



HOLLY LETTER



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EDITOR: DOROTHY EBEL HANSELL

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FIFTY-SECOND MEETING HOLLY SOCIETY OF AMERICA

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Headquarters: Holiday Inn, Hempstead, Long Island

Eleven years have passed since the Holly Society of America met on Long Island, with Planting Fields as the headquarters. Members who attended the meeting in 1964 will remember the magnificent trees which graced the expansive lawn, the conservatory, and the hollies.

There is pleasure in store for Holly Society members who have not previously visited Planting Fields Arboretum in Oyster Bay, Long Island, which was formerly the estate of the late William Robertson Coe. Mr. Coe gave it to the State of New York, in 1949. At his death in 1955, the State University of New York became the administrator; then 16 years later, in 1974, the Arboretum was transferred from the State University to the State Office of Parks and is now administered by the Long Island Park Commission. Gordon E. Jones is the Director.

Since the Society met there in 1964, a new feature has been added—a synoptic garden covering approximately five acres. In it 500 different species and varieties of flowering shrubs are arranged in alphabetical order and labeled with both botanical and common names, the name of the plant family, and the country of origin. This garden has proved to be interesting and valuable to home gardeners, students and professional horticulturists.

The holly collection, in very good condition, includes such species as *Ilex aquifolium*, *centrochinensis*, *ciliospinosa*, *cornuta*, *crenata*, *glabra*, *insigne*, *integra*, *latifolia*, *opaca*, *serrata*, *sugerokii*, *pedunculosa*, *pernyi*, *rugosa*, *verticillata*, and *yunnanensis*; cultivars of *I. aquifolium*, *crenata*, *cornuta*, and *opaca*; and certain inter-specific hybrids. Nearby is the attractive dwarf conifer garden.

At the Brooklyn Botanic Garden in Brooklyn, New York, members will view its three different Japanese gardens and its bonsai collection, one of the largest bonsai collections outside Japan. And if the weather holds, autumnal color will be most attractive.

Bonsai has long been associated with the Brooklyn Botanic Garden—ever since 1925 when Ernest F. Coe's collection was presented to it, and later other private collections. The Garden's collection was increased substantially when George D. Avery, Director Emeritus, obtained many very fine bonsai from Japan. One, a Japanese white pine (*Pinus parviflora*) is between 200 and 300 years old, and another, a Japanese red pine (*P. densiflora*), over 100 years old. And there are also fine bonsai which were trained by Frank Okamura of the Brooklyn Botanic Garden's staff, including miniatures, one of which is a Japanese holly (*Ilex crenata*).

The Japanese garden, designed and constructed in 1914-15 by Takeo Sheata, is a "mirror of nature." In Japan, several styles of gardens were created during the past 1200 years, and this "lake-and-island style" is the favorite. The Ryoanji Temple Stone Garden is "a recreation and masterpiece of the Orient." It has neither tree nor shrub, but is a level area of crushed stone and sand, ripple-raked to suggest water, and on it are groups of large

rocks. This type of Japanese garden is for contemplation and mediation and stimulates the imagination. The original Ryoanji Temple garden has been in Kyoto, Japan, for 500 years. The Japanese hill-and-pond garden, which was built in 1914-1915, is a very beautiful "stroll-in garden." In this garden, also designed and constructed by Takeo Sheata, there are a shinto shrine, torii gate, small lake, waterfall, bridges, and a viewing pavilion.

What horticultural treats await those who will attend the 52nd meeting! Also stimulating talks, the popular "Question and Answer" session, and the opportunity to share holly experiences with your fellow HSA members. Be sure to set aside some of your 1975 vacation days for November 11-14, 1975.

HOLLY IN NOVA SCOTIA

by John K. Weagle
Halifax, Nova Scotia

I thought that members of the Holly Society of America would be interested in learning that *Ilex opaca* and *I. aquifolium* are growing in Nova Scotia. *Ilex glabra*, and *I. verticillata* are native to the Province.

Growing holly is not popular here, chiefly because no one realizes that the two first-mentioned species do well along the coast. As the population is centered on the coast, I see great potential for growing holly as an ornamental in gardens. It is unfortunate that there is not one holly in the Public Gardens in Halifax.

Since the hollies I have observed are in Halifax and Digby, here are statistics to give you some information on the climate.

Mean Daily Maximum and Minimum Temperatures

| | Halifax | | Digby | |
|---------------------------|---------------------|--------|-------------------|--------|
| | Max. | Min. | Max. | Min. |
| Jan. | 32.9 | 19.7 | 32.7 | 20.1 |
| Feb. | 33.0 | 19.1 | 33.0 | 19.6 |
| Mar. | 38.8 | 25.6 | 39.0 | 26.5 |
| Apr. | 47.8 | 33.3 | 48.4 | 34.6 |
| May | 57.7 | 41.3 | 58.9 | 42.0 |
| June | 66.5 | 49.5 | 67.0 | 49.8 |
| July | 73.3 | 56.6 | 73.5 | 55.6 |
| Aug. | 72.9 | 57.7 | 72.5 | 54.4 |
| Sept. | 67.3 | 52.5 | 66.6 | 48.6 |
| Oct. | 58.0 | 44.3 | 57.5 | 41.9 |
| Nov. | 48.0 | 36.3 | 48.0 | 35.6 |
| Dec. | 37.1 | 24.9 | 36.9 | 25.5 |
| Record low and high | Halifax -13° 94° | | Digby -11° 95° | |
| Number of days with frost | 128 | | 124 | |
| Average annual rainfall | Total | Rain | Snow | |
| | Halifax | 51.92" | 43.64" | 83.0" |
| | Digby | 48.42" | 43.35" | 48.42" |

The Canadian Weather Office puts Halifax and Digby in different climatic zones, Halifax in 6a and Digby in 6b (the milder). These zones are roughly equivalent to the warmer part of Zone 4 and the colder part of zone 5, respectively, of the Arnold Arboretum zoning system.

Despite the impressive amount of snow, it rarely accumulates to be an asset; in fact, we get our coldest weather during periods of little snow cover. Both Digby and Halifax have at least seven days, rather seven nights as a rule, of below zero weather every year. These days usually occur during the first half of January (followed by an almost predictable two-week thaw) and any time in February.

Spring is a most frustrating season in the Maritime Provinces, since they tend to receive an overabundance of fog, rain, and clouds, accompanied with temperatures in the high 30s to upper 40s. This often continues well into June, although by that time temperatures are more seasonal. It is certainly not ideal weather for berry formation on *Ilex*, since bees are sluggish and the moisture plays havoc with the spread of pollen. Despite such gloomy sounding weather conditions, *Ilex opaca* and *I. aquifolium* will grow in this Province and sometimes quite impressively, as the following will indicate to Holly Society members.

Digby seems to be the holly grower's paradise in Nova Scotia. While there on August 18, 1974, I saw no American holly (*Ilex opaca*) but several magnificent English hollies (*I. aquifolium*).

One specimen with a height of 15 feet, breadth of approximately eight feet, girth of 12 inches (measured five feet from the ground), and circumference of 25 inches, had one main trunk and several smaller ones. The tree was in excellent shape--no bark split, leaves extremely fine--although tent caterpillars were doing some damage. The tree stands quite near the house on level ground; however, there is a very steep cliff about 20 feet away. It is protected on the west and south by nearby house walls. The soil is extremely sandy and leafy. There were no signs of winterkill, though the top foot of the leader, at roof level, was devoid of leaves which, I believe, was caused by tent caterpillars. The tree was heavily berried and there were numerous rotting berries from the previous year. The tree has not been fertilized nor sprayed in over 25 years; and it has not been pruned. The owner planted holly cuttings which his son had sent from England during World War 1. They began growing in 1918.

