HOLLY LETTER

PUBLISHED BY THE HOLLY SOCIETY OF AMERICA, INC.
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25 Ames Road, Morristown, N.J. 07960

HOLLY LETTER No. 48 **APRIL, 1974**

IN THE SHADE OF THE ILEX AT PINEHURST

Fred Ebersole, PhD.
Pinehurst, North Carolina

Why does one begin a holly collection? I can answer only for myself. In the background motivation of the collector lie personal facets which flesh out the skeleton of probable latent vanity, perhaps even some elemental covetousness. In my case, these are interwoven with a childhodd-instituted curiosity concerning values of a very wonderful genus of evergreen plant life. These later values developed as the delineation of certain species and varieties for landscape purposes and the resulting beautification of our homes, parks, arboreta, and the countryside generally. To accomplish this in the Sandhill region of North Carolina is also to study the mini-environmental combinations of soil and climate to be found in southern Moore County and upper Hoke county, 75 miles south of Raleigh and 100 miles east of Charlotte.

At the turn of the century Paul Bunyan, woodsman of fabled feats in the North woods, found nothing in the cottonwoods and buck brush of North Dakota to interest him. But there at a birth point a few miles below the Canadian border, my *Ilex* quest began. Compared to cottonwoods, the dazzling image of bright and shining clusters of rich green leaves and red berries which characterized those Christmas cards *(Ilex aquifolium,* as I discovered 30 years later) had by World War I implanted a firm desire to live some day where such gorgeous plants grew. The quest via Massachusetts, New York's Hudson Valley, North Jersey, and finally Pinehurst, North Carolina, is another story. Suffice it to mention that a happy introduction to the real *Ilex* world occurred via personal visits to the New Jersey nurseries of Elizabeth White and Earl Dilatush in the mid-forties.

Life as a retiree began January 1, 1969, near Pinehurst. There, on January 27, 28, and 29, the well-known Clarendon Gardens Nursery was liquidated at wholesale auction. I stress the term wholesale, since even with judicious bidding on smaller lots to obtain a wide spectrum of varieties, my wife and I found we had an "instant garden" of thousands of azaleas and hundreds of hollies. Most of the latter were potted liners or in cans. Azaleas and hollies are wonderful companion plants and, since acreage demanded minimum maintenance, the azaleas became the skeleton framework at "Acadia." Camellias and rhododendrons compete in some areas with the hollies. There is a liberal sprinkling of dogwoods with day-lilies and crape-myrtle for summer color.

Visitors to this area via routes 301, I-85, and I-95 will find a welcome at Clarendon Gardens just west of the Village of Pinehurst. Since Francis Howe liquidated the nursery operations in 1969, he continues to provide two garden attractions. The lake as a landscape feature, lying in the midst of azaleas, hollies, camellias, and rhododendrons, remains as a ready-made park for the enjoyment of the home owners whose sites have been purchased under Mr. Howe's plan of environmental protection of his several hundred acres. Adjacent to the lake is the Holly Arboretum, which probably contains specimens of more *Ilex* variations than any one garden in the Carolinas. The age of these trees, including those in the residence garden, many set out in the 1940's, has demonstrated the adaptability of some hollies to the Sandhills soil and climate. Thus, *aquifoliums* coming from the cool, rainy, fertile Northwest have to put roots into 65-70 percent silicon dioxide with little original humus and practically no nitrogen, and minimum amounts of phosphate and potash. It becomes almost hydroponic operation on the grand scale. July and August are very hot and, in years previous to 1972, very dry. For the first 10 to 15 years of a holly's life here, the answer must be pine straw or bark mulch, liberal fertilization, and water. The rainfall, though usually annually sufficient, is extremely variable, which makes it necessary for artificially controlled watering for the younger plants.

One can appreciate why the *aquifolium* species left alone to discover its own abode would not voluntarily choose the Sandhills (or the Southeast for that matter). So when one views Mr. Howe's 'Escort', 'Jan Van Tol', or 'Teufel's Special', they affirm both his gardening ability and the genetic strength and adaptability of selected cultivars. Visitors calling at the home will be shown the beautiful Humes in the side yard. Also remaining in the former nursery fields are hundreds of opacas in variety which, because of size or the wholesale purchaser's ineptness, reverted to Clarendon ownership. They make for a delightful rambling walk any time of the year, but especially so in November and December when their bright berries dominate the scene.

Here at "Acadia", we are growing examples of some 70 cultivars or clones representing all but two of the species listed at the top of page 324 of The *Handbook of Hollies.* In addition, we have specials from Henry Hohman, Tingle Nursery, and Dan G. Fenton; also seeds from the United States National Arboretum, courtesy of Gene K. Eisenbeiss. An interesting little group getting under way is that of *Ilex vomitoria,* including 'Intermedia', 'Schilling's Dwarf', 'Nana', 'Price of Texas', and several seedling variations provided by nature. A small cluster of deciduous plants, inspired by Bon Hartline, are representative of *I. decidua* and *I. verticillata.* Several dozen collected seedlings, mostly of *I. opaca* and *I. cornuta,* showing unusual leaf form or growing characteristics are being grown to fruiting age as a sideline "surprise" package. Among these a male *opaca* has been selected, which appears to be a twin brother of 'Slim Jim', Miss White's favorite pollenizer in New Jersey. This one, however, bears a load of blossoms several times more abundantly than my New Jersey Jim.

As one drives around the homes in the Pinehurst, Southern Pines, Aberdeen triangle, the presence of *Ilex opaca* is beautifully obvious. Uncle Sam has one towering over his Southern Pines post office entrance. On the private grounds of the "old Gibbons House" in nearby Hamlet, now owned by Mrs. Lindsey, stands the parent tree which Clarendon propagated as 'Hamlet'. At Pinehurst Inn (formerly the Carolina Hotel) is the parent tree of 'Big Carolina'. A very beautiful and rare form of *I. opaca,* 'Clarendon Spreading' is seen in mature form at Clarendon's lake and in more juvenile form here at "Acadia". It has a unique heavy texture. *Ilex cornuta* 'Burfordii', of course, is in evidence everywhere.

May I close with the collector's prayer for cuttings or sources of unusual *Ilex* and a cordial invitation to "Acadia".

HOLLIES IN HOT SPRINGS NATIONAL PARK AND GARLAND COUNTY, ARKANSAS

Dorothy Dennis
Hot Springs, Arkansas

Probably most people, when they hear holly mentioned, think of American holly, *Ilex opaca.* I know I do.

Here in Hot Springs National Park there are eight "bath palaces," which utilize the water from 45 to 57 hot springs. Forty-five springs are covered to prevent pollution; the other two are open for exhibition. This water is pumped into a 300,000-gallon reservoir and is then pumped into an adaptor which cools it so that it can be used in the baths. These baths are regulated by the Federal Government.

In front of each of these bathhouses is a magnificent American holly. They are female trees and all of one size and form. They are the most beautiful American hollies I have seen, and especially beautiful in winter with their red berries. During the holidays the trees are strung with hundreds of tiny lights, which create a cheerful sight as they glint on the shiny leaves and red berries. Also, in front of each bathhouse is a hedge of the Chinese holly, *Ilex cornuta,* which adds to the festive scene with its berries. There is a 12-foot wide sidewalk which arches over Hot Springs Creek. This is a large creek and runs through the center of the town and here is parallel to the bathhouses. I have often wondered if all that water has anything to do with the well-being of these trees.

These handsome trees, I am informed, were probably planted before 1900 by the Federal Government when the creek was covered, a distance of about 3,500 feet. One of my friends said she worked at the baths 50 years ago, and the trees were mature then.

There is another fine American holly which I pass on my way into town. It is not quite so spectacular as those in front on Bathhouse Row, but this tree has been there only 30 years. It is on property which was part of a large farm with a wide creek across the back. The holly was dug from along the creek and brought to the house, where it was run over a couple of times. There is no evidence of injury now.

Above and behind Bathhouse Row is a bricked promenade overlooking the city and at the outer edge of this approximately one-mile walk is another hedge of *I. cornuta,* also beautifully tended.

At our former home in Lake Hamilton, we had several different hollies, all growing well: *I. cornuta, I. crenata, I. crenata*'Convexa', Burford holly, and Foster holly*. In the nine years since these hollies were planted, they have made a creditable showing. Probably the most important of those used in this area is the Burford holly. It grows well and is so useful where a large, broad-leaved evergreen is wanted. I first made the acquaintance of this holly when we came down this way before retiring from New Jersey. We came into Arkansas at the northeastern corner of the State and on the grounds of the motel in which we stayed was this enormous, berried shrub. I had not seen this holly before, and the motel owner didn't know what it was either. He said it had been there when he bought the place. Anyway, I was interested enough to check it out and found it was Burford holly, a selection from the Chinese species, *I. cornuta,* which fruits by itself. Since we moved from Lake Hamilton four years ago, perhaps 25 miles northeast, we have had freezes in spring which destroyed the flowers, so no berries. This spring there were several freezes in late April with warm spells between them, so everything was clobbered, not only hollies. We shall have a few apples from one of our trees, but not another piece of fruit.

