



HOLLY LETTER



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More People Knowing and Growing More Holly

HOLLY LETTER NO. 58

JULY, 1977

"HALLELUJAH TO THE HOLLY"

Under the above title, The Sunday Times, London, December 19, 1976, carried an account of holly legends and symbols by Graham Rose. Two paragraphs of Mr. Rose's article are of special interest to HSA members. These follow:

The common holly, *Ilex aquifolium*, used as a symbol of friendship during the Roman festival of Saturnalia (a custom adopted by early Christians) is only one among hundreds of hollies. The American industrialist James R. Frorer has given a collection of more than 450 species and crosses to his old college in Pennsylvania. Everything was moved from the Frorer estate and transplanted, including several 40-foot trees.

In England, the holly has become the subject of intensive research. Seven years ago, Peter and Margaret Brown, who run the North Newton Nursery in Somerset, decided to specialize in holly. Their aim was to build and multiply an extensive collection to provide stock for use by other nurseries and to produce comprehensive material for research and future breeding. The Browns now grow more than 200 different hollies, which they supply only to the nursery trade. While all the species and hybrids are of great interest to botanists, Peter Brown believes that only about 20 would prove exciting to the private gardener. He forecasts that three of them will become really popular because of their very distinctive characteristics: *Ilex* 'Ferox Argentea'; *Ilex x altaclarensis* 'Lawsoniana'; and *Ilex aquifolium* 'Amber'.

NOTES ON HOLLIES FROM ENGLAND

by G. Peter Brown
Newton near Bridgewater, Somerset

Ilex x attenuata: we received this female plant from Hilliers in 1975. It appears to fit the description in the *Handbook of Hollies*, page 18, and is predictably rather tender here, having been badly damaged this winter. 'East Palatka' appears to be stronger, and liners have survived well outside without protection.

Ilex x altaclarensis 'Barberberry' is our provisional name for an exceptionally free-fruited, flat-leaf form from Barters Farm Nursery, Wiltshire. The nursery has no record of the origin of the tree, though it thinks that this holly came as a named cultivar many years ago and is not a seedling. If we cannot trace the original name, we shall probably offer it under the name of 'Barberberry' in three or four years.

Ilex x altaclarensis 'Bosgold' is a branch sport of 'J.C. VanThol', itself a very popular holly in Europe. It is similar to that cultivar in all respects, except that it is boldly splashed with gold in the center of the leaf. The sport appeared in the nursery of Bos and Boogenboom in Boskoop, Holland and, as far as I know, they have not named it. 'Bosgold' is my provisional name (*Bos* is Dutch for wood) and I shall have to speak to them soon in order to agree upon a name for registration. Our plant is 18 inches high, bushy, and healthy; has flower buds forming; and so far does not show signs of reversion. Further trials are needed to learn whether

the fruits are parthenocarpic as in 'J.C. VanThol' and also whether there is going to be a tendency to revert to green. But I am already pretty sure that this could become a popular holly in Europe where this kind of variegation is in fashion.

Ilex x altaclarensis 'Ashford' and 'Broomfield': our landscape architects rarely specify hollies by cultivar names and, in most of their planning for hedges and mass plantings, they tend to ask simply for *I. aquifolium*. For this reason, many thousands of common *I. aquifolium*, raised from seed, are sold every year. I do not use any seedlings but have selected three clones, from healthy trees growing wild in our county, and raise some 6000 of these every year from cuttings. I have given them provisional names for use in our nursery [North Newton Nursery], but do not intend to register them because I do not claim that they have any new or improved qualities. Indeed, they have been selected simply because they are typical and make it easier for me to offer evenly graded plants. 'Ashford' (from Ashford's Farm) is a free-fruited female with prickly green leaves and red young growth. 'Broomfield' (from Broomfield Churchyard) is similar but the young growth is green. I have a prickly male clone to keep them company.

Ilex aquifolium 'Hascombensis' is a neat male holly, pyramidal in habit and slow-growing. It is rather similar to *I. aquifolium* 'Angustifolium'. Our cuttings came from Will Ingwerson, a great plantsman, who has a nursery in Sussex. He received it many years ago from Charles Musgrove of Hascomb in Surrey, in whose garden it is thought to have appeared.

Ilex aquifolium 'Langport': I found this sport in a hedge of common *I. aquifolium* in the village of Langport, Somerset. The smallish leaves are streaked with gold. Our two-year-old plants are already reverting to green, so I shall not propagate it.

Ilex aquifolium 'Somerset Cider', 'Vaggs Hill Yellow', and 'Weeping Milkmaid' are my provisional names for hollies found at Vaggs Hill Nursery, Yeovil, Somerset. They were planted as a mixed hedge by the father of the present owner, when he started the nursery some 50 years ago. He had previously been head gardener to "Montacute House," a prominent estate in Somerset; but I cannot find any of these cultivars there now, even though he is said to have brought the plants from "Montacute House" with him. 'Somerset Cider' is a typical, green-foliaged *I. aquifolium*; the berries are creamy yellow with a distinctly red flush on the sunny side, as in the cider apples for which Somerset is famous. *I. aquifolium* 'Yellow Beam' (HSA 9-76) appears from the description to be similar. 'Vaggs Hill Yellow' may prove to be 'Bacciflava', in which case I shall drop the provisional name. 'Weeping Milkmaid' has foliage similar to the plant usually sold as 'Golden Milkboy', but it is a free-fruited female with a distinctly weeping habit. The mature tree shows very little reversion, but the foliage is rather sparse.

Ilex aquifolium 'Somerset Cream': It is fairly common to find 'Silver Milkmaid' type sports on silver forms of *I. aquifolium*, especially 'Argenteo-marginata', and this one appeared on a mature

tree only a hundred yards from our nursery. It fits the description of John Wieman's 'Crinkle Variegated' (HSA 10/76), except that it is blotched with cream rather than yellow, being neither golden nor silver. It is free-fruiting and very attractive, and I am propagating it as quickly as possible; a few plants have been sold.

Ilex centrochinensis: I had this from Hilliers two years ago and lost both the stock plant and the progeny during the very cold winter. The plant seemed to fit the description on page 196 of the *Handbook of Hollies*, although, of course, I have not seen any berries. Hilliers claim that their plant is the one described by S. Y. Hu.

Ilex crenata cultivars were obtained from Norman Cannon, Greenwood, Delaware. 'Hetzi Sport' is described as a heavy fruiting, spreading form, with the convex leaf of the regular 'Hetzi', but growing faster and larger. 'Sensation' and 'Crazy Quilt' came as generous gifts without any description; both are green-foliaged, convex-leaf plants, the latter apparently rather slow-growing. I am waiting to see how they will develop. It is difficult to sell green crenatas here.

Ilex opaca 'Westonbirt': You are correct in your assumption that opacas do not grow well with us. The few plants which survive have very dull leaves and always look unhappy. When I came across a mature and healthy tree at Westonbirt, I thought it would be worth taking a few cuttings to see whether it would do well with us. I believe you would think it not very special and the only unusual quality it might have is the ability to survive. I shall probably produce a small quantity to sell to collectors. Incidentally, there are two good plant collections in the village of Westonbirt in Gloucestershire; one is the government-owned arboretum which has a fine collection of trees, but not many hollies, and the other is now the garden of a residential school for girls. It is open to the public on certain days of the year. The *I. opaca* came from Westonbirt School.

Do you know that Theophrastus Publishers of Little Compton, Rhode Island, have published a reprint of Dallimore's *Holly, Yew, and Box*? Nearly all Dallimore's hollies are still growing in the Holly Walk at Kew; most of them are excellent in maturity, but some sadly reverted to the point of being unrecognizable. I have cuttings from the best branches of the latter and hope to replace the trees in due course, unless the new Keeper of the Arboretum feels that it would be better to replace with some of the new hybrids. He has 'Elegance', 'Accent', 'John T. Morris', and 'Lydia Morris' and all are doing well.

The above was dated March 14, 1977, Mr. Brown is a member of the Holly Society of America. He and his wife run Newton Nursery, and have been specializing in hollies for seven years or so.

A BIT OF HOLLY SOCIETY HISTORY

Alice Wieman
Portland, Oregon

At the fall meeting of the Northwest Pacific Chapter Alice (Mrs. John) Wieman gave a talk of past years. Her talk, reported in the May 1977 *Newsletter* of this Chapter will be of interest to H.S.A. members everywhere. Also reprinted from the *Newsletter* is Virginia Morell's account of her trip.

