THE DISTRIBUTION AND ECOLOGY OF ARUM NEGLECTUM IN SOUTHERN ENGLAND

By C. T. Prime, O. Buckle and J. D. Lovis

PART I. KENT, SUSSEX, HANTS. AND DORSET

Arum neglectum (Towns.) Ridley was first recorded in the British Isles by A. Hambrough in 1854 when it was identified as *A. italicum* Miller. Subsequently Townsend (1883) distinguished it from *A. italicum* as var. *neglectum* and as recently as 1938 it was re-described by Ridley as a separate species. The plant is present as a native in southern and western England and northern France but its status and distribution on the Continent are very inadequately known. *A. italicum* (*sensu stricto*) probably does not occur in England as a native, but it has been cultivated, particularly in the south west and it is found occasionally as an escape.

THE DISTRIBUTION OF *ARUM NEGLECTUM*

A. neglectum has been recorded with certainty from ten vice-counties and the records from the more easterly of these will be treated in detail.

East and West Kent (Vice-counties 15 and 16)

Hanbury and Marshall (1899) give six localities for Kent, but it is very doubtful if the plant has ever occurred in the county [see Prime (1954), also Melvill (1888) and Briggs (1888)]. *A. italicum* (*sensu stricto*) has been recorded from Westwell near Ashford (v.c. 15) but in this locality it is an undoubted garden escape.

Sussex (Vice-counties 13 and 14)

Eight records were published by Wolley-Dod (1937); one (Arundel, 1920) is a duplication and another (Park Bottom) is now known to be an error. The following additional information has been collected from the labels of herbarium specimens at the British Museum and at Kew.

(a) Offington near Worthing, May 1858, *W. W. Saunders*; with a note that he tried for the plant between Broadwater and Sompting without success, and that he knew the plant only at Goring and Arundel.
(b) Lane leading to the Downs at Sompting, 1881, *Oakeshott*.
(c) Goring, *1921, C. E. Salmon*.

One of us (O. Buckle) has searched the county systematically for this plant and has added many localities. The complete list for *A. neglectum* now reads:

1. Southwick
2. Lancing Manor
3. Bramber Castle
†4. Bramber
5. Steyning
6. Cokeham Road
7. Sompting Village
8. Sompting Church
9. Nr. Sompting Abbots
10. Upper Brighton Road, Sompting
11. Lambley Lane
12. Tarring
13. High Salvington
14. Ham Farm, Goring
15. Old Forge, Goring
*16. Sea Lane, Goring
17. Titmore Lane
18. Sea Lane, Ferring
19. Hangleton Lane
20. Nr. Kingston Copse
21. Copse nr. Ferring
22. Holt Farm, Clapham
23. Clapham Church
24. Clapham Village
25. Nr. Patching Pond
26. East Preston
27. West Preston
28. Rustington
29. Brookpits, nr. Littlehampton
30. Clymping
31. Cross Bush, Arundel
32. Arundel Bridge
†33. Swanbourne Lake
†34. Black Rabbit
†35. Cocking Village
36. Roadside north of Cocking
37. Treyford
38. South Harting
39. Bury Hill
40. Bignor
41. Barlavington
42. Offham
43. South Stoke

The plant has been seen recently in all these stations except the first, and until its rediscovery, Lancing Manor (v.c. 13) remains the eastern limit of the species in Great Britain. It is absent from E. Sussex (v.c. 14). Sites 35-41 serve as a link with the Petersfield localities in Hants. The chromosome number of two plants of *A. neglectum* from Steyning has been determined as 2n = 83 (J. D. Lovis).

The cultivated form of *A. italicum* with marked cream veins in the leaves occurs in the following localities:

1. Newtimber
†2. Offington Lane
†3. Offington Hall
†4. Offington Corner
5. Sutton by Bignor
6. Bognor

The Offington plants were possibly planted by the owners of Offington Hall who were enthusiastic gardeners. One or two plants from the Tarring Colony of *A. neglectum* have the appear-

†A record given in Wolley-Dod (1937).

*Now destroyed by building.

ance of hybrids. All the plants from the first list are quite clearly *A. neglectum,* and all have unspotted leaves.

The Newtimber record based on a leaf specimen in the Druce herbarium at Oxford was refound in 1953 growing in cultivated ground. The localities at Sutton by Bignor and Bognor are similar.