The next tree, a male, looked to be of the same origin and age--56 years. Its measurements: height, six feet; breadth, six feet; diameter at ground level, about six to eight inches. I could only estimate the diameter, since the foliage, in good condition, was so dense and prickly. The tree is growing in the same soil as the previous tree. It is on a gently sloping site and is overgrown with raspberry canes. The female *I. aquifolium* depended on this male *I. aquifolium*, which is about 500 feet away, for fertilization until 25 years ago when another male was planted at about the same distance. No sign of winterkill nor of tent caterpillar. It has received no protection and no attention.

Another male *I. aquifolium* in Digby, originated as a seedling from a holly tree received as a gift from a friend in British Columbia. Seeds of the Christmas gift tree sprouted three years later. It is now 30 years old, with a height of seven to eight feet, a breadth of four and a half feet, and a diameter of three feet at four feet from the ground. Its condition is good, although some bagworm damage is evident. There is no winterkill. The site on which this English holly stands is fairly level, but nearby is a sharp drop; the soil is average; the drainage excellent. The tree is protected on all four sides by a line of trees and shrubs about 20 feet away on each side. The ground is mulched with leaves before freeze-up, fertilized occasionally, but no spraying has been done.

In Halifax, I examined six English hollies. Two were raised

from cuttings of a tree of British Columbia origin, which was purchased at Christmas. The age of both trees and the sex of one is unknown. One tree is five feet high, with a breadth of five to six feet, and a diameter of three to four feet at ground level. This tree, espaliered against a basement wall, receives little sun--shaded on the east and south by large oaks. The foliage is good, but shows some insect damage. The soil has good drainage and oak leafmold. The second tree, a female, is six feet high, six feet broad, and four feet in diameter at ground level. The growth habit is spindly and there is much suckering; the foliage, however, is good. It is growing in the same soil as the first tree on a sloping side heavily shaded by oaks; protected by large trees on the east and exposed on the west. It has never produced a heavy crop of berries. The leader has repeatedly burnt down eight to ten inches by winterkill.

In Prince's Lodge, a suburb of Halifax, where the minimum winter temperature can be five to eight degrees lower than that of Halifax, I found *Ilex opaca* 'Old Leather Leaf', which came as a small, rooted plant from Dilatush of Robbinsville, N.J. The owner estimated this tree to be 25 years old. Its height is nine feet, its breadth five feet, and its diameter six to eight inches at ground level. The owner said that the tree was burned to the ground 15 years ago by extremely low temperatures, but its condition today is excellent. Its site is a sharp slope with average soil and good drainage. This is slightly protected on the south by the house and by oak trees on the north. It is mulched with oak leaves in the fall and is occasionally sprayed for leaf miner and tent caterpillar.

In the City of Halifax, I examined the female *Ilex opaca* 'Perfection', also from Dilatush. Fifteen years old, it is five feet, six inches high, four feet broad, and has a diameter of seven inches at ground level. The soil is average; the drainage good. The site on which it is growing is near a sharp drop of about four feet, and protection on the east is provided by the house. The condition of the tree is excellent, with slight chlorosis of the leaves on the bottom part. The owner sprays and mulches in the fall with maple leaves. It was protected well during its first three years. 'Perfection' bears a heavy crop of berries.

Ilex opaca 'Old Leather Leaf' from Dilatush, of the same age and size as 'Perfection', is growing on the same site and in the same soil and is receiving the same attention. The owner reported that five years ago the tree lost all its leaves during an ice storm which was followed by subzero temperatures. He watered it abundantly in the spring and new leaves appeared. Its condition today is excellent. There is no sign of chlorosis.

On the adjacent property are two trees of 'Old Leather Leaf'. Both male and of the same age, 15 years. Both are about 10 feet, six inches high, with a breadth of three and four feet, and a diameter of about five inches. They are growing in average soil with poor drainage and on a level site. All leaders have suffered severely from winterkill. They are protected on the north by a large cherry tree 'Kwanzan' and on the east by hibiscus. The two neighbors ordered their plants from the same source, Dilatush, at the same time, but there are marked differences in the hollies today. The importance of proper drainage for hollies in the Northeast is obvious.

I have heard that *Ilex aquifolium* can be found in the wild in the Annapolis Valley of Nova Scotia. It is found growing like a ground cover in the woods. It is winterkilled above the snow line. Seeds were probably spread by birds which had picked them from Christmas holly which was tossed outside.

I was unable to get a picture of a massive English holly hedge in Yarmouth, Nova Scotia. I have heard that it is 10 feet high and 40 feet long. Yarmouth's weather is slightly more severe than Digby's.

I have rooted cuttings from the hollies mentioned--the Digby

female and male aquifoliums, the opacas 'Perfection and 'Old Leather Leaf'. Now growing them under lights in the basement, they should be ready for planting outside next year.

John E. Ford, Curator of Secrest Arboretum, has sent *Ilex opaca* 'Santa Claus', 'Cape Cod', 'Arlene Leach', 'Wyetta', and 'Secrest' to D.L. Craig, Head of the Small Fruits and Ornamentals Section, Canada Department of Agriculture, Research Station, Kentville, N.S. Dr. Craig is initiating a testing program [hopefully later on in Yarmouth], and the results will doubtless prove interesting. Kentville's very fine breeding and testing program of rhododendrons and azaleas has resulted in their great popularity here. Hopefully, the same will prove true for hollies in Nova Scotia.

When I became a member of the Holly Society, Secretary-Treasurer Bluett Green suggested that I contact Richard Steele who also lives in Nova Scotia, about 70 miles from here. What a stroke of luck! Capt. Steele is a noted breeder of rhododendrons and azaleas and is interested in all borderline plants in the Province. A friend of Orlando Pride and the late Joseph Gable, he has obtained many hollies which should soon be tested outside. He is developing a large nursery and has several tracts of land in different climatic zones so the results of his efforts will prove very important.

We have a lot to do before holly is a common sight in Nova Scotia, but we are working hard at it, and I'll try to keep you informed.

AN ARBORETA IN KOREA-- WITH EMPHASIS ON HOLLY

by Carl Ferris Miller
Seoul, Korea

I am establishing an arboretum at Chollipo at the top of the Taean Peninsula, which juts into the Yellow Sea. I own over 100 acres, including an offshore island of about 10 acres. It is an extremely beautiful location and blessed with a climate much warmer than that of Seoul. The terrain is varied. My rice fields occupy the bottom lands. Then there is undulating terrain, which consists of fields and forested areas. And, as a backdrop, there are heavily forested hills which form a protective screen.

I have nine full-time employees and, as needed, hire day laborers from the fishing village which has a population of about 600.

My arboretum project began in 1971 and, in the interim, we have made tremendous progress. I have received cooperation from the Central Forestry Institute in Seoul, especially in procuring indigenous plants. I have no formal training as a botanist, but I spend all my spare time pouring through books about plants which I have collected from the United States and England.

