

like frankness and honesty of expression. It can probably be said that neither in U.S.A. nor Britain has the perfect system of judging yet been devised; but I am satisfied that you are actively trying to achieve the ideal. I wish you the best of luck in your efforts which, when successful, will benefit iris growers everywhere.

Harry Randall is a past president of the British Iris Society, and there probably are few people who see irises over a wider range of geography than he does.

Paul Howard Cook . . . and Median Irises

BEE WARBURTON

A few years ago, when the Median Iris Society was attempting to set up a program for an effective study of the breeding potential of *Iris aphylla*, Paul Cook made the following reply to an invitation to direct this study:

"I hate like everything to write you that I don't see how I can possibly undertake the direction of the aphylla research for the MIS . . . I am sure, as I have said before, that aphylla will be found to carry genes that will have a profound influence on the development of the median irises, and of course, of all the other bearded irises.

"The trouble is that I am already working seriously on a number of breeding projects that I want desperately to complete before time runs clear out on me. I know they are just individual projects but they have been under development for a long time and I wouldn't want to let up on any of them now. Sure, I do take up some new schemes at times. I have a small project in the tables, or rather in the 24 chromosome irises, dwarf and tall, and I have made some aphylla crosses, and others. But these are not the big, important things that I have been working on so long—the darks, the amoenas, the yellow/blues, the reds.

The darks, or "blacks"—a term I hate—still need some finishing touches, some smoothing up—not necessarily of hafts—before I am going to think I have done my best with them. The blue amoenas are fixed as to type now, but this "new blue" as Mrs. Walther called it, is going to require a lot of work before it reaches the true blue everybody wants. In 1958 Earl Roberts hung a big paper label on a blue amoena that had falls of real blue, and I am confident this same very blue color can be obtained in other amoenas in various tints and shades, AND in blue selfs likewise. You wouldn't believe me if I told you how much thought I have given this scheme since the blooming season of 1958. And it will require more thought, and a lot of time to work everything out. But real blue color in irises—in the tall I mean—would be worth any amount of thought and work.

"The yellow/blue bicolors, a scheme I have carried along in my mind and have worked on since I first saw the old C&K LORELEI is now yielding to the action of genes out of the PROGENITOR line of amoenas (aphylla will also provide genes of presently unknown value in breeding) and I hope a couple

of generations more will let me lay this project aside. Not that it will be completely finished, but I think it will be finished as to type, which will satisfy me, knowing that others can put the finishing touches on.

"Then the reds—this problem I have struggled with since the days of SEMINOLE way back in the twenties. I honestly think, short of a breakout of tangerine, that the red problem will be with us another thirty-five years, and that real red color, as in tulips and gladiolus and roses, will not yet be attained to. But I do think clearer and redder color will gradually appear, and I have a conception of red color that I want very much to test out, and in fact have been testing out through these seven or eight years since Greig Lapham got his YLEM and other seedlings from intercrosses of his PACEMAKER and my older reds.

"In view of all this, I think I will have to decline your request that I direct the aphylla research. If I could be of help at any time in an advisory or consulting capacity, I would be glad to do what I could. It will be a long time before we have all the answers to the makeup and the capacity of the differeint aphylla forms. But the answers will gradually be revealed in the hybridizing of this species with the various tall and other bearded irises, after which the real use of aphylla and its hybrids can be made. Twenty years will not see the species aphylla exhausted of useful genes and the characters in which the genes express themselves."

Everybody is familiar with Paul Cook's work with PROGENITOR. Its parents were a tall bearded iris and a species dwarf seedling, and it is but sixteen inches tall, actually a median iris though Paul didn't think of it so. To him, it was a carrier of new potentials for his tall bearded projects. What he had actually uncovered was that great rarity in iris breeding, a new dominant trait, and that in a pattern, previously recessive, which had offered the supreme in frustration to those who had tried to improve it.

Actually, Paul had no idea of such a result when he made the original crosses. What he had been doing for some time, and continued to do after the advent of PROGENITOR, was to cross every species he could into his tall bearded strains in an attempt to locate genes for new flavones that would make the blues bluer, as flavones sometimes do in other genera. Because he was a truly great plant breeder, he accepted and followed through as sidelines some of the smaller irises that were byproducts of his major work; but all of the dwarf and median progenies were originated with the ultimate purpose of introducing new germ plasm into the tall bearded irises.