When I looked back, way back, into our old files, I found that this is the 50th anniversary of John's interest in holly (mid-1926). I wonder how many of you were members of the Holly Society of America in 1954 and how many belonged to the Oregon Holly Growers then. I was curious about how much you present Society members have been told about this organization to which we belong. So, being one of the old timers, I thought you may be in-

terested in the history of the Holly Society of America.

The Society was started in 1946 by Clarence Wolf. It included in its membership any "holly lover," even if he or she had only a single holly bush or tree.

In 1954, John and I attended the Society's meeting in the East and were guests of Mr. and Mrs. Wolf. I had a long talk with Mr. Wolf (now deceased) about his outstanding interest in holly. He told me how he went into their woods and gathered their beautiful native hollies (*Ilex opaca*) to send as gifts to his customers. (He had a very large, successful Silica Sand Co. at Millville, New Jersey). The holly was so enthusiastically received that he decided the holly which was being destroyed should be saved -- and he would head the group to save it. It's a bit the way we talk about "endangered species" now. Then it was holly.

The group chose the name Holly Society of America rather than American Holly Society because of the many more holly species, English, Japanese, Chinese, and others. The purpose was to save holly and enthuse people about holly. For years Mr. Wolf did not sell a pound of holly but started planting. He employed Dan Fenton, a horticultural graduate of Rutgers University, to take charge, and eventually a holly business developed.

Incidentally, Mr. Wolf started "Holly House" in Millville, home of New Jersey Silica Sand Co., where every conceivable thing made of holly is exhibited - a beautiful business desk, tables, chairs, etc. We were proud to be honor guests at a luncheon there, and treasure the genuine friendships of members of the Holly Society we met.

In 1954, the Oregon Holly Growers through Ambrose Brownell extended an invitation to the Society to meet in Portland, but it was not until 1956 that a large group from the East came for their meeting. Al Teufel was our President at that time.

It seems apropos to tell you about this "not to be forgotten" meeting in Portland at the old Multnomah Hotel. H. Harold Hume, author of *Hollies*, was the guest speaker. He chided us in Oregon because we didn't promote holly enough. He said there should be a holly tree in every yard, since there is such a selection of berry color, leaf variation, and plant size. He encouraged the improvement of hollies, as John is attempting to do. In W. Dallimore's book *Holly Box and Yew* reference is made to a "white-berried holly" and John has been working toward that.

Personally, I have believed that the colored berries from deep red to orange through the apricots, down to the yellows, as well as the many leaf variegations, should be used in many ways - all the year round.

Dr. Roberts, Dr. Young, Dr. Svenson, and Dr. Delaney, all from Oregon State University, were on the program. They gave information that Mr. Wolf had hoped for, i.e., disease-resistance, winter-kill, growing techniques, marketing, and other aspects we still discuss at our Oregon meetings.

Harry Dengler, Editor of the *Handbook of Hollies* (1957), gave a talk on the "Folklore of Holly." Mrs. Byam (Chattie) Stevens of Chestertown, Maryland, gave quite a thesis on landscaping, pointing out that holly can be used in so many places - "from groundcover, as shrubs on the patio, up to big trees." Brian Mulligan of the University of Washington Arboretum told of hollies at the Arboretum which were planted in 1949. Dr. Clark of Long Beach, Washington, gave an excellent paper on the botanical nomenclature of holly.

Dan Fenton of Millville, N.J., who followed Mr. Wolf as President of the Society for several years, is now Permanent Trustee of the Holly Society. He announced that the Society had been made the International Registration Authority for the genus *Ilex*.

We toured holly farms around Portland. I recall, when we got

to our place, that it was in an Oregon mist, but the visitors didn't object because it was so much kinder than the eastern rains. Some one asked what we sprayed on our hollies to make them so shiny. As you know American holly (*I. opaca*) does not have the sheen of *I. aquifolium*.

This meeting in Portland gave the Oregon Growers an impetus to do something. At Christmas we sent a holly wreath to every State Governor in the U.S. We had TV programs about holly and then a three-day exhibit at the Oregonian Hostess House, showing plants, making arrangements, and answering questions on holly.

Might we not use some of those ideas from the "old days" to put the use of natural (not artificial) holly "back on the map?"

PERNYI HOLLY

Anthony R. Gould
Bethesda, Maryland

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Dr. D. Schulman, is to blame for this piece. He sent me a spray of holly to identify and, when I called him to tell him it was *Ilex pernyi* from central China, he seemed too hurried to listen to the rest of my tale. So you will either have to read this or skip it. The people with whom I associate this plant make it important to me.

Pernyi hollies have small leaves, two to three cms. long and up to 2 cm. wide, with usually two sharp spines on each side and a vicious spine at the tip, which is at the apex of a distinct triangle one third the length of the leaf (2 1/2 cm. is about one inch). The tree is slender growing to a height of 15 feet. The branches tend to droop.

Twice it was introduced by E.H. Wilson of the Arnold Arboretum and once in an exchange with a Chinese University. To this history I must add one more introduction, probably from Europe. Joe Gable went to New York at the end of the importing season to look for bargain plants for his work with rhododendrons. He brought back an English female holly, *I. aquifolium* 'Pyramadalis', and a male plant of *I. pernyi*.

Some years later he found berries on the 'Pyramadalis'. There was no English male within, let's say, 40 miles, possibly in Baltimore. American hollies did not bloom until weeks later, and the male *I. pernyi* did bloom at the same time as 'Pyramadalis'. The seeds were planted, and eventually Joe Gable had a new plant. Its leaves were slightly larger than those of *I. pernyi* -- up to 5 cm. long and it had the distinctive triangular tip. The foliage was a dark green and glossy like that of both parents; the fruit was a bright red as was the fruit of both parents, so he called it 'AQUIPERN.'

I. aquifolium 'Pyramadalis', the female parent, has leaves five or six cm. but is unlike most English hollies in that many leaves have only the terminal spine or two or three lateral spines near the tip. It bears a tremendous crop of berries every year. 'AQUIPERN' seemed a logical name for this hybrid.

A few years later, Henry T. Skinner, Ph.D., working at Morris Arboretum on the north side of Philadelphia, crossed *I. pernyi* with *I. cornuta*, also from China. From the offspring, he selected male and female plants and named them 'John T. Morris' and 'Lydia Morris' after the brother and sister who maintained the arboretum. The foliage of these plants and the habit of growth are quite similar to Gable's 'AQUIPERN'. The most notable difference is that the veins in the leaves are depressed, a characteristic of the *I. cornuta* species.

For some reason, nurserymen and holly growers group these with Mr. Gable's as 'AQUIPERN.' They must have questioned

whether they could get acceptance of a new term "cornupern" or other more logical term.

Also, in the trade, is another illogical 'AQUIPERN' under the name of 'Brilliant'. Except for habit of growth and the triangular tip (*pernyi* characteristics), it is still different. The foliage is not shiny but dull and looks much more like the foliage of another holly from China, *I. ciliospinosa*. 'Brilliant' and *I. ciliospinosa* grow much taller than the other aquiperens. Where and how it originated I do not know. This is a question for holly growers to search out. But at least Gable and Skinner are familiar names and the products interesting.

I first became attracted to these hollies, because they seemed adaptable to small gardens of which there is a growing market. All have some drawbacks, such as trunks which are too slender for the foliage on dropping branches. All these drawbacks, it would appear, could be reduced if some grower would grow on numerous seedlings and select the better forms. This may be impossible. I'd like, however, to think it was possible, for I have seeded at least 40 different batches and not gotten one seedling to grow on! I can root cuttings, but I can't seem to grow from seeds. Anyone want to try with my seeds?

HOLLIES DOWN-UNDER

Virginia Morell
Oak Harbor, Washington

A horticultural tour is always fascinating, but the one I took to Australia and New Zealand in October, 1976, was doubly so, since I was particularly interested in seeing if they could grow holly down there. I had read in several publications that no holly is native to Australia. That left me wondering how, if at all, holly would thrive "down under." I was told in Sydney that there was at least one good-sized English holly growing in a garden in the Blue Mountains, west of Sydney. The next day a tour of that area including a trip to Sorenson's Nursery, where I found nursery row after nursery row with gallon cans of *Ilex aquifolium* in several varieties. Besides the usual all-green, there were silver-variegated types as well as media pictas with silver and gold blotches. This is a very well-known, old-established nursery, so it would seem evident that *Ilex* was a salable commodity, or it wouldn't have been displayed in such numbers. I never saw holly growing in any of the gardens visited in the area, but in the Melbourne Botanical Garden there was a very few hollies so well hidden in obscure places that they were really not on public view.