Last year I joined the Korea Plant Taxonomy Society, which has 60 members; but so far only two Koreans I have met really know their plants well, Lee Tchang-bok and Cho-Mu-yon. Dr. Lee, who spent two years at the Arnold Arboretum in the 1950s, is Professor of Botany and Plant Taxonomy at Seoul National University and Mr. Cho is on the staff of the Central Forestry Institute.¹

More about Chollipo. It has a very interesting microclimate which, based upon the proven hardiness of some plants, I place in Zone 8 of the Arnold Arboretum Zone Map. I have recently installed equipment to measure rainfall, temperature, and wind speed, so from now on should have more accurate data on weather conditions. This past winter the coldest weather was -7°C, while in the winter of 73/74 our low was -10°C or 14°F. In 71/72 and 72/73, the temperature did not fall below 20°F. However, wind chill and salt spray have to be taken into consideration.

Nevertheless, some plants are surprisingly hardy. As an ex-

ample, *Gardenia jasminoides*, not reliably hardy anywhere in the British Isles, has been growing outside at Chollipo since 1971 with no winterkill whatsoever.

The surrounding area is primarily covered with Japanese black pine (*Pinus thunbergii*). Japanese red pine (*P. densiflora*), and the natural hybrid *P. densithunbergii*. Undercover includes *Elaeagnus macrophylla*, *Rhododendron mucronulatum*, Korean hornbeam (*Carpinus koreana*) and *Platycarya strobilacea*. The last-named, a member of the Walnut Family, is a beautiful small tree, native to eastern Asia. The curious fruits can be used as combs. The sand dunes provide a home for *Rosa rugosa* and *R. maximowicziana*, *Aster spatulifolium*, *Viburnum carlesii* var. *bitchuense*,² and so on.

Deciduous plants common in the area include *Evodia daniellii*, *Tilia manschurica*, *Jilia taquetii*, *Vaccinium oldhamii*, fragrant viburnum (*V. carlesii*), Japanese snowball (*Styrax japonica*), Korean mountain-ash (*Sorbus alnifolia*), golden-rain tree (*Koelreuteria paniculata*), Japanese sumac (*Rhus japonica*), sawtooth oak, Korean oak, and daimyo oak (*Quercus acutissima*, *Q. variabilis*, and *Q. dentata*), Amur corktree (*Phellodendron amurense*), Empress tree (*Paulownia tomentosa*), *Paulownia coreana*, *Zizyphus jujuba*, many species of *Lespedeza*, Mandshurian ash (*Fraxinus mandshurica*), *Fraxinus rhynocophylla*, autumn oleaster (*Elaeagnus umbellata*) Japanese persimmon and date-palm (*Diospyros* and *D. lotus*), Japanese dogwood (*Cornus kousa*), *Caragana microphylla*, *C. sinica*, and *C. sinica megalantha*, Japanese alder (*Alnus japonica*), silk-tree (*Albizia julibrissin*), and Chinese-fringe-tree (*Chionanthus retusa*).

Among the conifers are the needle and Chinese junipers (*Juniperus rigida* and *J. chinensis*), *Cryptomeria japonica*, China-fir (*Cunninghamia lanceolata*), Hinoki and Sawara false-cypress (*Chamaecyparis obtusa* and *C. pisifera*), Korean plum-yew (*Cephalotaxus koreana*), Japanese yew (*Taxus cuspidata*), deodar cedar (*Cedrus deodara*), *Thuja orientalis*, and *T. koraiensis*.

Broad-leaved evergreens include the common camellia (*Camellia japonica*), Japanese aucuba (*Aucuba japonica*), *Machilus thunbergii*, *Neolitsea sericea*, Japanese pittosporum (*P. tobira*), Yeddo-hawthorn (*Raphiolepis umbellata*), Japanese timber bamboo (*Phyllostachys bambusoides*), *Quercus myrsinaefolia*, evergreen euonymus (*E. japonicus*), Japanese privet (*Ligustrum japonicum*)--all native.

This should give some idea of what was growing on Taean Peninsula before my arrival. To the best of my knowledge, no species of *Ilex* is endemic to the peninsula. But Korea does have *Ilex*, to wit: *I. cornuta*, *I. cornuta* var. *integra*, *I. macrospora*, *I. macrospora* f. *pseudomacrospora*, *I. crenata*, *I. crenata* var. *microphylla*, *I. integra*, and *I. rotunda*.

Ilex cornuta is native to the island of Cheju, many of the offshore islands, an area in southeastern Korea, and as far north as the Pyonsan Peninsula. *I. rotunda* is also found in Cheju and other offshore islands. *I. integra* is fairly common throughout the lower third of the Korean Peninsula (ROK). *I. crenata* and *I. crenata* var. *microphylla* grow along the coast, especially in the mountainous areas in the lower two-thirds of the ROK peninsula. *I. macrospora* f. *pseudomacrospora* is found in the Chirisan area

1. There is surprisingly little interest in exotic plants (except hothouse types). Even such a fine ornamental as *Pieris japonica* (from next-door Japan) was introduced by me in 1972. Choice indigenous ornamentals, including *Stewartia koreana*, *Koelreuteria paniculata*, and *Abies koreana*, are neither widely known or planted.

2. The Koreans list *bitchuense* as a variety of *V. carlesii*, but Hilliers list it as a separate species. [Several botanical references give it specific rank, closely related to *V. carlesii*. Ed.]

and in Cheju growing in association with *I. macropoda*.

I have not seen a specimen of *I. cornuta* var. *integra*, but Dr. Lee describes it as a *cornuta* with no or very few spines. Dr. Hu in her article, "Eastern Asian Hollies in Cultivation...." does not mention it. I doubt the authority of this variety but shall explore further. It is probably *I. cornuta* 'Rotunda'. I have not seen *I. macropoda* f. *pseudomacropoda*, but Dr. Lee assures me that this is common. It differs from the species in that the under side of the leaf is glabrous, while the leaf of the species is pubescent underneath.

Ilex crenata needs further study. I have noted several types not distinguished to date. What Dr. Lee points out to me as *I. crenata* f. *microphylla* is, I believe, *I. crenata* 'Convexa'. I have seen leaf shapes which seem to include var. *buxifolia*, 'Rotundifolia' and var. *macrophylla*. On Cheju there are beautiful specimens of *I. rotunda*, some of which have much longer peduncles than others. These also require further investigation.

Last year in Kwangju City I found an *Ilex cornuta* which is 70 years old and over eight meters (over 26 feet) high. I am collecting dimensions on all these plants.

According to Dr. Lee, all the hollies I have mentioned are endemic to Korea, notwithstanding that Korea is not given credit for these species in various publications.

As to introduced species, there seems to be only one species which is fairly widely grown, that is, *Ilex serrata* var. *sielboldii* called in Korea *Naksanghong*, which is roughly translated into "Falling Dew Red," a name I really like. *I. serrata* is ridiculously popular--flower shops sell small plants with berries for the equivalent of \$14 to \$20.

Over the last three years I have brought to Chollipo from the United States and England many species and cultivars, in addition to planting *I. cornuta*, *I. crenata* and *crenata* 'Convexa', *I. integra*, and *I. rotunda*. I am growing cultivars of *I. opaca* and *I. aquifolium*, as well as interspecific hybrids. Strangely, *I. opaca* seems to do the least well, suffering considerable burn this past winter, even though Wyman reports it as suitable for seaside gardens. However, all plants are growing, and I haven't lost any. *I. aquifolium* and *I. cornuta* and their cultivars are especially vigorous. So far, no pest of any kind, and I have used no pesticide in the arboretum.

Being pretty well surrounded by the ocean, extremes in temperatures are few. We experienced our first killing frost this fall on December 4, 1974; the last frost is usually between March 1-15. Rainfall is usually quite plentiful, except during the September-November period. The spring season is generally sufficiently wet, and in July and August we have our rainy period. Summers are warm, but not uncomfortably hot--the maximum temperature, perhaps 90°F for five to six days in August. The weather is amazingly predictable.

