CROSS WORDS

THE GESNERIAD HYBRIDIZERS ASSOCIATION

NEWSLETTER

VOLUME NUMBER 1 ISSUE NUMBER 1 SPRING 1977

DIRECTORS MESSAGE

Peg and I have persisted with the idea of forming the G. H. A. with the sincere feeling that a group of dedicated people could derive more enjoyment from their hybridizing efforts simply by having a central newsletter that would print their questions, provide answers from the body if possible, publish their achievements and perform other useful services in the future. Evidently others share this thought, as we have received inquiries from all over the States, even some from overseas.

One of the great pleasures to be derived from hybridizing is to share experiences, success or failure, with someone who has an interest in and knowledge of Gesneriad hybridizing. In the rare visits we have been able to exchange with Carol and Bill Saylor the conversation was primarily hybridizing and the time flew by. Peter Shalit came by for a short visit and we were still talking about hybridizing after midnight.

We've been fortunate because we are two people under the same roof, hybridizing independently and cooperatively and have discussions at length regarding results and new ideas. We think a newsletter dedicated to publishing Gesneriad hybridizers successes and problems would be enjoyable for all, and an organization that is helpful and enjoyable to its members is certain to have positive reactions as a by product favorable to an increased interest in the GESNERIACEAE.

Art Belanger

(acting) Director

The Gesneriad Hybridizers Association is a non-profit organization. The newsletter is published quarterly, copyright by G.H.A. The membership year is the calendar year, dues $3.00.

G. H. A. General Policy

The vitality and success of this association is entirely dependent on its active members, participation is essential. Our major source of printable material must come from the members in the form of questions, answers to previously published questions, anecdotes on actual hybridizing happenings etc. These will be augmented by an occasional article on a specific subject by an experienced hybridizer.

The basic policy, which will always be open to change for the better, will be an organizing of material with minimal editing; an attempt to publish all offerings with a credit line for the author, except in a case of mass duplication or unforseen problems in regard to space or funds.

Newsletter type of communication between all interested parties is not novel, trying it with an unknown factor is. How many people in this world have enough desire to be part of a Gesneriad hybridizing group, pay their dues, and participate in the programs to come? (programs to be originated by the members). We need about 50 members as a minimum number to create activity and provide money to defray publication costs. Since the write-up Renee so kindly published in T.G. Jan/Feb, 1977 we have decided to issue Vol. 1 Issue 1 Spring 1977 and gamble on a response large enough to complete the year. If we fail to get our 50 members we will simply send refunds.

The cooperation from everyone involved in writing articles and offering suggestions has been terrific, but it points up the fact that a very few are doing all the work. This is to be expected on issue 1 with the membership at 0. Things would be much better for all with 50 or 60 members available to draw short articles, etc., from.

On the commercial side; we won't be able to accept advertising but welcome all commercial people as members. Would appreciate some good "How I Do It" articles from all of them, and there is certainly no harm in printing the author's name address and place of business.

We have been asked about the status of Saintpaulia in the G. H. A. Without hesitation we stated: Saintpaulia is a Gesneriad and entitled to all family privileges.

FINALLY

'CROSSWORDS' THE G.H.A. NEWSLETTER DOES NOT REJECT ANY ARTICLE BECAUSE CROSSWORDS IS NOT A FORMAL PUBLICATION, IT IS A GROUP CORRESPONDENCE. THE RESPONSIBILITY RESTS SOLELY ON THE AUTHOR. WE SHALL HELP EDITING ONLY WHEN SO REQUESTED.

NOTES ON KOHLERIA HYBRIDS

by Frances N. Batcheller

Kohlerias have several assets for a hybridizing program. There are a number of species with differing characteristics available for parent stock. There does not seem to be any pronounced color dominance, so it should be possible to blend shades from red-purple through yellow-green. There are a number of different patterns of lines, dots, eye spots and patches. Sterility of hybrids is not a serious drawback, as vegetative propagation by rhizomes is easily accomplished. Most species will cross readily.

The first Kohleria hybrids were produced in Europe over 100 years ago. Few are now cultivated, although they must have been handsome plants from the illustrations which appeared in botanical magazines. Two of the species used in these hybrids, K. warszewiczii and K. ocellata, do not seem to be in cultivation at present.

