President's Message:

This next year will be an epoch in preparing for the future: planning for the International Primula Conference 1992 in Portland; arranging for a National Show Chairman; increasing membership in the Society and its Chapters; and standardizing the Rules and Regulations for Primrose Shows. The American Primrose Society is indeed looking ahead; as well as fondly reflecting on the wonderful events of this past primrose season. For those members who were not able to attend the National Show, Annual Meeting and Banquet held in Seattle, you missed a marvelous function. The Washington State Chapter is to be congratulated on an excellent job. The primulas were at their peak performance, the Plant Sale had an abundance of choice offerings, and the Banquet and Speaker (Kris Fenderson) highlighted a most enjoyable weekend. For the first time in many years, entries included a member from Canada (Dr. John Kerridge from Vancouver) who returned home with trophies won on his excellent showing of Gold Lace Polyanthus and Show Auriculas. Hybridization efforts were exemplified with Rosetta Jone's latest color breaks in double primroses, Peter Atkinson's crosses with P. marginata and P. auricula, as well as his crosses with Julies. I am anticipating an equally great time at this year's National Show being hosted by the Tacoma Chapter on the 1st and 2nd of April 1989.

The APS Annual Potluck Picnic and Plant Auction, held in July, was another delightful gathering of Primula growers that would have been unfortunate to have missed. It was a great time to meet growers and new friends. The Chehalis Rare Plant Nursery in Chehalis, Washington, as in the past, extended their welcome mat to members and guests. The Plant Auction contained many exciting and rare specimens; bidding became quite lively when Primula nutans, P. anvilensis and P. eximia (flown in from Nome, Alaska the day before) was put on the auction block. Members should really try to attend this important fund raising event held each year on the second Saturday of July; this year it will be held on July 14th.

The month of January is that pulsating time when primrose growers are scurrying around preparing for a new season; sowing seed, identifying crosses to be made, anticipating unwelcome pests and girding for the shows and exhibits. This year the American Primrose Society will be represented at three major Flower and Garden Shows: Tacoma (February 8 through February 12); Seattle (February 17 through February 20); and Philadelphia (March 5 through March 12).

What an exhilarating season coming up!

Best wishes for the New Year and pleasant gardening.

Larry A. Bailey
1570 9th Ave. North
Edmonds, WA 98020
Where have all the flowers gone?

by Larry A. Bailey
Edmonds, Washington

In looking over the latest seed catalogues, brochures and publications; looking forward to my latest attempts at growing new and exotic plants, I suddenly realized that over the past few years, there has been an alarming increase in the number of organizations, societies, individuals and small companies that have been sponsoring seed and plant collecting expeditions throughout America and our world. These organizations and individuals are gathering plants and seeds of not only the rare and endangered species, but also anything that strikes their fancy or they feel might be sold or given away to other individuals or organizations. Oftentimes, much of the seed is not distributed and discarded. I guess I am just as guilty as others — but if we are to have any kind of variety of flowers and plants for ourselves or for future generations, this collecting has got to slow down — now!

The horticultural community is on a deadly cycle: more and more individuals are gaining leisure time for horticultural pursuits, increasing the demand for interesting flora. As the supply of these plants dwindles, the price of the seeds and plants rise, making it more profitable for commercial enterprises to make forays into the “back-country” for collecting purposes. As citizens of the world, we must all stand up, and demand that it be stopped — now! Just think about it: There is no state or country in the world that has been immune to indiscriminate collecting, or overgrowing of live-stock, pollution, and construction projects where the flora has been permanently damaged; many species have simply ceased to exist. Disappearing are the flowers in the alpine meadows, plains, deserts, jungles, and rain forests. The deflowering of the world is not a new issue, but what currently concerns me is the exponential rate at its demise.

If the seeds and plants collected “in the wild” survived domestication, the world would have an abundance of flowers and plants to enjoy, enable research for medical and commercial purposes, and be safe in the knowledge that future generations will have these same benefits. But this is not the case. Anyone who has tried to grow plants collected from their native habitat knows that the rate of survival is extremely low for the first year and almost nil thereafter. Seed collected under these conditions are not better off. A person feels lucky if he can get it to germinate, and extremely lucky if he can get it to flower. With rare exception, the plants do not survive more than a couple of years, many are monocarpic or cannot physically produce seed under cultivation. Additional plants or seeds are not produced. For every seed or plant taken from its native environment, we know we have reduced the chances of the original species to expand or to even maintain its original numbers. Even without disruptions from man, it has taken hundreds or thousands of years to develop into surviving colonies. We simply lack the knowledge or environment to experiment with most of these plants. Of the hundreds of thousands of seed collected over the past few years, I would venture to guess that less than 1% will survive over two years, and less than a hundred will still be under cultivation in five years. Gone forever are the chances to maintain the present status of a species with each seed taken.

We know that all domesticated plants now under cultivation had to be collected in a native habitat at one time or another. But we also know that of the thousands of different plants that grow in the wild, only a handful can be cultivated successfully. Credit has to be given to those plant explorers of the last century and the early part of this century, who themselves faced treacherous and often fatal expeditions to collect seeds and plants for introduction into cultivation and which we now enjoy and cherish. But we should also remember that even though these expeditions were financed by large seed companies, the seed that was brought back was often contracted to the leading botanical gardens; who would raise the plants in controlled environments before it was determined if it was suitable for introduction to humane gardens. Even then, under what would be considered ideal growing conditions and under the guidance of leading botanists, only a small percentage of the species collected survived the first couple of years, much less found their way to the seed racks.

The seeds and plants the explorers shipped back to England and Europe were measured by the tons! If should also be noted that after the various exploration parties criss-crossed their way across the continents, some of the rare species collected disappeared from the face of this earth. Subsequent search parties, following the notes and routes of previous teams have failed to find any trace of the plant. One has to presume that under the stiff competition of the seed companies and in the pursuit of fame and fortune, the last remaining colonies of some species were destroyed.

Unfortunately there is still presently a mental attitude that if a plant, flower or seed has not been placed on an endangered species list, is not located in a National Park or is not on protected land, it is free for the taking. We all know that even in protected locations, the plants are not safe from people who are not knowledgeable of the restrictions; individuals who know better but can’t resist temptation; and even some botanists and students of botany who feel, that with a degree (or in pursuit of a degree), they have some special right to forage any location. Lacking is a wide spectrum of education and deeply felt commitment to exercise control in preserving all of the remaining flora in native habitats, regardless of its location. If we don’t start now and learn from our mistakes, our wild flowers, not only the rare and unique, will soon be gone — forever.

Who is to safeguard our national and world plant treasures? This is going to be a hard question to answer, for in reading the literature from the various seed collecting firms I notice where even some of the leading botanists and trained horticulturists of public botanical gardens are now establishing their own collecting firms or are lending their names to private firms and organizations by identifying plants and seeds collected in the wild. What is known is that a system for wildflower protection is not working and swift and radical changes must be made as well as
1. We must immediately stop all collection of native plants and seed, regardless of their location or apparent abundance.

2. A program must be initiated to educate and make every citizen conscious of wildflower protection. To collect or buy plants, flowers or seed from its native habitat is wrong.

3. Strengthen the various agencies in charge of protecting the wild flora to a level where protection laws can be upheld and severe penalties handed out to violators.

4. Establish a national trust and research centers for native plants. Experimentation on the adaptability of any native plant to cultivation should be carried out at such centers and released to the public only after the plants have proven their adaptability.

