

ing plans to be there ever since we got home from the St. Louis meeting which I am so thankful now that he did attend. I hope you will have a successful meeting and please convey my heartfelt thanks to all the members for kind sympathy. Sincerely, Erma J. Kern, (Mrs. Carl E. Kern).

Our program chairman Vince Bailey has assembled a very interesting program for us and the first part of this program is a round table discussion. So without any further ado, I am going to turn the program over to Vincent Bailey, Bailey Nurseries.

VINCENT BAILEY: Members, guests, friends, we have a very crowded program so I will not take any of your time. We will go immediately to the round table discussions listed in your program. I feel we are very fortunate to have prominent people for moderators and recorders of these sessions.

[*Editor's Note:* The following round table discussions were held; "Storage of B and B Plant Materials," Arie J. Radder, Moderator, Harvey Gray, Recorder; "Viruses — Their Importance to the Plant Propagator," Professor Donald Cation, Moderator, Zophar P. Warner, Recorder; "How Critical is Timing in Taking Cuttings", Dr. F. O. Lanphear, Moderator, Hans Hess, Recorder. Summaries of the round table discussion were presented and recorded on Friday evening.]

PRESIDENT ROLLER: The next part of our program was to be moderated by Roger Coggeshall but unfortunately he is not able to be here because of illness. However, we have Dr. Robert Mullin of the University of Minnesota who has kindly agreed to take care of that duty.

MODERATOR MULLIN: I know you are all interested in hearing the next speaker. In fact I heard the comment as I entered the room, "When is Mac going to talk?". Our first speaker is Mr. Ian F. Mackay from the Conrad-Pyle Company. He will be speaking to us on the need for research on the Nursery Level.

THE NEED FOR RESEARCH ON THE NURSERY LEVEL

IAN F. MACKAY, *Director of Research*
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Before getting too deep into this talk perhaps I had better introduce myself. While at one time I was the propagator of a large nursery, for the last 12 years I have not produced a saleable crop of anything and I have had more failures than successes. Yet I am still employed and not by a charity organization. Indeed I might say that my employers have a very high regard for the value of a dollar.

What I have been doing is research on the nursery level. A broader and more embracing job than the name implies. And

also a job that is not as common as it should be.

Horticultural research is one of the oldest branches of research in existence. Earliest man carried on research every time he tried a new plant or berry for his menu. It must have been a hazardous job and some undoubtedly did not live to carry out any more experiments.

Early man also experimented and found that some plants have healing properties. As a result of which he started a line of research which continues to this day. This attracted the interest of the great intellects of early times and inspired the growing and collecting of plants in an organized manner. Thanks to these intellectuals we have landmarks in the form of writings some of which go back to 300 B.C. These allow us to gauge the progress of research for the last 2300 years.

I am not going to go back as far as this but I am going back to 1663. Three hundred years ago John Evelyn wrote about seed stratification, seed selection, wounding to promote rooting and the dangers of air pollution. By reading this author's works I had hoped to show how we had progressed over the course of the last 300 years and I was rather put out when I realized that here we are today still talking about the identical subjects.

From Evelyn's time progress in horticulture relied on the stimulation of such organizations as the Royal Society, and also on the great estate owners of England and continental Europe. It became fashionable among these wealthy people to garden on a grand scale and to fill their grounds with collections of all the plants that were available. To further their ambitions some even sent members of their staffs on plant hunting expeditions to all parts of the world. It was on these estates that the finest gardeners that the world has ever known practiced their art.

This was the golden age of discovery in gardening and the commercial nurseryman was not long in getting in on the act. Increased interest on the part of the average man in gardening spurred the demand for plants novel and different. When importations did not fill this need, nurserymen turned to hybridizing and by the mid-19th century they were already meeting with success. This can be judged by the fact that many of our best hybrid Clematis such as Clematis Jackmani were produced at this time and roses hybridized in the same period are still cataloged today.

These newly introduced plants were valuable to the nurseryman for then as now a customer was prepared to pay for the privilege of having something that his neighbor did not. As evidence of this, 100 years ago *Lilium Auratum* sold for \$40.00 a bulb.

In the mid-1800's there were two developments in America which have helped to alter the whole course of horticulture in this country. These were the founding of the land grant colleges in 1855 and of the U.S.D.A. in 1862. While at first their work was concentrated on food crops, towards the end of the last century the colleges started showing an interest in ornamental nurs-

ery crops and floriculture. At a later date the U.S.D.A. began working on the same subjects. As a result of the participation of these two institutions we have seen the whole concept of horticultural research change in the last seventy years. It has changed from the amateur methods of experimentation of the last century, to the modern scientific approach that now exists.

Today we have three important sources to which to look for new techniques and materials. The first and foremost of these are the universities and their experimental stations.

The second source of research work is that of the U.S.D.A., both at its Beltsville Research Center and its satellite stations scattered over the country.