Kohleria 'Longwood' is a hybrid of unknown parentage introduced by the USDA from a botanic garden in Portugal. It is characterized by exceptionally large flowers of a beautiful strawberry red.

In the United States, a number of hybridizers have worked with Kohlerias. Michael Kartuz has introduced a number of excellent plants, such as 'Princess' and Dragon's Blood'. Dr. Carl Clayberg did genetic research with this genus. 'Connecticut Belle' is one result of this study. The author has worked with Kohlerias for some time. So far, only 'Rongo' has had any widespread distribution. This is a cross of K. amabilis with a 'Sciadotydea' hybrid, a name which does not indicate any definite parentage. Another hybrid, not yet in general circulation, is 'Kapo', which is a cross between 'Longwood' and the same 'Sciadotydea' hybrid. It seems to be more compcat in growth habit than 'Longwood', producing heavy bursts of flowering rather than a continuous supply as does 'Rongo'. The redder color of the larger flower is more pleasing than the magenta of 'Rongo'.

'Rongo' has been crossed with a number of species - K. bogotensis, K. longifolia K. spicata, K. tubiflora, K. digitaliflora, K. eriantha, and backcrossed to K.amabilis. None of the resulting seedlings seem to be any great improvement over the original hybrid or species parents, but work is still in progress. Most of the seedlings were quite floriferous, but plant size is too large or flower size is too small.

The main objectives for the hybridizing program are smaller, neater plants, attractive foliage, larger flowers of a pleasing color, and everblooming habit. These do not seem impossible in view of the available traits to be found in the genus Kohleria.

The following brief notes on some of the species presently available may be helpful to other workers.

K. amabilis. Low growing - variegated foliage - medium-sized flower, purple-pink, curved tube, wide lobes, pattern of lines and spots - some material pollen sterile.

K. bella. Tall, foliage dark, reddish reverse - floriferous - large flower, long inflated orange red tube, soft yellow wide lobes with pattern of lines and dots. May be a natural hybrid, as there seems to be considerable sterility.

continued

NOTES ON KOHLERIA HYBRIDS (cont.)

K. bogotensis. Sprawling habit - foliage with lighter midvein, red reverse. Medium-sized flower, divided horizontally with bright red-orange above, bright yellow below, wide lobes, pattern of lines and spots - some material probably of hybrid origin so sterility may be encountered.
K. digitaliflora. Very tall - foliage dark green, red reverse - most unusual large flower, wide pink tube, wide lobes, 2 lower green, spotted with purple, 3 upper dark maroon, very heavy texture (probably bat-pollinated) - does not flower readily.
K. eriantha. Tall, very vigorous with strong straight stems - red hairs on leaf edge - large flower, wide tube, wide lobes, bright red-orange, pattern of spots - some material probably of hybrid origin so sterility may be encountered.
K. hirsuta. Very tall - reddish foliage, long internodes - large inflated red-orange tube, small yellow lobes with red crescent pattern.
K. lanata. - compact growth - soft light green hairy leaves - medium-sized pink-orange flower, lobes with wide spacing, not overlapping, pattern of spots - produces "spaghetti" propagules, tends to revert to terminal rhizome type growth instead of flowering if conditions are not ideal - difficult to grow - long dormant period.
K. longifolia. Compact growth - unusual narrow leaves - small solid color red flower, tubular with small reflexed lobes.
K. spicata. Tall, strong straight stem - large leaves - flowers borne terminally, medium size, red to orange, curved tube, wide lobes, pattern of spots and lines - variable, wide-spread species.
K. tubiflora. Fairly compact growth - foliage with reddish edge and veins - small red-orange tubular flower with very small bright yellow lobes not exceeding tube width.

Some other Kohlerias which are now in cultivation in limited supply have not yet been used in hybridizing by the author. Kohleria platylomata has small dark foliage and bright red small flowers. It seems to be difficult to flower.
K. magnifica, should be very promising, with brilliant red hairs on the straight stem and bright red flowers. K. schiedeana and K. peruviana are larger plants with light green hairy leaves and red-orange flowers.

A.G.G.S. CONVENTION ??

There have been inquiries regarding an informal meeting at the National A.G.G.S. Convention. It should be possible with the help of the convention committee. Any G.H.A. members or potential G.H.A. members should ask at the registration desk for time and place.