5. Before any plants or seeds are collected from their native environment:
   a. An investigation should be completed to determine their population, range, macro-environmental conditions, potential suitability to cultivation, and the chances for survival.
   b. Present a detailed proposal for a program on how the plant or seed is to be handled, tested, cultivated, distributed and returned to its original location.

Already, much of the world’s flora has been destroyed; the plains, alpines, forests and deserts have all been assaulted. We can no longer enjoy many of the flowers we knew as children. With the world population still growing at an alarming rate and the accompanying demographic shifts, our generation is slowly awaking to the fact that “wilda,” “backcountry,” “unexplored territories,” and “wilderness” have long gone; what we have now is only protected environments, plants and animals. Along with losing the wilderness and wildflowers we are also losing a little of ourselves and our little joys and appreciation of life itself. The same elation of experiencing tiny campanulas clinging to windswept alpine cliffs, primulas and saxifrages wallowing in glacial runoffs, rainbows of desert wildflowers after spring rains, or calypso orchids springing and dancing from moss covered forests floors cannot be transplanted to the backyard. Let’s leave some for our children.

Editor’s note: This article, by the current president of APS, is just possibly the most important article to appear in these pages since I became Editor, possibly ever. I hope that it has made you think about a blight that is spreading with incredible speed throughout the whole plant community. It certainly did that for me. As a result I have decided to take this pledge: that I will buy or accept no seed or plants — ever, from any one — that has been collected “in the wild.” Further, I will order no seed from any society seed list that has been collected in the wild. You may not feel like taking these steps, but we hope that you will feel moved to respond — pro or con, briefly or at length — to this moving appeal. We have all been appalled at the viciousness of poachers in Africa who are destroying the rhinoceros for its horn (for use as a sexual stimulant, or for dagger handles). Are we guilty of aiding and abetting the same kind of poaching by patronizing those collectors in the wild who pand to our need for the stimulus of the new/unique, the ornament for our scree? Let’s get a groundswell going here. Thank you Larry for this marvelous start.

The manuscript which follows recently fell into the hands of your Editor, quite by chance, and was recognized at once as something which might be of interest to you readers. And so, permission was secured to present it. If any of you out there have a book which you would like to get written and published, or know of anyone else who does, by all means write me about it. I may be able to help. The Editor

Introduction
Timber Press is dedicated to publishing only first-rate books. The recommendations in this manual are designed to help you prepare the best possible manuscript and then to make its transformation into book form as timely, painless (to all of us), and accurate as possible. In general, Timber Press follows the style recommended by The Chicago Manual of Style, 13th edition. For questions regarding style which are not answered here, please refer to that manual.

The publication of a book involves several stages. Usually you will first submit a book proposal in outline form to the publisher. After the outline has been finals tuned, you will begin sending chapters to the publisher for editorial review. You establish a dialogue with him as you rewrite early chapters and submit new chapters for consideration. You and the publisher will also determine what illustrations will be most useful to your readers. After all the chapters have been written, and rewritten as many times as necessary to incorporate any editorial changes, the completed MS. in its final, re-typed form is submitted to the publisher, along with the illustrations. The final form of the MS. will be proofread here and any necessary clarifications made before it goes on to the next state.

Next your MS. will go to our designer, who selects typeset and format. She will mark it up for the typesetter. He sets the type as the words will look in final form; this product is called “galleys.” You will receive a copy of the galleys for proof-reading. This is the actual typeset, so please read it very thoroughly, checking for typographical errors, such as misspellings, punctuation errors, wrong type (e.g., roman type which should be italic, as for a species name, etc.), sections out of sequence, missing sections, etc. Clearly mark any corrections to be made by the typesetter. Please resist any urge to start rewriting in galleys. This will not only increase the cost to you, (for Author’s Alterations), but also delay the appearance of the book. The place to make the text right is in the manuscript.

After any necessary corrections have been made by the typesetter and proof-read, the designer will “paste-up” the type, producing what are called “mechanicals,” or camera-ready copy for the printer. You will receive a photocopy of the paste-ups, or page
proofs, for a final check and indexing. You will complete the index at this point by inserting the page numbers in your previously prepared list of index terms. When the index has been typeset, proofreading, and pasted-up, the mechanicals will be ready to go to the printer.

The time lines in producing a typical book are as follows:

1. Design 4 weeks
2. Typesetting 4 weeks
3. Proofreading by author 2 weeks
4. Correcting typos 2 weeks
5. Making mechanicals (also referred to as paste-ups), resulting in page proofs 2 weeks
6. Review of page proofs & indexing by author 2 weeks
7. Typesetting, proofing, & pasting-up index 2 weeks
8. Printing and binding 10 weeks
9. Shipping 2 weeks

Total time 8½ - 9 months

I. Before You Write A Word —
A. Define your audience.

You already know what you want to say; you want to tell someone else about it. But the qualities of that ‘someone else’ will determine to a large extent how you go about presenting your information. For instance, you would argue a point more thoroughly if you suspected that your audience was inclined to disagree with you; or you would supply more background information if you believed that your subject was brand-new to your audience.

Furthermore, readers generally develop a pretty good notion of the author’s attitude toward them; they will become irritated if they think the author is either patronizing them or, on the other hand, breezily ignoring their legitimate questions.

By setting down in writing a thorough description of the audience you want to reach, and by keeping at hand during the entire writing process, you can avoid making the kind of mistake that loses the reader’s goodwill.

A good way to make your audience come to life is to think of one person who has all the important characteristics of the audience. This may be someone you know, or a composite of several people; or it may be someone you make up. Call him Joe and take his point of view every once in a while as you work; you will find that he will help you control the whole writing process.

B. Define your goal.

Do you want to instruct the reader in a method? Or alter a deep-seated prejudice? Or put a fact or situation in historical perspective?

By setting down in writing exactly what you hope to accomplish with your book you will keep your focus sharp and control the natural impulse to digress.

C. Remember that you are the boss.

You now have two written documents (your description of the audience, your goal definition) which you should have at hand during the whole writing process. But if you find that they are shoving your thoughts in a direction that is increasingly uncomfortable for you, it’s time to stop and rethink your approach. You may have made a mistake in your analysis; rather than struggle to fit your ideas to the framework you have set up, go back to the beginning and re-define your audience and goals. This may seem painfully time-consuming at first, but you will find that in the long run you save yourself much distress and enable yourself to write a better, more interesting book.

Now you have the vital orientation to control your presentation. You know your audience and you know what you want to accomplish with them. You have a working idea of the preconceptions, prejudices and gaps in knowing they are likely to have, as well as their strengths.

II. Work out the basic logic and organization of your approach.

A. Write a one-paragraph summary of your book.

In every subject there is a natural logic inherent in the relationship between and among its components. In describing a process you start with step one and proceed through a series of steps to the final finishing touch; in constructing an argument you present evidence and then draw a conclusion; in examining a historical event you follow the chronology of that event.

The best way to uncover the natural logic of your subject is to condense it into a single paragraph. A carefully prepared summary will naturally reveal the components of your idea and their relative importance.

B. Break down your one-paragraph summary into parts of equal weight.

You are now ready to use your summary as the basis for dividing your subject into its basic parts, each of which will constitute a chapter in your book.

The first step in this process is to decide on a device or method of organization. You may want to look at a single idea from a variety of viewpoints — economic, philosophical, social, biological; or you may need to develop a series of steps in a process — gathering materials, preparing them for use, constructing an object; or you may want to put an event in perspective — establish the background, document the event, fit it into the background.

How to decide to break down your subject is a matter for your own discretion; the important point is that you settle on a plan which suits your subject and approach, and then stick to it.

