# The International Plant Propagators' Society: The Early Years©

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The concept of an association devoted to plant propagation had its origin in 1919 as the National Association of Propagating Nurserymen. The association met annually with the American Association of Nurserymen and published six proceedings. Sixty nurseries held membership in the Association. The name was changed in 1928 to The American Plant Propagator's Association. Three years later, in 1931, it passed out of existence possibly due to the impact of the Great Depression and according to Jim Wells a failure of members to freely share information. Roy Nordine, propagator at the Morton Arboretum, described some of the activities of this predecessor association in his presidential comments in Volume 9 of the Proceedings of the Plant Propagators Society.

The organizational meeting of today's Plant Propagators' Society was held in Cleveland on November 8-9, 1951. Ed Scanlon, Commissioner of Shade Trees in Cleveland, and editor of *Trees* magazine, convened the meeting. The first officers of the new Society were James S. Wells, President, L.C. Chadwick, Vice President; and Ed Scanlon, Secretary Treasurer. The organizational committee was made up of Peter Zorg, Fairview Evergreen Nursery, Fairview, PA; William E. Snyder, Cornell University; John D. Siebenthaler, The Siebenthaler Company, Dayton, OH; James E.E. Ilgenfritz, Ilgenfritz Nursery, Monroe, MI; Richard H. Fillmore, Arnold Arboretum; Roger W. Pease, West Virginia University; F.L. O'Rouke, Michigan State College; and Roy M. Nordine, Morton Arboretum.

Part of the success can be attributed to the background of the founders of the Society. They represented successful nurserymen, plant propagators from industry and arboreta, and academics from colleges and universities. The synergism of bringing together the practical and the theoretical and the private and public sectors made the meetings very exciting and beneficial to all who participated. The motto of "To Seek and to Share" had real meaning at the meetings. This was an ideal mechanism to speed the rate of technology transfer and provided not only an exchange of information, but also a reality check on what worked and what did not work and what was needed. Propagators who kept locks on their greenhouses found that they gained much more by sharing information than by keeping it to themselves. There was also the very positive influence from some very colorful members in addition to the organizers. Many were of Dutch immigrants including my Dad, Case Hoogendorn, Martin Van Hoef, and John and Peter Vermuelen to name a few. They added color and vitality to the presentations and particularly to the discussions that followed.

The formative years were not without disagreement. Jim Well's early vision of the Society, as expressed in the first meeting, was a "Guild of Plant Propagators". Full membership would be stringent and reflect an extremely high standard of ethics, skill, and experience. The requirements suggested were:

- At least 10 years of active and practical experience in the art of plant propagation.

- A high standard of integrity in the community and trade. Not less than four people of similar standing should vouch for this.
- A ready willingness to freely share his knowledge and skills with other members.

Of the three requirements, Jim considered the third of paramount importance. He said, "It is unfortunate that many growers do not subscribe to this idea of free exchange of information which they have perhaps acquired after much time, trouble, and expense. There are arguments which they can put forward, based entirely on the commercial aspects of these matters to support their views, but I would strongly urge that we, as a group of craftsmen, would place ourselves above the almighty dollar, and we should take every possible precaution to see that people who are mainly concerned with what they can get out of the organization, and not one bit concerned with what they may contribute, should be rigorously excluded." Jim proposed that if an individual met the first two criteria, 10 years experience and references who vouched for his integrity, he should be admitted as novice membership, and only after participating in a number of meetings and demonstrating his willingness to participate, would he be considered for full membership. The concept of "To Seek and To Share" had its origin in the very first presentation to the Society – "The Propagator –The Basis of Our Industry!"

Not all members agreed with the proposed exclusive membership requirements. It was finally worked out that membership would be by invitation only and that full membership required 5 years of practical experience in plant propagation and a strong desire to share information. Three members were required to vouch for and support the application. A membership committee was appointed to review the applications of invited prospective members. Individuals with less than five years experience would be admitted as junior members.

