The Boxwood Bulletin

A QUARTERLY DEVOTED TO MAN'S OLDEST GARDEN ORNAMENTAL

The Box Wood at Boxwell in Gloucestershire. In front stands the gardener's cottage; and to the right (out of the photograph) within the wood arises the spring which gives the locality its name.

Photograph from M. J. C. Staples, England.

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INDEX

A Boxwood Grows In Israel _________________ 33
Dr. Henry T. Skinner

A History of Box in the British Isles ______ 35 - 37
M. J. C. Staples

An Integrated Program for Control of Boxwood Pests _______ 38 - 41
William A. Gray

“The Earth Was Ploughed By Earthworms” 42 - 43
Charles Darwin

Boxwood In Old Sun-dials” ____________ 44
Alice Morse Earle

Boxwood, Its Uses and Its Ailments ______ 45 - 47
Ernest H. Wilson

New Members _____________________________ 47

Annual List of Honorary Life, Life, Sustaining and Contributing Members ____ 48

ILLUSTRATIONS

The Box Wood at Boxwell in Gloucestershire, England ___________ Cover
A Boxwood Grows In Israel _________________ 33
Map of Distribution of Box Place-Names in England ___________ 34
Edge of the Box/Yew Wood at Box Hill, Surrey ____________ 36
Encourage Ground-Feeding Bird Species _______ 38
Quail Policing Young Boxwood _______ 39
Provide Near-By Nesting Sites _______ 41
Sun-dial In Box At Ascott, England ____________ 44
A BOXWOOD GROWS IN ISRAEL

Dr. Henry T. Skinner

Knowing that I was planning to attend the 1970 International Horticultural Congress in Tel Aviv, Israel, the Bulletin's indefatigable Editor, Mrs. Edgar Whiting, asked that I be sure to provide her with a story on the Boxwood Gardens of Israel. It was a straightforward request but little did I realize how mini the gardens would prove to be, or how brief the story.

Headquarters of the Congress was the Tel Aviv Hilton, a modern waterfront highrise surrounded by a park filled with palms, olives, carob trees, acacias, and aglow with tibouchinas, gazanias, cactus and monstrous scillas. With camera well loaded I sallied forth on the second day to locate the park's boxwood garden—or hedge or plant. Unhappily there was not so much as the tiniest seedling. Nor, in over a week, did my wife or I find a single specimen in any garden or municipal planting of Tel Aviv or adjoining Joppa. In course of excursions which took us from the flower-laden slopes of Mt. Carmel to Jerusalem, Bethlehem, and Beersheba and the Negev Desert nowhere was a boxwood seen—with just one exception which by then had become so essential to prove the rule or fact that boxwoods are just not grown in Israel. The unglamorous exception was a single plant less than three feet high on the grounds of the Mikve agricultural training school, a few miles east of Tel Aviv towards Jerusalem. It was a struggling sample of common box, Buxus sempervirens.

This situation is actually not surprising for Israel's coastal, higher rainfall climate produces avocados, tasty bananas and delicious citrus fruits. It is akin to that of Florida or southern California, both of which are less than famous for their boxwood gardens. From the lesson of California we suspect that the oriental boxwoods, particularly B. microphylla japonica, might be more successful in Israel than common box but, so far as we could ascertain, it did not seem to have been tried. It would be interesting to know whether any reader of this note knows of a second Israeli boxwood plant. Unfortunately I did not happen to have an A.B.S. membership application to leave with the Mikve school.
Map showing the distribution of 'box' place-names in England. The broken lines delimit the counties.

M. J. C. Staples

Map, cover photograph and photograph on p. 36, are illustrations for A HISTORY OF BOX IN THE BRITISH ISLES; Part II, The Place-Name Legacy, by Mr. Staples.
II. THE PLACE-NAME LEGACY

‘BOX’ WORD-ELEMENTS

The word ‘box’ has been noted to occur frequently in British place-names, in one of several forms. ‘Box’, or ‘boxe’, is the normal Anglo-Saxon form, meaning ‘a box-tree’. It was also spelt ‘byxe’, which gave rise to a Kentish variation in which ‘y’ replaces the ‘y’; hence ‘bexe’. The adjectival form, ‘byxen’, is found in some place-names too, for example Bexington in Dorset (Byxen, -tun). From these roots have arisen nearly fifty English place-names.

DIFFICULTIES OF INTERPRETATION

The superficial appearance of a modern place-name often conceals its true origin and meaning, and there is often the necessity to delve back into its earlier forms to elicit this information. For instance, Boxworth in Cambridgeshire might seem to be simply ‘box’ and ‘worth’ (= enclosure); however in the Domesday Book (1086) the spelling is Bochesuorde which suggests the genitive of ‘boc’, ‘boces’. Skeat (1911) suggests that ‘boc’ was either ‘an he-goat’ from the Norse, or ‘a buck’ from the Anglo-Saxon. Alternatively it may derive from a personal name, i.e. ‘Bucc’s Enclosure’ (Reaney, 1943). ‘Boc’ also complicates the issue for philologists in other parts of the country. Its normal meaning in Old English was ‘beech-tree’, but it later developed another sense of ‘charter’. Thus Boxted in Essex is said to be derived from this, in the Domesday Book it being Bocchesteda (Reaney, 1935). It may mean ‘place of the beech-trees’, or ‘land granted by charter’.