Another holly which I feel should be grown more widely, especially in this wooded section, is *Ilex decidua.* I had never seen this holly until we found three plants here, two medium-sized ones and one large, many-trunked tree. They are attractive plants, with their greyed twigs and many berries, which are dark coral rather than red. Added features are the browning of the leaves in fall before they drop and the retaining of the fruit all through winter and into spring. Often there are both coral berries and new, little green ones. Just the other day I looked at our large plant (early September) and found a few coral berries still on it, along with the green.

I see only one other large plant of this species of *Ilex* along the road to town. Surely there are more, but they don't show from the road. Neither do ours, but quite a few young ones are coming along at the edge of our borrow pit. Our pit runs about 250 feet along the highway and goes from nothing to 20 feet deep or so. The former owner had stock, and I wonder if his stock browsed on these small plants. These are at the top edge of this pit, which I call my "gulley," and are in company with button bush, wild blackberries, sweet gums, cork-bark elm, and other wildings. A couple of years ago, I thought one of the larger plants was bearing berries, but it turned out to be a deciduous greenbrier with its red berries. This fall, though, when I went to look, I did find one fair-sized, fruited *Ilex decidua.* It probably will not be too long before others berry.

Another holly which does well here is what is known as Foster holly.* It grows quickly and berries early. The berries are not so large nor so red as those of other sorts, but they do make a pleasing show.

The smaller-leaved hollies, such as *I. crenata* and *I. crenata* 'Convexa' are not so showy with their black berries, but they make up for it in easy, good growth. Many of these smaller-leaved Japanese hollies, such as 'Hetzi', are used in foundation plantings, but we were pleased to find the 'Dwarf Burford', which we have in front of our almost ground-level porch. Our house is brick and the porch is cement, so this heavy-leaved, small shrub is preferable to the finer-leaved ones. 'Dwarf Burford' is also especially attractive when putting up its new, pinkish bronzy leaves, as it does from time to time.

I'm sure other hollies are grown hereabouts, but I just haven't seen them.

*The holly, known and sold in the South, as Foster holly, is one of the Foster Hybrids, probably 'Foster No.2' or 'Foster No.3'.

TAPED INTERVIEW WITH HAROLD F. KARRENBAUER ON SEPTEMBER 21, 1973

Oliver D. Diller, PhD.
Wooster, Ohio

O.D.D. Harold, I believe the members of The Holly Society will be interested in the conversation you and I had at Ollie's Holly Hilltop in Wooster, Ohio, on September 21, 1973. I doubt that any member of our society has ever propagated as many different cultivars of *Ilex opaca* as you have. But before we start talking holly, I believe our readers would like to know a little about your background.

H.F.K. O.K. I was born in Massillon, Ohio, and have lived in this area all my life. After attending the Massillon schools, I completed an engineering course with the International Correspondence Schools. In addition to my engineering work, I was an instructor at Republic's Educational Institute for 14 years. I retired in August, 1972.

O.D.D. Now, I'm sure that a lot of your friends in the Holly Society will be interested in knowing just why you are interested in American holly.

H.F.K. Well, I got interested in 1959 when I bought a lot of shrubbery for our new home. I helped design the plan and I was determined to plant it and take care of it.

American holly came to my attention, but the local nurseries didn't know what American holly was. So I went to Mentor, Ohio, (someone had referred me to Paul Bosley) and I came home with five specimens. Then I became really interested in holly. I like hollies because they are doing something the year around. In the spring they bloom, then the berries come, in the fall they turn red, and in the winter they stay on the tree; and in the following spring they start all over again.

O.D.D. When did you join the Holly Society?

H.F.K. In 1962. During the period from 1959 to 1962, I was on my own, trying to identify some of the hollies I bought, and then I joined the Society. The meeting in Wooster in 1968 was the first one I attended. I learned a lot at that meeting.

O.D.D. What are the things you enjoy most at the annual meetings?

H.F.K. Well, I enjoy a really good frank discussion from the experts. I also enjoy seeing all the members and I learn a lot just talking shop.

O.D.D. Harold, I'll bet you have more cultivars of American holly at your place in Canton than any other member of the Society. How many do you have?

H.F.K. I have 203 *Ilex opaca* cultivars, I have a few cornutas and English hollies, but I'm only fooling around with those.

O.D.D. What do you do with all those plants you have propagated?

H.F.K. Well, I grow a lot of them and I give a lot of them away. This spring I donated about 60 plants to the Stark Wilderness Center at Wilmot, Ohio. I not only donated them but I planted them, and I expect to take care of them as long as I'm around. This is just the beginning of this project. I was looking for something to do after I retired and this is keeping me busy.

O.D.D. What spacing are you using at the Wilderness Center?

H.F.K. I'm planting them in irregular wilderness form in contrast to orchard pattern, but I'm always maintaining at least a 15-foot spacing. I have some spruces and pine mixed in with the hollies, but all the trees are at least 15 feet apart.

O.D.D. That sounds interesting. Now I'd like to get your reaction to whether there are enough differences in the many named cultivars to warrant naming so many.

H.F.K. Well, I tell you if there were only one variety, it wouldn't be nearly so interesting and I doubt that we would even have a Holly Society. But I do think that not everybody should be able to name a tree, because he may want to name one for his daughter or wife. I think there should be good credentials to back up a name. The specimen should be examined and approved by a committee of experts.

In my short experience with hollies I have run into the fact that a lot of the small plants which I purchase are identified wrong. I buy a 'Merry Christmas' from one nursery. Later on I buy a 'Merry Christmas' from another nursery, and they don't look alike. I have heard others tell me that this holly has been mixed up. However, since you got your specimen from Dilatush who named this cultivar, yours must be authentic.

O.D.D. You have made some good points. Now, I think our members would be interested in your propagation procedures.

H.F.K. Of course, if you have a greenhouse plus the mist system, heating, etc., you have the ultimate in propagation equipment. Since I don't have a greenhouse, I do the next best thing. I built a propagation unit about seven feet long and 30 inches wide. I have controlled bottom heat by putting cable on the bottom and laying a piece of serrated metal on top to diffuse the heat. I have three mist spray nozzles inside the unit, which are hooked to a timer.

O.D.D. What hormones do you use?

H.F.K. I use two kinds, "Hormodin No.3" and two percent indolebutyric acid.

O.D.D. Why do you use two kinds?

H.F.K. I use the two percent on 'Old Heavy Berry' or with late summer or fall hardwood cuttings. I learned that from Alan Cook, Horticulturist at Dawes Arboretum, in Newark, Ohio.

O.D.D. Do you have any particular problems?

H.F.K. Yes, I have one problem I haven't been able to lick on some of my small plants in the nursery and that's chlorosis. I guess I'd better have the soil analyzed.

O.D.D. Since you have over 200 cultivars, let's just suppose that all of a sudden you became limited in space and you had to simmer them down to ten or a dozen. Which ones would you keep?

H.F.K. Well, Ollie, that's a tough one. I like most of them. Many I haven't seen in adulthood. Some are only a year or two old in my nursery. But here goes. Of those I have seen I'd choose 'Sanat Claus' as the male, because he's a good grower and a good pollinator. As for the females I'd pick 'Hedgeholly', 'Old Heavy Berry', 'Cumberland', 'Wyetta', 'Emily', 'Needlepoint', 'Red Spice', and 'Miss Helen'. 'Canary' would be my choice for a yellow-fruited cultivar. For an orange berry I'd have 'Denglebells'.

O.D.D. Harold, you are certainly performing a worthwhile service in collecting and propagating so many different cultivars of American holly and having them at one place. Now tell me about a few cultivars which you don't have and you really want. Perhaps, our fellow holly enthusiasts will cooperate and send you some.

H.F.K. O.K. The ones I don't have and have been trying hard to get are 'Grandpappy', 'B.60.', and 'Brooks'. I'd give almost anything for a little 'Grandpappy' or bonafide cuttings. I'd sure like small plants or cuttings from these and any others, as they become registered and available.