The debate over membership continued in the early years. At the ninth meeting the membership committee reported that in some cases sponsors listed on the membership application were not aware they had sponsored the applicant in question. This led Jim Wells to state, "I feel very strongly indeed, as one of the original members, that we should look back to the original goals of the Society and try to refresh our memories as to what we were trying to achieve. This will enable us to be sure that the present excellent standards are maintained and improved. I see around here a number of people that I don't think ought to be here, and I don't quite know how you are going to keep them out unless we make it more widely known that this is a restricted meeting and that you just can't barge in."

Jim's statement prompted this response from Dick Fillmore now from Duke University: "Now, while I sympathize with Jim Well's general statement, I want to make one qualification, and that is, there can't be chief's without Indians, and where some folks simply sit quietly and listen respectfully, they may also be contributors, too, in the sense that they furnish a source of body in the meeting. On the occasion in which I have looked out over the group, I have felt that when I spoke the people were listening to me with reasonably good attention, and I think that is one criterion of interest. The total criterion of interest can't be determined by how much a man talks. How much he listens may be important also."

Jim Wells raised the issue again at the 12$^{th}$ meeting in Cincinnati, Ohio in 1962. He restated his concerns made 3 years earlier that the Society was getting too large and too dilute and that there were people who were not contributing. The member

ship committee recommended that beginning with the meeting in 1962 each member be required to attend the annual meeting at least once in three consecutive years or make a contribution by submitting an appropriate paper to the Editor. Failure to comply with these requirements would result in automatic suspension. Jim wanted to be sure that the recommendation was actually adopted, and after much debate, moved the issue to a vote by the membership during the business meeting. The vote passed and one member was so upset he resigned.

Another area of disagreement was the meeting site. After the first meeting in Cleveland's Statler Hotel, meetings two through eight were held at the Wade Park Manor, also in Cleveland. It was a quaint hotel that the propagators had pretty much to themselves. It also had a good bar that met the needs of many members after the hours of presentations and discussions. It also provided a place to iron out some of the disagreements. However, as the Society grew, the space became limiting, snow sometimes presented problems in Cleveland in December, and some members wanted to visit other parts of the country to attract new members and visit other nurseries and propagation units outside of Ohio. A poll was taken and 56 respondents voted to stay in Cleveland, 30 voted for Philadelphia, 25 for Chicago, 22 for Mobile, 10 for Louisville and six other cities received one vote. The Executive Committee decided that by combining the votes for places other than Cleveland, a majority of members wanted a change and, thus the ninth meeting was held in Philadelphia, Pennsylvania, but with the agreement that the next meeting would return to Cleveland.

Other members began to express concern that the meetings were getting too large and that the opportunity for thorough discussion at the meetings was diminished. In addition propagators in other parts of the country felt it was a burden to travel to the East Coast. One solution was to establish regions or chapters of the Society. A proposal was presented to hold a Western Conference. Ed Scanlon expressed concern about loss of control and it was proposed that the Western Conference be conducted as a trial for a 3- to 5-year period under the supervision of the Eastern Region. However, when the final vote was taken, the recommendation to establish a Western Conference was approved without restrictions.

Perhaps, the most contentious issue to face the young Society occurred in 1961, after the first very successful Western Plant Propagators Conference, when the Constitution necessary to establish regions was presented to the membership for a vote. Included in the constitution was a proposal to change the name of the Society to the International Plant Propagators' Society. Opinions were expressed that this was an American society and that people in Europe would want no part of it. Others suggested that rather than "international" the name should be changed to the American Plant Propagators' Society. The discussion was so heated that the business meeting lasted for 2 h. People were exhausted and finally voted to approve the new Constitution that established regions with the understanding that an amendment to consider the name of the society would be presented to the membership at the 1962 meeting.