It takes courage to embark upon a breeding project that goes back to the species. For many years, Paul's seedlings were objects of pity to many of his fellow iris breeders. They bore the mark of the wild, where other values than the wishes of gardeners are in force. PROGENITOR itself is a rather dreadful little iris, which almost any other iris breeder might have discarded with a shudder. Then, eventually, the plant breeder's work began to pay off. The long apprenticeship came to an end, and the good new introductions were recognized as among the best of their years. As any iris hybridizer who has used them knows, Paul's tall bearded irises are thoroughbreds. They are not casually lucky beauties from catch-as-catch-can crosses . . . they have concentrated genes for the virtues which distinguish them.

This concentration of good genes shows up in the first generation species crosses of later years, and notably in the original pumila-tall hybrids, BARIA, FAIRY FLAX, GREEN SPOT and BRITE, which were selections from crosses first reported in AIS Bulletin 119, page 58. After the PROGENITOR work, this was probably Paul's most important contribution to the future of irises. These fine irises were not entirely the result of concentrations of desirable genes in the tall bearded seedling, #10942; the desirable traits, and particularly the pumila blue, had been equally concentrated by careful selection in the seedlings of *Iris pumila* which Paul had grown from a strain of Austrian pumilas sent him some years before by Robert Schreiner. Incredibly, these first impeccable products of a new type of cross remain, after 15 years, standards for their class . . . a class which was actually not even established until six years after they were registered. Lovely in themselves, their influence as parents and grandparents in strains of median irises cannot even be suggested in an article of this scope.

Paul's collecting and breeding with the species led to some important chromosome studies by Dr. L. F. (Fitz) Randolph, who was then head of the AIS Scientific Committee. Dr. Randolph found that the new pumila-tall hybrids had 40 chromosomes, of which 24 came from the tall bearded parent and 16 from tiny *Iris pumila*; and he proved that the known 40 chromosomes of the species *Iris chamaeiris*, *italica*, *olbiensis* and *subbiflora*, and of their named garden derivatives, were in this same grouping of 12-12 and 8-8 rather than in four sets of 10 chromosomes each, as had previously been surmised. This finding suggested to Paul Cook another fertile level at which irises might be interbred, and desirable genes concentrated, before making the more difficult transition of these genes into the tall bearded irises.

Briefly, the theory of what we have called the "40-chromosome pot," and which is the basic principle whereby the standard dwarf irises are bred, is that tetraploids of like amphidiploid constitution are interfertile to a degree that permits selective breeding on a large scale. Paul proposed that in addition to the pumila-tall hybrids and the existing species and garden "chamaeirises" of like constitution (e.g. TINY TONY, WHITONE, ORANGE GLINT, BLAZON,) further hybrids should be created by crossing species or species hybrids known to have 48 chromosomes, with the improved selections of *Iris pumila*, and thus their genes might also be incorporated into this pool. A number of these Paul himself developed and distributed, notably the hybrids of PROGENITOR X pumila; these carry the PROGENITOR bicolor-amoena pattern. When he first developed them, Paul remarked that the yellow or PROGENITOR blended oddly with the pumila colors, and one of his seedlings, #3355, has a blended spot that is close to deep aqua. When these are crossed onto tall bearded irises they produce excellent and fertile seedlings.

Paul also offered some interesting data about crosses of *Iris aphylla* with the pumilas, along with plants which he contributed to one of the Median Society's auctions. These crosses confirmed his opinion that *Iris aphylla* carried a type of purple coloring which was not affected by the inhibitor in *Iris pumila*. These are interesting small plants, some with the aphylla branching at their six inch height; they also should be crossed with tall bearded irises for results of value.

It would require a volume to evaluate all of Paul's species crosses, many of importance to dwarf and median hybridizers. His first two introductions,

KEEPSAKE and TAMPA, were hybrids of *Iris arenaria*. Another type of hybrid which he recommended highly came from his "Hoogpums" as he registered them, no doubt with tongue in cheek . . . seedlings from *Iris hoogiana* X *I. pumila*. These he crossed with seedlings from his tall-pumilas and created what he considered a fine type in the standard dwarf iris height range, small flowered and slender stemmed; but like the *arenaria* and *bloudowii* hybrids, these proved almost totally sterile.

