ciliaris*
*mackaiana*
*Eriophorum gracile*
*Helianthemum canum*
*Hieracium sparsifolium*
*Hierochloe odorata*
*Impatiens noli-tangere*
*parviflora*
*Juncus capitatus*
*pygmaeus*
*Lagurus ovatus*
*Lotus angustissimus*
*hispidus*
*Luronium natans*
*Matthiola incana*
*sinuata*
*Mibora minima*
*Minuartia rubella*
*stricta*
*Myosotis alpestris*
*Oxytropis campestris*
*halleri*
*Phleum commutatum*
*Polystichum lonchitis*
*Potentilla crantzii*
*Ranunculus lutarius*
*ophioglossifolius*
*reptans*
*tripartitus*
*Salix myrsinites*
*Saxifraga cernua*
*nivalis*
*rivularis*
*Silene nutans*
*Spiranthes aestivalis*
*spiralis*
*Thymus drucei*
*Trifolium bocconi*
*molinierii*
*stellatum*
*strictum*
*suffocatum*
*Veronica filiformis*
*Vicia bithynica*
*hybrida*
*lutea*
*Viola stagnina*

Post-1950 records for any of these species would be welcome.

*This list contains rare species which should on no account be picked.

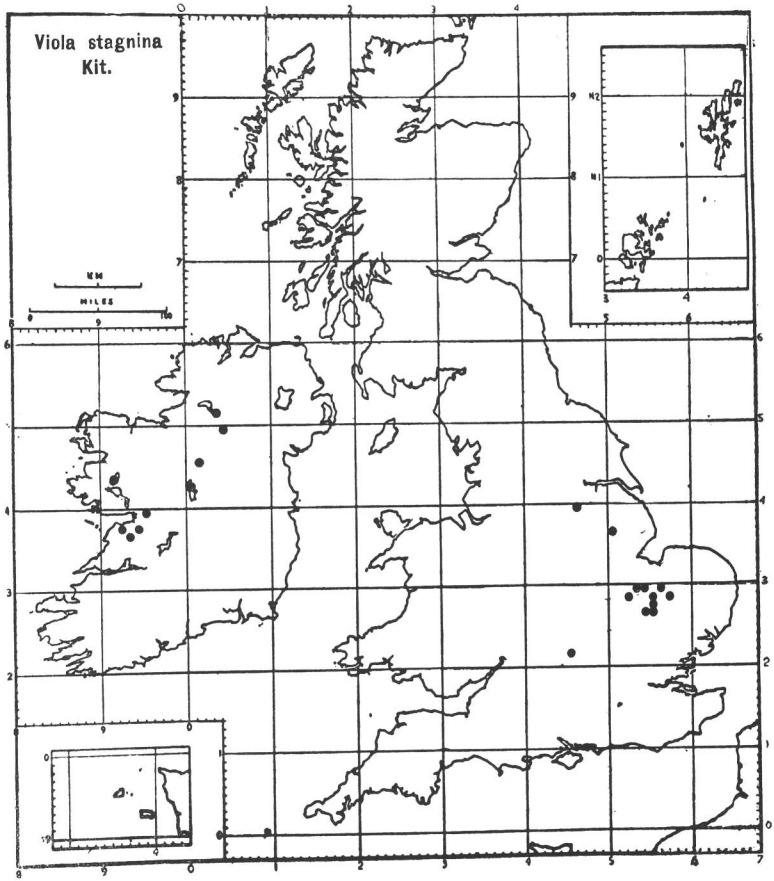


Fig. 4. Known distribution of *Viola stagnina* Kit.
(including extinct records)