Personal names, derived from ‘box’ or from a locality of Buxus may wrongly transfer the etymological association to quite a different place. Boxers Wood in Surrey evolved from Boxfordsmere (1461)* and Boxford (1403). It is to be associated with the family of Robert de Boxford (1279) who probably came from Boxford in Berkshire (infra). Boxgrove, also in Surrey, was originally land granted to Boxgrove Priory in Sussex (Gover et al, 1834).

Many compounded ‘box’ place-names can be traced back to the 11th and 12th centuries, but it has

to be remembered that the Middle English scribes who recorded these names for posterity were highly individualistic in their spelling. Bexhill, Sussex, suffered more than most. As Bexlea (772) to Bexlei (1086) it is easily recognisable as compounded of ‘byxe’ and ‘leah’ (wood). In later centuries, however, it became, in written script at least, Bixle (1186), Beause (1226), Bewes (1257), Boux (1341), Buxhull (1399), Byxhell (1496) and finally appeared as Bexhill in 1629 (vide Mawer & Stenton, 1929). The association with ‘leah’ was lost, to be replaced with ‘hyll’, a process more elaborate in written form than in speech.

A common fault in the Middle Ages was the transportation of ‘cs’ (= x) to ‘sc’, known as metathesis. It is found in the first record of Bexham Barn, Essex, which was Beschtan in the 13th century. This fault also led to the dropping of the ‘cs’ sound from Boscombe in Wiltshire, and Boscombe House in Gloucestershire.

‘BOX’-SIMPLE

To the Anglo-Saxon Buxus would have been an easily identifiable tree, widely distributed yet local enough to characterise a particular locality. The element ‘box’ was used on its own frequently, and is today found in Box, Gloucestershire (1234), Hertfordshire (1086), and Wiltshire (1144). From ‘byxe’ similarly arose Bax in Kent and Bix in Oxfordshire (1086). Bax was Byx in 1327, but in the 18th century this became confused with the family name ‘Back’, and Bax resulted.

‘BOX’—COMPOUNDED

‘Box’ is often compounded with topographical elements. Boxford, in Berkshire, does indeed as its name suggests lie on the site of a river crossing. The present name co-existed with Boxworth from the 17th to 19th centuries. In these names, nonetheless, both suffixes are superimposed on the old name of Boxoran (1022). The OE ‘ora’ here means either ‘the bank of a river’ or ‘the slope of a hill’. The hill rising behind the village would certainly provide a suitable habitat for Buxus.

Words indicating a valley, OE ‘cumb’, ‘denu’, and ‘slaed’ are frequent and not unconnected with the species’ “preference” for a well-drained hillside.
Some elements denoting vegetation also indicate the topography. Boxhanger (1241), in Gloucestershire, indicates *a wood on a steep hillside*, whilst Boxhurst (1240), in Kent, describes *a wooded eminence*.

‘Leah’ occurs frequently in British place-names. It originally referred to ‘a wood’, but later came to be used for ‘a clearing in a wood’. This element, compounded with ‘box’, is found today at Bexhill in Sussex (supra), Bixley in Norfolk (1285), and at Bexley and Boxley in Kent. At Boxley it certainly referred to a wood where *Buxus* grew in plenty until recent times (Hanbury & Marshall, 1899). Here there was a similar association of *Buxus* with *Taxus* as exists at Box Hill in Surrey.

Many other elements can be mentioned in relation to ‘box’. They can be roughly divided into two categories. There are those suffices referring to an area of land, such as ‘accer’ (= acre) eg Boxacker, Gloucestershire (1241), and ‘pece’ (= plot) eg Box Peice, Hertfordshire (1623). As well as ‘field’, as in Boxfield Farm supra, also found are ‘laes’ (= meadowland) eg Boxleaze, Gloucestershire (1691), ‘holm’ (= water-meadow) eg Boxholme, Sussex, and ‘maed’ (= meadow) eg Box Meadow, Berkshire. Dwelling-places represent the other group of elements. ‘Hamstede’ (= homestead) occurs in Boxted. Hertfordshire, which was recorded as Boxhamstede in 1309. ‘Stede’ itself means just ‘a place, or locality’. It forms part of many present-day Boxted’s in Essex (1377), Kent (1598), Suffolk (1086), and Sussex (1199 - now known as Buxted). ‘Tun’ (= farmstead) occurs in Bexington, Dorset (1086).

THE PLANT AND THE PLACE-NAME

Box Hill in Surrey and Boxwell in Gloucestershire are living examples of the correlation between the plant and the place-name. The name Box Hill is recorded in 1629; Thomas Atteboxe (1268) and William de la Boxe de Dorking (1268) indicate the antiquity of this site. Today on the steep chalk escarpment a *Buxus/Taxus* wood still thrives. Boxwell is a classic name. It is recorded as ‘Boxewella’ in the Domesday Book (1086). Even today a spring arises from the junction of the Great Oolite Limestone and the underlying Fullers Earth Clay within a wood of almost pure *Buxus*, thus demonstrating the origin of the suffix ‘wella’ (= spring or well). Even the third major existing site for *Buxus*. Chequers in Buckinghamshire, has given a local field-name, the nearby parish of Great Kimble containing a ‘Box Field’, recorded first in 1803.

PLACE-NAME DISTRIBUTION

The map shews the distribution of those place-names which are definitely or probably related to the occurrence of *Buxus*, native or otherwise. The three Buxtrees and one Box House in northern England are outside the natural limit of growth for *Buxus* and derive from plantings. Southern England has 47 localities however, many of ancient origin.
21% of the names are recorded in the Domesday Book of 1086, and a further 45% of them are known by the 14th century. Even those names only recently discovered may have a long unrecorded history. Several names, mentioned in the text supra, have been omitted owing to their exact location being unknown.