Strangely enough it was in warm, sunny Perth, the farthest western city in Australia, where I saw holly used. A friend and I were invited to attend a Floral Arts Club meeting at which a flower arranging demonstration was given by one of Perth's leading arrangers. This woman used a silver-variegated holly with red carnations in an arrangement to depict the Christmas season. She explained that it was with real reluctance she cut the holly from her small bush, as it was such a treasure. I was told that holly did grow in the area, but it never reached any great size, and was considered a very choice specimen. Perth has a climate similar to that of southern California, so I was quite surprised to find it growing there at all. None of the amateur horticulturists I talked to knew of any holly other than *I. aquifolium*. They had never heard of the crenatas, cornutas, or any of our American species.

The same lack of knowledge carried over to New Zealand. I saw several magnificent *I. aquifolium* trees in gardens on the North Island; one in particular was *I. aquifolium* 'Lawsoniana'. This was growing in a spectacularly beautiful garden out of New Plymouth. The owner specialized in rhododendrons, but he was inordinately

proud of that 'Lawsoniana' holly. He would like to have had many more hollies, he said, but could find no source of supply in the country.

When taken to many fabulously beautiful private gardens, I asked several of the owners if they had ever tried the Japanese hollies. None of them knew anything at all about them. When I described *I. crenata* 'Mariesii' to some of the bonsai fanciers they were fascinated--but where to get it? In the smaller home gardens *I. crenata* 'convexa', 'Helleri', 'Green Pagoda', 'Green Dragon', or any number of other small hollies would have been a welcome addition. I whetted many an appetite that went unsated. Department of Agriculture restrictions are so severe in both New Zealand and Australia that I am told it would be next to impossible to send anything to them. What a terrific challenge for us holly buffs though! Here is virgin territory, just waiting for the opportunity to try a hand at a new plant, if only we could get it to them.

From Newsletter, Northwest Pacific Chapter

NEWS FROM A MEMBER IN VIRGINIA

Merritt I. Taylor
Richmond, Virginia

My two bicentennial hollies are growing. If I were not four score, I would have a number growing from cuttings, and I will come spring. Twenty years ago, I had 4,000 cuttings (English holly) in coldframes, but the hot, dry summer and a hot subsoil were conditions difficult to compete with. However, I kept trying. One year I bought \$100 worth of Teufel's English holly--with the same disappointing result. However, bees were my first love (1930) and I am still building up my colonies.

If the bicentennial *Ilex opaca* 'Jersey Princess' had been available years ago, I would be in the holly business. It has the appearance of English holly and the stamina of the American holly--just what I have been looking for.

My farm is located one mile from a major interchange on rerouted I-95 and US301, which increases its value. At the moment, I have 23 heifers and steers, nine guineas, two pigs, and four cats. There are springs and a fish pond, 130 acres of mixed hardwood--ideal from a survivor standpoint. We have four grandchildren and look upon the farm as something worth preserving. And I enjoy every minute I am permitted to reshape it.

The Holly Society of America is the finest group it has been my pleasure to be associated with for many years, and I regret that I am now unable to attend its meetings.

AN EXPERIMENT BY ACCIDENT

William M. Close II
Allentown, Pennsylvania

On December 20, 1976, I put 10 cuttings of *Ilex opaca* 'Miss Helen' in a plastic bag and closed it with a "Twist-Em." This bag was outdoors (as it was a left-over Christmas gift which I give out at that time) until February 4, 1977 through ice, snow, sleet, wind, and cold temperatures from -4°F to -28°F for 52 days.

Upon opening the plastic bag on that date, I found the cuttings to be in excellent condition, as good as, if not better than when they were bagged. The leaves seemed to have more gloss and the berries were fresh. I immediately made a Valentine's arrangement for Mrs. Close and she was happy. The arrangement lasted for two weeks.

I believe that holly could be kept in cold storage for a short period of time.

A Corner Especially for the Novice

HOW I START CUTTINGS

By T. D. McLemore
Pennsville, New Jersey

For several years, I have rooted a few holly cuttings for friends and neighbors. This has been done by using a small coldframe, which I built against the foundation of my house in southern New Jersey on the south side. The cuttings are taken during the last week in August so the roots are well-established before freezing weather.

When rooting a dozen or so cuttings, I use a 10-inch clay pot filled with a 50-50 mixture of sphagnum moss and builder's sand, which has been mixed and wet thoroughly before being placed in the pot.

Cuttings from the current year's growth, which are usually about six inches long, are taken from the trees. Leaves are stripped from the bottom of the cutting, with about four remaining at the top. Using a sharp knife, I cut a small sliver of bark from the lower one inch of the cutting. This is called "wounding" and will encourage root-growth from that area. The lower end of the cutting is then dipped in a rooting hormone (I use "Rootone," which is available in many garden stores) and inserted in the clay pot to a depth of two inches. I use a pencil or small stick to make holes in the rooting medium and then firm the medium around the stem of the cutting.

When the pot is filled with cuttings, I water thoroughly and place it in the tightly covered coldframe. The coldframe must be shaded from direct sun or ventilated to prevent the cuttings from being overheated. The cuttings are watered frequently to prevent drying out, until the roots are established. They should be left in the pot in the covered coldframe until the following April, when they can be lifted out, planted in individual pots, and grown outdoors in a protected area for another year before being planted in their permanent location.

If you do not wish to use a coldframe, the pot of cuttings may be placed in a clear plastic bag and the top of the bag tied securely. (A wire frame over the pot will form a tent to hold the bag above the tops of the cuttings.) Placed in a shaded spot, the cuttings should root by October with no further watering needed. Before freezing weather, sink the pot in the ground in a protected place. Mulch with leaves or straw and leave the pot undisturbed until the following April, when the cuttings may be lifted and potted.

GARDEN STARS OF A HOLLY WOOD

Roy Lancaster, who is Curator of the Arboretum of Hilliers Nursery, Winchester, England, contributed an article, entitled "Garden Stars of A Holly Wood," to *Amateur Gardening*, December 1975. Members of the Holly Society, who attended the meeting in Valley Forge, Pennsylvania, last November, found this article on the inside back cover of Holly Scrapbook No. 10. The article was well-illustrated with a two-page color spread of several cultivars of *Ilex x altaclarensis*--'Balearica', 'Camelliaefolia', 'Golden King', 'Lawsoniana', 'J.C. Van Tol', and 'Wilsonii'. Several cultivars of *I. aquifolium* were also represented in the color spread: 'Amber', 'Angustifolia', 'Bacciflava', 'Ferox-argentea', 'Flavescens', 'Handsworth New Silver', and 'Muricata'.

It is reported that the County Government has taken over Hilliers Nursery and that it will be perpetuated. It is good news. This important, long-established nursery has a remarkable collection of plants in great variety, and its catalog is an impressive publication.

EMBRYOID INDUCTION - A POTENTIAL METHOD FOR HOLLY PROPAGATION

Ching-Yeh Hu, Associate Professor
Department of Biology

William Paterson College of New Jersey
Wayne, New Jersey

As all holly workers realize, plants which grow from holly seeds never look like the mother plant. This is why asexual cloning has become essential for obtaining similar plants. Currently, the most important cloning technique for holly propagation is cuttage. With this method, it would take more than ten years to propagate enough plants from a newly introduced holly plant to satisfy holly lovers all over the world. This is because through cuttage it requires a stem section at least a few inches long to produce a new individual.

A new cloning technique was developed by Professor F. C. Steward about thirteen years ago. He cultured a very small piece of root-tissue of Queen Ann's lace in nutrient medium for a few weeks. Then squashed the growing tissue into single cells and small cell clusters. Surprisingly, these cells and cell clusters mimicked the developmental stages of the zygote and developed into embryo-like structures, named "embryoids." These embryoids grew into plantlets upon maturity. From the original small piece of root-tissue, Prof. Steward obtained several Petri dishes of embryoids within two to three months. There were approximately 100,000 embryoids in each dish! Each of them would develop into a plant genetically identical to the mother plant.

