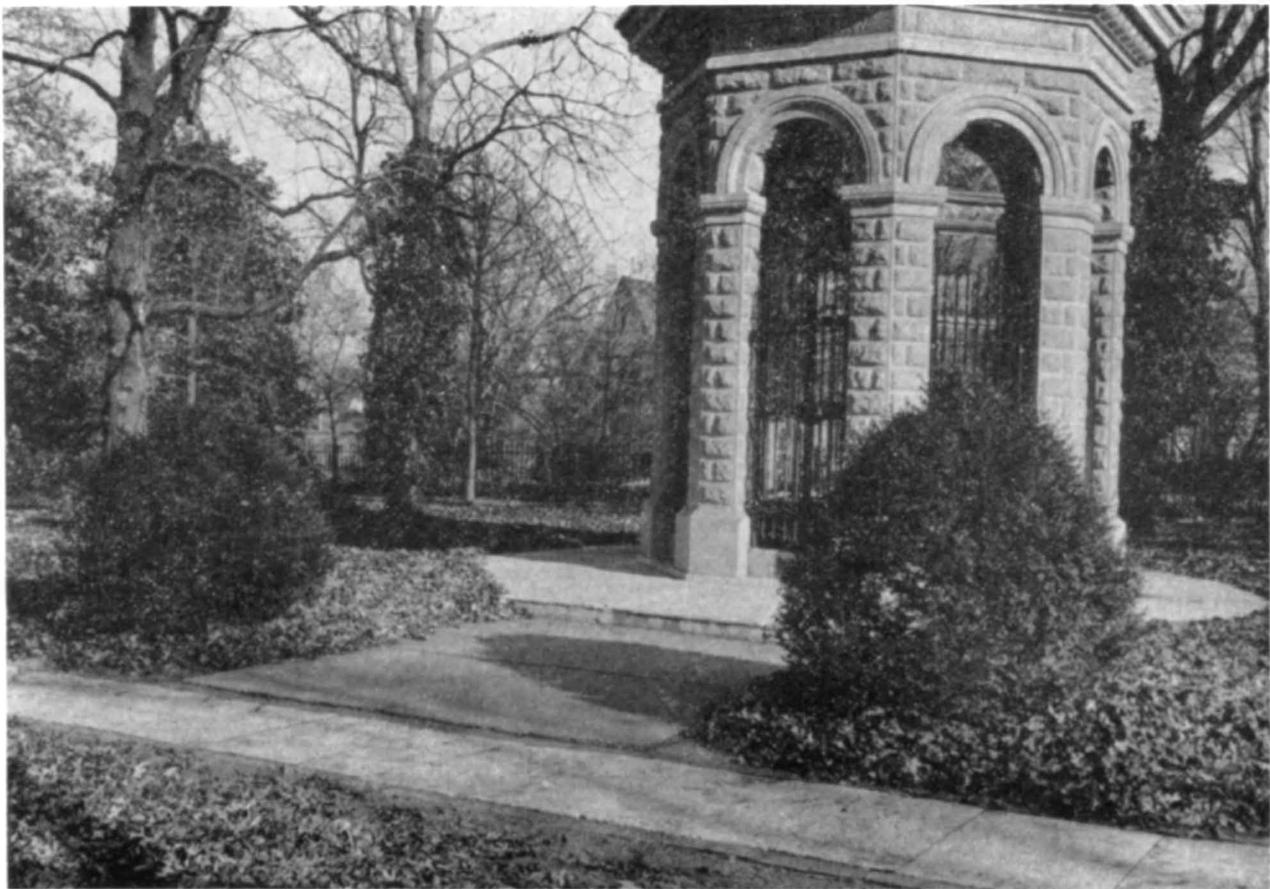


The

APRIL 1975

Boxwood Bulletin

A QUARTERLY DEVOTED TO MAN'S OLDEST GARDEN ORNAMENTAL



This matched pair of boxwoods is *Buxus sempervirens* 'Nish' (Balkan strain) growing in the Mausoleum Grove at the Missouri Botanical Garden in St. Louis, Missouri. The plants flank the tomb of Henry Shaw, who gave the garden to the city.

Photo by Claude Johnston

Edited Under The Direction Of
THE AMERICAN BOXWOOD SOCIETY

President ----- Rear Admiral Neill Phillips
 V. Pres. ----- Mr. Alden Eaton
 Executive Secretary & Treasurer
 ----- Mrs. Andrew C. Kirby

DIRECTORS

	Term Began	Term Ends
Dr. Ralph Singleton -----	1972	1975
Mrs. E. M. Whiting -----	1972	1975
Mr. Alden Eaton -----	1973	1976
Rear-Adm. Neill Phillips -	1973	1976
Dr. Henry T. Skinner -----	1973	1976
Prof. A. S. Beecher -----	1973	1976

Ex officio, Mr. Thomas E. Ewert, Director Blandy Experimental Farm.

Address: The American Boxwood Society,
 Box 85, Boyce, Virginia 22620

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The Boxwood Bulletin

April 1975

Vol. 14 No. 4

EDITOR — MRS. EDGAR M. WHITING

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The American Boxwood Society

Fifteenth Annual Meeting

Wednesday, May 14, at Blandy Experimental Farm (U. Va.) Boyce, Virginia

ANNUAL MEETING INFORMATION

Program

All times DAYLIGHT SAVING

Date: — Wednesday, May 14, 1975. (Please mark your calendar).

Place: — The Blandy Experimental Farm (U. Va.) near Boyce, Virginia. Sign at U. S. 50 entrance.

Time: — Eastern Daylight Saving Time.

9:30 A.M. — Registration begins.
Informal tours of the Arboretum and the boxwood collections.

10:30 A.M. — Business Meeting.

12:30 A.M. — Luncheon Recess (Bring your sandwiches, coffee will be available).

1:30 P.M. — Meeting reconvenes for unfinished business, followed by **SPEAKERS' PROGRAM.**

SPEAKERS: —

Mr. Robert Fisher, Horticulturist at Mount Vernon. Mr. Fisher has been in charge of the gardens and grounds at this beloved historic spot for more than a quarter-century. He will talk on "Boxwood at Mount Vernon" and tell about the exciting project of a "*son et lumiere*" presentation at this home of our first President, during the Bicentennial period.

Our second speaker will be Mr. Paul Saunders, head of the Saunders Orchards & Nursery, at Pine River, Virginia, a commercial grower of boxwood for thirty years.

VISIT HERONWOOD AFTER THE MEETING

Admiral Phillips cordially invites members and friends to stop by Heronwood after adjournment of the Annual Meeting to see the gardens and to renew boxwood friendships.

To reach Heronwood, go east on U. S. 50 through Upperville and past the Horse Show grounds to county road 623 (the first road to the right after the Show grounds), turn right and go 1.1 miles to Heronwood; on your right, stone gate posts with sign.