Special care must be taken to make sure that the divisions into which you break down your subject are of roughly the same importance. These divisions will ultimately be chapters; if your book is to be balanced and in proportion, you must establish divisions that accurately identify the components of your subject and give you enough scope to develop all the related ideas comprised by each division.

C. Write a one-paragraph summary of each division.

You are now ready to do for each chapter what you did for the book as a whole; but beyond this, you will also need to pay attention to the order and progression of ideas as they emerge in your summaries.

1. First write each chapter summary, again being careful to
state exactly what information will be included.

2. Then look at the order of the chapters. Have you put any carts before their horses? Does the material develop by building naturally on the information in the preceding chapter, and preparing the way for what follows? At this point you may want to write in succinct statements, in the space between the summaries, of the logical connectives linking each to what goes before and what follows.

3. Before going much farther, you will need to review your work.
   a. Is the order of the chapters the most compelling possible?
   b. Does each unit contain only material relevant to itself?
   c. Does each unit include all the material relevant to itself? If not, now is the time to re-organize.

D. Build an outline of the book.

By repeating steps B and C for each chapter, and then once again for each division of each chapter, you will produce a well-thought-out skeleton for your book. By continually reviewing your outline as suggested in C.3 above, you will be able to catch and correct mistakes of emphasis or logic.

As you work, ideas will occur to you which apply to a different section from the one you are working on; resist the impulse to make them fit somehow into the material at hand. Simply jot them down next to the chapter summary where they properly belong and include them in the development of that chapter.

E. Submit your finished outline to your publisher.

When you are satisfied that your outline really represents what you want to say in your book, submit it to your publisher to get his feedback. Doing this will not only give you the reaction of a fresh mind to your work, but will also assure the publisher that the idea is shaping up into a publishable manuscript. He will use your outline to begin planning for the appearance of your book.

III. Work on the diction and rhetorical character of your book.

You should now be free of the problems of logic and organization, and able to turn your energies to casting your ideas in graceful and clear language, again with your audience uppermost in your mind.

A. Define your terms.

Although you will want to avoid jargon as much as possible, still you will probably need to develop a small vocabulary of special terms the reader needs to understand in order to follow your presentation. Remember that here again you are the boss; you do not have to use a dictionary to define terms, and in fact will probably avoid doing so. Dictionaries are developed to cover every possible use of a word, whereas you will be using it in only a limited context. So you can construct a definition of the word that covers only your use of it. Be sure to think of your audience — old Joe — when defining a term. Your definition should suit both his limitations and strengths.

B. Develop useful metaphors and figures of speech.

Nothing brings an idea to life as well as a carefully chosen metaphor. For instance, in discussing organization above we might have described your ideas as a stack of bricks. A stack of bricks is just a stack of bricks until an artisan places them in order on a system of supports; then they become a house. Your system of organization is the framework which turns your ideas from a random group of thoughts into an orderly structure.

We wouldn't insist on the beauty of this particular metaphor, but we think it illustrates the usefulness of looking around for apt figures of speech to make your points more graphic. But if you can't come up with one which seems natural, it's better to rely on straightforward narrative than to try to force your ideas to fit an unsuitable metaphor.

C. Establish your tone of voice.

Do you want to be informal with your reader? Or do you want to speak authoritatively and more formally? Do you like to use words playfully, or would you rather speak authoritatively and more formally? Your reader will develop an idea of your personality as author, and it's best to make conscious decisions as to what you want him to think of you.

Again this is a matter for your discretion, but it is important to be consistent. If you are chatty and full of anecdotes in chapter one, it will confuse the reader to find you suddenly assertive and authoritative in chapter two, and then apparently not there at all in chapter three.

D. Review your choice of words and phrasing continually.

In order to say what you want to say, and to say it as clearly and gracefully as possible, you will have to re-write some or all of your book several times. You owe yourself and your reader this extra effort, and you will also find that as you struggle to find words to express yourself accurately your own understanding of your subject will grow and become more profound.

E. Get an occasional fresh reading.

Ask someone whose judgment you trust and whose criticism won't distress you — spouse, associate, friend — to read each chapter as you finish it. Such a fresh reader will be able to pinpoint rough spots and vague passages much more quickly than you, because your familiarity with the material blinds you to its shortcomings.

F. If you are unsure, use a writer's handbook.

A handbook, such as Strunk and White's Elements of Style, can answer many of your questions about matters of usage and style.

G. Submit each chapter to your publisher as you finish it.

Your publisher, or the editor he assigns to work with you, will need to see the finished version of each chapter as soon as you complete it. Your editor may suggest only minor revisions or may make suggestions about
organization or emphasis which could well affect the way you write the following chapters. The sooner you know this the more re-writing you can save yourself.

IV. Remember that your logic and organization will win the confidence and respect of your reader; your diction and rhetoric will win his goodwill and affection.

Elements of a Book:
A Checklist for Authors

(optional)

TITLE
Subtitle*
AUTHOR- name as you wish it to appear on title page and book jacket
Editor*
Dedication*- expressing admiration or affection for a person or a cause
(Table of) CONTENTS
(List of) Illustrations*
(List of) Tables*
Foreward*- front matter commonly written by someone other than the author, usually an authority in the field; his/her name given at the end

1989 Dues

1989 membership renewals are now due. Once again our annual rate for both home and overseas members remains at $10.00, and once more for members in the British Isles there is provision for paying in sterling. Here are the steps you must take:

1) Send your cheque, made payable to Brian Skidmore, Treasurer to Acct. #0291941, Lloyds Bank, C & C Branch, 47 Milson St., Bath, BA1 1DX.

2) In order to insure proper credit in the USA it is absolutely necessary to inform the Treasurer in Seattle by letter that your cheque has been deposited in the British bank.

All of you are reminded that membership for the calendar year of '89 and that renewals should be made before December 15. If you are in doubt about the status of your membership, just check the mailing label of the envelope in which this Quarterly comes to you. And say, thanks!

Preface*- author's introductory remarks about the production of the book; not signed unless it would otherwise be unclear who wrote it.

Acknowledgments*- giving credit for assistance, including permission to reprint (if not part of the Preface)

List of Abbreviations*

TEXT

CHAPTER HEADINGS OR TITLES, subheadings*

Parts*- chapters may be grouped in parts; if so, numbered consecutively within text (e.g., Part 1, Ch. 1, 2, 3; Part 2, Ch. 4, 5, 6, etc.)

Illustrations*- (charts, maps, graphs, photos, line drawings, etc.)

Appendix or Appendices*

Notes* (may be at end of each chapter, or at the end of the book)

Bibliography*

Glossary*

Index*

Provided by ISBN

Copyright Notice

Imprint & Address of Press

Jacket blurb

(To Be Continued)

V. The Extension of Your Eye

by Bruce C. Gould

Vincentown, NJ

The equipment scene of photography today is filled with so much glitter and hi-tech slang that too often the real needs of the art are lost. Since the camera body can be any light-tight box and all the electronics are only add-ons, what really permits you to photograph the image you want to record? The camera lens. Of all the equipment you can buy, this is the one piece you can never skimp on or never know enough about.

The lens captures the image, focuses it and transmits it to the film. The image, the photograph, that which you wish to convey to others or to keep for all times, is the physical result of how well the lens does its job. No other piece of equipment is so important in determining how your photographs will look. The lens "sees" what you see; but sometimes it sees more and sometimes it sees less. As an extension of your eye it can only see as well as its design and craftsmanship allow it to.