At the 1962 meeting an amendment was presented deleting the name "International" from the Constitution wherever it appeared. President William E. Snyder gave the instructions that a "yes"vote meant that the Society would be known as the Plant Propagators' Society and that a "no" vote would retain the name International Plant Propagators' Society. The first vote was 49 yeas and 28 no. Jack Hill raised the

question whether members really understood the voting procedure and called for a revote. After considerably more discussion a vote was taken to rescind the first vote. Upon reconsideration, the amendment to delete "International" was defeated and the consideration of the amendment moved to the West Coast for a vote the following year. Ralph Shugert, the I.P.P.S. historian, reported that several people left the meeting in disgust including Ed Scanlon, the original organizer of the Society who was concerned about the establishment of a Western Region and very opposed to the name change. The International Plant Propagators Society was formally established in 1963, when the Western Region voted 8 to 7 to defeat the amendment that would have removed the word International. Obviously there were mixed feelings on the West Coast as well as on the East Coast.

In spite of the disagreements, the Society prospered and grew to 2863 members listed in the 1998 membership directory with 8 regions and a Southern Africa potential region and a Latin America expansion. As I said at the beginning, the synergy and excitement created by a mix of commercial and academic propagators contributed to early success of the Society. This was reinforced by the philosophy of "To Seek and To Share" with emphasis on "Share." But there was yet another factor that contributed to the early and continuing success of the IPPS. It was the fact that we were in a very exciting period of new ideas, new materials, and new science related to the field of plant propagation.

Concurrent with the reinvention of the Plant Propagators' Society, was a great increase in research with naturally occurring plant hormones that regulated growth and development. Auxins that stimulate cell elongation and root initiation were discovered in the 1930s, and, in the 1960s cytokinins which stimulate cell division were identified. Synthetic root-promoting substances, such as indolebutyric acid (IBA) and naphthalene acetic acid (NAA) were synthesized and were being used in commercial plant propagation to expand the range of plants that could be propagated by cuttings. Jim Wells and Richard Fillmore, propagator at the Arnold Arboretum, gave a brief overview of the use of rooting hormones at the inaugural meeting of the Plant Propagators' Society. I remember one preparation that attracted a lot of attention on the East Coast. It was a product called Chloromone. It was allegedly prepared from young alfalfa shoots using a 2 x 4 method of extraction. It turned out to be a preparation of chlorophyll with a high concentration of NAA.

Increased interest in propagation by cuttings stimulated propagators to look for better environmental control of the area in which rooting was taking place. The first challenge was to contain the air space around the cuttings in order to raise the humidity and reduce moisture loss from the cuttings. The second challenge was to prevent the confined air space from getting too hot and "cooking" the cuttings. The introduction of plastic films made it possible to go from bell jars, used in the Ghent Botanical Gardens, and double glass to plastic films and tents.

There were some ingenious variations on how to achieve moisture control and avoid heat. Guy Neering, a nurseryman in New Jersey, developed a frame for the propagation of Rhododendron cuttings. The frames were oriented due north and used reflective metal to provide the cuttings reflected rather than direct sunlight. Leslie Hancock, from Woodland Nursery, Cooksville, Ontario, Canada, described a completely different approach at the third meeting of the Plant Propagators' Society. The inspiration for the technique, which he called the "burlap-cloud method," came from 4 years experience as a horticulturist at the University of

Nanking, China. The technique included careful preparation of a sandy loam soil in frames and sticking the cuttings directly into the soil. During the day, the frames were covered with burlap that was frequently sprayed with water. The evaporation from the burlap provided high humidity in the frames, as well as evaporative cooling. In the late afternoon the burlap was removed from over the beds to "air" the cuttings. Mr. Hancock had good results with wide range of deciduous shrub and evergreen cuttings.