HOW TO REACH BLANDY FARM

For those who have not already visited Blandy — it is on U. S. Route 50. If you are driving west, it is about 2 1/2 miles beyond the Shenandoah River bridge, and the entrance is to your left.

From Winchester going east, drive 8 miles on Rte. 50 to the Waterloo traffic light, then 1 3/10 miles more to the Blandy entrance, on your right. Entrance will be marked.

Notice: Dues will not be accepted at this meeting. Please mail your remittance to the American Boxwood Society, Box 85, Boyce, Va. 22620.

The American Boxwood Society

SPRING MEETING of OFFICERS and DIRECTORS

The meeting convened at 11 a.m. on March 26, 1975, at Heronwood.

Present: Mrs. Whiting, Mrs. Kirby, Dr. Singleton, Dr. Skinner, Mr. Otey, Mr. Ewert, Admiral Phillips. Mrs. Ewert and Mrs. Singleton were present as guests. Mrs. Dove was unable to be present as recorder. The president acted as recorder.

The President presided and announced that a quorum was present in accordance with the requirements of the by-laws.

Secretary-Treasurer's Report. Copy attached. Mrs. Kirby was thanked for her consistently able performance and for the clear and concise nature of her reports.

Editor's Report. Mrs. Whiting brought copies of the January 1975 edition of The Bulletin; just off the press due to unavoidable printing delays. She stressed the fact that ABS has had a long and satisfactory relationship with the Carr Publishing Company, and she expects the April 1975 edition of the Bulletin to be mailed out in ample time to inform our membership about the May 1975 Annual Meeting. Various facets of the editorship were discussed; demonstrating as usual the wide sweep of Mrs. Whiting's activities and expertise. Mrs. Whiting pointed out the fact that she must retire within the near future. The meeting agreed with her reasons but with the deepest regret. Various solutions of the problem of a successor were discussed. It was agreed that this is a matter of the most urgent importance.

1975 Annual Meeting. Following the provisions of the by-laws the date of the 1975 Annual Meeting was set for Wednesday, May 14; the second Wednesday in May.

Place: Blandy Experimental Farm, Boyce, Va.

Time: Registration begins 9:30 a.m.

Meeting convenes — 10:30 a.m.

Mrs. Kirby was requested to ask Mrs. George Burton, and the other ladies who assisted at the 1974 meeting to take charge of the registration.

Mr. Ewert announced that he would take care of the physical arrangements at Blandy.

Mr. Alden Eaton was elected Chairman of the Speakers Program, a job he so ably filled in 1974.

Mr. Woodson Houghton was elected Chairman of the Nominating Committee. The three-year terms of two directors (Mrs. Whiting and Dr. Singleton) expire in May 1975. The one-year terms of all officers expire in May 1975.

Mrs. Kirby, Mrs. Whiting, and Mr. Ewert agreed to handle information and public relations with the press.

Mrs. Kirby will try to arrange to include a membership application blank with each invitation to the meeting; with the urgent request that each recipient sign on a new member.

Mr. Ewert and others were asked to give suggestions as to post-meeting visits to points of interest in the general vicinity of Blandy. In the past these visits have been a most popular feature. Admiral Phillips gave a cordial invitation to Heronwood.

Dr. Robert Lambe had made the 2-1/2 hour drive up from Blacksburg to give the meeting a report to date on boxwood decline. Details will be published in the April 1975 Bulletin. The deadly fungus ravages continue in *B. suffruticosa* (English boxwood). A letter from Ambassador McGhee was read, stating that a commercial chemical which had seemed promising and that had been tried out in his gardens at Farmer's Delight seemed to be entirely ineffective; so that the extensive and important *suffruticosa* plantings at his estate are probably doomed.

The present situation is as follows: Research at VPI will continue, thanks in a great degree to the generosity of the Westmoreland Davis Foundation (Morven Park; Mr. Otey, Director) in providing financial aid now that ABS has fulfilled its underwriting commitment. However, due to the expiration of Mr. George Montgomery's contract, VPI must find a qualified graduate student as successor.

Though no final solutions of boxwood decline are in immediate prospect, much valuable basic research has been accomplished (e.g., isolation and identification of pathogens, elimination of sundry factors suspected as causes, research in the development of disease resistant plant strains, etc.). We are going to keep fighting.

An examination was made of the affected areas in the suffruticosa at Heronwood, where all infected plants are being dug up and burned as symptoms develop. At Heronwood the practice is continued of soaking with lime water the soil area where a plant has been removed; but this practice is strictly a matter of hope.

There being no further business, the meeting adjourned at 3 p.m.

Respectfully submitted,
Neill Phillips

SECRETARY'S REPORT

3/26/75

The current membership stands at about 550. Fifty-five new members were enrolled during the Society year. The ABS mailing list was purged in early February and 84 members removed because of nonpayment of dues.

The Boyce postmaster requires that a \$10 deposit be made at the beginning of each Bulletin quarter to take care of the bulk mailing of each issue when it comes off the press. Also, a new form (PS 3542) entitled "Statement Showing the Number of Copies of Second-Class or Controlled Circulation Publication Mailed" was filed with the Boyce Post Office on February 8, 1975.

Additional brochures are being printed, as well as remittance envelopes and window envelopes.

Respectfully submitted,
Anna C. Kirby
Secretary-Treasurer

3/24/75

ANNUAL MEETING
BOXWOOD SOCIETY
SECOND WEDNESDAY
IN MAY 1975

THE AMERICAN BOXWOOD SOCIETY

TREASURER'S REPORT

Treasurer's Report to the Officers-Directors Meeting, March 26, 1975.

Balance in checking May 1, 1974, \$1,155.89
less adjustment for Check
#199 out 10.00 \$1,145.89

Receipts (May 1, 1974 — March 21, 1975):
Membership \$3,430.00
Bulletins sold 25.45
Research Fund Gifts 870.00 4,325.45
Total funds accountable 5,471.34
Money transferred to A Savings Account:
Life Memberships (1974-75) \$ 600.00 4,041.34
Research Fund Gifts (1974-75) \$ 830.00 1,430.00
4,041.34

Disbursements:

The Boxwood Bulletin:

Printing 960.00
Copyrights 24.00
Mailing 43.06
Plates/Cuts 288.95 1,316.01
Final Payment to VPI & SU 1,000.00
Office Supplies 109.82
Secretarial Services 102.99
P.O. Box Rent 4.40
Letters Xeroxed 10:50
Honorarium — A. Kirby 189.00
Carr Publishing Co.
Addressograph job 13.30
President's Letter plus postage 113.40
Printing Manila
Envelopes (2000) 94.00 220.70
Total expenditures 2,953.42

Balance in Checking Account 3/21/75 1,087.92
plus

Savings Account plus interest \$35.29
(1/1/75 1,465.29

Total assets 3/21/75 \$2,553.21

(All funds are in the Bank of Clarke County.)