What is a lens? The term covers not just the glass surfaces but also the tube and focusing mechanism that hold the glass. Most lenses are a group of optically perfect discs of glass, ground and polished and combined in groups. The image is passed through them in order to magnify, shrink, or in some way alter the light waves and focus them on the film. Knowing this, one can easily understand the direct relationship between the quality of the glass, its grinding and polishing, and the quality of the photograph. Distorted lenses give distorted photographs. Unfortunately, even the best made glass, poorly-mounted, will give results as bad or worse. The whole lens must work as a unit and be able to do its job at all settings to be considered a quality piece of equipment.

Then are all "good" lenses expensive? No. Are there any "good" cheap lenses? No. There are some quality inexpensive lenses, but they are not always cheap. This is one of those situations where "you get what you pay for," up to a point.

Lenses have become the best bargain in photographic equipment. Twenty years ago all lenses were hand-ground. The good optics took a great deal of time and were truly expensive, and there were a great many poor imitations around. There were a handful of optical lens manufacturing houses world wide. These companies produced well over 90% of all optics for photographic use. Now, almost all the grinding, polishing and evaluating is done by computers. Computers don't have bad days, get rushed or make human mistakes and they love to do repetitive jobs and do them well. The optics in lenses today have improved many-fold. The only difference in the optics is the quality of the glass itself and even this is evaluated by computer. This technology has opened the door to many new optical supply houses and the competition has...
become intense. If you are plagued like
I am with poor eyesight you will have
noticed the change in producing eye-
glasses from large, distant manufacturer-
to inhouse labs that can give you
new glasses in a hour. This is the same
technology that applies to camera
lenses, producing relatively high qual-
ity and quick turn around. So even with
the economy and trade deficits and all
the other things that drive up prices,
the optics in our lenses, when you
compare price to quality, have become
a great buy.

If not properly mounted even the
best lenses are of little use to the
photographer. Here again new tech-
ology has stepped in to improve the
lens. Epoxy glues — waterproof and
extremely strong — keep optics in
place with little or no visual loss. Light-
weight metals from the space program
are now finding their way into lens
mounts along with Teflon to help the
focusing tracks move easily and with
less wear.

There are still premium lenses with
high price tags and they are worth every
cent. Many of them are speciality
lenses not made by other manufactur-
ers or they are lenses used mainly by
professionals under tough conditions.
Several notable camera manufacturers
produce lenses especially designed for
their cameras and while the price tags
are usually high the attention to detail
and reliability for the pro or semi-
professional make the expense worth-
while. However, the independent labs
are producing lenses that fit most cam-
era bodies and these can be better buys
than the brand names, enabling the
avocational photographer to find good
lenses at reasonable prices.

If you would like to add a new lens
to your working equipment, get one of
the many camera magazines filled
with ads to compare prices and manu-
facturers. If you have been around
photography for a while you may be
startled by the number of new lens
manufacturers, the lists of new lenses
and the wide variation in prices. Who’s
who and what’s what? Without some
background information you might as
well toss a dart at the page to make
your selection. In many cases you are
comparing apples to oranges.

A clue to the price differences lies
in a unit of measurement called an f/
stop. In the lens is a control device,
the diaphragm, that looks and works
like the iris of your eye. Metal leaves
move together and apart to create a
hole and to change the size of that hole.
The hole that is made is the aperture
and the measurement of that aperture
is the f/stop. It controls the amount of
light that may reach the film. A second
cue to cost is the focal length of the
lens.

Lenses that most of us use have their
focal length measured in millimeters.
A “normal” lens is somewhere around
50mm. This focal length will duplicate
on the film an image close to what your
unaided eye can see. A lens shorter
than 50mm is considered a wide-angle
lens, which compresses the image so
that more of the view will fit in the
same area of film. Lenses with a length
greater than 50mm are considered to
be telephoto lenses. They magnify the
main image area and give the impres-
sion of getting closer to the subject.
The main subject will be magnified to
the size, weight, speed and cost. A good
thing to look at are zoom.

The f/stop-focal length relationship
is the mathematical ratio between the
length of the lens and the diameter of
the aperture. When you divide the
focal length of the lens by the apature
it will give you the f/stop. Now let’s
look at this in terms of the largest
possible f/stop for any given lens. If
the diameter remains the same and the
lens gets longer the amount of light
allowed in will be decreased. To
increase the amount of light the diam-
eter must also be increased. When you
increase the diameter of the aperture
you must increase the width of the lens
and the optics themselves must be
larger. The larger the aperture the more
light can be admitted. Lenses are catego-
ized as fast or slow. A lens that will
allow in a lot of light will expose the
film quickly and is considered a fast
lens. A long fast lens will have not only
more glass elements but much larger
ones — and cost more money.

Let me give you one other piece of
knowledge so that you can recognize
this relationship as it is presented in
photographic terms. If you do the math
to find the f/stop you will realize that
they are ratios and read as fractions.
Which is bigger, 1/2 a pie or 1/4 of
a pie? In plain language the larger
the number the smaller the hole. F/22 is
much smaller than f/3.5.

Now when you look at an ad that
states the lens is fast you can judge
how fast a 50mm lens with a maximum f/stop of f/3.5 is a medium
speed lens, while a 50mm lens at f/
2 or f/1 would be considered a fast
lens.

The most obvious question is, how
fast a lens do you need? To answer
the question you must define your
needs. First, will you be working in an
area with poor light or lots of motion
of either photographer or subject? If
so, you will need a fast lens. However,
a faster lens, because of its increased
size, will be bulkier and weigh more.
Will this be a problem? And, just as
important, is the extra speed worth
the extra money? These are questions only
you can answer.

The new technology has produced
enough variety in lenses so that you
can find just what you need in terms
of size, weight, speed and cost. A good
rule of thumb is to buy the best you
can afford without buying more than
you need.

Other things to look at are zoom,
fixed focus, mirror, fisheye, or long
lenses. We will look at these and the
needs they fill in a future article.

NATIONAL AURICULA AND PRIMULA
SOCIETY — West and Midland Section
Invites all Auricula and Primula Lovers to join this Old Society
Membership includes year Book
Hon. Sec., Mr. B. Coalby
99 Somerfield Rd., Bloxwich, Walsall, West Midlands, U.K.

NATIONAL AURICULA AND PRIMULA
SOCIETY — Southern Section
Invites all Auricula and Primula Lovers to join this Old Society
Membership includes year Book
Lawrence E. Wigley
67 Warnham Court Road, Carshalton Beeches, Surrey, England

American Primrose Society
Growing Indoors
An Ideal Solution for Primula Obconica

by Roy Preston, Seattle Washington
Guest Speaker, American Primrose Society
Seattle Chapter, 20 October 1988
Notes by Mary Fisher and Larry A. Bailey

With rare exception, Dr. Preston starts all seeds (not only Primula), indoors under lights and in a sterile environment. A basic philosophy of “indoors to outdoors” is adhered to rigidly. Roy never brings a plant from the outdoors into his sterile environment indoors. By strict obedience to this program, his losses from insects, fungus and bryophytes have been eliminated.

Using odds and ends collected around the home and applying a little imagination and ingenuity, the cost of establishing a very efficient indoor sowing and seedling “nursery” can be within the reach of anyone. A device resembling a free standing book shelf with three shelves and two fluorescent tubes over each shelf can easily be constructed. Inexpensive simple fluorescent fixtures can be purchased at discount hardware or lighting stores, or many times can be found discarded by electrical contractors and/or at construction sites where remodeling is taking place. Roy likes to use “Vitallite” fluorescent tubes because of the wide color spectrum, but also relates that a combination of one cool white and one warm white tube can be used very effectively and will give the plants the necessary light range for growing. The use of the expensive “grow lites” has not been found to be cost effective.