The soil varies from sand through good loam; the acidity is about pH 4.5. Wind and salt sprays are factors to be considered, but there are well-protected pockets; and we are now busily engaged in planting windbreaks (*Cupressocyparis leylandii*) to provide further protection in the future. None of the hollies, except *I. opaca*, seems to have suffered any salt damage. I suspect our climate is somewhat similar to that of Vancouver, B.C., although not quite so cold, and we have more sunshine during the year.

Perhaps, in closing, I should mention that while I am especially interested in hollies, my arboretum at Chollipo has about 2,000 species of other plants, both exotic and endemic. It has a good collection of dwarf conifers, magnolias, pittosporums, camellias, rhododendrons, barberries, and so on.

EARLY HISTORY OF JAPANESE HOLLY IN JAPAN

Kaname Kato

Japanese Greenhouse Horticulture Association
Tokyo, Japan

It would be reasonable to assume that Japanese holly, *Ilex crenata* Thunb., was used in Japanese gardens since ancient times. It would have been traditional for it to be planted at the foot of large trees or by the side of garden stones as it is now. But, unfortunately, we can barely find descriptions of Japanese holly in ancient Japanese books on gardening in contrast to such plants as Japanese apricot, flowering cherry, maples, and pines which are often mentioned.

In ancient times *I. crenata* was often confused with the box tree, *Tsuge* in Japanese, (*Buxus microphylla* Sieb. et Zucc. var. *japonica* Rehd. et Wiels.) which is given the name *Inu-tsuge*, the name given to the plant we know as *I. crenata*. This name is also similar to the English transliteration of the name for horse-chestnut and chestnut. The name *Inu-tsuge* is the one we are searching for in the old literature, but sometimes it appears only as *Tsuge*.

As far as I have been able to determine, the first definite description of *Inu-tsuge* appears in *Kebuki-Gusa* (Book of Haiku, a 17 syllable verse) published in 1655 with *Tsuge* for *Inu* as a theme.

In the ancient book of horticulture, *Kadan-Chikin-Sho* published in 1695, Vol. 3, chapter on winter trees, appears *Tsuge* (large-leaved Japanese holly), having large leaves and not favored for garden use, and *Ko-tsuge* (small-leaved Japanese holly) favored for garden use. Also given is *Yadome* (another name for *Ko-tsuge*), with the color of the leaves dark. These *Tsuge* are genuine *Inu-tsuge*, the Japanese holly. In addition to these two hollies, mention is made of *Hime-tsuge* (*Buxus microphylla* var. *microphylla* Ohwi) and *Shiro-tsuge* (not identified).

After the publication of *Kadan-Chikin-Sho*, several books were published which mention Japanese holly and the box tree. Worth mentioning among these are *Yamato-Honzo* by the famous Ekiken Kaibara, published in 1709, (this is not a true horticultural book, but a book of herbals). Kaibara noted *Inu-tsuge* as occurring in gardens and listed it separately from *Tsuge*. In a supplement volume *Inu-tsuge* is illustrated. He described *Tsuge* (the box tree) as a garden tree. *Inu-tsuge* is not included among garden trees, but as one of the miscellaneous trees.

In the first encyclopedia in Japan, *Waken-Sansai-Zue* by Ryoan Terajima, published in 1713, the author compared *Inu-tsuge* with *Tsuge* as follows: leaves thick and darker green in color than *Tsuge*, in July (lunar calendar) green fruits are borne, large as on *Zanthoxylum piperitum* (L) DC., and mature to black by winter. It is a popular garden plant, evergreen and comparable in beauty to pines and Hinoki cypress. He supposed that there were male and female plants. Since *Honzo Komoku* (a Chinese book of herbals) is not included as a reference, it is probably that Japanese holly is not indigenous in China.

In *Jutei-Honzo-Komoku-Keimo* by Ranzan Ono (explanatory book of herbals), published in 1847, *Inu-tsuge* is listed in Vol. 32, chapter on shrubs. Many other names are given for this plant and it is stated that it is common in the wild in mountainous regions. The leaves are described as small, narrow, thick, finely serrated, deep green in color, and alternate. The author goes on to say that the branches grow dense and the plant is evergreen and does not bear fruit. Another *Ko-tsuge* has small leaves, and still another, *Yadome*, is desirable for garden use.

Toward the end of the Shogunate Era (1602-1866) horticulture in Japan flourished. Interest was especially high in variegated foliage and plants with unusual-shaped leaves. Two fine books on variegated and unusual foliage plants were published in the 1820's:

Somoku-Kihin-Kagami by Kinta, in 1827, and *Somoku-Kinyoshu* by Chukyo Mizuno, in 1829. Both books are beautifully illustrated with wood engravings. The first of these include six variegated cultivars of Japanese holly; and in the latter, 20 cultivars of Japanese holly, two *Buxus microphylla* var. *microphylla*, and one box tree appear. Among the 20 cultivars of Japanese holly, occur three with white-variegated leaves, five with yellow-variegated leaves, eight with white and yellow or brown and sanded [spotted] or blotched leaves, and four with unusual leaf shapes.

EFFECTS OF ALAR (B-9) ON HARDINESS AND FLOWERING OF ILEX CORNUTA 'BURFORDII'

John C. Pair — Wichita, Kansas
Ray A. Keen — Manhattan, Kansas

This is Contribution No. 503, Department of Horticulture & Forestry, Kansas Agricultural Experiment Station, Kansas State University, Manhattan.

Dr. Pair is Research Horticulturist, Horticulture Experiment Field, Wichita, and

Dr. Keen is Research Horticulturist, Kansas State University, Manhattan.

Numerous attempts have been made to increase hardiness of plants by the use of growth regulators. One such compound is "Alar" (Succinic acid-2, 2-dimethylhydrazide), a chemical which prevents biosynthesis of gibberellins in plants which is usually exhibited by shorter internodes.

Conflicting results are found in the literature regarding the use of "Alar" on various species. Granger and Hogue (2) found summer applications of "Alar" effective in reducing winter injury to raspberries along with a proportional reduction in growth. Copper and others (1) found winter applications delayed spring growth in some varieties of *Citrus*. Proebsting and Mills (5) reported growth regulators have both increased and decreased hardiness in various *Prunus* species.

To compare the effects of "Alar" at various times of the year, a broad-leaf evergreen, *Ilex cornuta* Lindl. 'Burfordii' was chosen to allow foliar applications at any season. Applications were compared during July, August, October, and January on plants in one-gallon containers in Manhattan, Kansas. Each treatment consisted of three applications of "Alar" at 2000 ppm plus the wetting agent "Tween 20" at 1000 ppm at weekly intervals sprayed to the point of run-off. Check plants were sprayed with water plus "Tween 20."

Since Burford holly is not hardy in zone 5, especially in containers, all plants were brought into a growth chamber on December 8 and exposed to daylength of eight hours and a night temperature of 40°F. The January treatment, therefore, was made inside the growth chamber. Spring conditions were then simulated by lengthening the day 30 minutes per week and gradually raising the night temperature to 55° until a 12-hour day was achieved.

Plant responses recorded were flowering, date of bud-break, and length of shoot-growth. To determine hardiness at the time of bud-break, two twigs each of five plants per treatment were frozen in wide-mouth thermos bottles at successively lower temperature at 3°F intervals. Temperatures were monitored by thermocouples attached to a recording potentiometer. Injury to twig sections was evaluated after three days under mist to detect browning of cambium tissue. Killing points reported are the average temperature at which all twigs were killed.