A similar distribution of place-names associated with Buxus can be constructed for France. Vincent (1937) lists 48 such places derived from the French 'buis' eg. Le Buis, or the Latin 'buxus' eg. Buxerolle. In northwest France their distribution is continuous with the English one.

It is evident that during the Middle Ages and before Buxus was widespread throughout southern and south-central England although most of the localities were disjunct (a similar situation existed in France). Whether the incorporation of 'box' into a place-name indicates a single tree, a scrub, or a wood of Buxus is extremely difficult to ascertain; but the great antiquity of many of the names suggests their origin to lie well before the Norman Conquest, when accurate documentation was rare. Buxus, indeed, must have been well-known to the inhabitants of those times. Many of the place-names tell of clearings and the establishment of farmsteads, or describe a natural feature. It was a time of great human expansion into virgin territory, and it may be conjectured that on many or all of these sites Buxus grew in its native wild state. In the final section of this account this relationship between the place-name record and the natural distribution and ecology of Buxus will be discussed.

BIBLIOGRAPHY (PART II)


A HISTORY OF BOX IN THE BRITISH ISLES will be concluded in the April issue of the Bulletin, with PART III, THE HISTORICAL PERIOD.

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The American Boxwood Society

Eleventh Annual Meeting

May 12th 1971

U. S. National Arboretum, Washington, D. C.

COMMENCING 10 A. M. PLEASE PUT IT ON YOUR CALENDAR
An Integrated Program
For Control of Boxwood Insect Pests

WILLIAM A. GRAY

Recently, much has been said and written about the feasibility of an integrated approach to the control of insect pests, as an alternative to heavy applications of chemical insecticides. In this context, an intent to rely on both natural and man-made controls is implied; and the approach comprises a combination of cultural, biological and chemical techniques. Additionally, in an integrated program, the chemical weapons must be compatible with the biological control measures and applied selectively as needed.

An integrated control program may involve exceedingly complex technology or may be a relatively elementary application of proven practices. In either case, it is important to know the pests and to recognize their effects upon the plant materials.

Compared with many widely planted trees and shrubs, Boxwood is free of serious insect pests. Of the 100,000 or so insect species in North America, about a half-dozen are considered as potentially damaging to Buxus sempervirens; serious infestations of these are not a common occurrence.

Hence, a reasonably simple integrated control program would seem practical for the Boxwood gardener. A review of our experience at Madoc Level with such an approach for English Boxwood may be timely, especially since complete freedom from pest infestation has been maintained for over ten years.

BOXWOOD INSECT PESTS

The several pests of concern have been thoroughly described in past Bulletins, as well as in other reference materials available to ABS members.

Except for the webworm, all of the species are very small insects, difficult to see. Their presence is likely to be discovered by their effect on the foliage. All feed on inner tissues of the plant; hence, contact insecticides are more effective than stomach poisons. All spend their full life cycle in the foliage or twigs of the Boxwood plant. For most, the active phase (and, generally, the period of greatest vulnerability to control measures) is roughly between late April and early June—coinciding with the normal growing period of B. sempervirens.

CULTURAL PRACTICES

Some of the agricultural techniques recommended for the control of insect pests, such as crop rotation, deep tilling, and a shift away from monoculture, are clearly not applicable to Boxwood. Since vigorous and healthy Boxwood plants are likely to ward off damaging insect attack, appropriate cultural practices are important.

Perhaps the first and most important measure is to avoid a planting location unsuited to Boxwood—most especially a spot that would result in wet feet. Reasonably good housekeeping is another important part of the program. Dead twigs and branches should be cut out. Weeds, lawn grasses, or ground cover should be kept mowed. Any excessive accumulation of dead leaves should be removed from within the plant. Do not bring in infested plant material from other locations without taking steps to control the problem immediately; this applies to cuttings, as well as rooted plants with soil.

The application of an anti-dessicant spray, widely used to reduce winter damage, may help control spider mites and scales. The thin film appears to act as a mechanical barrier to the movement of these tiny insects.

BIOLOGICAL CONTROLS

Insect populations are subject to a variety of natural controls, including predatory and parasitic insects, diseases, and a number of higher animals that feed on insects. In recent years man has devoted an increasing effort to the development of bacterial diseases, sterilization techniques, trapping systems and growth-limiting hormones as biological weapons against specific insect pests. None are useful to the Boxwood gardener.
Hence, at Madoc Level we elected to rely on natural biological controls as the primary defense against Boxwood insect pest attack. In practice, two measures are employed. We avoid discouraging the predatory insects by limiting our use of chemical sprays to situations where damage by the pest insects becomes apparent. No massive, area application of insecticides is made. Secondly, we encourage a large local resident land bird population by maintaining a regular feeding schedule the year around.

**BIRDS AND INSECT CONTROL**

Although some species of birds depend mainly on insects for a year-round food supply, all nesting land birds (including vegetarians) must give their young an insect diet. This is the only available food source with the high protein content required to achieve the necessary growth rate. Birds naturally adjust their nesting periods to insure a plentiful supply of insects; happily, this roughly coincides with the active, vulnerable phase for the target pests of concern. With insect population control as the aim, one should take steps to attract a large resident ground-feeding bird population by feeding 12 months a year and providing ample nesting sites nearby.

At Madoc Level, with about five acres in lawn, fields and gardens, we use 150 pounds/month of a mix of fine cracked corn, medium corn and sunflower seeds. This is put out daily on feeding trays. A variety of trees and shrubs in our fields and in adjacent wooded areas include species useful to birds—especially cedars, hollies, pines, wild cherries, flowering crabs and pyracantha.