THE DAWES ARBORETUM HOLLY COLLECTION

Alan D. Cook
Newark, Ohio

Holly plantings were made at The Dawes Arboretum from 1957 to 1962, with emphasis primarily upon *Ilex aquifolium, Ilex crenata,* and *Ilex opaca* cultivars. Plantings of 13 cultivars of *I. aquifolium* resulted in almost total failure, and *I. crenata* plantings fared poorly also. Data on these are incorporated in "Hardiness Performance of *Ilex* Species and Cultivars at Nine Locations." by Oliver D. Diller, October 1972.

Three plants of *Ilex glabra* have performed well here since 1962.

Deciduous holly has been somewhat neglected (a remedial program is in our "Future Planting" file). Of the few planted, *I. decidua* and *I. nipponica* have succeeded in fine fashion.

American holly, for the most part, has grown well on the gentle east-facing slope where the first plantings were made.

Ilex opaca cultivars planted from 1957 to 1962: 'Angelica', 'Arden', 'Betsy', 'Bittersweet', 'Brilliance', 'Canary', 'Cape Cod Dwarf', 'Cardinal', 'Christmas Carol', 'Christmas Tide', 'Clark', 'Cumberland', 'Delia Bradley', 'Draper', 'Farage', 'Goldie', 'Griscom', 'Hedgeholly', 'Johnson', 'Judge Brown', 'Mae', 'Manig', 'Merry Chirstmas', 'Miss Helen', 'Mrs. Santa', 'Makepeace', 'Old

Heavy Berry', 'Westcroft', and 'Yule'. Those are valid cultivars, according to *International Checklist of Cultivated Ilex, Part I, Ilex opaca.*

Invalid cultivars, according to the above publication, planted at The Dawes Arboretum from 1957 to 1962: 'Fire Chief', 'Frank Thomas', 'Kentucky Gentleman', 'Kildare', 'Tom's River', and 'Winter Glory'.

From both lists above, 'Canary', 'Mrs. Santa', 'Westcroft', and 'Winter Glory' have died.

In a quick survey of the above surviving cultivars, 'Farage', 'Bittersweet', 'Old Heavy Berry', 'Cardinal', 'Draper', 'Delia Bradley', 'Fire Chief', and 'Yule', present excellent countenances this fall (1973) from standpoints of growth habit, foliage, and berries. Other attractive cultivars are 'Merry Christmas' (growth a bit open), 'Cape Cod Dwarf' (no more dwarf at seven feet than many others, foliage dull, but still a good cultivar), 'Betsy', 'Angelica' (foliage a bit light), 'Cumberland' (berries not so prolific as some others), 'Goldie',

The only surviving cultivar that is unattractive is 'Arden', with open growth, chlorotic foliage (despite chelated iron), and poor fruiting. All other cultivars not specifically mentioned are at least adequate in the ornamental sense.

Cultivars planted as 12- to 18-inch container-grown plants in 1972: 'Amy', 'Beautiful Ohio', 'Big Red', 'Bountiful', 'Cardinal Hedge', 'Cheerful', 'Chief Paduke', 'Clarissa', 'Dorothy', 'Dr. S. Edwin Muller', 'Eleanor', 'Elizabeth', 'Emily', 'George E. Hart', 'Halcyon', 'Jersey Knight', 'Joanne', 'Laura', 'Mamie Eisenhower', 'Millville', 'Miss White', 'Morgan Gold', 'Rake Pond', 'Red Velvet', 'St. Mary', 'Westcroft', 'Wilfred', 'Wyetta'.

The above are valid cultivars according to *International Checklist of Cultivated Ilex, Part I, Ilex opaca.* Cultivars listed as invalid which were planted at Dawes in 1972: 'Big Mack', 'Cave Hill', 'Chesapeake', 'Judy', 'Klein', 'Old Science Big Leaf', 'Sherman' and 'Warrior'.

Other *Ilex* set out in 1972: *I. glabra* 'Ivory Queen', *I.* x *attenuata* 'Foster No.2', *I. pedunculosa,* male and female.

Plans call for additional holly plantings in reasonably near-future years.

AMERICAN HOLLY

George Wood
University Forester
University of Alabama
University, Ala.

We Alabamians are neglecting our native American holly, *Ilex opaca.* Very few young plants of this fine tree are being planted in Alabama today. The beautiful Foster hollies, a cross between *I. opaca* and another native, *I. cassine,* are being planted extensively and are deservedly popular. 'East Palatka' and 'Savannah', two other hybrids of *I. opaca,* are also being planted. These, however, do not take the place in the landsapce or as an object of sentiment of our native American holly. Few plants are more handsome or more a part of our heritage than a mature American holly loaded with bright red berries.

It is probably because it requires considerable space and several years to reach its prime that this fine tree is being neglected. However, an American holly is worth waiting ten to fifteen years to enjoy. It may then remain an object of beauty for two to three hundred years. We Alabamians should be planting them now so that future generations can enjoy this beautiful tree.

As with magnolias, there are a number of named varieties (cultivars) of American holly which are far superior to the average woodland plant. They represent the finest specimens which have been found throughout America, and they dependably have better leaf color, more berries, and better growth patterns than the average tree. Some are more resistant to leaf spot, which sometimes discolors the leaf of American holly. Yellow-fruited varieties are also available and are beautiful.

Few if any Alabama nurseries offer the improved varieties of *Ilex opaca.* Two reputable nurseries from other States, which offer a good selection, are Hartline Holly Nursery of Anna, Ill., and Orlando S. Pride of Butler, Pa.

When you are looking for a specimen plant for your landscape, give serious consideration to an improved American holly. When your garden club is landscaping a park, cemetery, a roadside planting, or other public area, use American hollies in appropriate places. You can do so with assurance that nothing else will be more beautiful or give more lasting enjoyment.

From Spring Newsletter of Alabama Wildflower Society of which Mr. Wood is President.

HOLLIES ON EXHIBIT ABROAD

Roy Lancaster, Curator
Hilliers Gardens and Arboretum
nr. Romsey, Hampshire, England

I have been interested in hollies all my life and during the last eleven years with Hillier & Sons I have acquired an intimate knowledge of a wide range of species. I have a particular interest in the old cultivars of the English holly and its hybrids with *I. perado (I.* x *altaclarensis).*

Several years ago, on behalf of this firm, I staged an exhibit of *Ilex aquifolium* and its cultivars at the annual Exhibition Meeting of the Botanical Society of the British Isles. This drew much favourable comment, and many botanists seemed amazed at the variation of our native holly. In September, 1972, I attended the Conference on Horticulture and Field Botany held jointly by The Royal Horticultural Society and the Botanical Society of the British Isles in London. Again, on behalf of Hilliers, I staged a large exhibit of "Cultivars of British Native Woody Plants." This exhibit contained a representative collection of English holly cultivars and was considered one of the highlights of the Conference and was given special mention by the respective presidents of the societies. An account of the exhibit and a list of cultivars on show may be found in the official Conference report *(Plants Wild and Cultivated,* edited by P. S. Green, published by the Botanical Society of the British Isles, 1973).

After the conference the above exhibit remained as part of the Royal Horticultural Society's Fortnightly Show and, as a result, was awarded the Lindley Silver Gilt Medal, the highest award for an exhibit of scientific and educational interest.

The week following the Conference I cut material representing some 132 species and cultivars of *Ilex* from the Jermyns Arboretum to take with me to the Great Dutch Floriade in Amsterdam. Here, in the huge and impressive Amstel Hall, I arranged my material in black dishes and bowls, using oasis, to create with each holly different patterns and effects. The centerpiece was a large arrangement of mixed hollies in which the neatly sprayed leaves of *I. pernyi,* the bold foliage of *I. latifolia,* and several variegated and berrying cultivars of English holly were prominent. This was raised upon a five-foot pedestal. All arrangements stood on black and sky-blue painted wooden blocks and looked most effective. The exhibit was situated against a side wall of the hall and occupied several tiers. The rest of the exhibition hall was filled with exhibits of flowering shrubs, heathers, house plants, and dahlias and yet, in spite of all this splended colour, the Hilliers Holly Exhibit created a great deal of interest among the international crowds which passed through the hall during the week.

Many photographs were taken and a panel of judges was specially convened to inspect the exhibit. After careful consideration

and animated discussion about the merits of individual hollies, the committee awarded the exhibit a Gold Medal. In addition to this, they awarded a First Prize for the selection of variegated hollies within the exhibit and yet another First Prize for a novelty to the American-raised *Ilex* 'Lydia Morris', The exhibit was thus a victory for the holly which triumphed over the flamboyance of flowers all around.