The third source of research is that of the allied industries who are interested in filling some specific need of the nurseryman. Profit being their motive they are only interested in research that offers a reasonable return on their investment and this in turn is dependent on the acceptance of the product by the nurseryman. In practice most of the new machinery, materials and chemicals that are made available to us from industry were originally developed for other branches of agriculture. The market we offer is small and certainly not large enough for large corporations to support either research or the manufacture of an exclusive product for our use. In particular the agricultural chemical industry is being faced with increasingly severe regulation of their business where new chemicals are concerned and the development of these is becoming so costly that limited use materials stand little chance of ever reaching the market. This is going to hurt us in the long run.

These are the institutions to whom we look for help in increasing our knowledge of plant life, for better methods of growing and propagating it, and for better materials to assist its growth and to protect it from disease and pests. Never before has more research been carried out of potential value to us commercial growers.

At this point I think we need to ask ourselves two questions:

1. Are we taking full advantage of this work?
2. Are we supporting it and encouraging it?

The answer to both is NO! We are not doing either to nearly the extent that we should and the results of this neglect may become apparent before too long. To see why, I think we need to consider the decreasing influence of the farm vote in the American political scene, for this affects us. Those who question excessive federal participation in this, that and the other, and those whose interest is in cutting federal expenditures may not be so sympathetic to appropriations being made for research to help commercial nurserymen and especially if we only show a half-hearted interest in the work. A further point we want to consider is that the universities in recent years have seen a declining interest on the part of students to take horticulture with the intent of nursery employment. And finally as indus-

try becomes more and more profit conscious and more interested in mass production it is becoming less interested in dealing with a small volume and disorganized trade. This happens at a time when we, too, are more profit conscious and need all the help we can get.

All of this points to a coming decrease in research in ornamental horticulture. In view of this I think our industry should look to the time when it must devote more effort and more of its income to doing its own research. We will have to do this not only in an attempt to increase the efficiency of our production methods but also to make more effort to satisfy the needs of our customers. We will have to supply the home gardener with better plants, that are hardier and better adapted not only to climatic conditions but also to his unintentional neglect and ignorance. We will have to devise ways of making gardening easier for these people for the day is gone when planting a shrub, evergreen or rose was a major earth moving project. In short it is up to us to simplify gardening for our customers and to make it a pleasure and not a backbreaking chore.

In England a good garden is looked upon as a status symbol and this is what I want to see happen in this country. This cannot be done by dozing in complacency while other industries take our customers' leisure time and money away from us. Perhaps I am looking too far ahead so I had better return to the present. There is no question of the need for research on the nursery level in the future but what of it today? Do we need it and what should be its function?

At this time when costs of production are rising faster than the prices of our products and many of us are feeling the so called profit squeeze, and we must lose no opportunity to increase the efficiency of our operations. It is to this end that nursery level research should be principally aimed with its objectives being *to acquire, translate and apply the results of academic and industrial research*. If a nursery accomplishes this to the point that it is keeping abreast of current research and as a result is using every uptodate and cost saving technique, it is well on the way to becoming a successful business that will be capable of weathering any storm ahead.

What are the requirements needed to accomplish this? I believe there are two:

1. The need for better communication between outside research and the nursery industry.
2. That nursery management be always aware of the need for constant improvement of its operations.

Communication is the biggest bugbear that has to be faced by the propagator or grower trying to keep abreast of the times. The results of research work and the observations made by individuals are published where? In any one of God knows how many society transactions and journals, government and university bulletins, county agents information sheets and in trade papers. In the case of the nursery industry discoveries made

by them are all too often kept in secrecy, either because the originator fears his competition or as is more usually the case because he has no facilities for getting his work acknowledged. This situation is satisfactory neither to the research worker nor the nurseryman. The researcher hopes that the results of his experiments will be put to some use and certainly a progressive nurseryman wants to avail himself of these. But he first has to be aware that the work has been done before he can put it into practice. Lack of communication is the stumbling block in the achievement of this aim.

How can this be overcome? Well if you can afford to employ a full time research employee, he can subscribe to the various types of publications that I have mentioned, but the ordinary grower has neither the time nor the money for this. What he needs is a publication of abstracts on research papers that deal in any manner with commercial horticulture. He needs to know not only what work his own university is doing but also what is being done in other parts of the country. While our business is in Pennsylvania, we receive much information of value from work published in Oregon, California or Ohio just to mention a few. There is no doubt that we still miss many that we would find of value. If we had any where to turn for a single source of information on these papers, our job would be a lot simpler. Abstracts are being produced to some extent by the AAN in their periodically issued Research Review and also by some university extension services, but none of these of which I am aware encompasses a wide enough range. Today's commercial propagator requires a knowledge, albeit limited, of chemistry, plant pathology and plant physiology in addition to his understanding of the various techniques of his trade, and regardless of whether he likes it or not, he has also got to face the problem of selling his product. He needs all the information in these fields that relates to his job and he must not limit his thinking in this to purely horticultural subjects. The only attempt that I am going to make to provide a solution to this problem is to suggest that the Plant Propagators' Society is the best and most logical organization to publish abstracts from current research work. We are a unique society in the breadth of our membership and with the combined knowledge and experience of its members none is better qualified to undertake such a project.