Those ground feeding land species that are year-round residents, winter visitors or migrants provide an added fringe benefit. Mocking birds, chickadees and some sparrows, for example, work on overwintering insect eggs and larvae.

**CHEMICAL WEAPONS**

There are two fundamental limitations to chemical weapons when applied to an area as a preventative measure. First, no insect pest can be eradicated by chemical means; at best, the population can be reduced temporarily well below damaging levels. Second, chemical weapons are not selective; in addition to the target species, a wide spectrum of useful and harmless insects are killed. In some situations, predatory insects can be affected more drastically than the target pest.

In an integrated program, the appropriate chemical weapon should be employed at the right spot and at the proper time—and then only if necessary. For Boxwood, a contact insecticide of short persistence should be used, directed at infested plants, and applied one or more times during the period when the target insect is most active and vulnerable.

At Madoc Level, when the need for a chemical control becomes apparent, we use a water mix comprising 2 tsp/gal of 57% EC malathion plus 1 tsp/gal of Wilt Pruf as a sticker-spreader. Three applications are made generally, at 10 day to 2 week intervals, between late April and early June.

Quail Policing Young Boxwood

*Taken with a telephoto lens. All illustrations for this article are by Mr. Gray.*
### TABLE: A SUMMARY FOR BOXWOOD INSECT PESTS

<table>
<thead>
<tr>
<th>Insect Pest and Order</th>
<th>Approx. Size</th>
<th>Life Cycle</th>
<th>Vulnerable Period</th>
<th>Typical Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Psyllid</strong> <em>Homoptera</em> (Hoppers, aphids, scales)</td>
<td>1/8”</td>
<td>Egg-crawling nymphs (winged jumping adult. 1 gen/yr. Overwinters as eggs/small nymphs under bud scales.)</td>
<td>As large nymphs and adults, late April to June.</td>
<td>Cupping of outer leaves, late spring, early summer.</td>
</tr>
<tr>
<td><strong>Scales</strong> <em>Homoptera</em></td>
<td>1/8”</td>
<td>Egg-crawlers-covered stationary nymphs &amp; adults. 1 or 2 gen/yr. Overwinters as eggs under old scale covers on inner twigs.</td>
<td>As post-hatch crawlers, May to June.</td>
<td>Reduced plant vigor; look for scales on twigs.</td>
</tr>
<tr>
<td><strong>Spider Mite</strong> <em>Acarina</em> (Mites, ticks, chiggers)</td>
<td>1/64”</td>
<td>Egg-nymphs-adult. 4 to 5 gen/yr. Overwinters as eggs on under sides of leaves.</td>
<td>As post-hatch nymphs, late April to summer.</td>
<td>Mottled leaves with bronze appearance, late spring &amp; summer.</td>
</tr>
<tr>
<td><strong>Leaf Miner</strong> <em>Diptera</em> (Flies)</td>
<td>1/8”</td>
<td>Egg-larval stages-pupa-adult fly. 1 gen/yr. Overwinters as larval worms within leaves.</td>
<td>As post-emergence adults, late April to May.</td>
<td>Blisters on under sides of leaves in late summer.</td>
</tr>
<tr>
<td><strong>Webworm</strong> <em>Lepidoptera</em> (Butterflies, moths)</td>
<td>1/2”</td>
<td>Uncertain; probably egg-larva-pupa-adult moth. 1 gen/yr. Overwinters as larval caterpillar in web within plant.</td>
<td>As larval worm in web, spring &amp; summer.</td>
<td>Uncertain; look for webs with worms on inner branches.</td>
</tr>
</tbody>
</table>
I should like to emphasize, however, that the elementary program outlined above is not the answer to all insect pest problems. It may not be effective for Boxwood in some situations where nearby massive spraying is the rule, or in extremely busy locations. From our own experience, it does not achieve acceptably low damage levels for some of the more susceptible plant species: we find it necessary to maintain a rigorous annual spraying schedule on our fruit trees, roses, and hollies.

Some fringe benefits, unrelated to Boxwood, have been apparent. On normally susceptible plant species in our vegetable and flower gardens, occasional spot applications of rotenone or sevin are adequate. Although we have our share of Japanese beetles, the only evidence thereof is the presence of adults inside our screen house (an enclosure on a turf area), in our swimming pool leaf basket, and on our net-covered blueberry bushes—all places inaccessible to birds.

To conclude, we believe that our experience at Madoc Level with some 6000 English Boxwood plants is convincing evidence that natural controls (mainly, insects and birds) can be as fully effective in limiting pest insect populations as any massive preventative chemical spray program. One must keep in mind, however, that the two approaches cannot be used together; the choice between these alternatives must be an individual matter.

Lorton, Virginia
September 1970

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GARDEN CLUB OF AMERICA

AWARD TO EDITOR

The Garden Club of America on December 16th, 1970, honored Mrs. Edgar Mason Whiting, editor of The Boxwood Bulletin, with its Medal of Merit. The medal was presented at the December meeting of the Winchester-Clarke Garden Club, which had nominated Mrs. Whiting for the award. The accompanying citation read: “For her remarkable accomplishments as Editor of The Boxwood Bulletin, and her many years of volunteer work on civic projects in Winchester and surrounding areas.”