Other hollies in the exhibit included the following: *I. georgei; I. yunnanensis; I. perado; I. corallina; I. fargesii; I. cytura; I. glabra; I. kingiana; I. platyphylla; I. macrocarpa; I.* 'San Jose'; *I.* 'Nellie Stevens.; *I.* 'East Palatka'; *I. crenata paludosa; I.* 'John T. Morris'; and *I. hookeri.* Cultivars of English holly included 'Amber'; 'Crassifolia'; 'Grandis'; 'Hastata'; 'Madame Briot'; 'Monstrosa', and 'Watererana'. Several clones of the Highclere holly *(I.* x *altaclarensis)* were shown including 'Balearica', 'Golden King', and 'Silver Sentinel'.

Illustrated accounts of the exhibit appeared in both English and Dutch horticultural magazines at the time.

DECK THE HALLS WITHOUT USING HOLLY*

Emily Malino

It's that time of year again and you might consider a substitute for a tree and all those needle-dropping wreaths that never last more than a day or two anyway.

I think it's time we put an end to the great rip-off of our evergreen forests; it may be quite true that these lovely yews and firs and pines are grown specifically to be cut each year, but what a waste of land and human effort.

And it's time for us to show that our inner resources are up to meeting the challenge of holiday decorating. Besides, for many folks, there's no room for a proper tree.

There are also many ingenious ideas for creating Christmas joy in our homes. And I don't mean plastic reporductions of trees or wreaths, but rather imaginative and fresh interpretations of the Christmas spirit.

One of my favorite ideas is to build a treelike set of steps, small at the top, broad at the base.

These can be geared to any space where you would ordinarily set up a tree—at a window, in the center of your living-room, or in a convenient corner, and they can nestle right into right angles in a way that a tree just never could.

I used just such a happy corner, adjacent to the front door, and built a series of boxes, each progressively smaller so that there was enough horizontal stepping space between two or three for gifts and decorations.

On these I set two hugh "Plexiglass" trays piled high with silver and shocking-pink tree decorations, looking like oversized baskets of sugar candy. Bright-colored candies or shiny apples and oranges in wicker baskets would work as well.

The steps are a convenient spot for placing those beautiful Christmas gifts ordinarily obscured by a conventional tree. On a step of their own they can form interesting and tempting visual forms and heighten the inevitable suspense as the holiday draws near.

I made my steps of quarter-inch plywood on a frame of stock one-by-sixes and used high-gloss enamel in bright shades of white, pink, and green to finish them.

I changed the light bulbs in the overhead ceiling track from clear to matching colors just for the holidays, and set two spherical table lamps on the steps for the occasion and to make the whole thing merry and bright the way Christmas should be.

After I finished my steps I realized that I could as easily have made the same arrangement out of corrugated cardboard or even large, flat cartons covered with coated, shiny paper with self-sticking backing.

But no matter which course you take, imagination has always been the best substitute for money. Use yours to create a super-special Christmas which is as new and fresh as the year ahead.

**Courier-Post,* Camden, New Jersey, December 15, 1973.

274 Lakedale Road
Berlin, N.J. 08009
December 19, 1973

Gary C. Snyder, General Manager
Courier Post, Camden, N.J.

Dear Mr. Snyder:

The following open letter is being written in rebuttal to the feature article in the December 15, 1973, edition of your paper by Emily Malino, entitled "Deck the Halls Without Using Holly."

I have no quarrel with the tenent advocating personal creativity; in fact, I practice this in many ways. My aim, in this instance, is to decry the lack of integrity shown by the author as she passes herself off as an expert and attempts, and no doubt is successful, in swaying the opinions of your readers without a modicum of research to establish the validity of her statements.

Item 1. "end the great rip-offof our evergreen forest." Yews are ornamentals and not grown for Christmas greens, and most of the trees are not grown in forests but as a cultivated crop, which for the most part utilizes land too poor for anything but short-lived weed-type trees and vegetation. They are also grown on hilly land too steep for cultivated crops. In addition, each tree during its lifetime provides food and cover for wild animals and replenishes the oxygen we humans do our best to comsume or befoul.

Item 2. Holly grown as an ornamental or as a orchard crop needs pruning each year to encourage branching and compact growth. It is, perhaps, the only shrub or tree whose prunings are not just waste to be disposed of, but rather provides a bright and glowing decoration in an otherwise barren part of the year in this area.

Item 3. "I made my steps of 1/4" plywood." The ambiguity of the statement after the second paragraph lends credence to the fact that the fourth estate requires more than a publisher to control the input. What happened to that forest that supplied the plywood? Did Ms. Malino ever see a logging operation? Where does she think the cardboard comes from?

Item 4. "imagination is always the best substitute for money." The dollars involved in the "Plexiglas" trays, the skeins of wool, plywood, enamel, etc., would purchase quite a few pounds of holly and a great many tree branches, which improved the atmosphere while living and are replenished by nature without harm to the environment. Can this statement be made by the manufacturers of cardboard or "Plexiglas?"

If your feature writers wish to foster creativity, they should be congratulated. In this instance, however, the stupidity exhibited is a prime example that most journalists are far better grammarians than thinkers.

I would appreciate your forwarding this letter to Ms. Malino and would also prefer a reply, which I doubt I will receive. As the manager of the *Courier Post,* you have my permission to publish any or all of the foregoing over my name. I feel tnat some public space should be given to rebut the false impressions contained in the subject article.

Barton M. Bauers, Sr.
Trustee, The Holly Society of America
Member, New Jersey Christmas Tree Growers

1974 ANNUAL MEETING
OREGON HOLLY GROWERS ASSOCIATION

Twenty-eight attended the annual meeting of the Oregon Growers Association held in Portland, Ore., on January 31, 1974. After the reading of reports, William F. Kosar, Chairman of the Nominating Committee, presented the names of Dingeman Bajema, William W. Berg, and Archie M. Erickson as nominees to the Board of Directors. They were elected to officers. (Out of the nine directors, eight are members of the Holly Society of America!).

Robert L. Ticknor reported on holly berry toxicity data, which he had obtained through his correspondence in 1973 with these agencies: National Clearinghouse for Poison Control Centers, Bethesda, Md.; School of Pharmacy, University of Washington, Seattle Poison Control Center, The Children's Orthopedic Hospital and Medical Center, Seattle; Environmental Protection Agency, Wenatchee Research Station, Wash; School of Pharmacy, Oregon State University, Corvallis; Jacksonville Medical Center, Jacksonville, Ill.; and University of California Medical Center, San Francisco. The only substantiative data revealed that the toxic properties to humans are indeterminable; the only systems were gastrointestinal upset; and no fatalities were recorded. Further research to isolate possible toxicity to humans would be very complicated and costly.

Dr. Ticknor presented a report on holly research at North Williamette Experiment Station, Aurora, Ore. Holly growth-measurements, berry-ripening records, and propagation of dwarf landscape selections were continued during 1973. The Holly Society granted $250. per year for three years for holly research at the Station. This was matched by $250 for 1973 by the Holly Growers, and a contribution of like amount for the year 1974.

William F. Kosar, Secretary

FOURTH GENERATION LEADER
in Pacific Northwest Holly Industry

Thomas Teufel, who is serving his second term as president of the Oregon Holly Growers Association, is the fourth generation in the Pacific Northwest holly industry. His great grandfather Gustave was a gardener in Portland and started collecting and propagating nice selections of English holly for the Christmas trade. His grandfather George, still living, established holly orchards, packing plants, and greenhouses for other ornamentals in the Portland area. His father Alfred continued in the expansion of holly orcharding and the general nursery trade, working closely with George in packing, processing, and cold-storage facilities. After Alfred's accidental death, Ruth (his wife) and George, with the help of other Teufel relatives, kept the holly and expanded wholesale nursery in operation. At present, Thomas is assuming more responsibilities in the Alfred Teufel Nursery.

Tom and his wife Jill left for Australia on February 4, 1974; Jill will teach school, while Tom hopes to do some hunting. He will return late in April and then go back to Australia about July 1; he and Jill will return to the States in early September. It will be a wonderful experience for them. All Jill's expenses are being paid, and half of Tom's. They decided it is a good time to make such a trip before the fifth generation of holly growers gets started.

OREGON HOLLY GROWERS ORNAMENTAL SHORT COURSE

The Ornamental Short Course of Oregon State University for the Oregon Holly Growers was held in the Dwyer Room of Portland Memorial Coliseum on January 31, 1974, with an attendance of 60 members and guests. Lee Fuchigami of the University was chairman. Thomas Teufel, in welcoming the gathering, made note of the problems of the holly industry which still require research.