INTRODUCTION TO CHROMOSOMES

by Peter Shalit

Chromosomes are particles of DNA found in every cell of every plant. They contain nearly all of the hereditary material of a plant, and thus determine most of a plant's appearance and behavior. In addition, chromosomes govern the fertility of a plant, and they influence which crosses can be made with a particular plant.

The number of chromosomes per cell is constant in a given plant. These chromosomes can be counted under the microscope, and it is found that each species has a characteristic chromosome number. Usually it is not possible to cross plants which have different chromosome numbers. However, among the gesneriads, several genera with different chromosome numbers are interfertile: Achimenes (n=11), Smithiantha (n=12), and Gloxinia (n=13). Conversely, plants with the same chromosome number cannot necessarily be crossed with each other. For example, although Saintpaulia ionantha and Aechynanthus marmoratus have the same chromosome number (n=15), I don't expect that they could be crossed with each other. And sometimes even closely-related plants with the same chromosome number cannot be crossed, for reasons unknown: eg., Sinningia speciosa x S. eumorpha, a cross which one would expect would be quite easy, has proven impossible so far.

Before I go on, let me explain why chromosome numbers are listed as "n=15" or "n=12", rather than just "15" or "12". Usually, a plant contains two complete sets of chromosomes in each cell. Such a plant is said to be diploid. For example, Nematanthus gregarius has sixteen chromosomes per cell, in two sets of eight chromosomes each. When sex cells--that is, pollen or egg cells--are formed, each gets only one chromosome set, so these cells are haploid. Fertilization entails the fusion of a pollen cell with an egg cell, the two haploid cells forming the first cell of a new, diploid plant. (See diagram). Since the chromosome number periodically halves and doubles during the sexual cycle of a plant, scientists have adopted a terminology to avoid confusion. The letter "n" refers to the haploid chromosome number of a plant. So, for Nematanthus gregarius, the plant has 2n (=16) chromosomes per cell, and the pollen and egg cells contain n (=8) chromosomes per cell. Usually, the chromosome number listed in tables is "n", the haploid number.

The typical diploid species is fertile when self-pollinated. Cross it with a related species, and the offspring are often not nearly as fertile. They may even be completely sterile. The reason for this lies in the chromosomes. Let's illustrate it with an example. When Sinningia pusilla (n=13) is crossed with S. eumorpha (n=13), the resulting plant grows well but is sterile. That is, it can't produce normal, fertile pollen or egg cells, and so it can't produce selfed seed. Why?

Although (Sinningia pusilla x S. eumorpha) is a diploid plant, its two sets of chromosomes come from very different parents, and hence are very different from each other. In order to form sex cells, the two sets of chromosomes in a diploid cell must be able to match up with each other, into pairs.

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When they don't match up very well, the process gets messed up and the resulting sex cells don't get complete chromosome sets. Without a complete set of chromosomes, a cell usually dies, so these egg cells and pollen grains are usually sterile.

Such a sterile diploid, like the one in our example, can be made fertile by treatment with colchicine, a chemical that doubles the chromosome number. This treatment produces a tetraploid, a plant with four sets of chromosomes, in this case 52 in all. A tetraploid is usually slightly larger and more brittle than the corresponding diploid. Sterile diploids are often made into fertile tetraploids this way. The tetraploid is fertile because in its cells, each chromosome has an identical partner with which to pair, and functional sex cells can be formed, each containing the 2n number of chromosomes. Such plants are called allotetraploids, or amphidiploids, the latter term referring to the fact that they are often as fertile and true-breeding as diploids. Sinningias 'Dollbaby' and 'Cindy-Ella', and xachimenantha 'Diamond Lil', are examples of allotetraploid gesneriad cultivars.

Further complications are possible. Sometimes, a tetraploid can be crossed with a diploid. This produces a triploid plant, possessing 2n chromosomes from one parent and n chromosomes from the other, a total of 3n. An example is Earl Morey's cross of tetraploid Sinningia 'Dollbaby' x diploid E. eumorpha, named 'Grace M.'. Triploids are usually quite sterile, but they occasionally do produce viable seeds when pollinated by related diploids or tetraploids. And sometimes they confound all predictions by being highly fertile.

