BEGINNER'S SERIES

Orchid Culture — 12 — Propagation on a Small Scale

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BOTH seedling and mericlone production of orchids are involved procedures requiring considerable equipment and materials. And yet, they compensate for this in the number of plants they produce. In contrast, orchid hobbyists have several simple and reliable methods at hand with which to multiply their orchids — on a far smaller scale. These include propagation by division, and by keiki (offset) production. Like meristem tissue culture, each of these techniques is a form of asexual or vegetative propagation; that is, they result in more of the same, genetically identical plant.

DIVISION

As mentioned earlier in this series **(Orchid Culture — 10 — Repotting,** in the December 1981 BULLETIN, pages 1437-1445), propagation by division is an option logically contemplated at the time of repotting. Illustrated here is the plant subject of the pictorial series on repotting featured in last year's December BULLETIN — before and after division (FIGURES 1 and 2). For sympodial orchids, such as cattleyas, the cutting point for division is obviously the connecting rhizome. Before the cut is actually made, two questions should be asked. One, will each resulting division have at least one viable "eye", one capable of (if not already) producing new growth? And two, will each division have enough pseudobulbs to support this new growth?

Most pseudobulbs have at their bases several triangular patches of meristematic tissue, tissue made up of cells capable of rapid division and differentiation. Each patch of this special tissue, commonly called an "eye", when motivated will produce an additional pseudobulb. Nearest the base of a pseudobulb are the primary eyes, usually two in number (if on a front growth). In addition to these, slightly further up can usually be found another set of smaller, secondary eyes. These can serve as a back-up for the pseudobulb if, for some reason, its primary eyes are no longer viable. If this is the case, a secondary eye can frequently be induced to initiate new, though typically somewhat weak growth *(see* FIGURE 3).

Making certain that each resulting plant has sufficient pseudobulbs is also important in division, if flowering is to continue with as little interruption as possible. Historically, the recommendation has been to make four-bulb divisions or larger, particularly with regard to cattleyas. This is not to say that anything smaller will dry up and blow away. One-bulb divisions that survive are certainly possible with many sympodial orchids (FIGURE 3), but whether they flower for years to come is another question altogether. Without the energy supplied by supporting, mature pseudobulbs and their roots, new

growths on small divisions are likewise small — and highly unlikely to flower. A hobbyist has no need for many, small, unflowering divisions of one large, flowering plant, so the rule-of-thumb — no fewer than four pseudobulbs per division — holds true.

Modern *Cattleya* hybrids with a mixture of genera in their backgrounds, such as the *Potinara (Brassavola* X *Cattleya* X *Laelia* X *Sophronitis)* hybrid pictured in FIGURES 1 and 2, are more inclined to have branching rhizomes with several active "leads", or growing points, than the hybrids of earlier times. This gives the grower the convenience of being able to divide such hybrid plants into several divisions, each with its own active, young pseudobulb capable of

FIGURE 1 — Division is usually accomplished at the bare-root stage of the repotting process. The yellow vertical line indicates a suitable dividing point for the plant of *Potinara* Golden Delight 'Tangerine' pictured here.

quickly initiating new growth. Nevertheless, this is not always the case, and "back-bulb" (older, inactive) divisions may be necessary if a sympodial orchid is to be propagated. The two criteria for division still apply: a back-bulb division must have at least one viable eye, and enough pseudobulbs to support new growth. Removal of dry sheathing at the base of the pseudobulbs may be necessary to determine the condition of the dormant eyes. Once located, if they are green, most likely they are viable; if they are brown and shriveled, most likely they are not *(see* FIGURE 3).

Once it has been determined that the backbulbs do have eyes capable of initiating new growth, the question then is one of timing. Many growers have greater success with backbulbs if the division is made well before the repotting process, while the plant is still properly established in its present medium. Severing the backbulbs should be sufficient inducement to activate a dormant eye. When repotting time arrives, the two now active divisions can then be potted separately.

FIGURE 2 — after the cut is made, the now two separate plants are groomed of all dead or damaged roots and leaves. Each resulting division has its own active growth and at least four mature pseudobulbs. They can now be potted up separately.

Photography: Stephen R. Batchelor

If severance of the backbulbs before repotting does not induce new growth, or the division is made at repotting, an examination of the root system of the back-bulb division is in order. Many older bulbs tend to lose their roots, and it is not at all unusual for pseudobulbs over two or three years old to have few viable roots on their connecting rhizome. If this is the case, and no eye has swelled and begun to grow, repotting of the backbulb division may be premature. Many hobbyists will maintain such a dormant backbulb division unpotted under conditions of high

Photography: Stephen R. Batchelor

FIGURE 3 — this one-bulb division of *Epidendrum falcatum,* accidentally broken off of an established plant, has managed to grow despite its size and the loss of its primary eye *(lower center).* With the initiation of a secondary eye farther up the bulb, a new, though far smaller pseudobulb has formed and matured. From its primary eye, in turn, a more vigorous growth has begun.

humidity and low light to prevent its desiccation until an eye "breaks" and/or new roots form. Repotting of a rootless backbulb division can of course be successfully done, provided that the plant is securely staked and kept under these same conditions, with little watering, so as to encourage precious new roots and growth.