When it comes to publication of the experiments and experiences of members of this Society, I think we may have an easier solution. Actually this subject was covered by Peter Vermeulen two years ago at our annual meeting. He put forward several suggestions for the improvement of communication among our members and I hope these are still being considered. It is worth noting that over half of our membership have either not had the opportunity or have not felt inclined to present a paper at any meeting. While obviously not everyone can contribute a paper at every meeting, I think a way needs to be found to allow these silent members to contribute. Could this not be

achieved by asking members to contribute not a complete paper but a short summary or abstract to our newsletter, on some feature of experimental work that they have carried out, or of some original technique that they use. From these abstracts our program chairman could draw for complete papers or individuals could write to the originators for more complete information if it is a matter that is of particular interest to them. There is no member of this society who does not have something worthwhile to contribute; otherwise, he would not be a member.

I think that is enough on the subject of communication. Now to turn to the second cause of the failure to translate research to operation. Management and where it fails to manage.

In a speech given the other day the President of the American Nurserymen Association, Sidney Hutton, Jr., made some remarks that I think are worth repeating. I quote, "We are not used to many of the methods, means and aids accepted by other industry as a part of modern management." He went on a little further, "Occasionally, when people in other industry have realized how unsophisticated we are they have jumped to a very erroneous conclusion. They have considered the nurseryman to be a little dumb or a little stupid." And he continued, "We are unsophisticated, Yes; dumb, No. The very fact that we have come as far as we have without the use of these other management tools proves that we cannot be dumb."

There is no question about it, nurserymen are not so dumb but being plant lovers first and businessmen second, too many lack accurate records of production costs. Selling prices are based on a study of the competitor's catalog and if all is well the business remains solvent. However, without an accurate breakdown of the cost of each phase of the production of a plant, the grower has no means of determining where there is a possibility of reducing costs. Without this information the need for research on the nursery level goes unrecognized and techniques are either not adopted or are very slowly adopted. Do we honestly still believe that sweat, the employment of mules and ragged weed chopping hoers are the best way of growing a nursery crop? If they are, then it is only because we as an industry have failed to support horticultural research. Look at any other branch of agri-business and you will see research being applied. Vegetable farmers, cut flower growers and dairy farmers are all more receptive to new ideas and consequently more is done on their behalf. They are all willing to carry out research on their own level to prove that a new idea will or will not work, but not the average nurseryman unless he is first worked over by a very good commercial salesman. You don't believe me? Well how many growers have a really well planned chemical weed control program? How many treat their soil with nematocides without first having the nursery inspector quarantine their crop? Why are we still digging evergreens by hand and shearing them by hand? We certainly would not be if we gave researchers the support they need to invent alternatives and if

their inventions were used.

If we look to our brethren in the floriculture industry, we will find that they co-operate very closely indeed with the universities and the U.S.D.A. They recommend where they think research can be of the most use, they maintain close contact when this is being done, and finally they put the results of the work to use. Of course, their prime interest in growing is how many cents they can get per square foot of bench space. Most of us commercial nurserymen are more interested in the beauty of the plants. Now this is no crime and indeed it is an asset. If we are enthusiastic about our product so will be our customers. But we can learn from the floriculturist. We need to follow his example in co-operating with academic research and with applying the results it achieves. But to do this we have to experiment ourselves under our production conditions.

If we are successful in this, our industry will not only be more progressive but it will also appear more attractive to the type of employee we need now and will need even more in the future. This is the space age and few aggressive, ambitious young men want to be associated with an anachonism in industry. To progress we have got to:

1. Acquire
2. Translate
3. Apply

the results of academic research.

To achieve this spells out the need for research on the nursery level.

MODERATOR MULLIN: We will proceed with the next speaker who represents one of three major research areas — the university, the U.S.D.A., and private industry. Our speaker is from the second area, the U.S.D.A. Dr. Marc Cathy will discuss what a propagator should do to pace the development of his plants.

PACING DEVELOPMENT OF WOODY PLANTS

HENRY M. CATHEY¹

Many growers have already made great advances in accelerating handling of woody plants. Most growers still aim their material towards seasonal sales for plants to be used as foundation plantings for the home, business, or factory. Growers must continue to service the landscape horticulturist but they also must service markets with cuttings and liners of woody plants that have been regulated. Regulated liners will provide plants for decoration inside the home and also can be used as plantings outside the home. Many berried or flowering plants are now on the market that can also serve as decorative house plants.

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