Decline of English Boxwood In Virginia



R. C. Lambe and W. H. Wills

Associate Professor and Professor of Plant Pathology, respectively, Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061.

Contribution No. 287, Department of Plant Pathology and Physiology.

From PLANT DISEASE REPORTER, Vol. 59, No. 2, February 1975

U. S. Department of Agriculture

ABSTRACT

FIGURE 1, above. A nursery of English boxwood in Northern Virginia, showing plants in advanced stages of decline, plants in foreground are dead.

A recent outbreak of root rot of English boxwood, *Buxus sempervirens* var. *suffruticosa*, has reached epiphytotic proportions in northern Virginia. The disease appears to be unaffected by drainage, cultural practices, soil reaction of type, or other identified environmental factors. Certain fungi previously associated with boxwood, including *Paecilomyces buxi* and some fusaria, have been regularly associated with the disease. Symptoms include root rot and basal stem discoloration.

Both English boxwood, *Buxus sempervirens* var. *suffruticosa*, and American boxwood, *B. sempervirens* var. *arborescens*, are grown in all of the different geographical regions of Virginia. English boxwood is especially valued because of its short annual growth increment. Infrequently occurring twig blight and relatively minor fungus leaf spots are the only disease problems ordinarily encountered in its cultivation. Its relative freedom from serious disease has made boxwood a preferred landscape shrub.

Periodically, however, outbreaks of a decline of uncertain etiology have been recorded. Andrus (1) reported in 1933 that the fungus *Verticillium buxi* (Link) Sacc., which he regarded as a growth form of *Volutella buxi* (Corda) Berk., to be the cause of wilting and death of individual branches, sections of plants and sometimes whole plants in the Washington, D.C. area. He isolated *Vert. buxi* from roots and stems of both English and American boxwood plants, and thought that certain environmental conditions rendered the plants susceptible to the fungus. He successfully isolated *Phytophthora parasitica* Dastur from a dead English boxwood plant also. Dodge and Swift (7) believed that *Vert. buxi* and *Vol. buxi* were stages of the same fungus. Dodge (6) later questioned that assumption. He considered *Vert. buxi* to be the less pathogenic of the two fungi. Both fungi produced *Verticillium* stages. McBryde (11) reported extensive boxwood blight in 24 counties of Virginia following the drought of 1930. Two fusaria and two isolates of *Verticillium* were among the fungi she isolated. All attempts to reinfect boxwood by stem inoculation failed. Harrar (10) isolated seven different strains of *Verticillium* from boxwood; three were pathogenic. The taxonomic question concerning *Volutella* and *Verticillium* was finally settled by Bezerra (5). He showed that *Vol. buxi* is the imperfect stage of *Pseudonectria rousseliana* (Mont.) Seaver and *Vert. buxi* is not connected to *Volutella* or *Pseudonectria*, but is instead a member of the form genus *Paecilomyces*. *Volutella buxi* appears to be the cause of a twig blight of boxwood and is regularly found on senescent leaves and on green leaves under conditions of high humidity.

Late in the 1950's boxwood decline was again reported from Virginia (2). Nematodes and *Phytophthora* were implicated. Haasis (9) reported *P. parasitica* to be the cause of root rot, canker and blight of boxwood in North Carolina. Both English and American boxwood were susceptible to the *Phytophthora*-caused disease (4).

The objectives of this report are to describe the present incidence and symptoms of decline of English boxwood which has reappeared in devastating severity in certain western and northern counties of

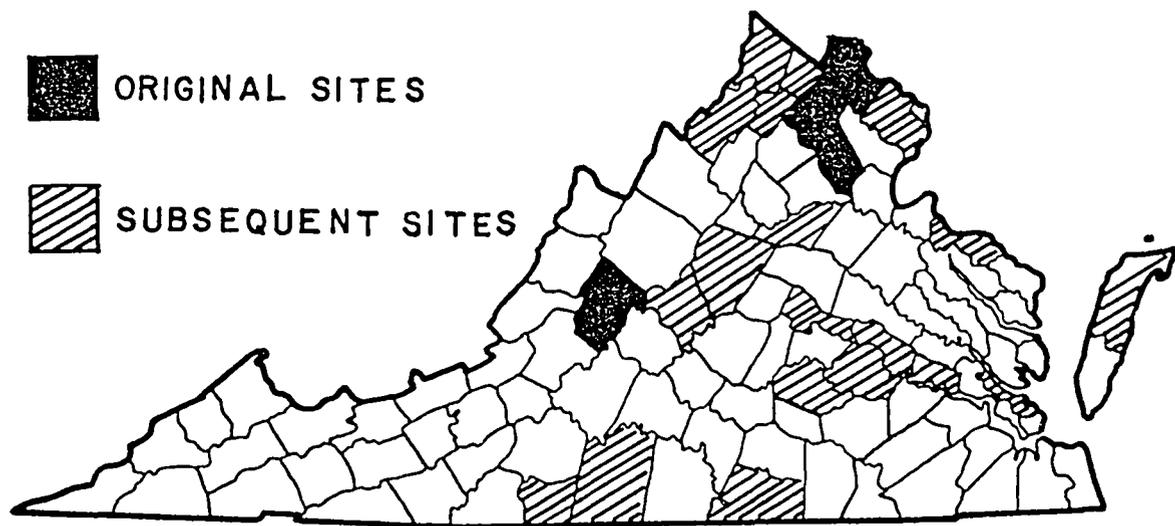
Virginia and is spreading to additional regions of the State. A status report on boxwood decline was made to the American Boxwood Society in 1973 (12).

OBSERVATIONS

Incidence: From 1968 through 1973, an average of 170 declining boxwood specimens have been received each year for diagnosis in the Plant Disease Clinic in the Department of Plant Pathology and Physiology, VPI and SU, ranging from a low of 117 in 1968 to a high of 232 in 1970. For the past 2 years, all decline specimens have been routinely cultured on the *Phytophthora* selective medium of Eckert and Tsao (8) and before that, by the apple baiting technique (3). Of these, only 32 have yielded *Phytophthora* upon culturing and only 5 of the *Phytophthora* isolates were from northern Virginia, that is, from locations near Washington, D.C. On the other hand, certain fungi previously reported in association with boxwood disease have been regularly associated with the presently observed English boxwood decline. These include *Paecilomyces buxi* (ert. *buxi*), some fusaria, and *Vol. buxi*. Less frequently, traditional root rot organisms such as *Rhizoctonia solani* and *Pythium* sp. have been isolated.