The real break-through came with the introduction of moisture into the cutting bed. At the inaugural meeting Dr. L.C. Chadwick described the used of binks humidification nozzles in his paper on "Controlled humidification as an Aid toVegetative Propagation". Compressed air was passed over a column of water to produce a fine mist. At the second meeting, during a discussion period, Jim Wells described an experiment he conducted following a visit with John Watkins from the University of Florida. In July he stuck magnolia, azalea, rhododendron, *Pieris japonica*, *Taxus*, juniper, Japanese maple, and euonymus cuttings in a sand and peat mixture medium. He placed water lines over the beds with Monarch nozzles installed at 2-ft intervals. The sash had been removed from the greenhouse, and no shade was used. The mist was run from 7 in the morning to 6 or 7 at night and, during very hot periods, it was on all night. Jim showed slides of the "astonishing results" and observed that there was a complete absence of any fungus and that "it would appear that this method of propagation has considerable possibilities and it seems to indicate that rather than protecting ourselves against the intense summer sun and difficult weather at that time, it is better if we can throw ourselves open to it, use all the energy that is coming from the sun and just give the plants sufficient water so they do not flag." This was the first report of the new technique of mist propagation to appear in the Proceedings of the Plant Propagators' Society.

At the third meeting Harvey Templeton described an ingenious approach he developed and named the "Phytotector system" of propagation. Harvey combined a plastic tunnel with a mist line down the center and, as did Leslie Hancock, rooted his cuttings directly in the sandy, Winchester, Tennessee, soil. The rooting was fast and excellent and following rooting and hardening off, the plastic tunnels were removed and the young plants grew rapidly in place. The third meeting was my first and I was a graduate student at Cornell University under the tutelage of William E. Snyder. I presented a paper on the construction of a simple and inexpensive time clock to turn mist on in the morning and off in the afternoon, to provide intermittent mist during the day. We had found that using intermittent mist gave excellent results and used much less water, reducing drainage problems and excessive cooling of the medium. By the fourth meeting there was a roundtable discussion on mist propagation moderated by Bill Snyder. By that time we began to ask questions as to why mist propagation was so successful by making comparisons between cuttings under double glass and under mist. The bottom line was that cuttings under the combination of full light intensity and cooling effect of the mist had lower respiration levels and produced more net carbohydrates which could be used as the energy source for root initiation. The open air and full sunlight, plus the washing action of the mist and the presence of free water probably helped reduce the incidence of molds as compared to the high humidity and darker conditions of double glass. Mist propagation spread rapidly through the nursery and floriculture industries and greatly increased the range of plant material produced by softwood cuttings.

During this same time period another breakthrough in the plant sciences was occurring – plant tissue culture. Initially, plant pathologists used the technique of culturing the growing points of plants to develop virus-free plant material. If a plant is grown under favorable conditions, the spread of the virus does not keep up with the plant growth and it is possible to remove the growing point, or meristem, and regenerate a total plant, which is virus free. Orchid growers used this technique to produce virus-free plants and in addition found that the meristems produced not a single plant, but multiple plants. It could be used as a propagation technique to produced large numbers of genetically identical plants or clones. Also in this period, in the early 1950s, Dr. F. C. Steward, a plant physiologist at Cornell, perfected the technique of growing plants from single cells. He used the wild carrot as his experimental material and could produce a complete plant from a single cell taken from the carrot root. He demonstrated that each cell was totipotent. That is, each cell contained all the information that was needed to form a total plant. These developments led to the field of micropropagation that is particularly important in forestry.