There were a number of other species; WIDE WORLD, from *imbricata*, has been carried further by other breeders and has shown that it is capable of producing reverse amoenas of great beauty. Some of the earliest *mellita* hybrids were bred by Paul; the seedling species he identified as *Iris reichenbachii* came from seed labeled *I. mellita*. The dwarf iris, INCHALONG, involves *mellita*, but other than the *arenaria* hybrids, Paul's miniature dwarf introductions were mostly from *Iris pumila* which, indeed, of all the species has showed the greatest garden-compatibility. REMNANT and SKY PATCH are pure species; ALINDA, VIOLET GEM, STINT and BLUE BAND are species hybrids. A *pumila* hybrid seedling, #1546, proved to be the most valued of all *pumilas* or near-*pumilas* for both miniature and standard dwarf breeding. His bright red-purple intermediate, FLORINDA, came from a *pumila* hybrid crossed with tall bearded. KISS ME KATE, of course, is one of the Progenitor hybrids.

During his probings into the genetic constitution of the species *pumilas*, Paul came to believe that their lovely and distinct blue came from a different aggregate of genes from the blue of the tall bearded, and he expended a great deal of effort in an attempt to carry this blue into the tall bearded. Although he had decided that this was probably impossible, and that the gene for the *pumila* blue would disappear before tall bearded stature and bloom season had been regained in repeated backcrossing, he was still working for a specific answer on this when he died. His method was to cross a recessive white tall bearded seedling with blue species *pumila*, and to continue crossing the resulting hybrids back to the recessive tall bearded until all the blue had dropped out. We hope that this experiment has been saved and can be continued, because it should give the answer to one of our more perplexing problems.

One of the more interesting theses which Paul gave to us also involved continuously crossing back the *pumila*-talls to tall bearded; that is, the problem of the segregation of small-late irises . . . dwarfs which bloom with the tall bearded. Although Paul bloomed some of these himself, and certainly knew whereof he spoke, they are by no means a commonplace. We will not discuss here the genetic principles involved; they have been published in AIS Bulletins and elsewhere by Dr. L. F. Randolph and Dr. Katherine Heinig. We have here size factors: small, tall; and season factors: early, late. In the course of segregation we may have small-early, small-late, tall-early and tall-late. Small-early and tall-late are familiar. Tall-early I saw once at Paul's in early May, blowing out like a flag in the strong spring breezes. These are not much use; they tend to frozen bloom-buds in late spring freezes. Small-late should be passionately pursued; we need better small irises in the tall bearded season, as anybody might conclude after looking at PALTEC and PEEWEE year after year in the place of honor, in front of the TB guests at our conventions.

The one primarily median project which Paul retained was his work on the table irises, which had proved to be the most challenging of the median classes. Since Paul had assisted at their birth, when the first ones were selected by Ethel Peckham out of the Williamson seedling patch, he doubtless felt some responsibility for their existence. At any rate, after he had turned over most of his median material, plants and plans, to people he felt were competent, he settled down to this one obstinate problem. It was also a long range problem, and we hope it can be carried on from where Paul left off.

In his last five years, Paul was greatly handicapped in his median work by late spring freezes which, if they did not destroy the bloom, apparently damaged the viability of the pollen so that in some crosses large numbers of pollinations gave not a single capsule, and in some years the trouble lasted into the tall bearded season. The result, of course, was irretrievable loss to the iris world but the loss would have been infinitely greater had he not so generously shared his knowledge and his ideas, as well as his plant materials, with his friends.

Bee Warburton really needs no introduction to the readers of the Bulletin; she is known well and favorably wherever irises are grown.

ELUSIVE HUES— *An Article About Melba Hamblen*

DR. LORENZO A. MEDRANO

The fact that a path is well worn is a testimony to its safety. It also may be a testimony to its dullness. But if you seek adventure, if you want to explore what lies behind the next hill, or from where that brook is coming—then yours is not the well-worn path, but you must open your own as you go along.

Seeking new paths in irisdom, trying to find out what lies ahead, is the way Melba Hamblen has given to us those irises we have come to love and appreciate, and those hues of orange, apricot, orchid and beige, which have come to enrich our gardens in the last few years.

There is method . . .

It has become a cliché of the iris world to refer to many of Melba's crosses as unorthodox. Two ladies were ordering irises for their garden club from one of those catalogs which mention color. They came across one of Melba's irises, and one lady said, "Isn't that an unorthodox cross?" To which the other promptly replied, "Yes, it is. I also wish that I had thought of it first!"

Actually, when we speak of crosses where there is so much inbreeding, so much mixed blood, who can tell what is an orthodox cross, and what isn't? If your work carries you to the improvement of blue and white strains, your crosses must follow a standard pattern, and any deviation from it may be