Geographical Distribution: Despite the low numbers of positive isolations of *Phytophthora* sp. from northern Virginia (in contrast to other parts of the State), numerous specimens of declining English boxwood have been received from three counties west of Washington, D.C., that is, Clarke, Fauquier, and Loudoun. These cases of decline have been limited to the English boxwood cultivar, with no reports of decline in the American cultivar or among other species of *Buxus*. Fifteen on-site inspections of the diseased plants have confirmed the incidence of decline to be limited to English boxwood. Similar reports have been received from numerous other locations. Healthy American boxwood often were observed growing in the midst of declining English boxwood decline has been noted in the city of Lexington, Virginia, in the Shenandoah Valley more than 100 miles southwest of the main area of the disease. Decline has been observed in widely scattered locations of the State ranging from the Eastern Shore through central Virginia and into southwest Virginia. A majority of the sites of greatest disease severity, however, have been restricted to the northern Virginia counties and the city of Lexington (Rockbridge County). In these areas, decline has appeared in large nursery plantings, formal gardens on large estates, and modest front-yard plantings.

Effect of Environment: At all of the infection sites visited, we have failed to detect a consistent pattern. Disease has been found in sunny and shady locations, on poorly-drained and well-drained sites, in highly managed (regularly fertilized and pruned)



and minimally managed (no fertilization) nurseries and gardens, and in one instance in an abandoned nursery overrun by weeds and underbrush vegetation. Disease occurs on both acid and alkaline soils, and on soils high and low in minerals and soluble salts. With our present knowledge, disease incidence cannot be attributed to rainfall or temperature patterns. Thus far, no correlation of parasitic nematode associations with plant decline are evident.

Symptoms: Symptoms are quite similar to those described for *Phytophthora* root rot and blight of English and American boxwood (4). This similarity has resulted in considerable confusion. Foliage symptoms develop over a period of one to several years, beginning with off-green foliage of one or more branches of a plant. Subsequently, the leaves turn bronze, then dull yellow and finally straw yellow if in the sunlight or dull green to brown in the shade. Frequently bronzing is observed in cold weather before any other discoloration. Normal green color may return in the spring with decline ultimately beginning in the summer. All bronzing that occurs in the winter cannot be attributed to decline, however. Additional branches become infected until the whole plant dies and the leaves drop off leaving a gray skeleton of woody twigs (Fig. 1).

Usually in later stages of decline, there is some blackening of the wood, just beneath the bark in the basal area of the stem. Sometimes the discoloration will extend far up the stem, and is frequently dis-

continuous along the stem. When plants in an early state of decline are uprooted, the most conspicuous symptom is the lack of feeder roots in association with the foliage symptom expression. By the time the earliest foliage symptoms are expressed, 75% or more of the root system has been destroyed, giving the characteristic symptoms of the root rot. Thus, early, above ground, visual diagnosis of the disease is difficult.

Epiphytology: English boxwood specimens received recently suggest that the disease is spreading rather rapidly within the areas of northern Virginia and Lexington and is spreading slowly into other areas (Fig. 2). Spread may be related to the intensity of boxwood cultivation in these areas as compared with a sparser distribution beyond these areas. Studies of etiology, epiphytology and control of this disease are in progress.

FIGURE 2, above. Map of Virginia showing original sites of decline, by county; and counties in which subsequent sites of decline have been identified.

Map and photograph from PLANT DISEASE REPORTER.

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English Boxwood Decline in Virginia

SUMMARY

The determination of the geographical extent of English boxwood decline in Virginia, description of the symptoms of decline, determination of organisms associated with declining plants, investigation of host-parasite relationships and determination of the environmental aspects of the decline were investigated under laboratory, greenhouse, and field conditions.

Plantings of English boxwood are declining, particularly in northern Virginia and the Shenandoah Valley. English boxwood also continues to decline steadily in the Lexington, Virginia, area and recent reports indicate that English boxwood decline has increased in the Richmond area. In a Loudoun County nursery monitored throughout this study, the disease severity index (DSI), based on foliar symptoms, increased from 39.4% on August 15, 1972 to 63% by November 11, 1974. Percentages of plants rated as dead increased from 16.47% to 55.29% during the period of this study.

Phytophthora was shown not to be a factor associated with the present decline. *Paecilomyces buxi* was consistently associated with declining plants when the moist chamber was employed as an isolating technique. *Fusarium oxysporum* was isolated consistently from English boxwood. During the

spring months of each year of the study, *Phoma* was isolated from declining English boxwood. Colonization by *P. buxi* was most apparent at the point where lateral roots emerge from main roots and near the attachment to the main tap root while *F. oxysporum* was isolated mainly from root tips.

Foliar infection was originally thought to be of significance in the decline syndrome; therefore, this hypothesis was tested with *P. buxi* and *Vol. buxi* along with a root inoculation test. At the end of 3 months, no symptoms were observed and the plants were uprooted and rated. The DSI's were no greater than 10%. *Paecilomyces buxi* was isolated from the roots of two plants in each treatment and the remaining plants were then repotted. The roots of all plants were discolored in 6 months but there were no significant differences between checks and inoculated plants. Isolation of various organisms from non-inoculated plants prevented the reporting of any positive conclusion concerning causal organisms.

Root-dip inoculation studies of greenhouse grown English boxwood were conducted with *P. buxi* and *F. oxysporum*. After a 4 month period, all plants inoculated with *P. buxi* were significantly different from the uninoculated checks. *Fusarium oxysporum* produced lower root-rot ratings but was consistently isolated from greenhouse and field plants so it was included in the remainder of the tests. Koch's postulates were not completely satisfied as *P. buxi* and

/or *F. oxysporum* were not always isolated from plants inoculated with these two organisms. *Phoma* sp. was highly pathogenic to English boxwood while *F. solani* was not pathogenic to wounded or non-wounded plants in other tests.

English boxwood plants inoculated in the field were diseased. Since both inoculated and uninoculated plants showed symptoms of decline, positive conclusions concerning pathogenicity cannot be stated.

Inoculation of excised English boxwood roots with *P. buxi*, *F. oxysporum* and *Phoma* sp. demonstrated that these three organisms can readily colonize senescent or dead root tissue with the optimum temperature, *in vitro*, being 25° C. Colonization of attached roots was also accomplished but with different growth patterns and symptoms development. Optimum growth of all three pathogens on PDA was 25° C which corresponded to the optimum temperature for development of disease on excised roots.

Results of studies of the effects of soil moisture were inconclusive as decline was present at both the Sat-FC-Sat and FC-PWP-FC regime, even within check treatments. Results did demonstrate that a decreased level of soil moisture (FC-PWP-FC) would result in an increase in disease severity. Temperature was the best correlated environmental factor in controlling disease development. Higher disease severity indices were recorded at the highest temperature tested (30° C) and the DSI's decreased with decreasing temperature.

Plant parasitic nematodes, particularly *Pratylenchus* (meadow) and *Helicotylenchus* (spiral) were consistently recovered from healthy and declining English boxwood. Population levels required for disease development are not known and conclusions concerning pathogenicity cannot be stated. The observed field populations were generally in the range of 50-100 nematodes per 250 cc soil and fluctuated over time. Populations did continue to increase in greenhouse plants grown in naturally infested soil; therefore, it is postulated that some factors may be preventing high populations from developing in the field.