Embryoid induction has been performed in numerous herbaceous species, since Prof. Steward first describe this technique. Workers in this field gradually came to realize that the induction of embryoid formation from tree species was extremely difficult. Thus far, only two tree species have been proven successful in embryoid induction. Fortunately, English holly is one of them.

In 1971, when I was seeking an improved technique for culturing rudimentary embryos of various holly species, I noticed that some of the embryos of English holly had grown into seedlings with abnormally thick and discolored cotyledons. One day, when I re-examined these cultures, I found numerous strange-looking structures developing on the surface of these deformed cotyledons. What could they be? I asked for assistance from the laboratory director, the world-known plant embryo physiologist, Ian Sussex, Ph.D. After close examination, Dr. Sussex announced that this was the first case of embryoid production from tree Angiosperm. He helped me complete a histological study on this material and the work was published in an international journal, *Phytomorphology* (for details, please see Vol. 21, pp 103-107, 1971).

I have continued to direct part of my research effort in this special line of work, since I established my tissue-culture laboratory at the William Paterson College of New Jersey (1972). The embryoids producing cotyledons were subcultured several times over four to five week intervals and were then transferred individually onto fresh medium. Each section would grow and produce a crop of embryoids in four weeks. Occasionally, callus tissue would initiate from these cotyledon sections. These calli could also be subcultured and produce crops of embryoids.

Gradually, my research students and I found that the embryoid-production potential was not confined to cotyledons of the young seedlings. Cotyledons of immature embryos in culture may also produce embryoids. When a very young embryo was involved, each tiny cotyledon could only develop into one embryoid. Twin seedlings, sharing a common root-system, would result from such embryoid-bearing young embryos.

The morphology of embryoids of the English holly is very similar to that of the zygotic embryos of this species, except in the following two respects: 1) although, like the zygotic embryos, most young embryoids were colorless, some of them did show a light green or red coloration; 2) the majority of the zygotic embryos of the English holly had two cotyledons, while the embryoids of this species frequently contained two to five cotyledons. This phenomenon of excess cotyledons present on the embryoids was common for embryoids produced from other dicotyledon species.

Several attempts were made to define the ideal culture conditions for embryoid induction for this species. No factor has yet been positively identified in these experiments as the driving force for embryoid induction. These works indicated that addition of various exogenous plant hormones did not affect embryoid production to any significant level. The very high N, P, K levels in the initial culture medium were not responsible for the induction either. Nevertheless, various embryoid-forming potentials were expressed by ten different English holly plants tested.

Embryoid production has also been observed infrequently in my cultures of American and Chinese hollies. Currently, I am attempting to induce embryoid formation through cell suspension of leaf and filament origin. No significant break through has yet occurred.

Although there still are numerous unsolved problems in holly embryoid production, I do foresee the distinct probability of applying this exciting new cloning technique in the future for a rapid propagation of hollies in exceptionally large quantities.

HOLLY SOCIETY PUBLISHES TWO NEW BULLETINS

Two new bulletins have been published this spring by the Holly Society of America: Bulletin No. 15, *How to Pick A Winner--A Guide for Competitive Exhibition of Holly Sprigs* by Barton M. Bauers, Sr., Executive Vice President of the Society. This Bulletin is being brought to the attention of the National Council of State Garden Clubs, other horticultural organizations, and to others interested in competitive plant exhibits through horticultural periodicals and news media.

Bulletin No. 16, *The Coin-leaved Japanese Hollies, Ilex crenata 'Nummularia' Franichet & Savatier and Ilex crenata 'Mariessii' Veitch ex Dallimore and the New Allied Cultivar 'Nakada'*, by Theodore R. Dudley, Ph.D. and Gene K. Eisenbeiss, Research Botanist and Research Horticulturist, respectively, of the U.S. National Arboretum. This Bulletin, in careful details disposes of the confusion which has existed for many years between *I. crenata 'Nummularia'* and *I. crenata 'Mariessii'* and also introduces and describes the new cultivar 'Nakada'. A more scientific version of this important subject will be published by *Baileyi*, of the Bailey Hortorium of Cornell University, Ithaca, New York.

Members of the Holly Society of America on written request before September 1, 1977 to Bluett C. Green, Jr., Secretary-Treasurer, 407 Fountain Green Road, Bel Air, Md. 21014, may obtain a copy of these Bulletins at the special price of \$1.00 each. Thereafter, the price per copy of Bulletins No. 15 and No. 16 will be \$1.50 as to all other interested parties.

MARYLAND BICENTENNIAL TREE

The Enterprise, Lexington Park, Md., in its issue of December 9, 1976, carried an interesting account by Dorothy Shannon of a 220-year-old American holly, which was dedicated on December 5, 1976 at St. Mary's College, St. Mary's City, St. Mary's County,

Left to right. Dr. Orton, Mrs. Walton, Mrs. Byrne, Harleigh Kammerrer, Chairman of the Shade Tree Commission of Princeton, and Mrs. Hansell watch as Mrs. Green starts the hole to receive *Ilex opaca* 'Jersey Princess' while Mrs. Bennett holds the tree.



Maryland. The aged holly is estimated to be 70 feet tall. It was "fed intravenously" for several months through tubes, which were placed in holes bored in the thick bark by a tree surgeon, in order to rejuvenate the roots.

A bronze plaque was presented by the Maryland Forest Commission. The inscription reads: "Maryland Bicentennial Tree. It has stood its ground, survived the American Revolution, and continues to serve an appreciative nation." The plaque is on a 90-pound piece of granite from historic Point Lookout.

"Portions of the lower bark show signs of weathering storms and have bulging areas like hugh warts. In the crotch of the tree, bees nested for generations; and when the Forest Service first examined this holly tree, they were besieged by swarms of bees," reported Ms. Shannon.

MORE 'JERSEY PRINCESS' PLANTINGS

The Garden Club of New Jersey celebrated Arbor Day, May 2, 1977, by planting *Ilex opaca* on the grounds of the Governor's mansion in Princeton, N.J. Mrs. Robert Green, Trees Chairman of the Garden Club of New Jersey, told the gathering that it was appropriate to plant this holly, whose name had been obtained by a contest conducted by the State organization through its member clubs and which had been selected by the Holly Society of America as the Bicentennial holly.

Others at the planting were Mrs. Anthony Bennett, President of the Garden Club of New Jersey; Mrs. William M. Boyd, Advisory Council, Mrs. Thomas B. Everist, Central Atlantic Regional Tree Chairman, and Mrs. Grant Walton, representing her husband, Dean of Cook College, Rutgers-The State University; Elwin R. Orton, Ph.D., the originator of 'Jersey Princess', and Mrs. Orton; Mrs. Brendon Byrne, wife of the Governor, and Dorothy E. Hansell, President of the Holly Society of America.

On June 4, 1977, Dr. and Mrs. Orton were present at the planting of 'Jersey Princess' at the Frelinghuysen Arboretum Morristown, N.J., as was Russell W. Meyer, Director and Secretary of the Morris County Park Commission, and Quentin Schlieder, Director of Horticulture. Frelinghuysen Arboretum is one of the many fine facilities of the Morris County Park System which is considered among the 10 best in the United States. In 1975, at

Dallas, Texas, William Arthur Lewis, President of the Morris County Park Commission, was presented the Leadership Award by the Commission-Board, Membership Section, of the National Recreation and Park Association.

The planting of 'Jersey Princess' at the Frelinghuysen Arboretum honored Mrs. Hansell as President of the Holly Society of America and took place during a special events meeting of the Home Garden Club of Morristown of which Mrs. Hansell is a Trustee.

MESERVE HYBRID HOLLIES at the Bayard Cutting Arboretum

Among the hollies in the holly collection at the Bayard Cutting Arboretum, Oakdale, Long Island, are hybrids which are the result of a 30-year hybridization program by Kathleen Meserve of St. James, Long Island. They are interspecific hybrids from the English holly (*Ilex aquifolium*) crossed with *I. rugosa*, a species from the Sakhalin Island, Japan. The latter is of little interest except for its hardiness.

These Meserve hybrids, with the characteristic leaf form of the English holly and the hardiness of the Japanese species, are large shrubs rather than trees. The more recent introductions, 'Blue Prince', 'Blue Princess', and 'Blue Angel' are considered to be better than the original introductions, 'Blue Boy' and 'Blue Girl'.