The editor well knows that the award is for the achievements of the Bulletin and the Boxwood Society rather than for her personally, and thanks all who have shared the work and should share the credit. This includes (among many others) Admiral Phillips, Dr. Baldwin, Mrs. Kirby, all the Directors and advisers, all our contributors of articles and pictures, our patient and always helpful printers; and not least the whole membership of ABS, whose loyal support has made it all possible. Thank you, please keep up the good work.
"Long Before Man Existed, the Earth Was Ploughed by Earthworms"

Charles Darwin

The interest in earth-worms stirred up by Mr. H. H. Carr's article in the October BULLETIN, on these humble but immensely important creatures, suggested to Dr. Baldwin the publication of a part of Darwin's classic on the subject. From the Biology library at the College of William and Mary, Dr. Baldwin supplied the final and summarizing chapter of Charles Darwin's THE FOUNDATION OF VEGETABLE MOULD, THROUGH THE ACTION OF WORMS, WITH OBSERVATIONS ON THEIR HABITS. (D. Appleton & Co., New York, 1883.)

CHAPTER VII

CONCLUSION

Summary of the part worms have played in the history of the world—Their aid in the disintegration of rocks—In the denudation of the land—In the preservation of ancient remains—In the preparation of the soil for the growth of plants—Mental powers of worms—Conclusion.

Worms have played a more important part in the history of the world than most persons would at first suppose. In almost all humid countries they are extraordinarily numerous, and for their size possess great muscular power. In many parts of England a weight of more than ten tons (10,516 kilogrammes) of dry earth annually passes through their bodies and is brought to the surface on each acre of land; so that the whole superficial bed of vegetable mould passes through their bodies in the course of every few years. From the collapsing of the old burrows, the mould is in constant though slow movement, and the particles composing it are thus rubbed together. By these means fresh surfaces are continually exposed to the action of the carbonic acid in the soil, and of the humus-acids which appear to be still more efficient in the decomposition of rocks. The generation of the humus-acids is probably hastened during the digestion of the many half-decayed leaves which worms consume. Thus the particles of earth, forming the superficial mould, are subjected to conditions eminently favourable for their decomposition and disintegration. Moreover, the particles of the softer rocks suffer some sort of mechanical trituration in the muscular gizzards of worms, in which small stones serve as mill-stones.

The finely levigated castings, when brought to the surface in a moist condition, flow during rainy weather down any moderate slope; and the smaller particles are washed far down even a gently inclined surface. Castings when dry often crumble into small pellets and these are apt to roll down any sloping surface. Where the land is quite level and is covered with herbage, and where the climate is humid so that much dust cannot be blown away, it appears at first sight impossible that there should be any appreciable amount of subaerial denudation; but worm-castings are blown, especially whilst moist and viscid, in one uniform direction by the prevalent winds which are accompanied by rain. By these several means the superficial mould is prevented from accumulating to a great thickness; and a thick bed of mould checks in many ways the disintegration of the underlying rocks and fragments of rock.

The removal of worm castings by the above means leads to results which are far from insignificant. It has been shown that a layer of earth, .2 of an inch in thickness, is in many places annually brought to the surface per acre; and if a small part of this amount flows, or rolls, or is washed, even for a short distance down every inclined surface, or is repeatedly blown in one direction, a great effect will be produced in the course of ages. It was found by measurements and calculations that on a surface with a mean inclination of 9°26', 2.4 cubic inches of earth which had been ejected by worms crossed, in the course of a year, a horizontal line one yard in length; so that 240 cubic inches would weigh 11½ pounds. Thus a considerable weight of earth is continually moving down each side of every valley, and will in time reach its bed. Finally this earth will be transported by the streams flowing in the valleys into the ocean, the great receptacle for all matter denuded from the land. It is known from the amount of sediment annually delivered into the sea by the Mississippi, that its enormous drainage-area must on an average be lowered .00,263 of an inch each year; and this would suffice in four and a half million years to lower the whole drainage-area to the level of the sea-shore. So that, if a small fraction of the layer of fine earth, .2 of an inch in thickness, which is annually brought to the surface by worms, is carried away, a great result cannot fail to be produced within a period which no geologist considers extremely long.
Archeologists ought to be grateful to worms, as they protect and preserve for an indefinitely long period every object, not liable to decay, which is dropped on the surface of the land, by burying it beneath their castings. Thus, also, many elegant and curious tesselated pavements and other ancient remains have been preserved; though no doubt the worms have in these cases been largely aided by earth washed and blown from the adjoining land, especially when cultivated. The old tesselated pavements have, however, often suffered by having subsided unequally, from being unequally undermined by the worms. Even old massive walls may be undermined and subside; and no building is in this respect safe, unless the foundations lie 6 or 7 feet beneath the surface, at a depth at which worms cannot work. It is probable that many monoliths and some old walls have fallen down from having been undermined by worms.

Worms prepare the ground in a very excellent manner for the growth of fibrous-rooted plants and for seedlings of all kinds. They periodically expose the mould to the air and sift it so that no stones larger than the particles which they can swallow are left in it. They mingle the whole intimately together, like a gardener who prepares fine soil for his choicest plants. In this state it is well fitted to retain moisture and to absorb all soluble substances, as well as for the process of nitrification. The bones of dead animals, the harder parts of insects, the shells of land-molluscs, leaves, twigs, etc., are before long all buried beneath the accumulated castings of worms, and are thus brought in a more or less decayed state within reach of the roots of plants. Worms likewise drag in an infinite number of dead leaves and other parts of plants into their burrows, partly for the sake of plugging up them up and partly as food.