So knowledge about chromosomes can provide useful guidelines for the hybridizer. The most important of these are:

1) Plants with equal chromosome numbers are much more likely to cross than plants with unequal numbers, and

2) The offspring of a cross between two plants with equal numbers of chromosomes is much more likely to be fertile than one whose parents have unequal numbers.

But remember that these are only guidelines; they only hold true in some cases. The whole matter of chromosomes and fertility is still poorly understood by scientists, and for every plant that conforms to prediction there are ten that don't. So go ahead and try that wild cross; you may be pleasantly surprised.

For an exhaustive list of chromosome numbers in the Gesneriaceae, consult the Brooklyn Botanic Garden's Handbook on African-Violets and their Relatives, revised edition, pp. 79-80. For a thought-provoking article on allotetraploidy, see Bill Saylor's article "Alloploidy in Sinningia: Fact or Fancy?", The Gloxinian, March/April 1975, pp. 17-20.

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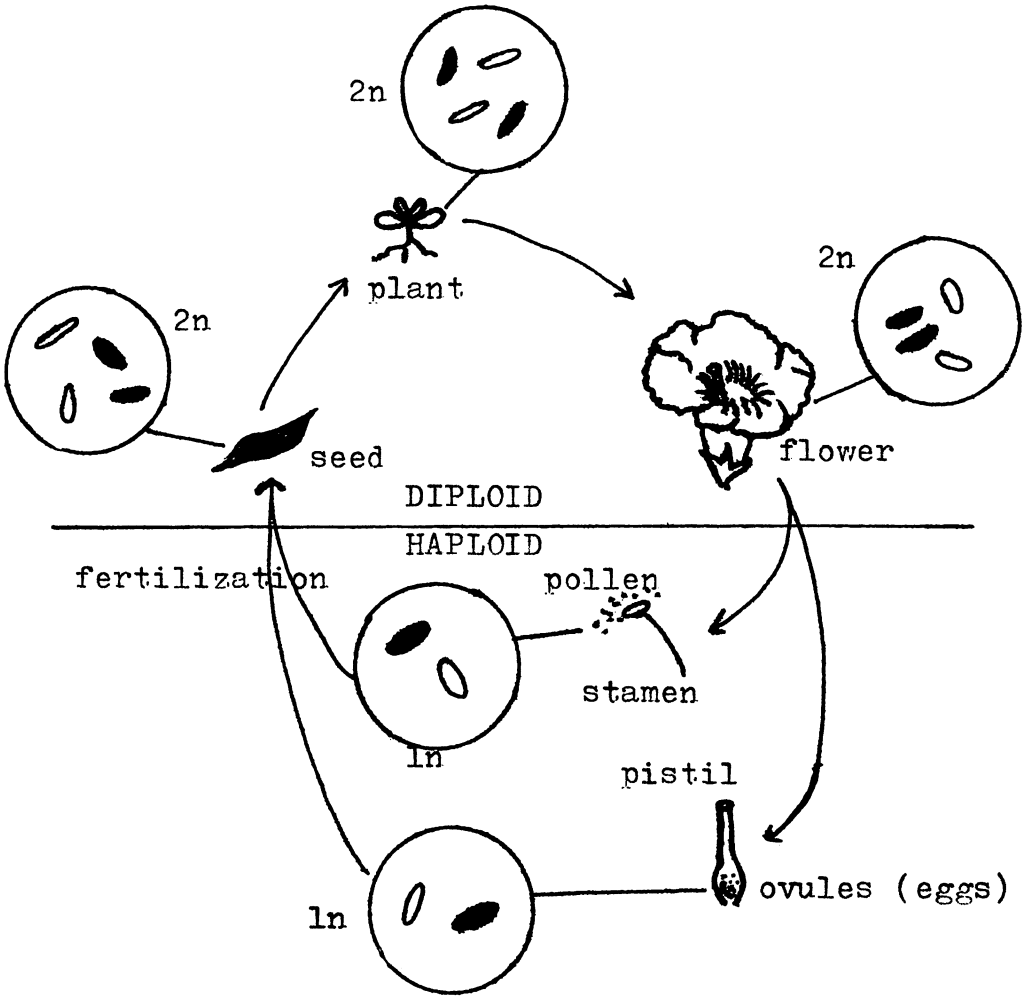

The life cycle of a diploid plant having two chromosomes per set (n=2). Circles contain magnified views of chromosomes at each stage.