After laboratory freezing tests, the plants were then placed outdoors on March 12 and exposed to a natural freeze of an overnight low of 20°F. Injury was estimated on a scale of 0 to 5 with 0 = no injury and 5 = completely killed. Results appear in Table 1. There was a close correlation between the killing points and the injury from an outdoor freeze.

Summer applications of "Alar" actually reduced hardiness, but bud-break was delayed progressively by later applications which also gave indications of increased hardiness, although the differences were not highly significant. In order to further check the effectiveness of applications in late winter, another group of holly was obtained, still dormant, from a nursery and given weekly applications of 2000 ppm "Alar" from March 27 to April 23. Check plants were sprayed with water each time.

A different technique, which distinguished differences more quantitatively than visual observations, was used to determine hardiness. On May 2, as shoot-growth began, stem-sections were frozen to 15°F and injury was determined by an electrolytic method which measures diffusion of contents from injured cells (6). A higher percent diffusion indicates greater injury due to freezing. Results appear in Table 2.

"Alar"-treated plants were slower in beginning vegetative growth by about two days and were less injured by freezing tests. Resistance to freezing injury usually depends on the stage of development of a plant (3).

In the first experiment, although summer applications reduced hardiness, August treatments, which were made as a flush of growth was maturing, greatly increased flower initiation but did

Table 1. Effects of "Alar" on growth, flowering and freezing injury

| Foliar treatment | Application date | Summer growth (cm) | No. of flowers | Bud break ^x | Killing point (° F) ^y | Injury rating ^z |
|--------------------------|---------------------|--------------------|----------------|------------------------|----------------------------------|----------------------------|
| 2000 ppm | July 12, 21, 26 | 6.36b | 5.83b | 27.7ab | 22.0a | 3.4a |
| 2000 ppm | Aug. 2, 11, 16 | 9.97a | 21.17a | 21.8a | 21.8a | 3.0ab |
| 2000 ppm | Oct. 24, 31, Nov. 7 | 9.49a | 4.33b | 29.0ab | 16.9b | 1.8b |
| 2000 ppm | Jan. 2, 9, 16 | 8.00a | 1.33b | 31.0a | 16.4b | 1.6b |
| Check (H ₂ O) | July 12, 21, 26 | 8.19a | 0.67b | 19.0c | 18.3b | 2.4b |

Numbers followed by the same letter do not differ significantly at the .05 level.

x Number of days after Feb. 1 when growth became visible in growth chamber.

y Average of 2 stems of 5 plants per treatment.

z Based on visual rating following a 20° F freeze, scale 0-5 with 0 = no injury, 5 = dead.

Table 2. Effects of "Alar" on dormant Burford holly

| Foliar treatment | Application dates | Bud break ^X | Percent diffusion ^Y | Spring growth (cm) ^Z |
|--------------------------|-----------------------------|------------------------|--------------------------------|---------------------------------|
| 2000 ppm | Mar. 27, April 2, 9, 17, 23 | 28.67a | 12.31a | 11.20a |
| Check (H ₂ O) | Mar. 27, April 2, 9, 17, 23 | 26.50b | 26.64b | 19.87b |

^X Number of days after April 1 when growth became visible.

^Y Frozen to 15° F on May 3, average of 5 plants per treatment.

^Z Measured at termination of first flush, average of 3 shoots per plant.

not reduce shoot-growth significantly which agrees with results by March (4). The increased flowering and fruiting, however, were not particularly beneficial, since the extremely heavy berry crop reduced the following summer's growth.

Although these results do not suggest practical uses on Burford holly at this time, it is encouraging to note that growth responses, such as flowering, bud-break, and the accompanying loss of hardiness, can be manipulated through the proper timing of "Alar" applications. Potential uses on other woody ornamentals, possibly other holly, will be considered in future research with growth regulators.

LITERATURE CITED

1. Cooper, W.C., R.H. Young, and W.H. Henry: Effects of growth regulators on bud growth and dormancy in *Citrus* as influenced by season and climate. Proc. First International Citrus Symp. 1:301-314. 1969.
2. Granger, R.L. and E.J. Hogue: Effect of "Alar" on winter hardiness of raspberries. Can. J. Pl. Sci. 48:100-101. 1967.
3. Levitt, J.: The hardiness of plants. Academic Press, N.Y. 1956.
4. March, Paul C.: Effect of growth retardants on flowering, fruiting, and vegetative growth of holly (*Ilex*). Proc. Am. Soc. Hort. Sci. 83:777-781. 1969.
5. Proebsting, E.L., and H.H. Mills: Effects of growth regulators on fruit bud hardiness of *Prunus*. HortScience. 4:254-255. 1969.
6. Rollins, N.W. Jr., F.S. Howlett, and F.H. Emmert: Factors affecting apple hardiness and methods of measuring resistance of tissue to low temperature injury. Ohio Agr. Sta. Res. Bull. 901. 1962.

HIGHLIGHTS OF OREGON HOLLY GROWERS SHORT COURSE

The Oregon Holly Growers session of the Oregon State University Ornamentals Short Course was held in the Dwyer Room of Portland Memorial Coliseum on January 29, 1975. Tom Teufel, President of the Growers Association, welcomed 70 members and guests and introduced Robert L. Ticknor as Program Chairman. Archie Erickson reported briefly on the elk problem and the latest control by the Wildlife Conservation through trapping, since control by open-season hunting was overturned by the courts.

Dr. Ticknor introduced Gene Eisenbeiss, Research Horticulturist, U.S. National Arboretum, who is currently with the Arboretum's shade tree improvement project, and is an internationally recognized authority on holly. Mr. Eisenbeiss presented a survey of the holly industry in eastern United States, covering nursery production, relative importance of *Ilex* species, marketing

of nursery stock, orcharding, cut holly, and the current status of ornamental research.

The nursery industry in the U.S. is a three-billion dollar business, which roughly translates to one billion wholesale. In the East, holly is close to being the number one crop in numbers produced and dollar volume. In major nurseries of this region, holly is 40 to 50 percent of their production.

It is estimated that Japanese holly, *Ilex crenata*, makes up about 45 percent of all holly production; Chinese holly, *I. cornuta*, 20 percent; American holly, *I. opaca*, 15 percent; interspecific hybrids, 10 percent; and miscellaneous species, 10 percent.

Japanese holly owes its popularity and importance to these factors: It has a high level of soil type, air-pollution and salt tolerance; it is easily propagated, grows rapidly, and is easily transplanted; it has good disease-resistance and reasonable insect-resistance; it has a good hardiness range; and is salable in a wide range of sizes; it has enough variations within the species to provide unlimited landscape use; and salable plants can be produced in two years in the field, held in the field for five to six years, or be container-produced in one year.

Dr. Ticknor next introduced the growers' panel which discussed the advantages and disadvantages of cold storage. Archie Erickson described the use of ozone at 5 to 15 parts per million in the control of disease organisms; this has proved to be very effective under his conditions. Carl Bradenfels emphasized the need to keep temperatures between 32°-35°F beginning with initial storage and continuing with the transportation to wholesaler and retailer.

Duane Coyier, Plant Pathologist at the USDA Ornamentals Research Laboratory in Corvallis, gave a progress report on the control of *Phytophthora ilicis* which infects leaves and berries of English holly. (A report, authored by Dr. Coyier, Dr. Ticknor, and David Adams was published in *Holly Letter*, No. 51, April 1975.)