DELAWARE VALLEY CHAPTER

This chapter held a meeting and field trip on January 22, 1977. Sixteen gathered for lunch at the Holly Inn in Pitman, at which David B. Lansdale, Chapter President, read a letter from HSA Editor requesting members to write articles for "the novice." Dorothy (Mrs. Samuel A.) Reed of Glassboro, N.J. and Thomas D. McLemore of Pennsville, N.J. volunteered to do so; the former on "How We Got Started," the latter on "How I start Cuttings." Dorothy Hansell had already recalled Frank L. Suplee's article in *Horticulture*, December 1973, and had obtained permission to reprint it in a forthcoming number of the *Holly Letter*.

After leaving the Holly Inn, the group drove to Lynn Stewart's Nursery in Pitman. For 18 to 20 years, he has worked with a

mutation of American holly which was found on a seven-year-old seedling in his orchard; it has variegated leaves. Mr. Stewart has thousands of plants in containers, is in processing of having the tree patented, and plans to release it to the trade through Dan Fenton, American Holly Products, Inc., of Millville, N.J. It was a worthwhile visit, and Lynn was most generous with his time and information.

The group then viewed the holly hedge which fronts the Paul Kramm Estate in Monroeville, N.J., then drove to a location in the woods south of Glassboro where Sam Reed knew of an outstanding collection of native American hollies. The hollies are on the property of Schober Orchards (apples and peaches).

Some members of the group then visited the Mood property on the Bridgeton Pike south of Mullica Hill, where a holly orchard has been established. While the weather was really cold, the group's enthusiasm for holly offset the day's chill.

This Chapter had a meeting and field trip yesterday, May 14, 1977. A Dutch-treat luncheon was served at the Country Kitchen Restaurant, Malvern, Pa., after which the group visited the home of Mr. and Mrs. Frank Lockhart in Malvern.

On leaving the Lockhart's home, a short drive was made to Historic Yellow Springs, Chester Springs, Pa. Here are "145 acres of beautiful gardens, woods and fields, that will be preserved." It was the site of a Colonial Health Spa and Revolutionary War Hospital.

Twenty-one attended the meeting and field trip, and Dave Lansdale, President, reported that the Chapter has 66 dues-paid members.

OREGON HOLLY GROWERS ASSOCIATION

At the annual meeting of this Association, held on February 12, 1977, several interesting reports were presented. Among them:

Robert Ticknor, Ph.D., of the North Willamette Experiment Station gave a shelf-life study report. Dr. Ticknor stated that there are three problems in keeping holly - dehydration, defoliation, and berry drop. He reported that poly bags with no holes proved to be best for preserving the holly. The holly tips made very tiny holes in the bag and these were found better than the large holes in bags previously used. The study proved that wax is not good, that it causes discoloration of the leaves. Temperature is most critical in holding holly on the shelf. 32° is the best temperature for keeping holly salable. In stores only a few bags at a time should be on display and the rest kept in a cooler.

Dr. Ticknor then reported on phytophthora studies carried on with Dr. Coyier and Dr. Adams. One hundred and ninety-one varieties were tested, with *Ilex* 'Wilsonii' and 'Nellie R. Steven' the most resistant to the disease. Male trees were more susceptible than females of the same hybrids.

Duane Coyier, Ph.D., Plant Pathologist with the U.S.D.A. Ornamental Plants Research Laboratory in Corvallis, reported on holly dip tanks and handed out a fact sheet on his findings. He checked dip tanks on how close they were to 30 ppm copper sulphate to keep holly from getting infected by phytophthora in the dip tank. The size of tanks is very critical to the proper ppm of copper. To determine the size of tank, multiply length by width by depth of solution in inches and divide cubic inches by 231 to obtain amount of gallons in tank. For a round tank multiply radius by radius by depth and then multiply by 3.14 for number of cubic inches and divide by 231 to obtain amount of gallons in tank.

Dr. Coyier stated that to err on the high side is better than not enough copper in tank. While 30 ppm is the best amount, even

as high as 120 ppm could be used with no significant damage. Copper sulfate penta hydrate is the recommended item. Copper collects water if not kept properly sealed while in storage in a dry place.

Tom Teufel, in reporting on the starling problem, said that the State people have their hands tied because of lack of funds. Any programs should be started because once the birds have set their pattern of behavior, nothing disturbs them. One poison which can be used must be in feed lots; the birds usually don't eat holly berries if apples, etc., are near the holly orchards.

Pat Lee told of using plastic bags in a cradle and how much more efficient and ideal they were, because this method keeps the holly clean of mud and the dip tank cleaner. Members told how some use bags; some dip the bags in the tank and some dump the holly into the tank. When bags are put in the tank, they need holes for drainage. Bags can be stored in a dark place and used the following season.

The Board of Directors met later on the same day and elected Pat Lee President for a second term; Thomas Teufel Vice-President; and William F. Kosar Secretary-Treasurer for the sixth term. William J. Linfoot was elected to serve on the Executive Committee with Mrs. Lee and Mr. Teufel.

The Association will continue to support holly research for 1977 with a contribution of \$350. An honorary membership was awarded Dr. Ticknor for his research on holly and his helpful consultation with holly growers. A gift of two Lenox cups and saucers was presented to Mary Kosar for her assistance in the office of the Secretary.

During lunch, a question and answer period was held with Dr. Coyier, Dr. Ticknor, and Mr. Teufel on the panel. In answer to a question on how to handle the effects of the serious drought experienced this year, when lack of water caused holly leaves to turn gray, Dr. Ticknor said that deep watering in March will be given hollies at the Experiment Station. The use of "Wilt-pruf" was also suggested to guard against drying of the leaves, but it was noted that this method might be expensive.

When leaves begin to turn yellow, supplemental feeding is recommended in late August or early September--but this fall feeding may cause premature growth.

The spring meeting of the Oregon Holly Growers Association is scheduled for May 28, 1977 and will take place at the Stuart Olson's Holly Orchard where there will be a demonstration of equipment and where the members will find, in addition to hollies, acreage in cherries, peaches, and prunes; Norman and Elaine Holler Holly Farm to see the new planting of over 125 clones or varieties of holly for landscaping as well as general use; and the Linfoot Farm to see the quintet method of planting and a demonstration of the wire-basket method of cutting and dipping and cultural practices including pollenization by approximately two million pollenizers (honey bees).

QUESTIONS AND ANSWERS

Gene K. Eisenbeiss
Research Horticulturist
U.S. National Arboretum

Q and A- Several questions have been received concerning the holly berry midge, which attacks American holly. In recent years the problem caused by this insect has been increasing. For those not familiar with this pest, it might be helpful to briefly describe its life cycle, the injury it causes, and control.

In the adult stage, the holly berry midge looks like a small

black fly. At flowering time or shortly after, the pupa* emerges from the holly berry as an adult. Shortly thereafter, mating occurs and within a few days the female deposits eggs in the pistil of the flower. The pistil develops into the holly berry. After a period of incubation, the egg hatches and the larva** feeds on the developing ovules inside the pistil. It overwinters inside the pistil or developed berry, by this time, and emerges in the spring as an adult. The feeding of the larva destroys the developing seed. However, the rest of the berry continues to develop to normal size but does not turn red. American holly with unripened fruit late in the fall is the most conspicuous symptom of infestation of this insect.

Control of this insect has been difficult, since insecticides have been successful only when applied during the short life of the adult. The first recommendations for control of holly midge were with DDT. In Maryland, the current recommendation is to use diazinon at emergence time (shortly after flowering) about May 20. It is difficult to say if DDT is better than diazinon, probably diazinon is equal or superior to DDT in this case; and, since DDT is no longer manufactured, there is no longer a choice. The use of pesticides is under State Control and recommendations vary from State to State, so consult your local State Extension Service for a local recommendation and restriction on pesticide use.

* The pupa is a dormant developed adult, which is enclosed in a cocoon or casing usually for resting over winter.

** An insect larva is a wormlike stage of some insects.

Q- There seems to be some difference of opinion on the parentage of Dr. Kassab ['Doctor Kassab']. Some sources list it *I. cornuta* x *pernyi*. Others (including the tour this year) suggest that it is *I. aquifolium* x *cornuta*. It looks very good in our trials, although it has not fruited and, in that respect, resembles 'Nellie R. Stevens' (*I. aquifolium* x *cornuta*) and other *I. cornuta* types. Please comment on parentage and fruiting characteristics, requirements for pollination, etc.