These fluorescent tubes are replaced every year to insure that there is no substantial loss of “candlepower.” Any tube that starts to show darkened ends is replaced.

In sowing seeds, taking cuttings, or transplanting seedling, it is extremely important to use a sterile growing medium. Prepackaged soil-less mixes are highly recommended, and Roy has found both “Pro-mix” and “Sunshine No. 1 — Complete” have proven adequate (with the “Sunshine” mix personally preferred). It is important to read the directions printed on the bag for proper use. Be sure to add the necessary water to these dry mixes before using, as well as following the recommended program for fertilization. Most soil-less mixes containing a mixture of a finer peat moss, perlite and vermiculite should be adequate; but Roy has found many “Seedling” mixes promotes the growth of unwanted moss at a faster rate than other formulas.

Keeping with a philosophy of using discarded items around the home, Roy has developed a technique for modifying styrofoam egg cartons as containers in which to start seeds and grow seedlings. The twelve spaces for holding the eggs in place are ideal containers for plants; clean, easy to handle, free and easily obtained. The lid of the egg carton is carefully cut off along the seam that hinges the lid to the bottom part of the carton (which holds the eggs in place). This lid is then used as a tray under the bottom portion of the carton. The perforated slits that holds the lid shut is ideally located to allow drainage of the tray when watering. A pencil is used to poke a drainage hole into the bottom of each egg space to allow water circulation from the tray. This hole is made before placing the egg holder into the tray. All watering is done into the trays and not overhead into the containers holding the plants; filling each tray to the perforated slots.

When sowing seed, the seed is placed directly on the surface of the soil-less mix without any layer of the media covering them. After sowing or transplanting seedlings, the cartons or pots are placed in plastic bags to retain moisture and to help insure a sterile environment; they remain in the plastic bags until the plants outgrow the bag. “Food Storage and Freezer” bags (both Safeway and Albertson’s have these bags) are just the right size for two cartons and can easily fit on the shelves, under the fluorescent tubes. Dr. Preston noted “Food Storage” bags are smaller than the “Food Storage and Freezer” bags and do not serve the purpose. To allow more head room for larger plants, wire coat hangers can be bent (or any other type of simple wire framework forming a hoop) and placed in the bag to keep the surface from touching the plants. Thin plastic garment bags from the cleaners are great for inclosing larger plants. Sowing seed in 4” plastic pots with a pane of glass cover is often used in lieu of placing the pots in plastic bags. Keeping the temperature around 70 degrees, most seeds germinate within a few days to a couple of weeks. Direct sun light is never allowed to shine on the seedlings.

Be sure to provide the seedlings and plants with adequate food. A pinch of “Osomcote” slow release pellets (18-6-12) are very effective for growing plants indoors. After transplanting a seedling, Dr. Preston pushes at least one of the pellets (using a chopstick, pencil, etc.) into the soil mix to have direct contact with the roots of the plant.

To avoid daily watering after the plants that have been transplanted to larger pots are taken from the plastic bags, Dr. Preston often sets up a watering “wick” system for each pot. This is accomplished by placing a wick (stripes of nylon panty hose are ideal) in the bottom of the pot and allowing the end to dangle through the drain hole of the pot into a water container under the potted plant. Any type of waterproof container (can, jars, plastic food containers, etc.) that will support the potted plant will be adequate. If the plants are placed in public view, the potted plant and its water container can be concealed in a larger decorative vase or wrapped with cloth or paper for a very pleasing display.

As the plants start to outgrow the plastic bag, a gradual transition to the growing environment should take place. First open the bag and allow fresh air to circulate, then gradually cut more and more of the bag away exposing the plant to an "open" environment. Always, slowly condition the plants to new environments or when changing growing media. After the plants reach a size to be placed outdoors, a step by step procedure should be followed to slowly "harden" the plants: more indirect sun light, cooler temperatures, etc. When first placed outside provide shade and protection from winds, watch for extreme temperature changes and slowly allow more and more sunlight.
Dr. Preston specializes in the Primula obconica, a primula that has been cultivated in the Orient for generations. Although closely related to P. malacoides and other half hardy primulas, P. obconica does not cross hybridize with these other species. By hybridizing obconica, many interesting and unusual varieties have been developed over the years. Using the indoor gardening techniques described above, an abundance of blooms and a very wide range of pastels as well as brilliant colors can be expected year round. Sparkling oranges, pinks, blues and whites can enliven even the most gloomy winter day.

Dr. Preston did have one word of caution about Primula obconica; although not affected himself, some people do develop an allergic reaction to the minute hairs that grow on the leaves and stems of the plant. If a person notices any redness on the skin, small rashes, swelling or itchiness after handling these plants, he or she should take measures to avoid direct contact with them. Rubber, latex, or vinyl gloves can be purchased at most garden centers or drug stores. It is a good idea to always have a supply of these inexpensive gloves available when handling any pesticide and many fertilizers.

Although considered an "indoor" plant for most climates subject to winter freezes, Dr. Preston has been successfully growing the obconica outdoors, year round, in protected and ideal growing areas of his garden. When placed outdoors, a lot of attention should be given to Primula obconica to insure a successful venture: filtered shade, an abundance of moisture in well drained soil, loose humus and plenty of organic fertilizer. With the extremely wide range of available colors and long blooming cycle of P. obconica, it is an ideal plant even when treated as an annual or kept in containers; adding that distinctive summer color to those special areas of the garden or patio.
by both the president of the sponsoring society and the president of the APS will be presented to the winner. The winner of any perpetual or revolving trophy will be presented a similar certificate with the trophy.

11. All primula plants in competition are to be judged as garden flowers by accredited APS judges, except show auriculas, alpine auriculas, and gold-laced polyanthus must be judged as show flowers by accredited APS judges.

12. Decorative displays and arrangements may be judged by the standards of the area in which the show is held.

13. Any time there are three or more entries of one type or color of primula not included on the schedule a separate class can be created for them. A separate class may be set up for any entry not on the schedule if the show committee so desires. (This is useful when a new color break, new form, or new hybrid is first exhibited.)

14. Points for figuring sweepstakes winners are: Blue ribbons - 3 points; division champion - 5 points; other special awards not division champions - 5 points. Best plant of 2 or more divisions - 10 points, best plant in show - 15 points. Only when a tie exists will red ribbons (2nd place) be counted; then, they will be 2 points each.

**DEFINITIONS**

**Novice** — One who has never won a blue ribbon award on a primula plant in a show.

**Junior** — Age limits determined by the local society and published in schedule.

**Seeding** — A plant grown by the exhibitor from seed and displaying its first season’s bloom, not more than three crowns and with at least three open pips; except in the show auricula, alpine auricula, and gold-laced polyanthus class, a seedling is a plant that has not been named — and it does not have to be raised from seed by the exhibitor, but the source of the plant must be identified.

**Border Alpine** — Auriculas grown for garden plants that are predominantly alpine in character but having flaws such as pin eye, farina on pips or leaves, or notched or pointed petals that prevent it being benched as an alpine auricula; it shall conform to the show auricula in all other aspects (one crown, one umbel, at least 5 pips, etc).

**Garden Auricula** — Any auricula grown for a garden plant that cannot be placed in any other established section or class for competition.

**Show Auricula, Alpine Auricula and Gold Laced Polyanthus** — Plants that conform to the APS accepted minimum standards of the type for benching in a show.

Italiced words were added at the APS Board meeting, 8 October, 1988.