Al Robert, Horticulturist of Oregon State University, reported on "Foliar Analysis: What Can It Do for You?" Michael Chaplin and Daryl Richardson, also of O.S.U., who were in the audience, offered suggestions during the course of the presentation. Foliar analysis of woody ornamentals is the only accurate way of tracking nutrition. In Oregon we get response from only two elements--nitrogen and boron. The sooner the holly orchardist learns that nitrogen is the major element required for the production of quality cut holly, the sooner will he save money on fertilizer by buying only nitrogen. There is no reason to buy potash and phosphate, if the foliar analysis does not show the need. Boron deficiencies show up only in the corner of Clackamas County where it joins Washington and Yamhill Counties. This is a trace element, so very small quantities are required if deficiencies appear in the leaf analysis.

The best time for leaf analysis samples is in December and January. The proper fertilizing program can be started in early

spring, followed by a late fall application. Once a foliar analysis is started, it would be wise to repeat it annually with the same trees as samples, and to coordinate efforts with the County Extension Agent.

The last part of the session dealt with "Current Industry Problems." Five holly growers fielded questions from the audience which ranged from chicken fertilizer to dip tanks, field collection methods, storage temperatures, to foliar analysis, etc. One important suggestion came out of the questioning--that a standard analysis of the dip solution would be helpful in determining concentrations of chemicals and hormones and presumably save money in the efficient use of the dip solution.

OREGON HOLLY GROWERS ASSOCIATION

The annual meeting was convened in the Thunderbird Motel, Portland, Oregon, on January 29, 1975, after a luncheon in the Columbia Room, which was attended by 30 members and guests. Reports were presented by the Secretary and Treasurer. Carolyn Bajema, Paul Kirk, William Linfoot, and Thomas Teufel were elected members of the Board of Directors.

The Secretary reviewed the activities of committee during 1974: elk problem--Archie Erickson; carload-lot ordering of boxes--Carl Brandenfels and Tom Teufel; toxicity--Bob Ticknor and Gene Eisenbeiss; *Phytophthora* control--Bob Ticknor and Duane Coyier; lowering workmen's compensation rate (SAIF)--Vern Casebeer.

At the conclusion of the annual meeting, the Board of Directors met and elected as follows: President, Carl Brandenfels; Vice President, Archie Erickson; Secretary-Treasurer, William F. Kosar, for a fourth term. The retiring President, Thomas Teufel, was elected to serve on the Executive Committee with Mr. Brandenfels and Mr. Erickson.

President Brandenfels appointed Ernie Kolbe and Virginia Stalder to the Membership Committee, and Jill Teufel to the Hospitality Committee. Mr. Erickson was designated to gather information for a leaflet to promote holly as a decorative material.

May 3, 1975, is the date for the Spring Tour to Brownell Holly Farm, Milwaukie, with Helen Brownell and Patty Lee as hostesses; and October 11, 1975, is the date for the Fall Tour to the North Willamette Experiment Station at Aurora, for which Dr. Ticknor extended the invitation.

The Pacific Northwest Chapter of the Holly Society of America will meet on the afternoon of May 3 at the Ambrose Brownell residence. A cordial invitation is extended to all holly growers to attend the meeting, to bring a guest or two, and enjoy a full day of holly sociability.

William F. Kosar
Secretary-Treasurer

DWARF MOONLIGHT HOLLY

Newsletter of the Pacific Northwest Chapter of the Holly Society of America, Vol. 1, No. 1, May 1975, carried a colored illustration of one of John Wieman's Moonlight group of seedlings. The following is quoted, with permission.

W. Dallimore in his book, *Holly, Yew and Box*, describes this group as *Ilex aquifolium flavescens*. In controlled hybridization within the Moonlight group, John used his own male introduction, *I. aquifolium* 'Aurea Marginata Dale'. Emphasis has been placed on the selection of low-growing, bushy plants with outstanding golden foliar effects in the landscape. One clone, tested at Lake San Marcos in southern California, produced yellow berries but developed a rangy growth habit. Seedlings from the plant grown in Oregon are now three years old and making vigorous growth. Hopefully, some of the Moonlight offspring will be yellow-berried females with desirable landscape characteristics.

John Wieman's golden Moonlight hybrid selections are cold-resistant under Portland's climatic environment. The leaves will turn green when planted under extensive shade conditions. They show very little burn discoloration under normal conditions of exposure to sun, wind, and rain.

Two clones have been selected and tentatively named "Sunshine" and 'Moon-Glow'. They have been grown for six years as mature plants, withstanding severe winters. Their foliar effect should supply a glowing sunny attraction to landscape beautification.

COLOR SLIDES ON ILEX

Color slides are now available for showing to garden and civic clubs, and also other groups, to illustrate various species and varieties of *Ilex*--their usage in landscaping, foundation plantings, and decorative arrangements.

These slides have been contributed to the Holly Society of America by members, who are interested in encouraging the development and use of holly for many good reasons.

The slides have been compiled into "programs" for convenient projection. There are two identical programs on holly hedges, consisting of 87 slides each. Also, four programs of 40 slides each. Each of these are different; however, there are some duplications. Program IV contains 16 slides taken at Bernheim Forest, Claremont, Ky., during the 51st meeting of the Holly Society in Louisville, Ky.

The slide programs will be mailed upon written request to the Chairman, Audio-Visual Aids Committee. Please allow sufficient advance notice and state your showing dates. After showing, please return the slides promptly, insured and postpaid.

The Chairman solicits slides for new programs, including close-ups of male and female flowers and any slides of special interest.

M. Howard Goodman, Chairman
Audio Visual Aids Committee
1408 Butter Lane
Reading, Pa. 19606

LETTER TO THE EDITOR

In March of this year, my wife Ferry and I joined a group from the Missouri Botanical Garden on a trip to the Canaries and Tenerife, the latter an island about 60 to 70 miles distant. One of the guides in the Canaries thought there were hollies there, but he didn't know just where they could be found. So we decided to go to Tenerife, but luck was not with us.

While traveling up the mountain through the pine and laurel forests, where hollies are said to be found, we were in a heavy layer of clouds and fog and, of course, could not see anything. When the sun broke out about the clouds, the forests were behind us and only scrub pines remained. The pines, to our amazement, had ice on them, although the sun felt quite warm and the temperature rose in the 50s. Tenerife has a botanical garden, which we visited, but no hollies; so we decided that the hollies which had grown there, were there no longer.

The southeast of Gran Canaria (our base) has four inches of rain a year, while the northeast has 11 to 12 inches. The northeast also has a botanical garden and an Englishman, Dr. Bromwell, is its Director. I telephoned and made an appointment with him to visit the Garden. He told me that there were several hollies in the Garden, native to the Island.

The first holly we saw was an eight-foot "English type" tree with rather large leaves, some measuring five inches long and two and a half inches wide. This was a male *Ilex platyphylla*. The fairly flat leaves were edged with many short spines.

The three other hollies we saw were *Ilex canariensis*, female.

They bore no berries except four on one of the trees. These were given to me by Dr. Bromwell. I brought them home and sowed them in the greenhouse bench. The leaves of *I. canariensis* are oval and have only one spine at the tip. I have pictures of both. One is *I. perado platyphylla* and the other *I. perado canariensis*, according to the *Handbook of Hollies* (1970). Dr. Bromwell gave me cuttings and promised to send me seeds in the fall. At this time of writing (April), the cuttings are doing well.

On Sunday, April 6, Ferry and I went to the Chicago Flower and Garden Show. We had been invited to arrange a holly display. We took six species and about 40 varieties and had a one-day display. A great deal of interest was shown by the crowds, and we were surprised by the number of persons who said they had a holly or two growing in the Chicago area.