Dr. Fuchigama then chaired the growers' panel on holly problems. Glenn Walters of Hillsboro, Ore., talked from a pessimistic standpoint about the operation of a holly orchard--from cultural management to harvesting, packing, marketing, and collecting. From an initial costly investment, plus disease problems, labor problems, costly supplies, high freight rates, high insurance rates, there is very little profit at the end of the season.

Carl Brandenfels of Scappose, Ore., said his main theme was one quick way of solving all problems of holly growers, that is, to get more money for what they're selling. Carl has a number of manufacturing businesses. At one time he thought that if he doubled the cost of material he would make a profit; at the end of the year he owed the bank $120,000. The next year, he tripled his costs and came out $10,000 in the hole. After that, he followed a "good rule of thumb" - four times the basic cost of material and one ends with a profit. He urged all holly growers to get a good cost accounting of their business and not undersell competitors.

A. Erickson of Chehalis, Wash., discussed the problems of the buyer, from getting a continual reliable supply of quality holly to dependable transportation at the marketing end. Precooling holly, whether it is packed wet or dry, is very important to insure its arrival in fresh condition.

An informative film on air pollution and interpreted symptons of different pollutants was shown by David Tingy of the Environmental Protection Agency in Corvallis. Staff members of the newly organized U.S.D.A. Agricultural Research Center, Western Region, Ornamental Plants Research Laboratory, at Corvallis showed slides in their respective fields of fundamental research: Robert Linderman, PhD. Director and Plant Pathologist, dealing with soil-borne organisms: Duane Coyier, PhD. Plant Pathologist, dealing with foliar diseases; and Varon Jensen, PhD. Plant Physiologist.

William F. Kosar charied a panel on freeze damage. On December 8, 1972, temperatures fell to -12° F in the Willamette Valley. Some orchards were killed to soil level; others suffered only twig and leaf damage. Holly grower William W. Berg and Dr. Roberts and Darrell Richardson of Oregon State University contributed to the discussion. Practical suggestions on managing damaged orchards were recorded. William F. Kosar.

FRORER HOLLY COLLECTION
TO SWARTHMORE COLLEGE

The "green thumb" of George Washington has inspired a four-acre holly collection which is being given to Swarthmore College by James R. Frorer of Wilmington, Del., along with $100,000 for its movement and maintenance.

Impressed by the accounts of the holly collection at Mount Vernon, about 40 years ago Frorer began his own collection to beautify the grounds of his home at 1500 Talley Road. In addition to his duties at the Atlas Powder Company (later Atlas Chemicals Industries and Imperial Chemicals) where he rose from chemist to vice president and board member, Frorer roamed this country, the British Isles, Europe, and the Orient to compile his collection of about 450 holly plants, representing more than 250 different kinds. In fact, he was to become president of the Holly Society of America, in which he was very active and serving as vice president, but broke his back while hunting for holly in New Zealand.

A 1915 alumnus of Swarthmore, who recently celebrated his 80th birthday, Frorer has been a benefactor to the Friends Library on the Swarthmore campus and has a private collection of more than 4,000 Quaker journals, starting with the first published in 1656. For this reason, and because of his friendship with 1915 fellow-classmate Thomas McCabe of the Scott Paper Company, for whom the college library is named, part of the holly collection

will be planted in a small garden in front of the Friends Library Wing of the McCabe Library. The main part of the collection will be planted around the Crum Creek area of the campus.

"This is a generous, significant and beautiful gift," College Fresident Theodore Friend told Frorer in accepting the collection on behalf of Swarthmore. According to Joseph Oppe who, as Director of the Scott Horticultural Foundation, will be in charge of the collection's maintenance, the collection of hollies is one of the finest in the eastern United States.

Oppe went on to explain that the first two years after transplantation is a most critical time. The nursery and general contracting firm of Doyle and McDonnell, Inc., of Berwyn, will move the collection, starting in July, and the College's portable irrigation system will be put into operation, pumping water from Crum Creek. The critical nature of this transplanting is because of the age of the collection which has produced specimens 18 to 20 feet tall.

Frorer, who was born in Bryn Mawr in September 1893, was married to the former Isabella Johnston, who died in 1965. Their two daughters, Janet Taylor of Thornton, Pa., and Harriet Durham of Wilmington are Swarthmore graduates. Retired from Atlas Chemicals since 1958, he served as president of the Delaware State Board of Parole and as a member of the board of the Prisoners Aid Society in the 1960's. Mrs. Durham is currently president of the latter organization.

JAMES A. FORET RECEIVES A.H.S. CITATION

James A. Foret, who is a member of the Holly Society of America and who contributed "Holly in Landscaping in Louisiana" to Bulletin No. 12, Holly in U.S.A., received the American Horticultural Society's scientific citation at the 28th American Horticultural Congress, held in New Orleans in October, 1973.

Dr. Foret of the Department of Plant Industry and General Agriculture, University of Southwestern Louisiana, Lafayette, is widely known for his research in holly and swamp maple. His holly research is concentrated at Hodges Gardens. His work with the swamp maple, and in encouraging home gardeners to use this tree, has resulted in its being stocked by nurseries. Currently, Dr. Foret is supervising and directing research in ornamental horticulture in areas of plant nutrition, herbicides, growing media, plant propagation, and soil-moisture content.

WILLIAM T. WILSON

William T. Wilson, long a member of the Holly Society of America and a faithful attendant at many of its meetings with his wife, Grace, died on January 25, 1974. He was retired from the Navy Department, Washington, D.C. Navy Yard. Billy and Grace, as they were affectionally addressed by many Holly Society members, were natives of Georgia and moved to the Washington area about 30 years ago; their residence was in Bladensburg, Md.

Gene Eisenbeiss of Washington, D.C., reminded the Editor of at least one period of the darker hours of the American Horticultural Society--in the mid 60's--when it would have been difficult, if not impossible, for the A.H.S. to have survived without the combined efforts of Billy and Grace. During that time, the A.H.S. headquarters were within two blocks of the U.S. National Arboretum, and Gene and the Wilsons were in frequent contact. Grace, with the assistance of Billy and their daughter Grace Murphy, did all the secretarial work of the American Horticultural Society--gratis.

HOLLY REGISTRATIONS

1-74 *Ilex opaca* 'Miss Helen' female
Helen McLean
9010 Satyr Hill Road
Baltimore, Maryland
Registered January 1, 1974.

The original tree, growing at McLeans Nursery, 9010 Satyr Hill Road, Baltimore, Maryland, was discovered in 1936 by the late Stewart McLean in a woods near the Magothy River, south of Baltimore, in Anne Arundel County, Maryland. Subsequently, this cultivar Mr. McLean named 'Miss Helen' for his wife; propogated and introduced it in 1940.

The original tree is 92m (20 feet) tall and 47m (15 feet) wide, with a conical habit. The leaves are elliptic 7.75cm (3 inches) long and 4cm (1-3/4 inches long), keeled and strongly curved with generally five stout spines on each side. The fruit is borne singly, ellipsoid in shape, large, and glossy dark red. This cultivar is consistently heavy fruiting. Young plants also fruit consistently while still small.

'Miss Helen' is widely grown by nurserymen on the East Coast. Large plantings of sizable plants can be seen at Sassafras Farms, the holly orchard of Larry Dodge and Larry Livingston, Cecilton, Maryland, and in a planting adjacent to the famous 'B. & O.' holly at Jackson, Maryland

'Miss Helen' was previously registered by Steward McLean in the Woody Plant registration of the American Association of Nurserymen as No.144 and published in Porc. 74th Annual Convention Amer. Assoc. Nurserymen p. 17. 1949.

2-74 *Ilex (opaca* x *cornuta)* 'Shin Nien' male
Registered January 2, 1974
Joseph C. McDaniel
Dept. of Horticulture
University of Illinois
Urbana, Illinois 61801

'Shin Nien' (New Year in Manderin Chinese) is the result of a hybrid of *I. opaca* 'Chief Paduke' (female) and *I. cornuta,* produced from a cross made in 1966 at Urbana, Illinois, by Mr. McDaniel. This is the first cultivar to be named from this species hybrid combination. The original plant is 1.2m (4 feet) tall and .76m (2-1/2 feet) wide and conical in shape. In habit, it resembles *I. cronuta.* However, the leaves, while intermediate in shape between the two parent species, distinctly have the gloss of *I. cornuta.* They are elliptic in shape 6.3cm (2-1/2 inches) long and 3.8cm (1-1/2 inches) wide. Margins are undulate with 5-8 strong spines on each side, the tip spine deflexed. Root characters intermediate.

Flowering was first observed in spring 1972 from buds produced on previous season's growth, and it appears that viable pollen is produced. Inflorescences are fasciculate as in *I. cornuta,* but fewer in number.