A- In my opinion 'Doctor Kassab' (a putative hybrid) is the result of *I. cornuta* x *pernyi*, not *I. aquifolium* x *cornuta*. This opinion is based on the following. In general appearance, habit, leaf-color, shape and size of spines, leaf-gloss, branching habit, there is more similarity to *I. pernyi* than to *I. aquifolium*. These characteristics are not easy to measure. However, there are characters which can and have been measured.

The flowering time of 'Doctor Kassab' fits well with that of *I. cornuta* and *I. pernyi*, and other known hybrids of this parentage. *I. aquifolium* and hybrids of *I. aquifolium* x *cornuta* flower measurably later. The same is true of fruit-ripening time. The fruit-color also fits this same pattern of species and hybrid parentage, as does pyrene shape, size, and reticulation. A critical examination of the flower for petal size, shape, and color and the pistil for shape and size of the ovary and shape and size of the stigma will reveal a greater similarity to *I. pernyi* than *I. aquifolium*.

The ultimate test would be to reproduce a plant looking like 'Doctor Kassab' from a controlled cross. However, one might produce thousands of seedlings and never get a plant identical to 'Doctor Kassab'. Another test is direct comparison of hybrids known to be of the same parental species. A number have been named: 'Lydia Morris', 'John T. Morris', 'Red Delight', 'Cetus', 'Aries', 'Atlas', 'Beacon', and many more. While not identical, they are closer to 'Doctor Kassab' than any other hybrids known.

Still another test is to back-cross a hybrid to each of its suspected parents. The progeny in general would be expected to show a stronger resemblance to the suspected parent species than to a species to which it is not related. This has not been done

with *I. cornuta* x *pernyi*, but it has been done on a large scale with *I. aquifolium* x *cornuta* and back-crossing it to *I. aquifolium*, *I. cornuta*, and other species. The pattern of the progeny was as anticipated in all cases. Even though there was a lot of variability within each cross, the affinities were quite clear and were as expected.

With respect to pollination requirements, male plants of *I. cornuta*, *pernyi*, and *aquifolium* and hybrids of any combinations of these species would successfully pollinate 'Doctor Kassab'--provided they flowered with 'Doctor Kassab'. Since 'Doctor Kassab' is rather early flowering, frost damage to flowers may be a perennial problem in your location.

Q- Is there any way of telling a male holly from a female, short of waiting for the flowers to appear?

A- Currently, we have no techniques for sex determination in holly plants before flower-bud development. Perhaps we will some day. Some evergreen hollies produce flower-buds in late summer for the following season. Male plants of these types generally have larger clusters of buds than female plants. Also, these buds can be dissected. If the stamens are very prominent and the pistil is reduced, the plant is a male. If the stamens are quite small and the pistil is prominent, the plant is a female.

Q- Are holly berries truly poisonous? We make a wine from berries picked late in January, have done so for years, and are still here to talk of it.

A- There has not been sufficient study to describe reliably or adequately the poisonous qualities of holly. Evidence exists that the berries of some holly species are potentially toxic, but the degree of toxicity is not known. How many species might have toxic fruits, and whether their ripe or green fruit is toxic is also unknown. Perhaps in the wine you have made, the fermentation process has altered possible toxins or the alcohol and other chemicals produced have altered the toxins. From Johnson, H.: *World Atlas of Wine*. p. 254. 1971, an expensive kirsch is distilled from *I. aquifolium* fruit in Germany.

If you could be prevailed upon, the Editor of the Holly Society would like to have information about your holly wine.

Q- Presumably commercial orchardists fertilize their hollies in the fall in order to enhance foliage color for the harvest. As an amateur, I fertilize only once a year, rather heavily in late February or early March. Would it be advantageous for me to divide my feeding into two periods? If so, in what proportions? This is the Sandhill area at Southern Pines, N.C. My mulch is quite thick. Should I feed earlier in winter, say about February 1? After my mulching cycle is six or seven years old, would it be wise to skip nitrogen for a year and use 0-10-10 or 0-10-20 which are readily available here? I have several hundred trees.

A- Two separate applications of half the amount of a single once-a-year application would be better than one. Assuming that the nitrogen source of the fertilizer is a soluble type, two applications would provide the fertilizer over a longer period than one application. Even though only half the strength, the plants would have a longer period in which to take up the fertilizer. Three or four applications would be even better. Generally, on a large scale the problem with several applications is the cost of application. With respect to date of application, I recommend February over March. I don't know exactly when growth starts on your plants, but it would be desirable to have the fertilizer down to the root-zone before growth starts.

Concerning skipping nitrogen application the last year of the six-to-seven-year mulching cycle, this would save the cost of a nitrogen application and there would be less uptake by the de-

composed mulch near the end of the mulch cycle. However, the plants might benefit the most from a nitrogen application at this time. If you are satisfied with the condition of your plants, discontinue a nitrogen application at this stage. If you desire more growth and better foliage, continue nitrogen application yearly.

One more point, from your first statement that orchardists fertilize hollies in the fall to enhance foliage color, keep in mind that fall application will not affect the appearance of leaves the same fall.

Q- In "Holly Hybridization at the National Arboretum." Amer. Hort. 51(2): 32-37, mention is made of the possibility of multi-species crosses (three or more). In general, will an interspecific male holly, say (A x B) pollinate an interspecific female of parentage (C x D) if at least two of the four letters are the same? In particular, I am interested in the cases when the male is *I. pernyi* x *aquifolium* and the female is a) *I. cornuta* x *pernyi*, b) *aquifolium* x *cornuta*, and c) *rugosa* x *aquifolium*.

A- To the first question the answer is yes. I interpret that you mean if one species occurs in the make-up of the two hybrids to be crossed, the other is possible. While this is logical, when no other information is known, there are many possibilities why it may not work. No one knows for certain if a cross will work until it is tried. In the particular cases mentioned, there is enough information known to indicate that all possible combinations of the species mentioned would work and produce fertile progeny.

Q- Also, will the females of the species mentioned above produce berries parthenocarpicly?

A- Yes. While the nature of the inheritance of parthenogenic fruit is not well understood, fruit from all the species mentioned above have been seen with all empty pyrenes. This has also been seen in hybrids of most of these species.

Q- Why are they recommending diazinon instead of "Cygon?"

A- The manufacturers of "Cygon" have removed holly from the label, because it can cause injury to some kinds of holly under certain conditions, principally *I. cornuta*. However, "Cygon" is still an excellent pesticide for use on *I. opaca*. A general interpretation of pesticide laws is that no pesticide should be used on a crop or plant for which it is not labeled.

Q- Do all leaves fall off American holly each year in contrast to English holly?

A- No. An American holly in good condition can retain its leaves up to four years. Some leaf drop can occur throughout the year, but it is more pronounced in spring at the time new growth starts. Also, there is variation within this species--some plants will normally drop more leaves in the spring than others. English holly does not have the pronounced leaf drop in spring which occurs on American holly.

Q- Are there other species of *Ilex* than *I. cornuta* which can have berries without effective pollination, e.g., *I. crenata* or *I. pernyi*?

A- Yes. To a lesser degree, *I. opaca* and *I. aquifolium* can produce fruit without pollination. This can also occur in *I. crenata* and *I. pernyi*. This condition possibly occurs in many other species of *Ilex*, but other species have not been so carefully observed and reported on.

Q- Is 'Camelliaefolia' an English holly or a hybrid?

A- This cultivar is thought to be a putative hybrid, belonging to the hybrid name *I. x altaclarensis*, which is *I. aquifolium* x *perado*. In a loose sense, the common name English holly is sometimes applied to both *I. aquifolium* and *I. x altaclarensis*.

Q- Does *I. x 'Angustifolia'* mean an unidentified holly crossed with 'Angustifolia'?

A- Yes. An epithet of this kind indicates that 'Angustifolia' was one parent and the other parent is unknown. When using this epithet, care must be taken to indicate the status of the words precisely, that is, to indicate whether the name is intended as a species or as a cultivar. In the latter case, the first letter should be capitalized and the word enclosed in single quotes; this indicates 'Angustifolia' as a cultivar. There are interspecific hybrid names occurring in *Ilex*, such as *x aquipernyi*, *x beanii*, *x kiusiana*, *x koenheana*, *x makinoi*, *x meserveae*, and *x artenuata*. These are treated like species names, but should always be preceded by a multiplication sign.