The leaves, which are dragged into the burrows as food, after being torn into the finest shreds, partially digested, and saturated with the intestinal and urinary secretions, are commingled with much earth. This earth forms the dark coloured, rich humus which almost everywhere covers the surface of the land with a fairly well-defined layer or mantle. Von Hensen placed two worms in a vessel 18 inches in diameter, which was filled with sand, on which fallen leaves were strewed; and these were soon dragged into their burrows to a depth of 3 inches. After about 6 weeks an almost uniform layer of sand, a centimeter (.4 inch) in thickness, was converted into humus by having passed through the alimentary canals of these two worms. It is believed by some persons that worm-burrows, which often penetrate the ground almost perpendicularly to a depth of 5 or 6 feet, materially aid in its drainage; notwithstanding that the viscid castings piled over the mouths of the burrows prevent or check the rain-water directly entering them. They allow the air to penetrate deeply into the ground. They also greatly facilitate the downward passage of roots of moderate size; and these will be nourished by the humus with which the burrows are lined. Many seeds owe their germination to having been covered by castings; and others buried to a considerable depth beneath accumulated castings lie dormant, until at some future time they are accidentally uncovered and germinate.

Worms are poorly provided with sense-organs, for they cannot be said to see, although they can just distinguish between light and darkness; they are completely deaf, and have only a feeble power of smell; the sense of touch alone is well developed. They can therefore learn little about the outside world, and it is surprising that they should exhibit some skill in lining their burrows with their castings and with leaves, and in the case of some species in piling up their castings into tower-like constructions. But it is far more surprising that they should apparently exhibit some degree of intelligence instead of a mere blind instinctive impulse, in their manner of plugging up the mouths of their burrows. They act in nearly the same manner as would a man who had to close a cylindrical tube with different kinds of leaves, petioles, triangles of paper, etc., for they commonly seize such objects by their pointed ends. But with thin objects a certain number are drawn in by their broader ends. They do not act in the same unvarying manner in all cases, as do most of the lower animals; for instance, they do not drag in leaves by their foot-stalks, unless the basal part of the blade is as narrow as the apex, or narrower than it.

When we behold a wide, turf-covered expanse, we should remember that its smoothness, on which so much of its beauty depends, is mainly due to all the inequalities having been slowly levelled by worms. It is a marvellous reflection that the whole of the superficial mould over any such expanse has passed, and will again pass, every few years through the bodies of worms. The plough is one of the most ancient and most valuable of man's inventions; but long before he existed the land was in fact regularly ploughed, and still continues to be thus ploughed by earth-worms. It may be doubted whether there are many other animals which have played so important a part in the history of the world, as have these lowly organised creatures. Some other animals, however, still more lowly organised, namely corals, have done far more conspicuous work but these are almost confined to the tropical zones.

Boxwood Marked Time

In Old Sun-dials

Alice Morse Earle in her Old-Time Gardens, writes:

A very pretty conceit in Box was —

“Horizontal dials on the ground
In living Box by cunning artists traced.”

Reference is frequent enough to these dials of Box to show that they were not uncommon in fine old English gardens. There were sun-dials either of Box or Thrift, in the gardens of colleges both at Oxford and Cambridge, as may be seen in Loggan’s Views.

A modern one is in the gardens of Lady Lennox, at Broughton Castle, Banbury, England. Another of exceptionally fine growth and trim perfection is in the garden at Ascott, the seat of Mr. Leopold de Rothschild. These are curious rather than beautiful, but display well that quality given in the poet’s term ‘the tonsile Box.’” *

Writing of a similar sun-dial, Lady Warwick says: —

“Never was such a perfect time-keeper as my sun-dial, and the figures which record the hours are all cut out and trimmed in Box, and there again on its outer ring is a legend which read in whatever way you please: Les heures heureuses ne se comp­tent pas. They were outlined for me, these words, in baby sprigs of Box by a friend who is no more, who loved my garden and was good to it.”

* (The O.E.D. says: “Tonsile, ad. L. tonsilis, from tons-, tondere to shear); that may be clipped or shorn.”

Boxwood Its Uses And Its Ailments

A Chapter From “If I Were To Make A Garden”

ERNEST H. WILSON

If there is one outstanding favorite evergreen it is, undoubtedly, Boxwood, and it has been down the ages from so far back as one can trace gardening in Europe. Boxwood was known to the ancient Greeks, and Theophrastus ranks the wood with that of ebony. Pliny, the Roman scholar, distinguished three kinds which he called Larger, Smaller and Italian Box, and speaks of their use for topiary work. In Roman villas of the Augustine age, Boxwood was much employed in verdant sculpture and close-clipped hedges. The same practice is followed today in the gardens of the Vatican.

From medieval times onward, it was essential in the making of any and every garden and by many modern garden-makers it is still held in the same degree of admiration. And rightly so, for no evergreen is possessed of greater all-round ornamental qualities than Boxwood. Compact of habit, bearing clipping with impunity and varying tremendously in form and shape of leaf and in size and habit of growth, it is adapted for a great variety of uses in gardens. Moreover, the odor of its leaves and blossoms is unlike that of any other plant and creates a peculiar atmosphere, one reminiscent of age. When Boxwood was introduced into this country we do not know, but it was probably among the first exotics brought here. Long, long ago it was the pride of many Virginian gardens and in spite of neglect that, through no fault of the owners, has overtaken these gardens, Boxwood remains one of the greatest treasures they possess.