The history of the plant in Sussex is puzzling. The earliest notice was in 1858 at Offington and a specimen is in the British Museum. As already mentioned, it now seems certain that this plant was *A. italicum.* It appears from notes with the specimen that Saunders was at that time aware of the plant at Goring and at Arundel, and neither of these localities is under suspicion of producing *A. italicum.* Another specimen at the British Museum is labelled 'Near Sompting, June 30th, 1881', and is from C. Oakeshott. This locality is also under no suspicion of producing other than *A. neglectum* and is the first dated specimen for the species in Sussex. Other reliable dates are:

Arundel (Swanbourne lake), 1920
Goring, 1923
Southwick, 1931
Cocking, 1933

A. neglectum (as *A. italicum*) is boldly claimed as a native of the county in the *Flora of Sussex* (Wolley-Dod, 1937). Arnold's earlier *Flora of Sussex* (revised in 1907) gives only the Offington localities, but the plant has certainly been in the county since 1881, and very probably at Goring and Arundel (where it still grows) since at least 1858.

HAMPSHIRE (Vice-counties 11 and 12)

The following localities from Hampshire have been recorded:

1. Bordean Hangar, 1919, *E. H. White*; but not visited after 1923 (*Rayner*, 1929), v.c. 12.
2. Hockham coppice, East Meon, 1933, *F. Escombe*, Hb. Kew.
3. Compton, nr. Winchester, *F. Escombe* (*Ridley*, 1938).
4. Lyth Hanger, Steep, Petersfield, 1946, *Mrs. O. G. Seward* (*in litt.*)

The first record is supported by a specimen in the Kew herbarium and a small colony still persists (1953). Hockham coppice is the locality from which F. Escombe made extensive collections in 1933. These are now at Kew. Compton, nr. Winchester, given by Ridley (1938), was inferred from the extensive Escombe correspondence at Kew, but search of all likely spots in the area has failed.

To these may be added the following:—

1. Buriton v.c. 11
2. Ramsdean
3. Froxfield v.c. 12
4. Stonor Hill
5. Wheatham Hill
6. Roadside near Hawkley
7. Hawkley Hanger
8. Goleigh Farm
9. Noar Hill
10. Selborne Hangar
11. South Hay

In Hampshire the plant may be considered abundant where it occurs; in fact, it is found in every suitable locality along the whole of the Chalk escarpment, where the Chalk and Gault meet, between Cocking in Sussex and Selborne. It is most noticeable that the plant always grows along the lower slopes of steep woodland where the soil over the Chalk is relatively deep and rich as well as moist. South Hay is the northernmost locality in southern England and is 25 miles from the open sea. The chromosome number of two plants from Lyth Hanger has been determined as 2n = 84 (J. D. Lovis).

ISLE OF WIGHT (Vice-county 10)

A. neglectum was first recorded from Steephill, near Ventnor, by Hambrough (1854), but in his account he says that he had seen the plant there previously. Subsequently it was recorded from Bonchurch on the other northern side of Ventnor. At the present time the plant is common at the base of the Undercliff all the way from Niton to Bonchurch, being more frequent than *A. maculatum*. It shows some variation, for plants with a few round spots are frequent as are plants with a slight white venation, but they do not show the full development of this character which is so marked a feature of *A. italicum*. The chromosome number of one plant from Ventnor was found to be 2n = 84 (J. D. Lovis).

DORSET (Vice-county 9)

A. neglectum (as *A. italicum*) was found in this county in 1874 by H. N. Ridley "at Swanage" and "in thickets near the sea between Durlstone and Arish Mell" (Ridley, 1938). The first locality has now been built over, but recent search by one of us (J. D. Lovis) has located ten colonies in the second area. All the habitats are more exposed than those further east and the plants are slightly different, the leaves tending to a more pointed apex and showing a slightly wider divergence of the lobes. *A. neglectum* from other parts is sufficiently variable as to make it impossible to distinguish the Dorset plants from some plants of *A. neglectum* from elsewhere. Several plants from Dorset were found to have chromosome numbers 2n = 84. Two other determinations of 2n = 70 are probably hybrids between *A. neglectum* and *A. maculatum*.