Monopodial orchids, those which grow vertically from one growing point at the top, afford more limited opportunities for propagation by division. Conventional division is by "tip cuttings" — essentially by making the cut somewhere between the rooted base of an established monopodial and its growing tip. Vandaceous orchids, such as the ascocendas, fortunately produce roots along at least the lower half of the stem, so that a tip cutting of an older, established plant can be made which possesses those very helpful, already initiated roots *(see* Fitch, Charles Marden, How to Shorten Ascocendas, in the December 1981 BULLETIN, pages 1472-1473). Some leaves may have To be removed from the base of the tip cutting before potting up, so

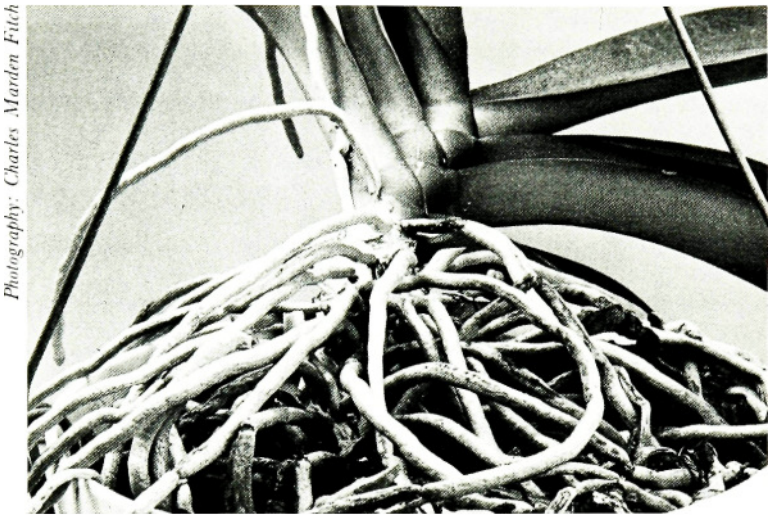

FIGURE 4 — well established some three years after its last repotting, *Phal*flrmj/'wi Martha Jane has extended some distance above its 12-inch plastic pot. This plant could be propagated by making a tip cutting of that portion, with its abundant roots, which has grown above the rim.

before potting up, so as to not bury leaves as well as roots in the potting medium. Shorter, slower growing monopodials such as phalaenopsis may also in time grow too tall, and will require division of the stem if anything just to place the majority of the roots properly in the medium when repotting *(see* FIGURE 4).

When a tip cutting is made, what results is obviously not just a tip cutting, but also an established "topless" base section of the plant. If the plant was vigorous to begin with, this base section is likely to initiate one, possibly more, new growing points. These in turn may be treated as keikis, separated from the mother plant and potted up when ready or left to continue on and flower.

FIGURE 5 — *Phalaenopsis* Tyler Carlson has produced a substantial keiki off an old inflorescence — one more than ready to be removed and potted up.

Photography: Charles Marden Fitch

Whatever the type of division made, it is crucial to make the separation with the proper tool: one that can make a clean cut, and has been sterilized beforehand (by flame, sterilizing solution or first-time use). This lessens the possibility of virus transference and disease attack. A clean cut, one preferably "dressed", or coated, with a powder fungicide, is not as vulnerable to infection as a ragged, untreated cut.

KEIKIS

Some commonly cultivated orchids obligingly produce vegetative offshoots, called keikis by orchidists. Keikis develop from uninitiated buds (areas of meristematic tissue) — be they on the flower spikes of phalaenopsis (FIGURES) or the canes of dendrobiums (FIGURE 6), for example. These, whether made independent by removal and potting up, or left on the "mother" plant, keep right on growing, and can flower in a surprisingly short time. With keikis, as with all propagations, the preference is to make the separation after roots have formed on the portion of the plant to be severed, to make rapid its establishment as an independent plant. Keikis readily form roots soon after they initiate. Once these roots are an inch or two long, the keiki can then be removed, either with sterilized clippers, or with a hand grasp and a quick snap of the wrist, and potted up.

Some orchids, such as *Phalaenopsis lueddemanniana* for example, have a disposition towards "throwing" keikis, while many others do not. Culture can greatly alter this inherent tendency to produce, or not to produce, keikis. Dr. Clair Ossian, author of the current series on antelope dendrobiums, makes this remark when writing on the culture of this group: "When truly happy, these forms can bloom much of the year, so if you get few flower spikes and lots of keikis, the plant is unhappy. In fact, this is one of the rare problems of the group. When you are doing things right and the plant is prospering, you don't get any keikis for trading stock."

Photography: Stephen R. Batchelor

FIGURE 6 — Over-potted and over-watered, this *Dendrobium nobilf-lype* hybrid is expressing its distress in the form of over-abundant keiki formation. Note the various stages of keiki development.