When planting Mount Vernon, Washington, we know, made liberal use of Box bushes and Box edging, as did all who labored to make pleasant places during that period. There is nothing more delightful than to wander along the paths and about the lawns where old Box bushes, often veritable trees, luxuriate. Irregular, often billowy of form, like dense waves of dark green, they stand unique. When topiary was at its height Boxwood was the favorite subject. Today the fashioning of plants into quaint shapes is no longer a vogue, but whatever we may think of the art we must admit that it was wonderful what designs old gardeners did create in Boxwood. The enthusiasm for gardens, which has been such a marked feature since the dawn of the twentieth century, has brought Boxwood into new prominence in this country and many an old Virginian estate has made large sums of money from the sale of its erstwhile neglected plants.

Extraordinary prices have been paid for fine specimens. Recently in Tennessee I was told of a Boxwood tree for which the owner, a farmer, demanded five thousand dollars; he had already refused an offer for half this amount! Wealthy people on Long Island and elsewhere, and they are to be commended for what they have done, have spent enormous sums of money in bringing large Boxwood bushes from the South and planting them in their new homes. Boxwood produces not only immediate effects but gives a sense of age beyond that of any other plant, so we need not wonder why people past middle life in forming a garden want to have something that fits in with their own age and thoughts.

Now, the common Boxwood, and by this is meant the one with which most people are familiar, is native of Europe, being doubtfully considered indigenous as far north as Box Hills, Surrey, England. It favors chalk and this fact may have something to do with the difficulty people have in causing it to flourish in the acid soil of New England. The greatest difficulty, however, lies in the climate, something which cannot be controlled. It is true that in the vicinity of Boston and at least as far north as Salem, Massachusetts, some old and very fine Boxwood bushes may be seen, but their presence is no real exception to the rule. Some peculiarity of situation probably accounts for their presence, for it must be admitted that strictly speaking the climate of Boston is too warm for the growing of this evergreen. On Cape Cod and even at Plymouth and nearby it may be grown very well.

The typical Boxwood (Buxus arborescens) is a small tree, 20 to 30 feet tall, irregular in outline and densely clad with dark green foliage. Under long cultivation this plant has given rise to a great many varieties and among them are found forms more useful than the type itself. Hardest is the variety myrtifolia, a compact shrub with myrtle-like leaves. Other tall-growing sorts are latifolia of stiff habit and leaves three-quarters of an inch wide, longifolia with leaves an inch and a half long and about half an inch wide, pendula with pendant branches which with age becomes a small tree, pyramidalis with erect branches useful for hedges but too ungraceful for common use, and rosmarinifolia with long and very narrow leaves not more than a quarter of an inch wide. There are sorts with white and yellow variegated foliage of which the best are aureo-pendula, the Golden Weeping Box, and elegantissima with narrow leaves bordered with white. Of dwarf sorts there are several, including prostrata, a low horizontally branched bush rarely 3 feet high, and myosotifolia, a curious, slow-growing variety of dense compact habit and very small leaves scarcely half an inch long and an eighth of an inch wide. There are other sorts but most useful of all is the dwarf variety suffruticosa, which from time immemorial has been used for edging around beds in formal gardens. In ancient gardens it was in great request for forming parterres or embroidery, being the only evergreen capable of forming the delicate lines this art required. In the days of Louis XIV,
when flowers used in ornamenting gardens were few, the great art of the gardener was to distinguish his parterres by beautiful and curious forms of evergreen plants. The portion of the ground plan of the parterre was laid out in such fashion that when viewed from above it looked like a piece of embroidery laid on the ground. The space between the lines of boxwood in the more common designs was covered with sand of one color. In choice parterres of boxwood in the more common designs was covered with sand of one color. In choice parterres colored sand, powdered glass, pot shreds and other articles were used to produce black, white and red grounds on which the green boxwood appeared to advantage at all seasons. The beauty of these parterres was most conspicuous when they were seen as a whole from the windows of the house or from the surrounding terrace walk. Sometimes, however, they were placed on sloping banks to be seen from below. This art has virtually if not absolutely passed away, but illustrations in old books give a lively idea of what these parterres looked like and whether we admire or disparage the fashion, the artists' skill calls forth admiration.

The variety _suffruticosa_ may form a hedge no higher than 2 inches tall and be kept at this by careful planting and proper feeding. It is easier, however, to keep it at 10 inches or a foot but if left to itself and neglected it will die in patches from overcrowding. Here and there clumps will remain and these will grow 5 or 6 feet tall.

Boxwood is easily propagated by cuttings and layers, less readily from seeds. If the latter be attempted, they should be sown the moment they are gathered in well-drained flats, but they are slow to germinate. The more rapid method is from cuttings each from 4 to 6 inches in length of half-ripe wood put in in August. The variety _suffruticosa_ may readily be propagated by division. To show how popular an edging plant this boxwood used to be, it was sold by the yard. I have before me a record of it being on sale in New York City in 1835 at fifty cents per yard. To keep box hedges and box edgings in good shape, close clipping is necessary. This may be done at almost any season of the year except the winter months but it is best to trim in June when the growth is about half made, for, since trimming cannot be done without injury to the leaves, this is soon obscured by the newer growth which continues at that season.

Gardeners as a rule are not particularly interested in the economic value of the wood of the plants they grow, but the boxwood may be considered an exception inasmuch as it was the first wood used for wood engraving. This art was invented before that of printing and is supposed to have been practised between the years 1400-1430. The first objects to which it was applied were different in their character, i.e., books of devotion and playing cards! The mere outlines of the figures were rudely cut in the boxwood with knives in the direction of the grain and impressions taken off by friction without the aid of a press. The earliest specimen of wood engraving now extant is in Earl Spenser's collection and represents St. Christopher carrying the Infant Saviour. The date is 1423.