Q- I have only a few hollies, and I have trouble raising *Ilex cornuta* 'Burfordii'. Does it require sun or shade? Does it require plenty of water?

A- 'Burfordii' is tolerant to both sun and shade; it performs best in partial shade to full sun. The water requirements for 'Burfordii' are comparable to most other broad-leaved evergreens. The average rainfall is normally adequate in your area. New plantings should not be allowed to severely dry during the first growing season. On established plants, watering during dry spells, particularly on sandy soils, is beneficial. Continual soaking or poorly drained soils can be harmful.

Q- Are there any new developments on the control of holly berry midge?

A- Currently, diazinon is being recommended in many areas for midge control. Some holly growers are having success with it, others are not. It appears that timing of spray is very critical. 'Cygon' is equally effective, though somewhat less safe to use. *Ilex* has been removed from the 'Cygon' label because of the injury it can cause on *I. cornuta*. Pesticide regulations are so strict that pesticide recommendations should come only from State and County Extension Services in the area where you live.

HOLLY REGISTRATIONS

1-77 *Ilex cornuta* 'Aglo' female
Clarence S. Britt
9010 Breezewood Terrace
Greenbelt, Maryland
Registered January 24, 1977

'Aglo' originated about 1955 from seed collected at Shayne, Louisiana. It was grown at 6010 31st. St., N.W. Washington, D.C. by Gilbert Posey, who selected and named it. The original plant, at the home of Mr. Posey, is 20 feet (6.1 m) tall and seven and one half feet (2.3m) wide, with a compact conical habit. The leaves are two to three inches (5.1 - 7.7 cm) long and one and one half to two inches (3.8 - 5.1 cm) wide, with three marginal spines on each side of the blade and a strong spine at the tip. The basal spines are large and give the leaf base a square shape. The small, middle, marginal spines are positioned about one quarter the distance of the blade, up from the lower spines. The upper marginal spines near the tip are very strongly lobed and forward pointing. The tip spine is also very strong and is reflexed downward about 90°. The size and position of the spines and spine lobes give the leaves a blocky appearance. The petioles are one eighth inches (3 mm) long. The fruit is bright red and rounded, 3/8 inches (1 cm) in diameter, on clustered peduncles 11/16 inches (1.8 cm) long. 'Aglo' differs from 'Olga', a sister seedling, in having flat leaves;

'Olga' has convex leaves. Also, 'Aglo' has a conical habit, while 'Olga' has a columnar habit; and the original plant of 'Aglo' is more than twice the size of 'Olga'. 'Aglo' roots easily and is hardy in Zone 7A, according to the U.S. Department of Agriculture Hardiness Zone Map. This cultivar is now in commercial production by Clarence Britt.

2-77 *Ilex cornuta* 'Olga' female
Clarence S. Britt
9010 Breezewood Terrace
Greenbelt, Maryland
Registered January 24, 1977

'Olga' originated about 1955 from seed collected at Shayne, Louisiana. It was grown at 6010 31st St., N.W., Washington, D.C. at the home of Gilbert Posey. The original plant, at the home of Mr. Posey, is seven feet (2.3m) tall and six feet (1.8 m) wide, with a compact columnar habit. The convex leaves are two to three inches (5.1 - 7.7 cm) long and one and half to two inches (3.8 - 5.1 cm) wide, with three marginal spines on each side of the blade and a strong spine at the tip. The basal spines are large and give the leaf base a square shape. The small, middle, marginal spines are positioned about one quarter the distance of the blade, up from the lower spines. The upper marginal spines near the tip are very strongly lobed and forward pointing. The tip spines is also very strong and is reflexed downward about 90°. The size and position of the spines and some lobes give the leaves a blocky appearance. The petioles are one eighth (3 mm) long. The fruit is bright red and rounded, 3/8 inches (1 cm) in diameter, on clustered peduncles 11/16 inches (1.8 cm) long. 'Olga' differs from 'Aglo', a sister seedling, in having convex leaves, while 'Aglo' has flat leaves. Also, 'Olga' has a columnar habit, while 'Aglo' has a conical habit; and the original plant of 'Olga' is less than half the size of 'Aglo' at the same age. 'Olga' roots easily and is hardy to Zone 7A, according to the U.S. Department of Agriculture Hardiness Zone Map. This cultivar is now in commercial production by Clarence Britt.

Gene K. Eisenbeiss
Theodore R. Dudley, Ph.D.

GEORGIA									
GA 1	64	51	36	F	2/2/68	St. Simons Island, on grounds of Christ Episcopal Church			
GA 2	109	46	48	?	7/11/68	off Ga hwy 39-1/2 mi. S of Clay Co. Early Co line 500 feet down old River Road			
GA 3	78	65	--	?		Stephens Co. 6 mi. E of Toccoa on grounds of Jarrett Manor			
GA 4	109	46	61-1/2	F	9/1/70	Ben Hill Co. near home of E.L. Snowden, Snowden Rd. Fitzgerald			
GA 5	111	46	28	F	9/30/70	Houston Co. 137 Napier Av., Waner Robins, on property of Mrs. Maggie Graham			
GA 6	133	51	39-1/2	?	9/23/70	2 mi. SW of Roberta, Crawford Co. and 1 mi. N of hwy 28			
GA 7	95	55	45	F	3/1/71	Cherokee Co. on GA hwy 92 8/10 mi E of intersection of Ga 92 and Bells Ferry Road			
GA 8	95	51	51	F	11/10/72	Troup Co. State Rt 27 5 mi. N of Pine Mountain on rt. of road by small white house			
	80	60	55			Augusta			
MARYLAND									
MD 1	81	40	40	M	12/26/67	Hyattsville			
MD 2	82	45	30	F	12/30/67	2 mi. N of Susquehanna River on Md hwy 40 between Balt & Wilmington on B & O right of way			
MD 3	144	51	45	M	1/17/68	St. Mary's City on property of St. Mary's College of Md.			
MD 4	81	39	36	F	1/18/68	St. Mary's Co. in field about 100 yds. W of St Rt 242 between Morganza and Clements. Milestown Rd opposite new school Chopticon High School on farm of the late Dr. Johnson			
MD 5	49	49	22	F	5/15/68	Prince Georges Co. Fort Foote opposite 8810 Buffwood Lane on property of Buffwood			
MD 7	123	56	34	F	7/9/68	Ann Arundel Co. Edgewater Holly Rd. corner Riverside & Fairlea			
MD 8	102	69	40	M	7/10/68	Near Easton Adkins estate "Woodland" Rt 322 Oxford Rd. Follow Harrison Str turn rt just past Paper Mill Pond about			

LIST OF THE LARGEST TREES OF *ILEX OPACA* IN THE U.S.

Slide No.	Trunk Cir. (in.)	Height (ft.)	Spread (ft.)	Sex	Date	Location
ALABAMA						
ALA 1	106	49	46	F	8/20/63	Excamiba Co. 20 mi. W of Andolusia S of hwy 29
ARKANSAS						
	89	67	35	?		Jefferson Co.
DELAWARE						
DEL 1	81	86	39	M	9/19/68	Sussex Co. in Ellendale St Forest
DEL 2	116	41	42	M	9/19/68	Dover "Eden Hill" farm along side of RR tracks where track narrows from 4 to 1 track