This outstanding selection has performed well in the open at Urbana, Illinois, taking temperatures down to -18° (0°F), being superior to *I. cornuta* in this region.

'Shin Nien' is easily propagated from cuttings. It has been widely circulated for evaluation in eastern United States and has performed well in all areas of southeastern United States from Urbana, Illinois, south. A very detailed discussion of 'Shin Nien' and its hybrid origin has been written by Mr. McDaniel in *Holly Letter* No. 39. p. 1-2. 1971.

3-74 *Ilex crenata* 'Ivory Hall' female
Norman H. Cannon
RFD 1 Box 165A
Greenwood, Delaware 19950
Registered February 7, 1974

'Ivory Hall' originated as a seedling of a sibling cross within an F_1 population of *I. crenata* f. *watanabeana*, U.S. Dept. Agri., PI 231948 yellow-fruited, and a male *I. crenata* of black-fruited parentage. This cross was made in 1963 at U.S. Dept. Agri., Agri., Research Service, New Crops Division, Plant Introduction Station, Glenn Dale, Maryland. While both 'Ivory Hall' and 'Ivory Tower' originated from the same F_1 population, they were selected from different F_2 clonal parentages.

Norman Cannon selected and named this clone about 1972 from plants of this F_2 population he received from Glenn Dale in 1965. After two years of heavy shearing, the original nine-year-old plant is 43c (17 inches) tall and 71cm (28 inches) wide and is now located at the residence of Norman Cannon at Greenwood, Delaware. The habit is compact and broadly globose to spreading. The leaves are light green in color, elliptic and obtuse at each end, 9-17mm (3/8 - 11/16 inches) long, and 6-13mm (9/32-1/2 inches) wide with a consistent ratio of twice as long as wide. The fruit is globose, about 6mm (5/16 inches) in diameter and is said to range from clear yellow to mostly greenish yellow. Ripening occurs in mid-November outside, but under greenhouse conditions the fruit is said to turn a true ivory color by January. 'Ivory Hall' roots readily from cuttings and four-year rooted cuttings have produced 30.5-38 cm (12-15 inch) plants.

4-74 *Ilex crenata* 'Ivory Tower' female
Norman H. Cannon
RFD 1, Box 265A
Greenwood, Delaware 19950
Registered February 7, 1974
'Ivory Tower' originated as a seedling of a sibling cross within an F_1 population of *I. crenata* f. *watanabeana* (yellow fruited) U.S. Dept. Agri. PI 231948 and a male *I. crenata* of black-fruited parentage. This cross was made in 1963 at U.S. Dept. Agri., Agri. Research Service, New Crops Division, Plant Introduction Station, Glenn Dale, Maryland. While both 'Ivory Hall' and 'Ivory Tower' originated from the same F_1 population, they were selected from different F_2 clonal parentages.

Norman Cannon selected and named this clone about 1972 from plants of this F_2 population he received from Glenn Dale in 1965. The original plant is nine years old, 1.2m (four feet) tall and .9m (three feet) wide, but has been sheared hard for the past two years. It is located at the residence of Norman Cannon at Greenwood, Delaware. 'Ivory Tower' is fast-growing and broadly erect in habit, with numerous upright leaders. The leaves are light green in color, elliptic with generally obtuse tips, 18mm (9/16 inches) long, and 7mm (5/16 inches) wide. The fruit is globose, 6.7mm (1/4 inches) in diameter and is greenish yellow, seldom true yellow. Ripening occurs in mid-November, but under greenhouse conditions they turn yellow in late December and then turn a true ivory color. This plant is easily propagated and has an excellent root system for balling.

LETTERS

At the suggestion of George Woods, University Forester of the University of Alabama, the Editor of the *Holly Letter* requested Jesse D. Rankin to contribute an article on yellow-fruited *Ilex opaca*, forms and cultivars, with comments and descriptions.

The Editor was not successful in obtaining such an article. However, Mr. Rankin's reply was so delightful as well as interesting, that she did obtain permission to publish it under "Letters."

Thank you very much for your kindly thoughts. However, this is the second and, I hope, the last time I shall attempt to use a typewriter during 1973. Any writing under my name will have to be ghosted.

I have all *Ilex opaca* xc and otherwise records in loose-leaf notebooks; each carbon copy of my original inquiry; the original response; and all the following information pertinent thereto. Unless this was followed by a fruiting spur with directions to the site of origin (not that I ever hoped to visit the tree but that anyone else might, if he so desired), I was not interested.

To create a small demand for my xc clones, they bore the maiden names of well-known horticultural personages; they commemorated lost daughters and granddaughters. If the man was unwed, his mother's maiden name was used or her first name or a familiar term using the letters of her family name, or the color the fruit reminded me of, etc. Harry W. Dengler married Dorothy Jacquets, whence 'Yellow Jacquet'—but she pronounced Jacquets—Jake's. ('Yellow Jacques' appears as 'Yellow Jacket' on page 77 of *International Checklist of Cultivated Ilex*. Ed. Note)

Here are further examples of my nomenclature. Brian O. Mulligan, Director Emeritus of the University of Washington Arboretum, Seattle, married 'Helen Mitchell', Cecil is the first name of Mrs. James S. Wells, formerly of Red Bank, N.J. Theodore R. Klein of Crestwood, Ky., married Martha Lee Sagaser--whence 'Saga Serene'. Fred C. Galle, Vice President and Director of Horticulture of Callaway Gardens, married 'Betty Nevision'. Henry P. Orr, Associate Professor of Horticulture of Alabama Polytechnic Institute, Auburn, was single (June 1, 1959); his mother's name was 'Ermine Watson'. W.W. Steiner, U.S.D.A. Soil Conservation Service, Upper Darby, Pa., married 'Jeanette Adamson', and W.F. Kosar of Corvallis, Ore. married 'Margaret Moran'. The names 'Jeanette Adamson' and 'Margaret Moran' appear on pages 41 and 50, respectively, of the above named *International Checklist of* Cultivated Ilex. ('Helen Mitchell', 'Saga Serene', 'Betty Nevison', and 'Ermine Watson' are also included in the International Checklist. Ed. Note.)

James D. Rankin
Salisbury, N.C.

Many thanks for your letter and for the copies of your freindly newsletter. In the autumn of 1971, I was a member of a plant collecting expedition to East Nepal where we spent three months. Among the many hundreds of interesting and exciting plants, we found the following four hollies: *Ilex dipyrena, I. intricata, I. hookeri, and I. fragilis.* We were able to collect seed of the first two.

I have long hoped for a trip to America and a chance not only to see her native flora (especially hollies), but to meet again with all the many people whom I have met here in England and as visitors to our Arboretum. If ever I do find myself with a ticket to your country, I shall bring lots of slides and give my Nepal Adventure Lecture. I could even do a talk on the hollies grown here.

All good wishes to your members, and Happy Days.

Roy Lancaster, Curator
Hilliers Arboretum and Gardens
Ampfield, Romsey
Hampshire, England

Under separate cover I mailed you a copy of *Performance Records of Woody Plants in the Secrest Arboretum.* 1. Holly Family and Box Family Aquifoliaceae and Busaceae. This is Research Circular 139 (Revised), November 1973, of the Ohio Agricultural Research and Development Center, Wooster. I had hoped to have this publication available at the Williamsburg meeting, but it was delayed because of paper shortage.

I will mail a copy of this publication to any member of the Holly Society upon request sent to me at the Secrest Arboretum.

John E. Ford, Curator
Secrest Arboretum, O.A.R.D.C.
Wooster, Ohio 44691

Mr. Ford also has reprints of "American Holly" from *Turf and Landscape Research*--Research Summary 71, September 1973. This is very interesting and includes ratings for cultivars growing in the Arboretum and listed in the article. Ed. Note.

MEET THE EXPERTS
at the 50th Meeting

Excerpts from the session on Plant Propagation and Pruning, conducted by Gene K. Eisenbeiss.

QUESTION: Why isn't vermiculite recommended with or as a substitute for peat and sand?

ANSWER: Vermiculte is suitable. However, I prefer sand or "Perlite" as a medium to mix with peat moss, and I shall give you at least one important reason. Vermiculite will not stand much handling; it crumbles easily and compresses easily. It is an inexpensive material and has been used commercially mostly for the germination of vegetable seeds. Over a period, vermiculite can become saturated with water, and its structure can be destroyed by squeezing or pressing. "Perlite" doesn't crush very easily. The use of vermiculite is still recommended, because it has been on the market for a number of years longer than "Perlite."

QUESTION: What rooting hormones do you recommend?