The results of this study indicate that several fungi possess pathogenic capabilities on English boxwood. Greenhouse and field studies have given some insight into the nature of this present decline but were by no means conclusive. A complex of factors appears to be associated with this disease and additional research is needed to isolate and discover the role of each in this decline. Further work should include stress as a predisposing factor and the role of toxins either by root colonizers or soil saprophytes should be considered.

R. C. Lambe

W. H. Wills

All of the Boxwood Society members are cordially invited to enter the "Enjoy A Day at Blandy" photography contest. Bring your camera along when you come to the Annual Meeting on May 14th.

The contest rules are:

"ENJOY A DAY AT BLANDY"

Photograph Contest

March 29, 1975 to May 31, 1975

Rules:

1. All photographs must be taken at the Blandy Experimental Farm. (Blandy is open to visitors daily from sunrise to sunset. Visitors must observe the posted regulations.)
2. Entries will be divided into three classes: Color prints, black-and-white prints, and transparencies. Prints shall not exceed 12" in length and width.
3. There will be a \$10 first prize, and a \$5 second prize awarded in each class. Additional prizes of plant material may be awarded to any entry which the judges feel is worthy of Honorable Mention.
4. Each contestant may enter only 1 entry per class.
5. All entries shall become the property of the Blandy Experimental Farm, and Blandy shall assume the right to use any entry at any time in its publicity, promotions, educational programs, etc.
6. All entries must be received by midnight May 31, 1975.
7. Employees of the Blandy Experimental Farm and their immediate families will not be eligible to enter.
8. The Contest is open to amateur photographers only.
9. All entries should be mailed to Mr. Thomas E. Ewert, Director, Blandy Experimental Farm, Box 175, Boyce, Virginia 22620, or brought to the Blandy Experimental Farm office.

The Edgar Anderson Balkan Boxwoods

Mary A. Gamble



The late Dr. Edgar Anderson was a boxwood enthusiast who did not accept the opinion often expressed by St. Louisans that "boxwood is beautiful but you can't grow it here". He believed there existed hardy strains that would grow in the Midwest and in 1934 he set out to find them.

In preparation for his search he studied world weather maps until he had located an area where the somewhat "chancey" climate of the Midwest was duplicated. He found it in the Balkans, center-

ed near Skoplje in the Vardar River valley of Yugoslavia (see map). In an article published in the January 1963 issue of the *BOXWOOD BULLETIN* (reprinted on following page) Dr. Anderson tells the story of his trip in the early fall of 1934 under the sponsorship of the Arnold Arboretum of Harvard University. In the following paragraph we cite his evaluation of its importance by Dr. J. T. Baldwin, Jr., of the college of William and Mary. Dr. Anderson considered him to be the great American authority on boxwood.

“Probably the most significant addition in recent years to the germplasm of *Buxus sempervirens* in the United States are the seedlings of Balkan origin grown by Edgar Anderson in the 1930s at Gray Summit, Missouri. Some clones from these seedlings are in the trade; notable among them is ‘Vardar Valley’, a handsome, low-growing plant with bluish foliage.” (BOXWOOD BULLETIN, April 1963)

COLLECTING BOXWOOD IN THE BALKANS

by Edgar Anderson

Missouri Botanical Garden, St. Louis

My Arnold Arboretum trip to the Balkans in the late summer and early autumn of 1934 was an attempt to get strains of holly, ivy, yew, and boxwood which would fit the difficult climate of the eastern United States, hot and dry in the summer, cold in winter with drying winds, late frosts following deceptive warm spells in the spring, bright winter sunshine sometimes in extremely cold weather so that leaves are apt to be damaged.

For these reasons I went to the Balkans since they have somewhat the position in Europe that the Ozarks do in the United States. Just as our Great Plains are a vast bowl of cold air in winter and of hot air in summer so the Russian steppes (which extend eastward to the very outskirts of Bucharest) are a similar bowl which slopes over now and then towards the Balkans and makes a difficult, chancy climate there, much like our own. It is not quite so difficult for plant life as ours since the presence of high mountains brings dews at night and cooler night air even in very hot weather.

Boxwoods are not evenly distributed all over Europe; there is a northern area where they are found and then another separate area at the south. At the Royal Botanic Garden at Kew and at the Botanical Garden in Belgrade by consultation and study in the herbarium I found that the northernmost extension of this southern strain was just outside of Skopelie in the valley of the Vardar river, in the Macedonian edge of Yugoslavia. The government gave me a courier to travel with me and help in buying tickets, reporting to the police, carrying luggage and generally serving as a companion. He was a White Russian and spoke almost no English but he spoke fluent German and we communicated in that language.



This is *Buxus sempervirens* ‘Edgar Anderson’ (Balkan strain) growing at the National Arboretum, Washington, D. C. It is a plant of great charm and vigor, much like its namesake.

Photo from U. S. National Arboretum

Our directions had been to go to a monastery in the outskirts of Skopelje and that there we would find boxwood in quantity. My memory is that we took some sort of conveyance out to the bridge over either the Vardar or one of its tributaries and then proceeded afoot along the pathway which lead to the unpretentious little whitewashed monastery. The river bed, broad and gravelly, was at one side and the mountains from which the stream rose loomed ahead, dry and rocky with some shrubs on the lower slopes and here and there an occasional battered tree. The records of the monastery showed that up to a few hundred years ago the mountain was largely covered with a beechwood forest, from which the monastery had drawn a substantial part of its revenue. Over-cutting and over-grazing had destroyed the forest. Heavy erosion had done the rest and much of the mountain was down to the bare rock. Goats, which were still everywhere, were the worst offenders and when we came to the acres and acres of boxwood they too were nibbled, sometimes almost down to the ground; seldom or never were they over shoulder high. While the boxwoods grew in great abundance there were other characteristic evergreen shrubs in with them; big bushy thymes and rosemarys I remember in particular.

The story of the Anderson Balkan Boxwoods falls naturally into three parts, beginning with those resulting from the trip sponsored by Arnold.

The Arnold Arboretum Anderson Balkan Boxwood

On this 1934 trip Dr. Anderson collected personally the plant materials — both cuttings and seed — from which five boxwoods were propagated at Arnold. We are indebted to Dr. Gordon P. DeWolfe, Jr., of the Arnold staff for this record from their 1934-35 accession book:

789-34. *B. semp.*, Seed #133 E.A., Treska Gorge, Yugoslavia

350-35. *B. semp.* #1 Bucharesk, Collected by E.A. (from the John Innes Hort. Institution), 18 cuttings

351-35. *B. semp.* #2 E.A., Bucharesk, Rumania, 58 cuttings

352-35. *B. semp.* 'VV' E.A. 133 Treska Gorge, Skopje, 50 cutts.