QUESTIONS FOR THE MEMBERS

Is variegation in Saintpaulia transferred only by using the variegated plant as the pod parent?

Can mutations in Saintpaulia be transferred to the next generations by self pollination?

Some of my Gesneriad hybrids are extremely slow to germinate. In time I have a heavy coat of green scum, algae? It seems to retard development of the tiny seedlings. How can I prevent this problem?

My seed flats are often swarming with springtails. So far they have survived chlordane, lindane, V.C. chlorox, Diazinon, methoxychlor and rotenone, even Cygon 2e. The seedlings look poor but the springtails are healthy.????

Bob Kelley of California has this one to ask.

Recently I had a 'Cupids Doll' throw an upright (peloric), florists gloxinia type flower. It was a rare beauty and I of course selfed it. I also put some pollen on a slipper form. Now, I believe it to be tetraploid. I have a number of questions about the genetic action and if it will ever come true. Maybe I will have the first upright mini on the market. A cross I made on my own stock produced two more uprights. Whether this was a mechanical or genetic thing remains to be seen.

It is my understanding from some sources that the upright flower appears from time to time on many of the genra. I have not seen it in other than the Sinningia, as this is what I am mostly involved in. I have never seen it occur in a sinningia species. I have heard of it occuring on Dollbaby and I have seen it occur on Cupid's Doll, a cross of mine between two hybrids, and another parties cross between two hybrids. This other party and I am wondering whether this might be a mechanical situation or not. I am inclined toward the genetic. The flowers come out exactly as the florists gloxinia does in all respects. In nearly all cases it is a single flower that comes upright.

SUGGESTIONS FOR THE MEMBERS TO WORK ON.

In the interest of saving time we thought it might be possible to establish a pollen exchange. Anyone desiring Gesneriad pollen send name, address and type of pollen needed. Your request will be printed on this page.

We also thought it might be a good idea to have new hybrid annoucements by the hybridizer with a complete description, and a note about the fertility, and the availability of such plant material.

WHAT'LL WE CROSS NEXT?

by Bill Saylor

When I was asked recently to write a short article on gesneriad hybridizing for the GHA, my thoughts were impelled back to the time some ten years ago when I was just starting my first breeding experiments within this relatively unexplored family. The first printing of the Brooklyn Botanic Garden Handbook on Gesneriads arrived very opportunely just at that time with a wealth of information not previously available to the amateur breeder. Even the list of Chromosome Numbers in the Gesneriaceae and the Classification of Gesneriad Genera included at the end of the handbook made it a priceless reference source which I still turn to frequently. The article Hybridizing Gesneriads by Robert E. Lee, then Professor of Floriculture at Cornell, provided the spark that started me on the Nematanthus breeding program that has been so exciting to me ever since. Bob Lee said among other things "The genus Gesneria has not been touched, nor has Hypocyrta, both with diverse species." Well, I had a few Hypocyrtas and a lot of curiosity, the pollen "took", and away we went. Nematanthus was listed as in the same tribe as Hypocyrta and these genera had the same chromosome number n=8, and so what more natural than to attempt crosses between the two. You know the rest--Hypocyrta has since been merged into the older genus Nematanthus largely as a result of this work.

No attempt will be made here to produce an exhaustive list of hybridizing possibilities within our family. Rather I'll try to hint at a few interesting combinations that might be tried.

A number of primary interspecific crosses have been made within the genus Gesneria since the appearance of Professor Lee's article. Most of the work has been done by Dr. Laurence Skog of the Smithsonian Institution. Larry has reported consistent failure in his attempts to progress to F2 and succeeding generations. However some years ago I bloomed a hybrid from G. christii x G. reticulata (formerly cuneifolia) 'El Yunque' and for some reason had no trouble in selfing these flowers. The F2 generation was maintained only long enough to bloom three plants which showed considerable attractive variation in color and shape of blossom. Surely there is room for much more careful investigation of the possibilities within this genus. Mike Kartuz' beautiful 'Lemon Drop' is the only named hybrid so far introduced.