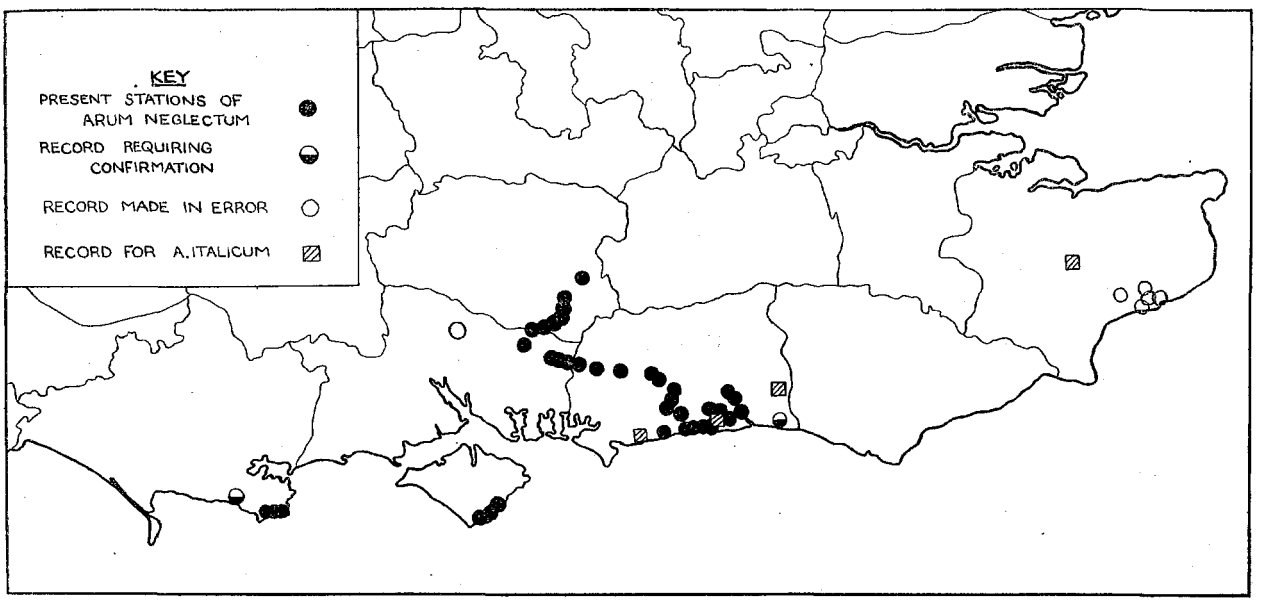

Fig. 1. The distribution of *Arum neglectum* in Britain
1. Dorset, Hampshire, Isle of Wight and Sussex

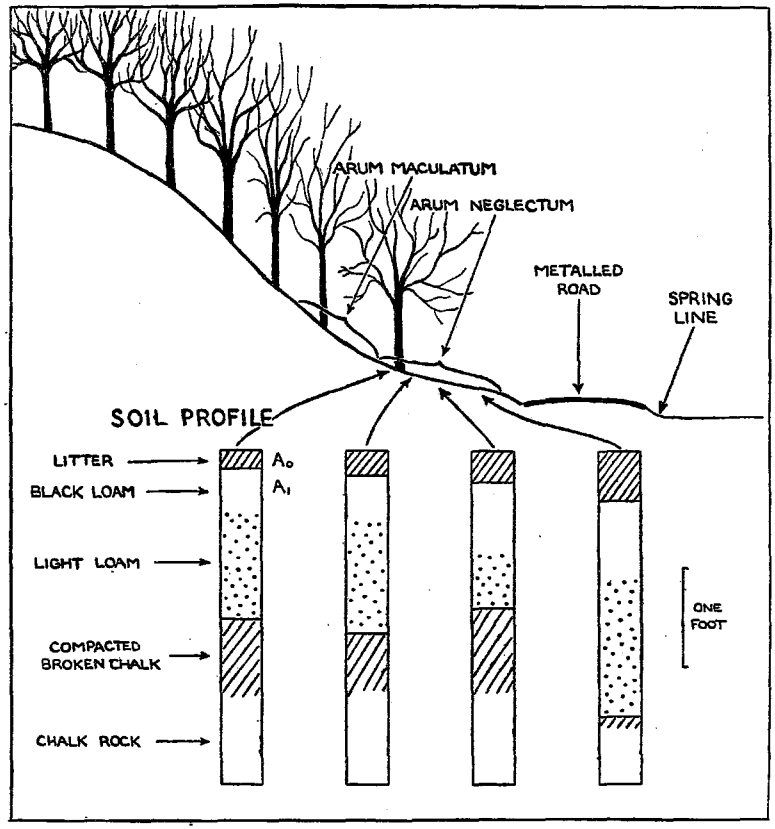

Fig. 2. *Arum neglectum* near Swanbourne Lake, Arundel

THE ECOLOGY OF *ARUM NEGLECTUM*

The present distribution is shown on the map (Fig. 1). The northern limit may be correlated with a susceptibility to severe frost during the winter (Prime, 1954). Within its range the plant shows distinct ecological preferences. Although it occupies rather varied habitats in different parts, these show similarity and careful study of them suggests that the first requirement of the species is a deep well drained soil.