353-35. *B. semp.* 50 cuttings - no label, Balkans



This is *Buxus sempervirens* 'Agram' (Balkan strain), which Edgar Anderson considered the most handsome of his Balkan boxwoods. This plant, now more than 20 years old, is growing in the Missouri Botanical Garden Arboretum and Nature Reserve at Gray Summit, Missouri.

Photo by Mary A. Gamble

In 1968 we obtained one each of these plants from Mr. Henry J. Hohman of the Kingsville Nurseries, Kingsville, Maryland. Mr. Hohman wrote me as follows: "When Dr. Anderson made the collection of *Buxus* in Yugoslavia for the Arnold Arboretum, it was my pleasure to receive a very small plant of each of the five collected for Arnold so that I would (build) up a stock of each and make them available."

In 1957 no. 352-35 was named 'Vardar Valley' and registered. The Registration List notes: 'Vardar Valley' (D. Wyman, *Arnoldia* 17(7):42.1957) "Hardy, the foliage keeps its green color throughout the winter. It is a wide-spreading, flat-topped plant of much merit in the north." Mr. Hohman wrote us that he had propagated 3,600 'Vardar Valleys'.

In 1973 the Boxwood Study Group, under the auspices of the Missouri Botanical Garden, registered no. 351-35 as the 'Edgar Anderson'. The registration notice which appeared in the October 1973 *BOXWOOD BULLETIN* read: *BUXUS sempervirens* 'Edgar Anderson' (Balkan strain). Registered by the Missouri Botanical Garden, St. Louis, Mo. The mature plant is pyramidal in form with a broad base and graceful, billowing and somewhat irregular outline. Foliage is dense, with an upward thrust of growth. The leaves are a strong, Medium green (Green Group No. 139A on the RHS Colour Chart). They are elliptic and acute in shape and medium in size, measuring from 1.3 to 2 cm. in length and from 5 to 9 mm. in width, with widest point occurring generally slightly below middle. The largest plant of which we have record measures slightly in excess of 1 m. in height at an estimated 20-25 years; however, it is believed this plant has not achieved maximum growth.

In publishing this registration Dr. B. L. Wagenknecht, in charge of *Buxus* registration, added this comment: "It is a pleasure to be able to accept for registration a boxwood named for Dr. Anderson."

The other three Arnold Balkans remain under number. We are presently testing no. 350-35 for *Midwest* hardiness. It is a dwarf type which Dr. Anderson considered second only to 'Agram' in interest. Dr. Henry T. Skinner of the National Arboretum expressed interest in it. The Arnold records bear a notation advising against naming the 353-35 clone. No. 789-34 appears on a par with plants already named.

At the time of our visit the seeds were already ripe and had been scattered by the browsing goats. We got down on our hands and knees and picked up the shiny black seeds (a little smaller than apple seeds) from underneath the bushes. It was slow work but we eventually got a hundred or so. We also took cuttings to send back airmail to my collaborators in England and made herbarium specimens of the boxwoods and other shrubs. The bushes had been so heavily grazed it was difficult to tell anything about their growth habit but from the stubs that were left it was easy to see that there was much more variation from bush to bush than in the boxwoods which grew wild (or apparently so) at Box Hill in the south of England. They varied conspicuously in leaf size and in leaf shape and in the amount of bluish bloom on the leaves.

The first Balkan boxwoods to be distributed in the United States were raised from these seeds collected in among the bushes of the goat pasture near the monastery. A year after I returned to Harvard University and the Arnold Arboretum where my seeds and cuttings were coming on safely, I went back to the Missouri Botanical Garden in St. Louis and it was from St. Louis that the largest number of boxwoods were introduced. I got in touch by mail with the acquaintances I had made in the Yugoslav forest service and we imported a pound or so of boxwood seed which was raised at the Gray Summit Arboretum of the Missouri Botanical Garden. Eventually a fairly complete set of more than a hundred different bushes was sent as cuttings under number to Henry Hohman of Kingsville, Maryland, for distribution to the Orland E. White Research Arboretum at Blandy Farm and to the box collection at the College of William and Mary. They are extremely variable like the population from which they came and among them are certainly going to be found the hardiest in existence. They are doubly hardy because of the area they came from, being drought resistant as well as cold resistant. They vary a great deal in branching habit as well as in leaf shape and color. One dwarfish lowgrowing form has been found among them and one gracefully columnar form. As a group they are rampant and a little coarse but they have great ability to do well under exacting conditions.

Dr. Anderson's brief report, "Collecting Boxwood in the Balkans," was first published in the *Boxwood Bulletin*, Vol. 2, No. 3, January 1963; reprinted in Vol. 10, No. 2, October 1970, as an introduction to Mary A. Gamble's article on the work of Dr. Anderson in St. Louis, and on the Boxwood Study Group he inspired.

The following evaluation of his own boxwoods was found among Dr. Anderson's papers. It is not known to whom the memorandum was addressed:

BALKAN BOXWOODS

Boxwood has two centers in Europe, and they are disjunct. My importations, I believe, are still the only ones from the southeastern piece of its range, where it varies enormously from plant to plant, and where many of the plants are extremely fertile, setting much seed and the seed germinating well. A very few were brought in as seeds and cuttings on my expedition in 1934 under the auspices of the Arnold Arboretum of Harvard University. The bulk of the collection comes from seeds which I had collected in the Vardar Valley, not far from Skoplje, in Southern Yugo-Slavia. This is a region with, roughly, a climate like Little Rock, formerly covered with Beechwoods which were destroyed by grazing and cutting during the late middle ages. Now, very much run over by goats and badly denuded. So far as I know, all of the lot which was sent to you come from this place. They vary from dense to high, from very blue to very green, from narrow-leaved to wide-leaved, from big-leaved to small-leaved. On the whole, they get to be, under good conditions, very big plants. Only a few of them have dense, or somewhat weeping growth, but these do turn up. It is difficult to generalize about what the mature trees are likely to look like because in the place where I found them they were badly cut back by goats one could only imagine what a normal plant was going to look like. I think they will do their most outstanding service in places like the drier parts of Arkansas and in Oklahoma where there are sudden freezes in the spring and long periods of drought. They come from that kind of a violent climate.

Edgar Anderson

Curator of Useful Plants

Missouri Botanical Garden

The MBG (Missouri Botanical Garden) Anderson

Balkan Boxwood

These are the plants propagated at the Missouri Botanical Garden in its city greenhouses and at Gray Summit from the "pound or more" seed that Dr. Anderson obtained direct from Yugoslavia. According to Mr. Paul A. Kohl of the Garden staff this seed arrived in September 1936 and first plantings were in January, 1937. Mr. Kohl reports no difficulties in propagation in the greenhouses, but Mr. Martin R. Bagby, then a propagator at Gray Summit, tells a different story. Planting at the Arboretum was in an outdoors nursery bed where, for a time, field mice ate the *buxus* seeds faster than they could be planted. The problem was solved when an enterprising workman freed a sack of black snakes near the seed bed and the snakes eradicated the mice.