**Show dates for 1989**

Northwest Flower and Garden Show will be held February 17 thru February 20, 1989 at the Washington State Convention Center in Seattle. The APS will have an information booth at this great new garden show, as well as a display of plants. Call Larry Bailey for information or to offer help.

Other show dates:
- Eastside Chapter - April 14 and 15 at Totem Lake Mall in Kirkland, WA.
- Washington Chapter — April 8 at the University of Washington Center for Urban Horticulture, Seattle.

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**Judges Notice!**

Some time in early March, 1989, I would like a meeting of all judges, senior, junior and any others interested in becoming a judge.

The purpose of this meeting will be to review rules and procedures for judging.

Junior judges having completed their necessary number of shows as a junior judge and having passed the written exam will be issued their senior judges cards.

Any judges wishing to remain on the active list please contact Judges Chairman, Al Rapp, 4918 - 79th Ave. W., Tacoma, WA 98467. Phone (206) 564-9557. Any judge not wishing to contact judges chairman will be placed on the inactive list.

Any input you might have in regard to judging and or shows please feel free to share this information at the March 1989 meeting.

Sincerely

Al Rapp

P.S. The exact date and time in March 1989 will be decided after confering with all those interested.

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**Board Meeting Minutes**

The fall meeting of the American Primrose Society was called to order by President Larry Bailey, at 10:10 a.m. on October 8, 1988. We met at the home of Herbert Dickson where we were served a delicious lunch by Herb.

The minutes of the last meeting were approved as printed.

Brian Skidmore gave the Treasurer’s report. He said we had a quiet quarter with no major problems. We need to drum up more advertisements because there are at least two pages of the quarterly available. Larry will try to find additional help for promotions.

The January meeting will be held at the Berry Gardens in Portland on January 14, 1989. We will begin at 12 p.m. and try to adjourn by 3 p.m. The Annual meeting will be held Saturday, the first day of the National Show.

A motion was made, seconded, and carried to approve the new Chapter formed in the Seattle area. June Skidmore is its new President.

The Board approved the naming of Elizabeth Van Sickle as chairperson of the Round Robin.

Richard Critz from Pennsylvania and Sue Chilton from Portland attended our meeting.

Mr. Critz presented information from the International Primula Conference. The steering committee has presented, for our consideration, a list of possible speakers. We need to keep in mind an effort to follow-up the convention to enhance our society.

The logo has been approved and is now complete. It incorporates the Berry Gardens, the Royal Horticulture Society, and the APS logos.

It is becoming necessary to appoint flower show and plant sale chairpeople. More details on this later. If the show is International it will necessitate Department of Agriculture approval.

A question also arose as to whether the National show should be conducted as a regular show with judges from different areas. More discussion on this later. Larry Bailey will look into conditions for the plant sale.

Mr. Critz presented the “Memorandum of Understanding.” A motion was made, seconded and carried to accept it. The “Resolution of American Primrose Society” was also accepted.

A motion was made, seconded, and carried to accept the “Publishing Agreement” with its modifications.

The Berry Gardens, with the Hardy Plant Society of Oregon presented the steering committee $1,000. Brian Skidmore was advised to give the steering.
committee $1,000 from our quilt fund to represent us.

Sue Chilton presented the arrangements made by the arrangements committee. The Greenwood Inn will provide the convention with its rooms and meals at an agreeable price. It is attractive and conveniently located. Meeting rooms and shuttle service are available. We look forward to at least a registration of 300 people.

The Japanese Garden Society has offered the Tea House as part of the tour of the Japanese Gardens. Also available will be a tour to Bishop's Close — also known as Elk Rock. A day at Timberline Lodge and Gorge is also optional. Plans are shaping up beautifully.

After lunch we reconvened to discuss National Judging rules. The corrected rules are included in the minutes and were approved by the board. Meeting adjourned.

Respectfully submitted,
Candy Strickland, Secretary

Letters to the Editor:

Congratulations on such a fine bulletin as has just been published, Fall '88.

A treasure!
I have 75+ different kinds of sieboldii and so an article such as you published hit the spot! Now, How can I get 200+ different kinds?

Kazuo Hara is Secretary to a Club. Do they share seeds also? Can anyone join? What's the address?

(Ed note: See ad this issue for Matsumoto Sakurasoh and Primula Club.)
—Paul Held
195 North Ave
Westport, CT 06880

Dear Mr. Critz,

My gardening activities being by now definitely over, I keep thinking I should write to tell you not to send the Quarterly (it's still that to me) any longer — in order to save a bit of postage. Then along comes the latest issue with an article that takes me back to my introduction to the Primula family shortly after our marriage in 1952. That was when Elmer began collecting information he required for his idea — "A Cultural Chart for Certain Species of the Genus Primula." Replies to inquiries started coming in from everywhere and entailed sorting, listing, etc.

From then until his death we seemed to be "living primroses" some way or other. His last project, of course, was the index of the Quarterlies to that date. In between we did the seed exchange. He sure would have appreciated the Japanese article this time — as I did.

Keep up the good work.

Sincerely,

—Hilda M. Baldwin
1074 Avenue Rd.
Toronto, ON, M5N2C9
Canada

Dear Richard Critz,

Thanks for printing Joseph Haldal's articles, with his wife's most brilliant drawings — I hope you'll continue to publish "older articles"* as they seem from people, usually who got their hands dirty and were not just mental researchers.

With best wishes,

—Rohilah Guy
Horticulture
2719 Action
Berkeley, CA 94702-2302

*such as "transplanting seedlings," p. 149, Vol. 46, #4

The wax begonia on the windowsill was once a bushy green plant covered with pink flowers. Now only a few blossoms cling to it. Its oldest leaves are yellowing and, when touched, they fall from the plant. New foliage does not replace those leaves that disappear.

There's an African violet sharing this windowsill. In spite of the eastern exposure, the plant stopped blooming months ago. Its foliage is lush and resilient but there are no buds poking their heads into the air.

Close inspection of both plants reveals no sign of pests or diseases. Each is well watered whenever its soil dries out. Cool morning light bathes them without burning their leaves. Both are misted and groomed regularly.

These two plants are almost perfectly cared for by the meticulous grower. But, for all her effort, nothing's happening. She has forgotten one of their most crucial requirements and so is abusing her plants. She has never fertilized them.

The indoor gardener's failing isn't the result of laziness. The problem is she doesn't know what to do.

And simply telling her to fertilize won't help. There are so many plant food products on the market and so much misinformation about them floating around that anyone might be bewildered. And we all know how intimidating confusion can be. It can lead to a complete inability to do anything at all. In other words, if you are boggled by your fertilizer options, you might not fertilize out of fear of making a mistake.

But, for the record, any fertilizer is better than none at all. The wrong plant food may not achieve the results you hope for, but it will improve the situation. Having absolutely concluded that you should fertilize, even if you don't know what you're doing, the next obvious step is to learn how to do it right, and that's where the confusion really begins. There seem to be as many kinds of plant foods as there are species of house plants. Deciding between a soluble powder and a liquid concentrate that seem to contain identical nutrients can be baffling and knowing the time-release from the ready-to-use foods, deciding among pellets, spikes, crystals and squirts can discourage even the most committed horticulturist.

Ironically, the disorienting array of fertilizers is supposed to benefit the consumer. Manufacturers recognize that the needs of people are as varied as the nutritional requirements of the plants we grow. And so, thousands of forms of plant food have been created.