The plant often occurs on shady banks above or near water. In Sussex the usual station is on Brick Earth, Coombe rock, Valley gravel or Gault near the junction with the Chalk so that there will be a fairly continuous calcareous wash over the deeper and richer soil. Though it occurs near the Chalk, the plant is not found on the typical hot shallow rendzina soils; the nearest to

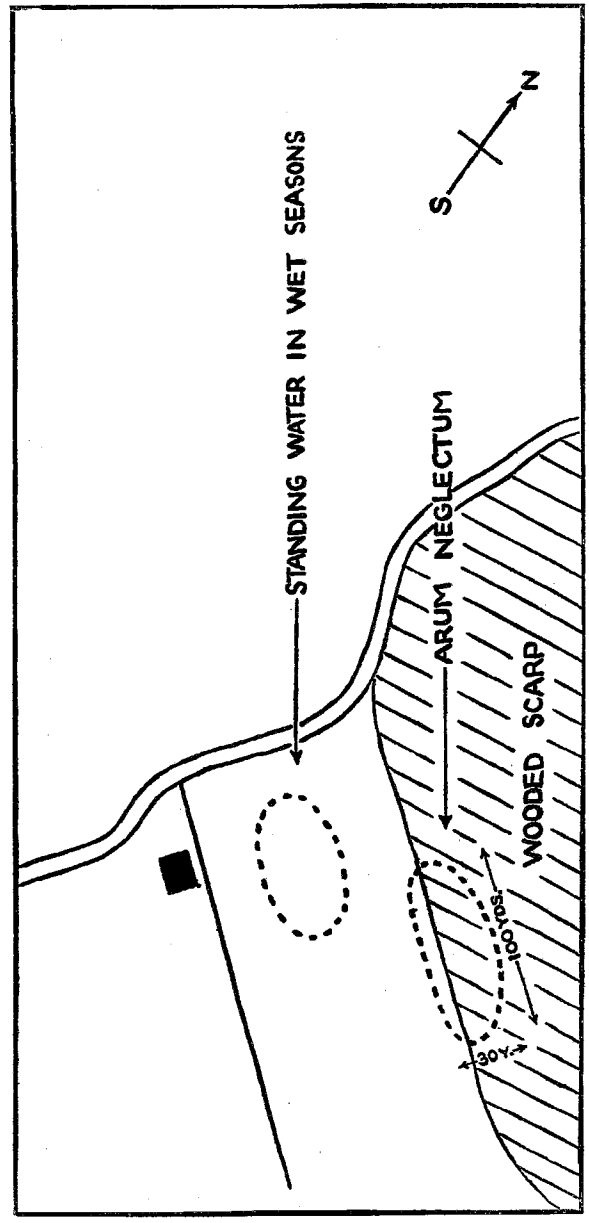

Fig. 3. *Arum neglectum* at Hockham Coppice, East Meon

this type is the soil of the Lyth Hanger escarpment near Petersfield. The rendzina soils are probably far too dry. A possible exception to the deep soil requirement is Purbeck, Dorset, where the soil is shallow, but the underlying rock is fissured and this allows a deep root penetration. At Arundel in Sussex (locality 36) where there is one of the largest colonies, the plant grows at the base of a steep chalk escarpment abutting on a road margin. Here there are springs which lead away into a stream running parallel with the base of the scarp. Fig. 2 is a rough diagram of this locality. The soil is alkaline with a pH of 8·0 and some drawings of the soil profile are given in figure 2. At this site, light intensity appeared to be far less important than water supply (Prime, 1954).

In other Sussex localities the association of the plant with water is most marked. Examples are sites 4, 19, 27 and 35. Hockham coppice, East Meon, Hants., is another locality where the plant is to be found on a good soil at the base of a chalk escarpment and near water (Fig. 3). The Isle of Wight sites show a similar well defined habitat, the plant occurring at the base of the Undercliff formed from Upper Greensand overlying the Gault. The soil is consequently derived from the downwash, and it is deep and moist and similar to those already mentioned.

The Dorset habitats are slightly different, for the parent material is of heavy grey clay and limestone, which forms a soil of a rich red-brown type (Robinson, 1948). The plant grows on the cliff tops which are, in places, obviously moist with springs issuing. There does not appear to be any correlation between the presence of *Arum neglectum* and these springs, but there are, no doubt, very many places where water is passing up in the soil, but not in sufficient quantity to show an outflow.