The genus _Buxus_ is confined to Europe, Asia and South Africa. Apart from the common species, a tree-like box with large leaves is _B. balearica_, native of certain islands in the Mediterranean Sea. Naturally it is more tender than the common sort. The only other species of boxwood that is of importance to American gardeners is the Oriental _B. japonica_, of which there are three well-marked forms. The type is similar in appearance to the common boxwood but has yellowish green leaves which in the winter are masked by a yellow-brown pigment; it lacks, therefore, the rich green which is the marked feature of its European relative. Moreover, it has not the fragrance although its flowers are quite as attractive to bees in the spring of the year. For Boston and vicinity, however, this boxwood has the merit of being harder than the common variety and where the latter cannot be grown it is a most useful substitute. An analogue of the variety _myrtifolia_ is to be found in the Japanese variety _microphylla_, which is of upright habit with slender stems and narrow leaves. It is, however, more tender than the typical _B. japonica_. The hardiest variety of the race and what promises to be the most useful is _koreana_, a native of the country around Seoul in central Korea. This is the homologue of the European _suffruticosa_ and can be used for exactly the same purposes. If this variety fulfills expectations, it should prove a boon to those who hunger for box edging in regions too cool for the well-being of the European type. I count this boxwood one of the most useful plant introductions I was privileged to make in Korea. It came to the Arnold Arboretum in 1918 and so far has never suffered winter injury. It propagates with the greatest ease and except that it does not keep a rich green in winter, has no faults so far as is at present known.

Like other plants, boxwood has its diseases and pests and they would seem to be on the increase. It must be remembered that in many gardens where it has been neglected, starvation may have much to do with it dying in patches and, moreover, that it is a chalk-loving plant ought not to be forgotten. Overcrowding in box edging will cause death and as this particular form has been propagated vegetatively through centuries, its constitution may be undermined in consequence.

There are certain diseases of fungoid origin about which little is known. One of the commonest is the boxwood leafspot, which sometimes causes severe damage. The affected plants are characterized by sparse foliage which dies early and falls off. It is claimed that this may be controlled by spraying with Bordeaux mixture, giving two or three applications during the growing season. Much work remains to be done in the study of the diseases of the boxwood and the problems are worthy of the attention of plant pathologists.
A bad pest on Boxwood as on other plants is the Oyster Shell Scale, which if neglected causes great damage. Spraying with miscible oil, one to forty or fifty parts of water, in May or early June, according to the locality, will effect a cure. If the infestation is bad several sprayings may be necessary.

The leaves of the Boxwood suffer from attacks of the little Spider Mite, which causes a light gray mottled appearance; later they turn grayish brown and the foliage drops prematurely. The insect is a minute, eight-legged mite which increases rapidly and by July and August causes very considerable damage. Spraying thoroughly with Wilson's Awine Spray, one part to fifty of water, is recommended.

Another pest is the Boxwood Psylla, a tiny insect which obtains its food by sucking the growing tips which causes stunted twigs and the leaves to curl. The young insects are covered with a white, waxy covering which readily distinguishes them from others likely to be found on Boxwood. This pest may be controlled by spraying with Wilson's O.K., one part to fifteen of water. Spraying should be done as soon as any curled leaves are noticed in the spring.

The most common and perhaps the worst pest on Boxwood is the Boxleaf Midge, which causes irregular oval swellings on the leaves, each marking a clear space mined beneath by one or more yellowish white maggots each about one-sixteenth of an inch long. This Leafmidge is a European introduction now well established from Rhode Island southward at least to the latitude of Washington. Badly infested leaves may contain six or more of the maggots and most of the foliage under such conditions may be nearly destroyed. In mid-June the leaves may fairly bristle with the whitish "casts" from which the tiny yellowish midges issue in swarms during the latter part of May or early in June. A very small proportion of the maggots may remain unchanged toward the end of June. The eggs are deposited in slits in the foliage late in May or early in June. The first evidence of attack is a slight change in color and then an increase in size of the discolored areas accompanied by more or less swelling. Toward the end of the season these may extend to the edge of the leaf and if there are several maggots they may unite. The maggots winter within the leaves, the flies appearing the following spring.

Dr. E. P. Felt states that spraying with a molasses solution has given excellent results, using four to six pounds of molasses to fifty gallons of water and making the application just as the midges begin to issue from the leaves and repeating the treatment every two days during the time the small yellowish flies are numerous, usually for ten days or two weeks. The precise time to begin spraying can be ascertained by looking for the delicate yellowish "skins" or "casts" protruding from the under surface of the leaves. Some gardeners believe they have obtained better results by adding to the molasses solution a general insecticide containing nicotine, soap and miscible oil.

Readers should be reminded that Dr. Wilson wrote this fifty years ago. The control sprays recommended by Mr. William Gray (pp. 38 - 41) are probably better and certainly more easily obtainable today.

The Editor, however, wishes someone would try, and report on, Dr. Wilson's molasses solution for psyllids. It would be like old-fashioned flypaper in its action on the tiny flies; but remember, its stickiness will also reach children and dogs.

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The Boxwood Society year runs from one Annual Meeting to the next; from May of one year to May of the next year. Those joining the Society at other times are sent all the Boxwood Bulletin issues for the current Society year, beginning with the July number. Their dues are then again due and payable in the following May. This was voted by the Society in order to lighten as far as possible the heavy work load of our busy Secretary-Treasurer; who, like all other officers of the Society, is an unpaid volunteer.

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