During the early years there also was considerable discussion about the physiology of root initiation and the substances that may be involved in stimulating or regulating root initiation and development. F. L. O'Rourke from Michigan State College gave a paper on "The Effect of Juvenility on Plant Propagation" at the first meeting of the Society. Juvenility is an area of great practical and academic interest. Plants in the juvenile stage of growth are much easier to root from cuttings than when in the mature phase. John Nitsch became my major professor when Bill Snyder went to Rutgers University and we worked with *Hedera helix*, the English ivy, because you could easily distinguish between the juvenile and mature stages on the same plant. We looked at growth-promoting and growth-inhibiting substances in the juvenile and mature tissues using a bioassay developed by Dr. Nitsch. We could not find differences that would account for the great difference in rooting response. A bioassay based on root initiation in mung bean cuttings was developed and differences were found. When the methyl alcohol extracts were partitioned by paper chromatography, four root-promoting substances were found that were greater in juvenile tissues than in mature tissues. The substances worked synergistically with an auxin, indoleacetic acid (IAA). One of the substances was identified as isochlorogenic acid and using this information, other phenolic substances which promoted root initiation in the presence of IAA were identified. The greatest biological activity was found when the hydroxl groups on the benzene ring were adjacent to one another as in catechol. It was also demonstrated that the possible mode of action of catechol was to slow the metabolism of IAA. These and related findings led us to postulate that root initiation was based on an interaction between auxin and other rooting cofactors. The greater the number of cofactors present, the easier the cutting was to root. We were not able to identify the other cofactors, and applying the crude extracts to the difficult-to-root mature cuttings did not make them easy to root. Today, the tools of molecular biology are being used to try and see what genes are activated during the processes of root induction, root initiation, and root formation. But I think it is still safe to say, that to make a difficult cutting easy to root, remains a challenge for both the commercial and the academic plant propagator.

I should not leave the impression that cutting propagation dominated the early years. I must admit that it was an area in which I was intensely interested. But there

was also excellent information exchanged on seed propagation, grafting, and details on the propagation of specific cultivars of evergreens, trees, and shrubs. The willingness to share the knowledge about the art, practice, and science of propagation made it possible for everyone to leave the meetings with new ideas that could be used in the nursery or the laboratory. This open exchange of information was at the heart of IPPS' tremendous success in the early days as it continues to be pivotal in the present!

## Breeding New Selections of Repeat Blooming Daylilies©

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Arlow Stout (1876-1957), while at the New York Botanical Garden, played a pivotal role in the development of modern daylilies. Through his various contacts (especially Albert Steward, 1897-1959, working at Nanking University in China), he was able to collect several *Hemerocallis* species and many of the existing cultivars. He used these plants for hybridizing and described them in a book entitled, *Daylilies*, published in 1934. Stout's well-documented ground work set the stage for the cultivar explosion that was to follow.

The effort was slowed by the Great Depression of the 1930s and World War II but met new enthusiasm in 1946 when the Midwest Hemerocallis Society was formed and hundreds of amateurs began breeding daylilies.

My first exposure to daylilies, was with the plant, *H. fulva*, 'Europa', which made its way to America with the European immigrants; Stout gave it cultivar designation 'Europa'. Its common name was the tawny daylily and it was planted under the roof eaves on the south side of my one-room country school in Wild Rose, Wisconsin. Sometime during those 8 years of elementary school, 1943-1951, (the same time the American Hemerocallis Society was formed) I saw this plant in bloom and admired how exotic it appeared in contrast to other flora of the area (incidentally, it never reblooms).

Much later, in the 1960s I began collecting plants, including 'Europa' and in 1969 made my first crosses. Since 1969 (for 31 years) I have grown a crop of *Hemerocallis* seedlings every year. At first I grew 500 hand-pollinated seedlings a year, later 3000 to 5000 and today as many as 18,000. In my early years of collecting daylilies I became aware that a few rebloomed and often extended the bloom season from 3 weeks to nearly 6 weeks. Unfortunately, the best rebloomers were usually yellow and gold cultivars, but there were a few notable exceptions. Two non-yellow rebloomers I grew in my garden in Lexington, KY, in the late 1960s were 'Baby Darling' (purple) and 'Chipper Cherry' (red). I began crossing them with 'Bitsy' (and evergreen reblooming yellow-flowered plant that bloomed 3 times in Kentucky) and started getting a few seedlings that rebloomed once. About that same time I made several crosses with species daylilies. Over the years I observed some rebloom in three species, *H. aurantiaca, H. thunbergii,* and *H. minor*. The observation of rebloom in *H. minor* is contrary to a few earlier reports.

With these experiences as a reference I established the goal to produce reblooming