A Fertilizer Survey

A practical guide to the mind-boggling array of powders, liquids and capsules that claim to help your plants grow better.

by Carla Petra Pavone
Reprinted from "House Plants and Porch Gardens" Nov. '78

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to offer us the greatest possible flex-
ibility and convenience. It is possible
to select a plant with very unusual
nutritional needs and match it with a
grower with peculiar cultural habits
and still find a fertilizer that is perfect
for both. But those variables produce
a huge selection. And the only way to
chart a path through such a maze is
to learn how to read the labels on plant
food containers. Only they can tell you
what you need to know.

Labels inform you of the contents
and style of the plant food you are
considering. Labels list nutrients and
forms. They tell you whether your
fertilizer is organically derived or
manufactured by artificially combining
raw chemicals. Labels even may tell
you something about how much to use
and what plants will benefit from the
stuff inside. But, you have to do your
homework before you can intelligently
purchase a fertilizer. Plants need too
many different things and manufactur-
ers try too hard to supply them for plant
food selection to be a simple job. To
begin with, it's a good idea to know
what a fertilizer is and what it does
and doesn't do.

Nutritious & Delicious
One of the most bewildering aspects
of buying a fertilizer is that hardly any
nutrient products are called fertilizers.
They are known as plant foods. But
“plant food” is a strange misnomer.
Plants don’t actually eat. Rather, they
combine a number of available raw
materials, carbon dioxide, water, sun-
light and minerals, to form real plant
food, the stuff they consume. To do
so, of course, they need a steady and
balanced supply of the raw materials.

In nature, plants produce long,
searching roots to gather nutrients and
water for photosynthesis. In pots, they
are confined to a limited amount of
soil and, consequently, to a limited
supply of nutrients. In order to keep
plants in containers, but still expect
them to go on growing, you constantly
have to replenish their supply of raw
materials. Sunlight flows to them daily.
Water is easy. And nutrients are con-
sumed unless you fertilize.

It’s important to point out that
though your plants get bigger when you
fertilize them, their growth isn’t related
to the sheer volume of stuff you add
to their soil. Plant food is only one raw
material that has to be combined with
all the others in a fixed proportion. If
a plant can’t use the mineral building
blocks that have been added to its soil,
this “food” collects around its roots and
goes unused.

If fertilizer salts just sat in the soil
without doing anything, there wouldn’t
be a problem. But, like the salt crystals
used each winter to melt ice and snow,
fertilizer salts have a corrosive effect.
Excess salts actually eat away at roots
and the lower stems of plants. The
affected parts look dry and brown, or
To avoid burning your plants during fertilizing, you have to give them only as much fertilizer as they need. If your quantities are right, the plants will absorb the minerals and won't be burned.

There are thirteen soil nutrients important to plant growth. All plant foods contain at least one of these nutrients. Many plant foods contain several. But each is absolutely vital to plant growth and health. Without any one of them the whole system can break down and fail. Fortunately, most of the thirteen are needed in only minute amounts and are supplied easily by food supplements or potting soil.

Three minerals are needed in large quantities. They are nitrogen, phosphorus and potassium. Nitrogen is the nutrient soils lack most often. It is essential to the growth of new green tissue. Phosphorus is involved in the development of strong roots and flowers. Potassium, which comes in a chemical form called potash, promotes disease resistance, bigger blossoms and overall vigor.

These three nutrients are those that dominate most plant foods. They are the three minerals in a fertilizer that most completely establish its primary purpose and they make up almost all of its working volume. But, in addition to these three crucial minerals, plants also use secondary nutrients that tend to stream out of the soil quickly and must be replaced regularly. Calcium and sulfur are consumed in very small amounts by plants. However, they serve to maintain the acidity of the soil at a constant level. Since acidity has a major impact on the ability of plants to absorb other nutrients, including the big three, calcium and sulfur can play an important role in the capacity of plants to take in what is also important. In some species it is as crucial as phosphorus and potash. It is a major component of chlorophyll, the green pigment that absorbs light energy during photosynthesis.

The last seven plant nutrients are called “trace elements.” They are consumed in minute amounts, sometimes so small that you never need to worry about adding them to your soil. Boron, molybdenum, manganese, zinc, copper, iron and chlorine sounds like odd chemicals to find in a leaf, but they are vital components of plant tissue. Fortunately, these elements tend to remain in the soil and don’t wash away as readily as do the major nutrients.

The single most important relationship among all the nutrients in a fertilizer is the proportion of nitrogen to phosphorus and potassium. If you want lush, green growth in a hurry, you should select a plant food that has a high percentage of nitrogen. If you are encouraging flowering or are interested in slower but generally vigorous growth, pick a plant food that has more phosphorus and potassium than nitrogen. The generalization just offered is overly simple.

The remainder of this article will touch on the many variables in plant foods that make choosing one more difficult than this paragraph might lead you to believe.

Guaranteed Ingredients

Fertilizer labels tell you what the fertilizers contain. They have a guaranteed analysis on them that lists their components numerically. The law requires that the analysis be accurate. Generally, the analysis tells you about the three major nutrients. The label tells you how much nitrogen, phosphorus and potash are present in a plant food before it is diluted and added to soil. The analysis also may list the proportions of some of the secondary nutrients in the package.

Great news: the proportions of nitrogen, phosphorus and potash are stated on the label of a plant food in exactly the same way every time. There is a uniform format that states what percentage of the total weight of the fertilizer is made up by each major nutrient. And the three main foods always appear in the same order: first nitrogen (N), then phosphorus (P) and finally potash (K). So, a 10-20-10 fertilizer contains 10% nitrogen, 20% phosphorus and 10% potash. The 60% of the fertilizer’s weight not represented is basically nonnutritious filler. A high-nitrogen fertilizer for foliage plants may have an analysis of 25-9-9, while a plant food for blooming species may have an analysis of 0-6-5.

Having mastered the three magic numbers on a bag of fertilizer, you now can proceed to find out more about the other important nutrients. Well, here’s the bad news: since the guaranteed analysis must, by law, represent what is in a fertilizer, it may not describe everything that is in it. The purpose of this regulation is to protect you from inflated claims and ensure that you really get your money’s worth when you buy plant food.

Secondary nutrients and trace elements may be included in a fertilizer without being mentioned on the bottle or package. They can’t be mentioned because they are present in quantities too small to control precisely and so can’t be guaranteed. However, since trace elements are needed in only small amounts anyway, not reading about them isn’t so bad. It’s likely that many plant foods contain trace elements without informing you that they do. The law is a wonderful device that sometimes creaks in strange ways when it’s in operation.

How Much, How Often

All fertilizers must be diluted in water before they can be absorbed by plant roots. Most fertilizers come either in crystal or powdered form and are mixed with water before they are applied to plants. Some come in premixed, liquid form can be added directly to the soil. And some, like time-release pellets and spikes, are dry fertilizers that are given to plants in their dry form. These rely on normal watering to dilute plant foods.

Given these different styles of fertilizers and the obvious differences among plants, you might wonder how much fertilizer a plant needs and how often it should be given. The whole matter of creating a healthy fertilizing schedule comes down to an understanding of how soil loses nutrients. After all, the real task is to maintain a fertile condition in the soil at all times even though many factors tend to make soil infertile.
To begin with, some mineral depletion occurs every time you water your plants. Each time water drains from a plant's soil after a thorough dousing, some minerals drain away too. In other words, the more often you water, the more often you need to fertilize.

If your plants live in small, clay pots, it is likely that they dry out frequently. It's also probable that you then water them more often than you might a plant in a large pot. Therefore, plants in small pots that are watered often may need fertilizing nearly every week. Specimens in large containers may require feeding only three or four times a year. The weather can be a factor too. Hot, sunny spells that trigger rapid evaporation of moisture from the soil create the need for increased watering and additional applications of plant food.