Codonanthe presents some intriguing possibilities and with them a complicating problem or two. There are only about nine species under cultivation at this point, of which four (C. caribaea, C. carnosa and its variant, and C. gracilis)are diploids. The others are all reported to be tetraploid. One hybrid 'Gina' (C. carnosa x C. gracilis) was introduced last year by Mr. Gary Hunter at the AGGS annual convention in Washington. There has been no other work publicized so far. Can floriferous triploids be produced? Or how about artificially inducing tetraploidy through the use of colchicine?

When Mr. George Kalmbacher of the Brooklyn Botanic Garden reported in the May/June 1968 issue of The Gloxinian that he had grown and bloomed a peloric (radially symmetrical) form of Rechsteineria cardinalis this news caused little stir among the membership.

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The plant was found to come true from seed and was subsequently named 'George Kalmbacher' in honor of its discoverer. A white peloric form has also since been bred and bears the name 'Skydiver'. Neither of these flowers would receive a prize for outstanding grace or beauty, but the breeding potential is enormous. Rechsteineria has since been merged into Sinningia and S. cardinalis in all its forms is capable of breeding with most other Sinningias. Notable exceptions include S. speciosa. The latter incidentally is the only other gesneriad which has produced a consistently peloric form, the form which is the source of all the popular upfacing peloric 'florists' gloxinias' now on the market. Why not a whole new category of medium-sized Sinningias with symmetrical upright blooms in a rainbow of colors?

The foregoing suggest only three of many breeding program opportunities in the Gesneriaceae. A little study and imagination will get you started. Then with patience, perseverance, and, perhaps, a little inspiration your project may take you further than you have ever dreamed you might go.

A NOTE TO BEGINNERS

Two recent articles in The Gloxinian provide complete instructions on the mechanics of cross pollination. Glen Herndon's photo essay shows the pertinent parts of the flower, and has a text that explains what to do. (TG, May/June 1976)

Bill Saylor has written an article entitled "Birds and Bees and Gesneriad Seeds" explaining how to set seeds in gesneriads, and how to harvest, store and plant it. (TG, Nov./Dec. 1976)

A very useful everyday reference is available from the Brooklyn Botanic Garden in the form of two excellent handbooks. #53 African violets * and their relatives, containing extensive chromosome numbers and classification information. #75 Breeding Plants for home and garden, basic genetics plus a fine article by Dr. Carl D. Clayberg.

It may be of interest to read the Gesneriad registers as listed in (TG,) Jan. Feb. 1977.

* AVAILABLE FOR $1.50 each from Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y. 11225

The set up listed below is as we see it today and is open to suggestions from anyone interested.

POSITION	DUTY	STATUS 1977
Director	Provide answers to hybridizing problems. Write quarterly message.	Open to volunteer.
Asst. Director (Saintpaulia)	Help with problems peculiar to Saintpaulia.	Open to volunteer.
Consultant	Deal with genetics in relation to hybridizing Gesneriads	Open to volumteer.
Organizer/Publisher	Arrange available material, print and mail same.	Art Belanger
Treasurer	Collect dues and record membership, and pay printing and mailing bills.	Art Belanger

Although Peg is helping with the above I put the one name in office to prevent confusion. The entire list of jobs will be open to volunteers for 1978.

As illustrated immediately below, I would like to list coming articles an issue ahead. Obviously to do this I need the article in hand 2 issues ahead. Projected printing dates are March 1, June 1, Sept.1, and Dec.1.

Questions and remarks or hints should be here 1 month before printing date.

COMING IN THE SUMMER ISSUE

SINNINGIAS.....FAST EXPERIENCE FOR THE BEGINNER by Peg Belanger.

You can see there will be a constant need for articles, questions and even short comments of interest to G.H.A. members. Everyone is invited to participate. It will help keep the newsletter going if you will write it immediately and mail it in. It takes a great deal of time to organize an issue.

GESNERIAD HYBRIDIZERS ASSOCIATION MEMBERSHIP FORM

Please enroll me as a member of the G.H.A. Enclosed find $3.00 for a years membership and the G.H.A. quarterly newsletter. (based on the calendar year, 1977)

Signed.....

Make checks payable to Arthur Belanger, Treasurer, G.H.A. Anyone wishing to join later in the year will receive all previous newsletters of that year to bring them up to date.

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