We were invited to return next year and put on a larger display, since our holly display attracted so much attention this year.

J. Bon Hartline
Anna, Illinois

SOURCE OF ILEX LAEVIGATA

John Ford, Curator of Secret Arboretum, ARDC, Wooster, Ohio, has furnished a source for *Ilex laevigata* (see "Questions and Answers," page 19, *The Proceedings* of the 51st meeting). It is Cole Nursery Co., Inc., R.D. 1, Circleville, Ohio 43113.

MORE ABOUT ASHUMET HOLLY RESERVATION

The Ashumet Holly Reservation, situated in the Hatchville section of the Town of Falmouth, has initiated a \$250,000.00 fund drive. The purpose of the drive is twofold: to provide a basic endowment fund which would augment yearly contributions and proceeds from semiannual plant sales and to provide a living memorial for the three men who were instrumental in the founding, development, and eventual preservation of Ashumet as it exists today. The three men are the late Wilfrid Wheeler, Joseph L. Dias, and J.K. Lilly, III, and each contributed according to his interest and ability.

Wilfrid Wheeler, the founder, came to Cape Cod in 1919 as an associate of Chicago millionaire Charles R. Crane, principal stockholder in the Coonamessett Ranch Company. The Ranch, as it was known in those days, was a 15,000 acre holding with headquarters in the village of Hatchville, where the farm buildings and most of the cultivated land were located. When this venture failed in the 1920's, Mr. Wheeler acquired 300 acres, including a farm with cleared land and buildings from the Ranch, and began an agricultural enterprise of his own. Recognizing the rapid rate at which native holly was disappearing from southern New England, he began collecting and selecting hollies for quality of berries and leaves for propagation by means of cuttings. Long before his death in 1961, Wilfrid Wheeler had become an authority on *Ilex opaca*, the American holly, with named varieties to his credit. On his farm alone grew more than 1,500 holly trees, with many other horticulturally desirable species of native trees and shrubs.

Working closely with Mr. Wheeler for over 30 years was Joseph L. Dias, who came to the United States as a boy from Fayal in the Azores. Mr. Dias lived in California for a short time and then, in his early teens, moved east with his family to take up residence on Cape Cod which became his permanent home. He worked in Coonamessett as a gardener. After Mr. Wheeler's Ashumet Farm became a going concern he began, in 1928, an extended term of employment which lasted 44 years and saw many changes in the original organization. In addition to the conventional farming at Ashumet, the growing of such crops as corn, asparagus, and melons, Mr. Dias devoted much of his time to propagating and growing holly and thus became an authority in his own right. After Mr. Wheeler's death and the purchase of what is now the

Ashumet Holly Reservation by J.K. Lilly, III, he stayed on as caretaker and continued in this capacity when the property was deeded to the Massachusetts Audubon Society for preservation. As superintendent at Ashumet, Mr. Dias enjoyed showing visitors the many varieties of hollies in the woods, each with its own name, the unusual types of beach plums, and the little known franklinia. Thus Mr. Dias, through his association of more than four decades, become almost synonymous with Ashumet. His passing in fall 1972 created a void which can never be filled.

AMERICAN HOLLY CULTIVARS AT YEW DELL FARMS

| NAME | SOURCE |
|------------------------|-----------------|
| 'Kate' | Wheeler |
| 'Alice Steed' | Steed |
| 'Arden' | Nearing |
| 'Amy' | Wheeler |
| 'Arlene Leach' | Pride |
| 'Aquapaca' (Male) | Angelica |
| 'Autumn Wine' | Klein Sdlg. |
| 'Betty Pride' | Pride |
| 'Betty Ann' | Hohman |
| 'Betty Nevison'* | Rankin |
| 'Beverley Belin'* | Rankin |
| 'Big Red' | Dilatush |
| 'Big Mack' | Reynolds |
| 'Big Daddy'(male) | Klein Sdlg. |
| 'Big Ditch' | Tingle |
| 'Bickel' | Cave Hill |
| 'Bittersweet' | Dilatush |
| 'Bosley Hedge' | Bosley |
| 'Boyce Thompson No. 4' | B. T. |
| 'Boyce Thompson*' | B. T. |
| 'Bountiful' | Dilatush |
| 'Blayden Maiden'* | Rankin |
| 'Bradshaw' | Hohman |
| 'Brown No. 7' | Brown |
| 'Brilliance' | Hillmeyer |
| 'Canary'* | Dilatush |
| 'Carolina No. 2' | Steed |
| 'Carolina Large Leaf' | Clarendon |
| 'Calloway*' | Rankin |
| 'Calloway Red' | Calloway |
| 'Cardinal' | Dilatush |
| 'Carnival' | Pride |
| 'Caroline Pearson' | Hohman |
| 'Cave Hill No. 1' | Cave Hill |
| 'Cave Hill No. 2' | Cave Hill |
| 'Cave Hill No. 3' | Cave Hill |
| 'Cecil'* | Rankin |
| 'Cheerful' | Hohman |
| 'Chief Paduck' | Hartline |
| 'Coral' | Pride |
| 'Cheer' | Pride |
| 'Christmas Carol' | Bosley |
| 'Christmas Tide' | Hohman |
| 'Corpening No. 1'* | Rankin |
| 'Corpening No. 2'* | Rankin |
| 'Corpening No. 3'* | Rankin |
| 'Clarissa' | Price |
| 'Clark' | White |
| 'Clemson College' | Rankin |
| 'Clatsworthy'* | Found in W. Va. |
| 'Cumberland' | Wolf |
| 'David' (male) | Wolf |
| 'Delia Bradley' | Hohman |
| 'Dengla Bells'* | Rankin |