As Dr. Anderson noted, the Yugoslavian seeds germinated well; hundreds of plants were grown. In the past we have referred to these as the K series, but careful re-examination of all available records shows this to be inaccurate. For while all of the boxwoods labeled K are part of the MBG group, not all of the MBGs are Ks. The MBG boxwoods can be understood best if considered in three parts. First, is the very small group of early named plants; second, the large and confusing group of Ks; and third, the indeterminate group of unnamed and unnumbered plants.

'Agram', 'Nish' and 'Serbian Blue' make up the first group. 'Agram' was named and registered in 1959, the Registration List reading: 'Agram' (Introduced by the United States Department of Agriculture, Glen Dale, Maryland, Spring 1959.) Collected near Skoplje, Vardar River Valley, Macedonia by Dr. Edgar Anderson. "A Columnar form." 'Agram' was Dr. Anderson's favorite and we believe he may have chosen the name, that of a town in Yugoslavia.

Dates and registrants of both 'Nish' and 'Serbian Blue' are unknown. The Registration List: 'Nish' (A name given to a plant grown from seed brought from the Balkans by Dr. Edgar Anderson in 1932. The original plants are still growing at Gray Summit, Missouri. Identical information is given for 'Serbian Blue.' We have found a 'Nish' at Gray Summit and all visitors to the Garden are familiar with the 'Nish' pair that flanks Mr. Shaw's tomb in the Mausoleum Grove. But we have been unable to find any trace of 'Serbian Blue.'

The MBG Ks numbered around 150. They were selected from plants either grown at Gray Summit or sent from the city greenhouses to be set out for testing in nursery areas at the Arboretum. The late

Mr. Clarence Barbre, boxwood enthusiast and nurseryman of Webster Groves, made the selection, choosing those he considered had special merit. These plants were numbered from 1 to 150 and given the designation K, standing for Kingsville Nurseries. Cuttings were made from these plants and sent to Mr. Hohman of the Kingsville Nursery, the exact date unknown. In 1973 Mr. Hohman wrote us that "among this group are some very handsome boxwoods." In 1957 Mr. Hohman sent identical shipments of cuttings of approximately 150 Ks to the United States National Arboretum, Washington, D. C., and to Blandy Experimental Farm (The Orland E. White Research Arboretum), Boyce, Virginia. In 1964 the National Arboretum sent 6 cuttings each of 63 Ks to the Arnold Arboretum.

We are indebted to Mr. Douglas P. Andberg, Curator of the Boxwood Collection, National Arboretum and to Dr. DeWolfe for most of the foregoing information and for reports on results. At the National Arboretum perhaps 50 plants are left. Mr. Andberg notes "There is some variability in them and a few exceptional specimens also." Of the Blandy Farm's 143 plants, 24 were left in 1973. The cuttings shipped to the Arnold Arboretum were a disaster. Of the 63, only one plant survived to go on the grounds, according to Dr. DeWolfe.

In searching through the Gray Summit boxwood "jungle" and the Garden grounds we have found 35 Ks so far. They are numbered 1, 6, 16, 18, 19, 22, 26, 27, 28, 29, 30, 36, 40, 57, 59, 61, 81, 82, 92, 96, 99, 101, 106, 108, 113, 126, 129, 131, 136, 139, 143, 144 and 146. A crosscheck of the Ks surviving at the Missouri Botanical Garden and Gray Summit, the National Arboretum and Blandy Farm shows only 6: Ke, K22, K28, K29, K57, K81. Three have survived at the Garden or Arboretum and/or the National Arboretum or Blandy: K26, K36 and K40. We have rooted cuttings of a number of Ks sent us as "promising" from the National Arboretum, as well as some we judged promising from Gray Summit. Our judgment is that there are a number which merit further work with a view to future registration and distribution.

MBG BALKANS, UNNAMED AND UNNUMBERED

There is a third group of plants propagated from the Balkan seeds that is both unnamed and unnumbered. The official *Registration Lists of Cultivar Names in Buxus L.* published by The American Boxwood Society takes cognizance of these as follows:

'Andersonii' (A name applied to a number of plants grown from seed collected by Dr. Edgar Anderson in Macedonia. In most instances, if not all, the name arose from the distribution of plants under Anderson's collection numbers which were dropped during the course of propagating and distributing the plants. No precise application of the name seems possible.

A number of these plants are at Gray Summit; others are on the grounds of the Missouri Botanical Garden. These were selected by Dr. Anderson himself from plants nurtured at Gray Summit. These, with the exception of the 'koreanas' were the only *buxus* on the Garden grounds until new plantings began in preparation for the EDGAR ANDERSON MEMORIAL BOXWOOD GARDEN.

We believe that at least two of these plants have real merit for the Midwest and we are now taking preliminary steps necessary to name and register them. These plants are totally dissimilar but share great hardiness; we think they will make friends for boxwood in the Midwest.

IN CONCLUSION, SOME PERSONAL REFLECTIONS

The path of the Edgar Anderson Balkan Boxwoods did not always run smoothly; for a time there was a hiatus in its development. On a bright summer day in 1968 as we sat beside Dr. Anderson on a garden bench near the Museum Building where he had his office, he told Mary Holekamp and me about it. He did not tell us when it happened, nor who was responsible, and his story was brief.

"One winter," Dr. Anderson said, "there was a bad storm accompanied by extreme cold. I was called from Gray Summit and told, 'I'm afraid your boxwood is gone.' I knew my caller was referring to the boxwood in the open nursery area and I said, 'Fine! Now we'll find out which plants are *really* hardy. I'll be out to see them."

He added that it was some time before he could get to the Arboretum and when he did he found that the boxwood nursery plants had been pulled up and destroyed. Fortunately, a considerable number survived in the wooded nursery area now referred to as the "jungle." Most of them, as noted, are Ks. This second personal story tells something about them.

In January 1969 Mary Holekamp, Jane Penhale and I — the three original members of the boxwood study group — drove with Edgar and Dorothy Anderson to see his surviving boxwoods. The day dawned stormy and by the time we reached Gray Summit a heavy snow was falling. "First, we'll find 'Agram'", said Dr. Anderson and directed us to an isolated area near the serpentine wall where 'Agram'

stood alone, classically symmetrical and poetically beautiful in the swirling snow. "Note its upward look," said Dr. Anderson.

The snowfall increased and it was agreed it was only sensible to eat lunch in the car and to postpone exploration of the "jungle" until spring when Dr. Anderson would come with us again. But in June 1969 Edgar Anderson died suddenly and we were never to have the benefit of his personal introduction to others of his Balkans. All we have learned has been pieced together from his friends, co-workers and fellow boxwood enthusiasts who, without exception, have expressed pleasure that work he began is continuing.