ANSWER: I recommend fairly strong rooting compounds for holly. "Hormodin No. 10," "Rootone No.3," and "Jiffy Grow." All are good products. The question arose in a previous session in relation to this. Cuttings had apparently been injured by a too strong solution of a rooting compound. It can happen, and my recommentation is to use a weaker rooting compound the next time. One has to learn this by trial and error, since what might not be too strong one year might be too strong the next. One softwood cuttings, use a weaker solution than on hardwood cuttings. The strength needed also varies with the particular plant and also between species. Some "Exopatro" color flowers are easy to root and some are difficult.

QUESTION: What are your recommendations for the best heat treatment for propagation?

ANSWER: The rule of thumb for the rooting medium is 10^{o} above air temperature for propagation which, of course, becomes impractical in summer. There would be beneficial effects in the range of 5^{o} to 15^{o} warmer rooting temperature than air temperature. It hastens rooting. You may apply heat without always getting the desired result, because you're in a propagation situation, especially under a misting system, when you're constantly applying cold water. In the course of the day, you're heating a lot of cold water and, therefore, not maintaining the desired temperature continually.

One man has reported success with the air temperature down to 60^{o} and a medium temperature of 70^{o}. I'll go along with that range. The air temperature from 50^{o} to 70^{o} would be a fair optimum range. With the medium temperature from five to ten degrees higher, there should not be any serious difficulty with rooting. When the temperature falls below 40^{o}, all rooting action will slow down. However, it will not stop. Cuttings will root, even with the temperature down to freezing; but the action will be very slow.

QUESTION: In a commercially prepared propagation set-up with "Styrofoam" and a plastic cover, cuttings were taken in the summer and on two occasions failed. Why?

ANSWER: I'd like to ask you a few questions. What time in the summer? July? More specifically, were your cuttings very soft? Reply: They were not soft; they were hardwood cuttings in August. Question: What holly? Reply: *Ilex opaca.* Question: How long for them to die? Reply: About a week. Question: Did you expose the propagation set-up to full sunlight? Reply: No.

It was important that I ask you these questions and get your replies, because a closed container of polyethylene, exposed to full sunlight, can reach high temperatures. Did you measure the temperature inside? Reply: No.

If the temperature rose over 100^{o}, the conditions would be undesirable. Was there drainage in the medium? Reply: No.

Now, I have a clue. In a propagation set-up, it is necessary to provide drainage. The cuttings need water, plenty of water; but the water has to be well-oxygenated. Cuttings of very few plants will root only in water, and hollies are not among them. What your medium needs is drainage--and it needs excellent drainage--almost a free-flow of water through the medium. You will have to provide drainage. For comparison, if you were to use peat moss for the medium, you could squeeze a slight amount of water out of it.

QUESTION: Why is drainage so important?

ANSWER: Drainage is required so that air can circulate and excess water drain off. Another way to express this: if water in a medium is above field capacity (or above the saturation point) there is too much, and it is almost impossible to propagate hollies under such conditions.

QUESTION: Do you have an opinion on the desirability of powder hormone over a liquid hormone?

ANSWER: From a practical standpoint, powder is easier to use; from a theoretical viewpoint, there are better and faster results from a liquid formulated hormone. In practive, they compare reasonably well. The main problem with a liquid hormone is the nuisance of dipping for five or ten seconds as compared to dipping in a powder. You can dip in a powder and put the cutting in the bench faster than dipping in liquid. If you are handling 500 cuttings or more, the manual process of dipping them in the liquid, setting them out to dry, and then transferring them to the bench is slow and time-consuming. I have seen commercial practices in which the entire cutting is dipped in a liquid hormone. There are scientific reports indicating that dipping the entire cutting will delay the top from growing, but the entire dip has worked well with some plants. I don't know how this practice would work with hollies. I haven't had any reports, so I do not recommend it.

If you use an 18-hour soak, the solution should be much weaker than two percent I.B.A. If you were to use a two percent I.B.A. solution, a five-second dip would be sufficient. Always look on the container for the concentration at which the hormone is to be applied.

QUESTION: Is *Ilex opaca* very difficult to root and how can I get it to root?

ANSWER: There is a great deal of variation among the different cultivars of *I. opaca* in their ability toroot—some root very easily and with others it seems impossible to root them. If you will tell me what techniques you have followed, I may be able to help you improve the rooting.

You say that you use sand and peat moss and two percent I.B.A. and have started cuttings in November. Do you get drying or rot at the base? If you get rot and cuttings of other plants nearby do not rot, then you need to reduce the I.B.A. to one and a half percent. Sometimes the hormone strength is too strong; and if it is too strong, then you will find this rotting effect at the base of the cutting. It will have the same appearance that you get from a root-rotting organism. And since cuttings of your other plants did not show rot, this makes me suspect that the hormone solution you are using is too strong. Using a fungicide is not so important the first time you use a fresh-made medium for cuttings; but in subsequent use, yes.

Another technique is to add a fungicide powder to the hormone powder. This ought to help control injury from disease in the propagation medium. The easiest to use and the one to be used as a preventative is "Captan." There are others: "Zeneb," "Fermate," and "Ferbam," which are zinc compounds and can be mixed with the rooting hormone compound.

I'd say the most critical thing in controlling rot in any holly is the handling of water: too much and the cutting will rot, and too little, the cutting will dry out and won't root. Another related important point is drainage; the propagation bed should be well-drained. Cuttings taken in January root faster than those taken in August--three weeks in January and five weeks in August. (Comments from Dan Fenton)

Timing is critical; you get the best results shortly before the first leaf drop. If timing is correct, many hollies are easily rooted; if timing is not correct, rooting is difficult. (Comment from Bob Winer.)

QUESTION: In pruning back a young plant, the second year from a cutting, what is the best method of pruning to develop it fairly and how hard can it be pruned?

ANSWER: You should prune lightly or not at all at that early age. There is not much growth on the young plant. Actually, you would not have to do much pruning to stunt its growth. *Ilex opaca* has a tendency to be leggy when young. Very seldom do you find nursery stock three, four, or five feet tall, which is well-developed. Most nurseries believe in letting the plant put all its effort into making height and then they begin to develop branching by pruning. To answer your question specifically--you could prune hard and develop branching at an early age. The young plant would tolerate the severe pruning, but it would slow its growth. Take your choice.

QUESTION: In the eastern area where I live, we have excessive sand in the soil. I get excessive tip growth which makes the fruit appear somewhat unattractive, because the tip is usually unbranched. How can I prune to remedy this condition?

ANSWER: I recommend cutting back the tip shoot.

QUESTION: Are some species of *Ilex* more difficult to propagate than others?

ANSWER: Yes. Here is a list of those which are easily rooted, those which are more difficult, and one which is extremely difficult. When I say difficult, I mean more difficult than the easy ones.

Easy to Root

I. hybrid *aquipernyi*
L. cassine
I. ciliospinosa
I. cornuta
L. crenata
I. hybrid 'Foster No.2'
I. glabra
I. integra
I. myrtifolia
I. pernyi
I. rugosa
I. vomitoria

Difficult

I. hybrid *altaclarensis* (sometimes)
I. aquifolium (sometimes)
I. decidua (sometimes)
I. hybrid *koehneana*
I. latifolia
I. opaca (sometimes)
I. pedunculosa
I. serrata (sometimes)
I. verticillata

Extremely Difficult

I. chinensis
I. opaca (sometimes)

Excerpts from the session on Insects and Their Control by John A. Weidhaas, Jr.

QUESTION: What are your recommendations for hard-to-control insects?

ANSWER: I am quite blunt with people, because we do not have adequate control measures for many insects, so I say, "I do not have any, but wish I did." There are two reasons: control tests have not yet been conducted; or numerous established recommendations, long-used, have been withdrawn because of the lack of approval by EPA or not registered for inclusion on approved labels of pesticides. There must be more research on pests of ornamental plants.

QUESTION: Shouldn't manufacturer's be pouring money into this kind of research?

ANSWER: Yes and no. They should be to increase the usage of their products on a greater number of pests, but are not likely to because the research investment is very much greater in relation to sales than what results from major crop pest development research.

QUESTION: What causes pin-point marks on holly leaves?

ANSWER: For the most part they are caused by holly leaf miner adults in feeding and egg-laying. Adults puncture the underside of the leaf with their needle-like ovipositors, at first to cause wounds where they can feed on cell sap, and then to deposit eggs inside the leaf tissue. A great many punctures are caused by relatively few flies. Any mechanical pricking of the leaves will cause a similar spot, a needle or the sharp spines on older leaves, if blown against young tender foliage. However, the number of specks and their location on the undersides of the leaves do not indicate this as a main cause.