[A **Review of the "Antelope" Dendrobiums (Section Ceratobium) — Part 1 — Introduction,** *Amer. Orchid Soc. Bull.* 50(10): 1219.]

So, if you have a dendrobium, be it a *Ceratobium* ("antelope") type, *Den. nobile* type, or *Den. phalaenopsis* type, and you would like lots of keikis, do as I did (and not as I preached!) with the nobile dendrobium in the accompanying picture (FIGURE 6). Repot the plant in too large a pot with a moisture-retentive mix, and be sure to overwater. The result: an imperiled plant with few roots, no flowers, but loads of keikis! This, I suppose, is what technically could be called "keiki induction", and through my own "experimentation" seems to be a successful propagation technique with many genera of orchids.

Other less foolhardy, though equally effective methods of keiki induction include either "stem propagations" or hormone paste applications. Stem propagation of phalaenopsis involves the removal of a portion of a flower spike possessing dormant nodes (eyes), followed by its placement in a sterilized bottle containing nutrient agar. This treatment encourages a node to develop vegetatively, hopefully within a few months. Vegetative development of a flower spike node into a keiki can also be induced with the application of a hormone paste. With this method, the outer bract covering the node is removed, while the spike is not. The paste is then applied *(see* Brasch, James D. and Ivan Kocsis, **You Can "Meristem" with Hormones,** *Amer. Orchid Soc. Bull.* 49(10): 1123-1132).

PURPOSES IN PROPAGATING

Propagating orchids by the methods discussed here can be fun, but unless done with the objective of creating "trading stock", it can soon be unpractical. In these days of high maintenance costs, space in any orchid collection is too precious to be taken up by needless duplication of a single cultivar or clone. Nevertheless, making more than one plant of a desirable cultivar is important. Not only can the extra plant(s) be traded or sold for other, equally desirable plants, but having extra divisions lessens the risk of a cultivar's extinction. Imagine receiving an A.O.S. flower award for a *Cattleya* hybrid you have painstakingly grown from a small seedling, only to have it collapse some time later from an insidious black rot. Had you not propagated that cultivar vegetatively (asexually) up to that point, you would have no chance of its recovery. It would be gone forever. However, had you wisely divided the awarded plant prior, and exchanged the extra division with someone else, all would not be lost. The awarded cultivar would still exist, and with some effort could be regained — *if* you had given the cultivar and its division a cultivar name!

PROPAGATION AND NOMENCLATURE

Vegetative propagation results in more than one plant of a cultivar. Any time there is more than one genetically identical orchid plant in existence, a cultivar name is absolutely necessary. It should become second-nature to all those who propagate their orchids to assign each cultivar propagated a cultivar name, if it does not already have one, and to write it on both the original tag and the additional tags accompanying each of its propagations. Call the cultivar whatever you like; it does not matter as long as it is unique to the hybrid and species involved. What does matter is that you maintain the identity of each cultivar, by means of a cultivar name, making known to all eventual owners of its vegetative propagations that they are indeed the same.

Consider a hypothetical, though these days pretty realistic situation in which Mr. Alpha displays his favorite orchid, a jungle-collected plant *of Cattleya skinneri* he has had in his possession for many years, as a part of his local orchid society's exhibit at an A.O.S.-judged show. To his delight and surprise, his plant is singled out for an Award of Merit. As required, he then gives his plant a cultivar name: *Cattleya skinned* 'Alpha', AM/AOS. Recalling that over the years he has divided the plant any number of times, and given away any number of divisions, Mr. Alpha attempts to contact those involved. After all, they should know that they have a division of an awarded plant. With some difficulty, he is able to contact Mr. Beta, who has since moved out of town. Mr. Beta informs him that he has gotten out of orchids, and has sold his entire collection. He has no idea who purchased his division. Mr. Alpha has better luck with Mrs. Gamma, who is thrilled to hear that she owns a *Cattleya skinned* with an AM/AOS. But which one? She has several plants from different sources, all without cultivar names. Perhaps, she says, Mr. Alpha could identify his awarded plant

when her plants of *Cattleya skinned* next come into flower?

Much of this confusion could have been avoided if Mr. Alpha had written *Cattleya skinned* 'Alpha' on each tag accompanying every piece of his *Cattleya skinned* — at the time of division. Mrs. Gamma would have had no difficulty in locating the one plant in her possession identified as *Cattleya skinned* 'Alpha', and could then with every right insert AM/AOS after the name to make it complete. Whoever ended up with Mr. Beta's division only then would have a fighting chance — if he reads the AWARDS QUARTERLY — of learning of the award. Coming across the publication of *Cattleya skinned* 'Alpha', AM/AOS, he would realize that he owned a cultivar of that species with that same cultivar name, and would be able to rightly add the respected AM/AOS to its tag.

Insist on a cultivar name when buying or receiving an orchid known to be a vegetative propagation! At the same time, be a responsible orchidist — assign a cultivar name to each unnamed cultivar you propagate! This simple procedure, if done routinely and consistently, could save all of us involved with orchids much of the confusion we contend with today. — *84 Sherman Street, Cambridge, Massachusetts 02140.*