Although as shown above, a moist soil is required, *Arum neglectum* cannot tolerate anything in the nature of a waterlogged soil. In Sussex it is very striking that, as soon as soil and water conditions permit *Phyllitis scolopendrium* and *Polystichum lobatum* to appear, *Arum neglectum* disappears. A favourite position for the plant is a well drained sloping shady bank, where the angle is steep, often exceeding 75°.

The reason for the plant requiring such a soil is most probably associated with the presence of exchangeable bases, particularly calcium. In Sussex the plant is never far from the Chalk, and it is worthy of note that deposits of Reading Beds lying across the area appear to be quite unsuitable for the plant, which has stations all round the perimeter of the clay but no station actually on it (Fig. 4). The Hampshire localities are all on or near the base of chalk escarpments. The Upper Greensand in the Isle of Wight is calcareous. In Dorset, the records are on the Purbeck series or the Portland stone.

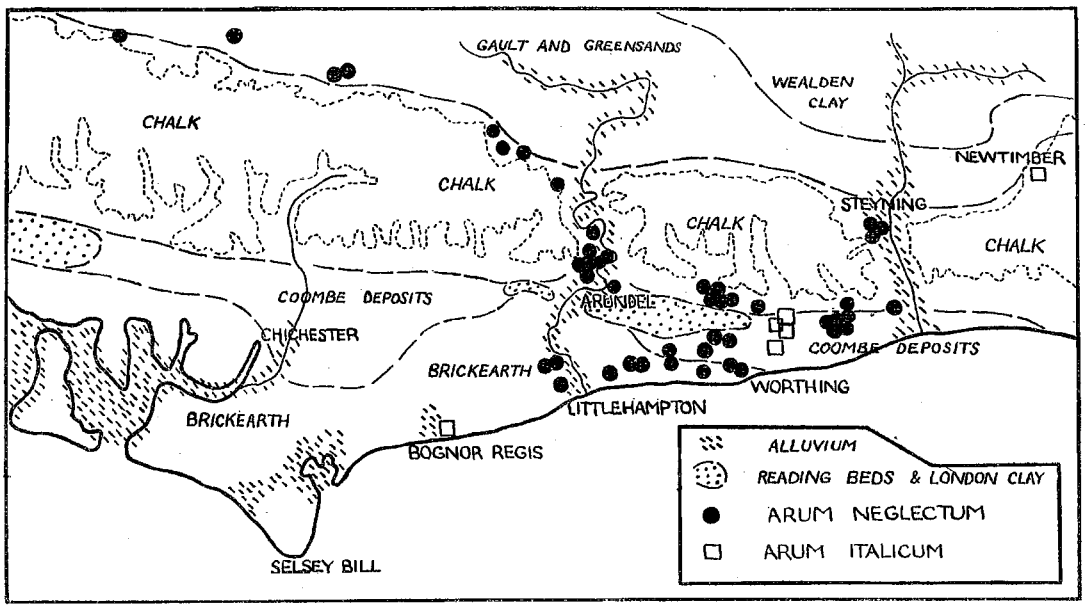

Fig. 4. Distribution of *Arum neglectum* in Sussex, with relation to Geology

Light shade is a second important factor, and shelter from the danger of drying out in hot summers is as important as winter protection. In Sussex, Hants., and the Isle of Wight many plants grow in the shade of deciduous trees, e.g., *Ulmus* spp. and *Corylus avellana*. Sites where shade is now absent can usually be proved to have had suitable shade in the not very distant past. *Hedera helix* is present on the ground in many localities, and this evergreen may give winter shelter.

In Dorset the sites are more exposed and of two kinds. One, very local, is in open grassland and dominated by *Brachypodium pinnatum*. Here *Arum neglectum* is not luxuriant but gains protection from the Tor grass which is very persistent in winter. The second is in scrub on the east side of limestone walls, and more rarely on the western sides where there is less scrub.

From a consideration of the foregoing, it will be seen that few situations having all the requirements of the plant occur on the south coast. Many possible habitats are too far from the sea, too bleak and exposed (the Chalk west of Brighton), the soils too heavy (London Clay of the Selsey peninsula), or lacking in calcium (Reading beds). There would appear to be suitable localities in the more eastern strip of Kent. Most of the Sussex sites occur in the sheltered valleys of the Arun and Adur. The Hants. localities are also well defined, while the optimum development seen in the Isle of Wight is associated with the added mildness of climate and shelter found in the south-east part of the island.

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