The plants in the row are all *Buxus sempervirens* 'Vardar Valley' (Balkan strain). The flattopped look is characteristic of the mature plant. It is possibly the most widely known of the Balkan boxwoods; Henry J. Hohman wrote that he had propagated 10,000.

Photo by J. C. Horner

THE MAIL BOX

When I met Dr. Baldwin at William and Mary in May, 1972, I asked him if he were still of the opinion that Dr. Anderson's Balkan boxwood introductions were a significant contribution to boxwoods in our country. His answer was "Yes." Then he added, "But not enough has been done with them."

The Boxwood Study Group of the St. Louis Herb Society, which now includes about one-half of the Society's active members, feels privileged to have had a part in renewing and continuing this work which Dr. Anderson began. In the EDGAR ANDERSON MEMORIAL BOXWOOD GARDEN it will have permanent value to botanists, horticulturists, students and gardeners throughout the world.

Mary A. Gamble, January, 1974

With appreciation to Ginny Maurer for typing this material, to Jane and George Penhale for reproducing it, and to Bob Dingwall's office for reproduction of Dr. Anderson's story.

NEW MEMBERS

(January 1 to April 1, 1975)

Bennett, Dr. Thomas G., Sr., Lusby, Maryland
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Curry, Cdr. Thomas H., 1212 Villamay Blvd., Alexandria, Virginia
Hooff, M. John C. H., 120 Cameron Mews, Alexandria, Virginia
McRorie, Mr. William E., 2600 Link Road, Lynchburg, Virginia
Massey, Mrs. Linton, Kinloch, Keswick, Virginia
Morton, Mrs. S. L., 6 Brentmoor Park, St. Louis, Missouri
Moss, Mr. Roger W. Jr., P. O. Box 408, Bryn Mawr, Pennsylvania
Murray, Mr. Maurice J., Rt. 1, Box 270-A, Mt. Vernon, Indiana
Robertson, Mrs. Elmer S., 1611 Wilmington Avenue, Richmond, Va.
Saunders, Mrs. Paul, Saunders Orchard & Nursery, Piney River, Va.
Schmid, Mr. Rudolf, Department of Botany, Univ. of California, Berkeley, California
Shanley, Mr. Seton, 54 Buells Lane, East Hampton, L.I., New York
Smith, Mr. C. L., P. O. Box 3723, Wilson, North Carolina
Wartman, Dr. William B., Williston Court, West Leigh, Charlottesville, Virginia

American Boxwood Society

Gentlemen:

I have been given your name in the hope that you can be of help.

At our farm here in southeastern Pennsylvania we have some very old and at one time beautiful English boxwood. Two rows some six to seven feet high and eight to ten feet across. From the time we acquired the farm in 1945 up to two or three years ago everything went along fine, the plants were quite healthy and only occasionally did a branch die back and have to be pruned.

Beginning about two years ago the die back problem ballooned with more and more and larger and larger branches turning suddenly straw colored and dying. We have sprayed with lime-sulphur, had the soil tested for nematodes, sprayed with various other items suggested by nurserymen, trimmed out the dead branches and cleaned out from under the bushes all dead leaves, etc. Nothing has stopped the progress of the disease. Some of our smaller, individual bushes have been entirely killed and we despair of saving the beautiful long rows even though some parts of the display have not yet been attacked.

This is not the sort of bronzing of some of the leaves which has always happened from time to time, but rather a relatively sudden turning of a single branch from eight inches to two feet at a time with the leaves first turning a straw yellow, then a dead gray and then falling leaving the branch completely bare. We cut back of the dead section with clippers dipped in creosote and destroy the diseased trimmings, but first one and then another branch succumbs. Thus even a very large bush gradually disappears a branch at a time. It never has infected a whole bush at a time.

Can you help us diagnose the cause of the problem as well as start us on the way to cure it?

Any help you can give us will be greatly appreciated. If there is any charge please let me know.

Sincerely,

John Moxon

P. O. Box 338

Oley, Pennsylvania 19547

THE MAIL BOX

James T. Gallagher

P. O. Box 46

Port Republic, Virginia 24471

March 20, 1975

American Boxwood Society

Box 85

Boyce, Va. 22620

I am writing at the suggestion of Tom Stevenson of The Washington Post.

Five months ago I bought an old house and fell heir to more than a hundred boxwoods, mostly medium and small size plants.

One large plant and two smaller ones were apparently dead when we took possession. Not long thereafter, many of the plants turned yellow, and some of their canes died. Later many (Most) of the plants turned bronze and red. I believe these are unhealthy if not dying.

My neighbors say

1—Don't worry; boxwood is tough!

2—It's just windburn (or winter kill)

3—Dogs cause the problem by urinating on the plants.

I had the soil tested; nothing wrong there.

Many of the red plants and those whose outer leaves are turning yellow and dropping off have what appears to be healthy green growth underneath.

As I told Mr. Stevenson, I'd hate to start my life as a Virginian by killing off a charming little boxwood garden.

Can you offer any suggestions?

Thanks much and good wishes.

Sincerely,

James T. Gallagher

When You See

Empty Space

Like This

It

Means

That

We Ran

Out Of

Material

Please!

We Want

To Hear

YOUR

Boxwood

Story

Your comments and advice are requested, for publication in future issues of the Bulletin.

THE AMERICAN BOXWOOD SOCIETY

INFORMATION

Address; Box 85, Boyce, Virginia 22620

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Regular membership dues of The American Boxwood Society are now \$5.00. This includes a subscription to *The Boxwood Bulletin*, to the publication of which the Society allots about 2/3 of the money received from dues.

Non-member subscriptions are for groups and institutions such as botanic gardens, libraries, etc. These are \$5.00 a year, and run by the calendar year.

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.

Price per single copy \$1.25 plus 5¢ postage to members; \$1.50 plus 5¢ postage to non-members. Orders of five or more copies are sent postpaid. At the present time any or all *Bulletins* are available, back to Vol. 1, No. 1 (Vol. 1 consists of three issues only, there was no Vol. 1, No. 4.)

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Gift memberships are announced to the recipients by boxwood-decorated cards which carry the information that *The Boxwood Bulletin* will come as your gift four times a year.

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Rear Adm. Neill Phillips, USN Ret'd., President,
Heronwood,

Upperville, Virginia 22176

If you have contributions for the Boxwood Bulletin — articles, news notes, photographs, suggestions of anything of probable interest to boxwood people, it saves time to direct them to

Mrs. Edgar M. Whiting, Editor,
The Boxwood Bulletin,
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All membership correspondence should be addressed to Mrs. Andrew C. Kirby, Secretary-Treasurer, The American Boxwood Society, Box 85, Boyce, Virginia, 22620.