						1 mi. long lane to abandoned old estate house on water front	94	40			Hatteras Island; Buxton			
MD 9	75	55	26	F	7/10/68	Adkin Estate near Easton same property as preceding; male tree	<u>OHIO</u> OH 1	65-59	40		9/12/68	Vinton Co. Vinton Twp near Carpenter		
							OH 2	75	51	35	?	9/12/68	Evergreen Motel parking lot on N side of Atl US 50, a few miles E of Marietta	
MD 10	108	45	32	F	10/21/68	"Woodstock" 6.7 mi S on US 301 from intersection of MD 408 & 1.3 mi S of subdivision known as Marlton. About 400 ft. from residence Prince Georges Co.	OH 3	32-30	39			9/12/68	Gallipolis State Hospital (SE Ohio near W. Va line)	
							<u>PENNSYLVANIA</u> PA 1	145	59	32	M	2/13/68	Longwood Gardens, Kennett Square. This tree divides into 3 trunks at 15' They at 4-1/4 are 82", 38", 69"	
	68	40		M	2/28/71	near Whitsford by old remodeled sandstone house, formerly known as Morgan's Tavern	PA 2	71	35	39	F	2/12/58	Pa rt 74 S to Delta turn E toward Susquehanna River cross New Holdwood Bridge Road to farm of R.A. Johnson. Owner	
	109	70	56	M		about 12 mi. from Chestertown	PA 3	79	65	43	F	4/12/76	Outercreek Park at Indiana Steps Park owned by Pennsylvania Power & light Co.	
	64	40	50	F	2/29/71	Harford Co. Whiteford Rd. from intersection of Md rts 165 & 136 (blinker light). Take 136 S to Ridge Road, the 2nd paved rd; turn left 3/10 mi. to Wm. LeMaster's home. Owner						3/14/71	York Co. went off Pa Rt 74 at Collonsville about midway between Delta & Red Lion on Legislative Rt 66013 1-1/2 mi. from Rt 74 Chznceford Twp	
<u>MISSISSIPPI</u>	92	40	35	?		Near Waynesboro, property of Scott West								
<u>NEW JERSEY</u>	100	60		M		Garden State Parkway 4 mi. S of Ocean City entrance								
	87					W Mary Elmer Lake Drive Bridgeton Cumberland Co.		101	35	21	F	2/28/71	Lancaster Co. Pa Rt 272 going toward Quarryville rt turn on Little Britain Church Road in Ful-ton Twp	
<u>NORTH CAROLINA</u>	NC 1	133	73	45	M	7/26/68	at New Bern take Rt 17 to Bridgeton Rt 304 to Olympia (4 mi.) cross small bridge at top of rise (400'); turn left across RR church on left go 2 mi. "Grandpappy Holly":	<u>SOUTH CAROLINA</u> AS 1	86	38	34	F	1/25/68	nr. Spartanburg take Rt 215 to West Springs 3.7 mi. past West Springs tree on lest Union Co.
	NC 2	103	65	40	M	1/23/68	Property of Mr. Cottrell near Louisburg	SC 2	25-30 27-41 35	38	39	F	1/27/68	Sumter Cr. RFD Dalzell 1 mi. E of Rt 521 1 mi. SE of Rts 521 and 441 on property of Mrs. l'Ans Jones
	NC 6	72	50	39	F	2/3/69	Jackson Hill N.C. (25 mi. from Lexington off Rt 8 S)	SC 3	42-21 16-33 30-31 28-23 43	45	41	F	1/27/68	Same directions and owner as above
	NC 7	81	41	39	F	2/3/69	Davidson Co. Southmont off Rt 8	SC 4	98	46	32	F	1/28/68	Sumter Co. Rt. 3 Sumter Property of Loring Lee Jr.
	NC 8	82	54	39	F	2/3/69	Davidson Co. New-some Tuckertown Lake	SC 5	60	54	31	F	2/ 7/68	Kershaw Co. Camdem, on grounds of Public Library
	NC 9	97	39	36	M	2/4/69	Rowan Co. near Bear Poplar at house "Woodgrove" near Salisbury W of High Point	SC 6	90	56	36	M	4/11/68	Fort Hill. John C. Calhoun's property on campus of Clem-
	85					Edenton								

SC 7	94	63	36-½	M	4/11/68	son University Same as above										down river from Jamestown
SC 8	48-44 50-44	37	35	F	4/15/68	Union Co. about 3 mi. SE of Pacolet about 1/4 mi. off Rt 176 on farm of Bud Free	VA 4	78	61	41	F					Westbrook Sanitari- am Westbrook Ave Richmond
SC 9	57	64	22	F	4/12/68	Oconee Co. above Walhalla Rt 1 off right-hand side of road by creek	VA 5	89	40	43	M	10/14/69				Hanover Co. Atlee 6 mi E of Rt 301 on Atlee Rd
SC 10	87	48	32	M	4/12/68	Oconee Co. off hwy 183	VA 7	111	44	42	M	10/24/69				Richmond West- wood Ave between Chamberlayne & 3200 block of Sem- inary on vacant lot
SC 11	48-41 51-26	40	41		4/12/68	Oconee Co. near Oakway off or near Rt 24	VA 8	57-38 26-28 54-38 75	45	38-½	F	10/23/69				5 mi N of Ashland. Meadow Farm at race track E off Rt 95 at Doswell Lum- ber Co cross North Anna River
SC 12	84	57	39	M	4/15/68	Union Co. off Hwy 176 & 9 about 2-3 mi. Sor E of Pacolet. Farm on Kennedy Mill Rd. Holly in front of small white house on hill	VA	66-62	58	40	M	3/8/68				Mt. Vernon
							VA	75								Vienna
SC 13	135	54	39	F	2/7/69	Near Newberry 1/2 mi. E of I-26 on left side of hwy in field about 50' from hwy (rt 121 to Whitmire)										
SC 14	102	48	28		3/14/68	Fairfield Co. at cross roads of Rt 54 & Rt 213										
SC 15	104	54	43	F	5/27/68	2800 Colonial Drive Columbia SC										
TEXAS																
	86	49	34-½			Indiana Mound Nur- sery near Alto										
TX 1	160	53	61		9/68	Liberty Co. near Hardin, 3 mi. W of Hardin adjacent to farm market Road 1411										
VIRGINIA																
VA 1	76	45	26	M	11/24/67	about 3950 Old Brook Road Rt 250 about 20 mi W of Richmond Junc Rt 632 with sign Gooch- land C.H. rt side of road near sign										
VA 3	132	31	31	F	7/11/68	Hog Island in James River, across from &										

Slide No. = Number on slides with other information

Date @ Date tree was measured

Location = Information from John H. Gruver and others.

This list was prepared by Edward Pettit, Chairman of the Big Trees Com-
mittee of the Holly Society of America, Spring, 1976; but not received
until early 1977. The Ed.

AN EFFORT TO CONTROL *PHYTOPHTHORA ILICIS*

The first report received of the meeting of the Oregon Holly
Growers Association at Beavercreek Farm, Oregon, in September
1976, did not contain Archie Erickson's remarks on the steps he
had taken to control *Phytophthora ilicis* in his holly orchard.

Mr. Erickson stated it was a new experience for him to come
into contact with this disease, since he had not met with it in
eastern United States. He applied "Nabam" in September, but it
did not prove successful control. He changed to tribasic copper
sulphate and he also cut skirts from the trees for air circulation.
He has eliminated certain hollies from his orchard, which he found
to be susceptible to phytophthora-heavy clustered types were
among those which he eliminated. Mr. Erickson removed about
1,000 trees; he learned that "Early Cluster" and "Pinto" are es-
pecially susceptible. It took him three years to control the dis-
ease with tribasic copper sulphate, then he went to "Dithane" to
keep the disease under control. His orchard is now in a fairly
stable condition.

The October *Holly Letter* will contain the Membership. Ed.

THE HOLLY SOCIETY OF AMERICA, Inc.

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Holly Society of America

INCORPORATED 1947

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July, 1977

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The Holly Society of America has been receiving reports of a rapid increase in the Holly Berry Midge (*Asphondylia illiciola* foote). This questionnaire is a preliminary survey to establish the degree and distribution of this particular insect pest, the natural range of the insect and other basic information to determine what, if any, additional action should be taken by the Holly Society.

We would appreciate your cooperation in answering the following questions and returning the completed questionnaire at your earliest possible convenience to enable us to tabulate the information.

Holly Berry Midge Report

Submitted by - _____

Mailing Address - _____

City, State, Zip Code - _____

County - _____

1. - Does the holly berry midge appear in your area? Yes // No// Unaware//

2. - If so, where is it most prevalent,
Commercial plantings//
Ornamental plantings//
Native stands //
All three //

3. - Has the insect population increased since 1973? Yes// No// Unaware//

4. - Do you know of any recommended control measures? Yes// No// Unaware//

5. - If your answer to #4 is yes, please list the control measures

6. - Do you know of any research on the life cycle, control measures or other research work being performed in your area on this insect? If so, please list the name of the person conducting this work and the name of the institution at which it is being performed.

THANK YOU,