QUESTION: What do you recommend to control holly leaf miner?

ANSWER: I have strongly favored dimethoate (Cygon ^{T} or DeFend ^{T}), but oxydemeton methyl (MetaSystox R ^{T}) and diazinon are very effective. Diazinon is particularly effective later in the summer when mines are larger. Cygon and MSR are systemic insecticides and should be applied just before or after

eggs hatch, a period of two to three weeks beginning the second week in June. Earlier applications in May are not effective and should be applied only after all eggs have been laid and are beginning to hatch. Holly leaf miners do not attack Chinese or Japanese hollies and dimethoate should NOT be applied to these plants.

QUESTION: Why don't you use the word "Systox" or "Isotox?"

ANSWER: "Systox" is a trade name for a systemic insecticide not now included in the recommendations, though it is effective as a soil treatment. "Isotox" is a brand name which does not indicate which chemical is in the container. For examples, there are Isotox Garden Spray, Isotox Insect Spray, Isotox Borer Spray, which tell me which company is marketing the product, not which insecticide is in the container, and some contain several different chemicals.

QUESTION: Is there a systemic insecticide which can be used on the ground so it is taken up to the leaves from the soil?

ANSWER: Systemics can be applied to the soil. However, the only systemic in granular form now approved for use is disulfoton (DiSyston T). It must be worked into the soil surface, which may be tedious on a large scale, but will give protection throughout the season. Dimethoate can be applied as a soil drench. Systemics are effective for mites, aphids, and leaf miners. It should be emphasized, however, that leaf miners are the chief problem on holly, have only one generation a year, usually, and can be controlled easily with a single spray in mid to late June.

QUESTION: What about maggots on holly?

ANSWER: I presume you are referring to the holly berry midge, the larva or maggot of which causes the berries to remain green instead of turning red normally. This pest has been occurring here and there for many years. Recently it has been reported more commonly in Delaware, Maryland, and Virginia. The life cycle was studied some time ago by Henry Highland in Maryland and more recently by John Schread in Connecticut. Control tests have been conducted by Norman Cannon, a graduate student at the University of Delaware. Adult flies lay eggs in very young fruits, while the petals are still attached. Since there are four seeds in each berry, there is a potential of four maggots, though the number usually is one to three. The maggots remain in the berry throughout the season until the following late May when adults emerge. Control tests have shown that endosulfan (Thiodan T), diazinon, and nicotine sulfate are effective against adults if applied 3 days after the flowers begin to open. However, these insecticides do not have specific registration or label approval for this use. We are more and more subject to restricting recommendations only to those uses approved by the Environmental Protection Agency in Washington.

QUESTION: Would it be possible to wait until after flowering and fruit set and then spray with Cygon to kill the maggots?

ANSWER: This might be a possibility, but seems unlikely, since the very young maggots may have already damaged the seed embryos when very young. Further, Cygon must be taken into the foliage and translocated to the fruit. It should be tested at least. One other point to keep in mind in spraying at the time of flowering is the effect of pesticide on pollinators. We need to know more about this, also.

QUESTION: I have had trouble with weevils and have not had any success in controlling them. What do you suggest?

ANSWER: To reply, it would help to know which weevil you have. If it is small, mottled gray and brown, and roundish, it is likely to be the Japanese weevil. If it is rather large (1/4") and black, it is the black vine weevil or taxus weevil. Both chew the foliage of many plants, scalloping the edges usually, but occasionally chewing holes. The weevils cannot fly but must climb up over the plants to feed. Controls have not been worked out for Japanese weevil, but chlordane spray on the foliage, bark, and ground surface in mid to late June have been found effective for black vine weevil and have been recommended for Japanese weevil.

QUESTION: Oil sprays have been recommended for control of scale insects. What do you think of them?

ANSWER: That is a good question. We should emphasize oil sprays more. They are effective, either as dormant oil or summer oil treatments. However, it is unfortunate that more research has not been done with the newer type petroleum spray oils, and particularly on scale insects. Most research has been on fruit trees for mite control. Oils are excellent against mites. It is very important to read the label thoroughly and avoid spraying plants which are injured by oils, as indicated. There is a greater margin of plant safety in the newer oils. But be sure to follow directions for proper dilution rates as given on the label. Oils which are rated at 70-second viscosity may be used as dormant sprays and in lesser amounts as summer oils. The 60-second oils are primarily for summer oil sprays.

Excerpts from the session on Plant Breeding conducted by Edwin R. Orton, Jr., PhD.

To begin this session, I shall comment on a general question frequently posed by holly enthusiasts. Holding a beautiful sprig of holly before me, the person will start with, "This holly has an unusual leaf type. Do you think it worthwhile to register this holly?" In the vast majority of such cases, the answer is "No!"

New hollies should be registered with the International Holly Registration Committee (Gene Eisenbeiss, Registrar) only after they have been grown for a number of years and found to be superior plants under the various climatic conditions of different test sites covering a farily wide geographical range. What may be misleading to the average holly enthusaist is the extreme variation that one observes in the foliage characteristics of seedling hollies. The matter is often compounded by the fact that the particular foliar trait in question may well be due to the juvenile nature of the holly. In that event, the trait may not persist after the plant reaches the mature, or flowering state. The main point to be made here is that someone who has not had the opportunity to walk down field rows of seedling hollies and to observe the tremendous variation in leaf size, shape, and color and in the branching habit, vigor, etc., of the plants just does not have the firsthand experience to appreciate the tremendous variation present in a group of seedling hollies. Hollies are dioecious in nature; that is, the plants are either male or female. As a result, inbreeding does not occur and the plants possess extreme genetic variability. However, this variation becomes evident only when reproduction is via the sexual cycle and the plants are produced from seed, as is the method employed by the holly breeder. Most holly growers have not had the opportunity to observe this variation since their common exposure to large fields of holly is probably limited to a local nursery where the propagator produced the plants sexually from stem cuttings. Such plants, of course, possess the same genetic make-up and exhibit the same characteristics as the plant from which the cuttings were taken. To be sure, variation resulting from environmental conditions is observed between plants produced from cuttings taken from the same parent tree, but this variation is not nearly of the magnitude one notes when studying a field of seedling hollies.

QUESTION: Do you believe that more males than females occur in seedling populations?

ANSWER: No, I do not. Robert Clark and I published the results of just such a study with *Ilex opaca.* We found sexual equality, in numbers at least, to be the case in that species. It had been reported that male and female seedlings of *I. opaca* occur in frequencies approaching a ratio of eight or nine males to one female plant. Such reports probably resulted from the fact that male seedlings often flower at an earlier age than do the female seedlings. Thus, if you go into a field of four-to-six-year-old holly seedlings and count the number of plants of each sex that are in flower, you will find that most of the plants in flower are male plants. However, in successive years as the plants become older, the majority of the seedlings which come into flowering for the first time are female plants. When accurate records were kept on the field of seedlings until the sex of all the seedlings had been determined (nine years), the ration of male to female plants was essentially 1:1.

QUESTION: What about storing holly pollen?

ANSWER: I have never stored holly pollen so cannot answer with the authority of experience. However, judging from work with other plant genera, I feel certain that pollen storage could be utilized in holly breeding work if one provides the proper conditions for storage of the pollen. Try short-term storage of the pollen glass vials at 0^{o} F. In practice, you can avoid the necessity of storing pollen by working with small male plants in containers. If you have several male plants, they can be shifted to a warmer or cooler room as needed to adjust the flowering period. Working this way with several small plants, the period of availability of fresh pollen can be extended to a period of eight to ten weeks. This time period is sufficient to provide coincident bloom for plants of most any other species of *Ilex* with which one might wish to attempt hybridization.

QUESTION: How do you sow the seeds?

ANSWER: Seeds of most species of holly can be planted immediately after removal from the fully ripened fruit. We plant many of the seeds in an ordinary soil mix in flats in the greenhouse. It may actually be preferable to use milled sphagnum moss. William Kosar, a professional plant breeder recently retired from the U.S. National Arboretum, handled thousands of holly seeds in a very small area by planting them in milled sphagnum moss in small plastic flats (approximately 7" long x 5" wide x 4" deep). Each flat was enclosed in a plastic bag and stored on a shelf in Mr. Kosar's laboratory. I believe he opened each bag approximately every two weeks to check the moisture of the sphagnum moss. Other than that the material required no particular attention. When germinating seedlings were observed in a flat, that flat was removed from the plastic bag and placed in the greenhouse. This technique releases valuable greenhouse space during the period of many months when seedling emergence is not occurring.

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