| | | | |
|------------------------|------------------|-----------------------|-----------------|
| 'Dorothy' | White | 'Marsh' (original) | Spring Grove |
| 'Diane' | Cave Hill | 'Marta' | Klein Sdlg. |
| 'Dilatush Cup-leaf' | Dilatush | 'Maxwell Point' | Hohman |
| 'Diaz No. 2' | Meriam | 'Mary Emily'* | Rankin |
| 'Draper' | Mattoon | 'McDonald' | Simpson |
| 'Dull Red' | Hohman | 'Margaret' | Pride |
| 'Dunn No. 1'* | Rankin | 'Morris Arboretum'* | Rankin |
| 'Dunn No. 2'* | Rankin | 'Morgan Gold'* | Darr |
| 'Eleanor' | Wolf | 'Miss White' | White |
| 'Elizabeth' | Wheeler | 'Millville' | Wolfe |
| 'Emily' | Wheeler | 'Miss Abbie' | Otte Nur. |
| 'Ermine Watson' | Rankin | 'Miss Angie' | Cave Hill |
| 'Exotic' | Angelica | 'Miss Helen' | McLean |
| 'Fallow'* | Batchlor | 'Merry Christmas' | Dilatush |
| 'Farage' | White | 'Margaret Moran'* | Rankin |
| 'Fair Lady' | Pride | 'Mrs. Robb' | Pride |
| 'Firechief' | Hillenmeyer | 'Mrs. F. J. Close' | Pride |
| 'Francis Fink' | Cave Hill | 'Mrs. Clark'* | Rankin |
| 'Frank Mack' | Hohman | 'Mrs. Lawrence' | Meriam |
| 'Freeman' | Hohman | 'Mrs. Santa' | Tingle |
| 'Fruitland Nur.*' | F. N. | 'Monantico' | Wolf |
| 'Galleon Gold'* | Rankin | 'Muench' | Cave Hill |
| 'Goldie'* | White | 'Nelson West'(male) | West |
| 'Golden Valentine'* | Klein Sdlg. | 'Oak Hill No. 1'* | Rankin |
| 'Goya' (male) | Klein | 'Oachs' | McDaniel |
| 'Greta' | Angelica | 'October Glow' | Hohman |
| 'Gee' | Pride | 'Old Gold'* | Found in Tenn. |
| 'Griscomb' | White | 'Old Heavy Berry' | Dilatush |
| 'Gunby' | Angelica | 'Old Science' | Hartline |
| 'Helen Mitchell'* | Rankin | 'Okrent' | Eagle View Nur. |
| 'Helen Makepeace' | Hohman | 'Osa' | White |
| 'Henry Clay' | Hillenmeyer | 'Parkton' | Angelica |
| 'Indian Maid' | Clark | 'Perle LeClare' | LeClare |
| 'Isaiah' (male) | White | 'Pin Cushion' | Hohman |
| 'Jesse Taylor'* | Rankin | 'Phillips'* | Phillips Nur. |
| 'Johnston' | Gable | 'Pride Dwarf' | Pride |
| 'Jeanette Adamson'* | Rankin | 'Pride Berry' | Pride |
| 'Joyce' | White | 'Pride Orchard' | Pride |
| 'Jersey Knight' (male) | Brown | 'Pride Hedge' | Pride |
| 'Judy Evans' | Cave Hill | 'Pride of Butler' | Pride |
| 'Judy Kay'* | Del-Mar-Va. Nur. | 'Prince Edd' (male) | Hohman |
| 'Julie Koehler'* | Found in W. Va. | 'Red Bird' | Hillenmeyer |
| 'Julian' (male) | Cave Hill | 'Red Tower' | Tingle |
| 'Katryn' | Klein Sdlg. | 'Red Flush' | Pride |
| 'King Midas' | Bosley | 'Red Spice' | Pride |
| 'Ky. Smooth Leaf' | Durrett | 'Red Velvet' | Wolf |
| 'Klein No. 1' | Klein | 'Reynolds' | Reynolds |
| 'Klein Compacta' | Klein Sdlg. | 'Richards' | USDA |
| 'Lady Alice' | Wolf | 'Ruston' | Hohman |
| 'Lakewood' | L.W. Nur. | 'St. Mary' | Wheeler |
| 'Lake City' | Hume | 'St. Stevon' | Hohman |
| 'Lady Blakeford'* | Rankin | 'Saga Serene'* | Rankin |
| 'Laura' | White | 'Sallie' | White |
| 'Longwood Gardens'* | Longwood Gds. | 'Salem Compacta' | Dauber |
| 'Linge Close' | Pride | 'Sallie May' | Cave Hill |
| 'Lowell' | Wheeler | 'Silica King' (male) | Wolf |
| 'Mae' | White | 'Somerset' | Tingle |
| 'Manig' | White | 'Slim Jane' | Wolf |
| 'Maryland Dwarf' | Dilatush | 'Skookum' | Hohman |
| 'Maryland'* | Hohman | 'Spring Hill' | S. H. Nur. |
| 'Mary Holman' | Pride | 'Spring Grove' (male) | S. G. Cem. |
| 'Margaret Smith' | Meriam | 'Spring Grove'* | S. G. Cem. |
| 'Maurice River' | Wolf | 'Stinkin Creek No. 1' | Found in Tenn. |
| 'Marsh Mutation' | Spring Grove | 'Susan Gregory'* | Found in W. Va. |
| (witche's broom) | Cemetery | 'Sun Tan' | Klein Sdlg. |

'Taber No. 3'
 'Tingle Nur.*
 'Tingle Opaca No. 3'
 'Toner'
 'Torchbearer'
 'Trisco'
 'Valentine'
 'Valentine'*
 'Vermeullin Pyr.'
 'Vermeullin Rotundifolia'
 'Virginia West'*
 'Virginia Giant'*
 'Warren Orange'*
 'Wheeler No. 4)
 'Nancy'
 'Wheeler No. 20'
 'Wheeler No. 25'
 'Westcroft'
 'Webber'
 'Webber 10-W.S.'
 'Winn Nursery'*
 'Wilfred' (male)
 'Xanthawood'*
 'Yellow Jacquet'

* Yellow = fruited

Hume
 Tingle
 Tingle
 Hohman
 Dilatush
 O'Rourke
 Pride
 Valentine Nur.
 Vermeullin Nur.
 Vermeullin Nur.
 Rankin
 Wmbg. Va.
 Warren Nur.
 Wheeler
 Wheeler
 Wheeler
 Wheeler
 Wheeler
 Bosley
 Cave Hill
 Webber
 Winn Nur.
 Wheeler
 Found in W. Va.
 Rankin

Theodore R. Klein
 Crestwood, Kentucky

ANOTHER OFFICAL HOLLY ARBORETUM

Bernheim Forest Arboretum, Clermont, Kentucky, has been designated an official holly arboretum by action of the Trustees of the Holly Society of America at their meeting held at Wye Institute, Maryland, on May 30, 1975.

In his application, directed to John E. Ford, Director of Secrest Arboretum and Chairman of the Society's Arboretum Committee, Clarence Hubback, Jr., Horticulturist of Bernheim Forest Arboretum, stated:

"Presently, we have approximately 65 holly species and cultivars growing either in the arboretum or in the nursery. We are clearing an additional 20 acre tract for the purpose of growing hollies. Part of this area should be ready for planting by fall of this year, the remainder by spring 1976.

"We plan to try growing as many different holly species and cultivars as possible in this area to check for hardiness and land-

scape value in our hardiness zone. This will also become a part of our permanent plant collection.

"The U.S.D.A. Plant Hardiness Zone Map indicates we are in hardiness zone 6b. However, we frequently have winter temperatures of -8° to -10°F.

"This holly arboretum will be properly labeled and will be open to the public. An accurate record will be maintained on each plant as to location, valid name, source, date received, size and/or age when received, and other pertinent data. The undersigned will act as liaison and report the progress of the collection to the Editor of the *Holly Letter*.

"With the exception of patented cultivars, propagating material will be available, on request, from these hollies as well as from other plants in the arboretum."

The above application met all the qualifications of an official holly arboretum.

AN OPTIONAL TOUR ON NOVEMBER 15, 1975

If you are planning to attend the annual meeting of the Holly Society, you may wish to add a day to your schedule and enjoy the tour on Saturday, November 15, 1975, to the "Sunken Forest" on Fire Island where you will see an extensive stand of large American hollies.

More about this optional tour and the program of the annual meeting will be sent to you by Bluett C. Green, Jr., Secretary-Treasurer, in due course.

AN ACCOUNTANT, PLEASE.

Is there an accountant among the members of the Holly Society of America? The Society seeks the cooperation of a member with this qualification who will chair the Auditing Committee and audit the treasurer's records? This task is performed annually in August.

Will any one, willing to serve the Society in this capacity, kindly communicate with Elwin R. Orton, Jr., the Society's Administrative Vice President? Dr. Orton's address is 1500 Main Street, Millston, Somerville, N.J. 08876.

William J. Dennis, who chaired the Auditing Committee and audited the records for 15 years, regretted he had to submit his resignation. In appreciation of his many years of faithful service, the Society presented an appropriately subscribed plaque to Mr. Dennis.

THE HOLLY SOCIETY OF AMERICA, Inc.

407 FOUNTAIN GREEN ROAD
 BEL AIR, MARYLAND 21014

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