When it is hot and sunny, of course, plants tend to grow faster. And that means they consume more soil nutrients than they do in the winter. During that dry season, plants receive less light and so can't collect as much solar energy as they do in the summer. So they don't grow vigorously and don't absorb nutrients as quickly. In fact, commercial growers have found that foliage plants growing in greenhouses need ten times as much plant food as their cousins in the relatively dim, fluorescent lighting of retail plant stores.

And this distinction can cause real trouble. For instance, the suggested dosage stated on a plant by its grower usually describes how much food it needs when growing in optimum (greenhouse) conditions. Similarly, fertilizer manufacturers often tell you to mix their products for these same conditions. Thus, both the plants and the fertilizers are tending to overstate your plants' needs. So, until you've had a chance to experiment with a product, use the manufacturer's dilution recommendation as an upper limit. Generally, use less than you are told to use until you're sure you're not being told to use too much. If you choose a fertilizer intended for outdoor use, be especially wary of it when applied to indoor plants. Use only one-half to one-third the amount the label suggests.

It's easy to say that different plants need different kinds and amounts of fertilizers. It's even easy to believe. But the differences among plants are so great that knowing how to treat each properly can be a challenge. Plants are as varied in their fertilizer needs as they are in their moisture and light requirements. And that, certainly, is varied.

Most ferns, for example, are acutely sensitive to overfeeding. They can go months without any fertilizer at all. If offered too much, too often, excess salts may form around a fern's roots, burning them and eventually shriveling the foliage. Tomatoes, on the other hand, are considered to be heavy feeders. They won't set their maximum numbers of flowers or produce sizable fruit without a weekly dose of full-strength mineral solution.

Growers respond to these varied needs with a number of fertilizing techniques. Some feed their plants often, but with small quantities of nutrients each time. Others prefer to dish out big feasts (though still not exceeding the manufacturer's suggested maximum strength) and follow these with long fasts. Either method will work. It all depends on how carefully you watch your plants' needs and how attentive you are to their growing seasons.

A workable rule of thumb is to feed indoor plants during the spring and summer with half-strength houseplant food every two weeks. Give foliage plants a fertilizer with a high nitrogen count and give flowering plants a fertilizer with an analysis that is high in phosphorus.

If you choose to fertilize your plants with each watering, compute how often, on the average, you water your plants. Apply the rule of thumb to this frequency and dilute each feeding accordingly. For instance, an African violet that is normally watered eight times a month (twice a week) should be treated to one-eighth of the manufacturer's suggested dosage with each watering.

Natural Foods

There are two kinds of fertilizer. The first has been around a long time and is, essentially, the same sort that has served plants since the beginning of time: this, or course, is organic fertilizer. Such plant foods come from natural sources that were either once living or are minerals mined directly from the soil. The other kind of fertilizer is manufactured by chemical means in a factory. Basic compounds are formed by fertilizer factories by combining raw materials in a number of ways.

During the last twenty years, a large outdoor gardening movement has built up around the concept of feeding plants solely with organic materials such as bone meal, fish emulsion, compost and manure. There are good reasons for this movement. Perhaps most important, the structure of the soil is gradually but definitely improved by the addition of organic matter. Needless to say, this can be very important to a farmer, or vegetable gardener, who plans on farming the same bit of ground for many years.

The indoor gardener growing ornamental plants in containers doesn't have to share the outdoor gardener's concern for the long-term health of the soil. A flower pot is an inherently unnatural environment and the soil in it can be changed easily. What's more, organic plant foods don't supply plants with any special nutrients. Plants cannot distinguish between nitrogen that is manufactured in an ammonia factory and nitrogen that is created in a compost pile. By the time a plant absorbs nutrients, it has broken them down to their simplest form and so cannot discern one kind of nitrogen from another.

However, natural nutrient compounds are extremely complex. They are, therefore, much slower to dissolve in the soil and so aren't leached away by repeated watering as quickly as are artificial fertilizers. Natural compounds are also very mild. Their complex make-up means they are available to plants more slowly and in a less concentrated form than the simpler, quicker, artificial compounds. On the one hand, this assures you that your plants won't be burned by excess fertilizer and, on the other hand, means you can't give your plants a zap of instant food if you want to.
Another advantage of organic fertilizers is their natural "impurity." Organic materials generally contain many trace elements and secondary nutrients in addition to the main three listed in a minimum guaranteed analysis. Even if you normally use synthetic chemical fertilizers, an occasional dose of organic plant food ensures a balanced diet for your plants.

A Few Favorites

Farmers living along the coasts of Europe have used a seaweed mulch to fertilize their gardens for centuries. Today the stuff is available in bottles. Seaweed extract is nothing more than the pulverized and liquified remains of choice sea plants. The brown liquid, unlike other organic foods, is not malodorous. Perhaps for this reason it has become an increasingly popular fertilizer for use on house plants. Since it is derived directly from plants, the extract is chock-full of the growth hormones and secondary nutrients lacking in most plant foods. Although the chances of burning your plants with this mild fertilizer are fairly slim, follow the dilution instructions on the package before pouring the mixture onto your soil.

Fish emulsion is another natural fertilizer from the sea. Essentially a mash of liquified fish, the emulsion is a particularly good nonburning source of nitrogen and trace elements, especially helpful to sensitive foliage plants such as ferns. The main problem with the stuff is that even the deodorized brands smell like a fish store when first watered. Bone meal also has the advantage of having an alkaline chemistry. It can help neutralize the high acidity of a peat-based potting mix. This makes it an excellent addition to many cactus and succulent potting mixes.

Organically derived fertilizers are mild sources of slowly available major plant nutrients and many of the occasionally needed trace elements.

Bone meal once was processed from buffalo bones gathered from the great Plains. Today the bones come from cattle slaughterhouses. The stuff is an excellent source of phosphorus and is traditionally used to treat the soil of flowering bulbs such as tulips. Bone meal also has the advantage of having an alkaline chemistry. It can help neutralize the high acidity of a peatbased potting mix. This makes it an excellent addition to many cactus and succulent soil mixtures.

Dried blood, or blood meal, comes from the same source as bone meal. It contains organic nitrogen and is a relatively strong organic fertilizer. Use blood meal sparingly, measuring carefully to be sure your mixture is well within the manufacturer's suggested limits.

One of the oldest fertilizers around, cow manure, can be purchased as a dehydrated, pasteurized, inoffensive powder. It contains very low quantities of nitrogen, phosphorus and potash, but is a good temporary source of nutrients. About 95% of dehydrated cow manure is composed of trace elements or nutritionally useless filler.

Applying Dry Organic Fertilizers

Processed organic fertilizing powders can be mixed directly into potting soil the next time you repot your plants. All you have to do is be careful about the dosage you offer your plants' roots. Careless growers have discovered that even these relatively weak, slow-acting substances have a strong effect on container plants. To create a beautifully fertile soil that probably won't burn your house plants, try mixing equal parts of soil, peat moss and sand with one-half part cow manure. Throw a large handful of bone meal into each bushel of this mixture.

A less disruptive way to apply organic fertilizer to potted plants is to mix the powder into the top inch or so of moist soil. Add less than the package says you should. Then water the soil thoroughly to spread the nutrients through the growing medium.

Note

There is much to be said for artificial, chemical fertilizers. But there is something terrific about using organic plant supplements, especially when they are homemade. Until the turn of the century, processed, chemical plant foods were unknown. Folks on farms recycled their organic trash to feed their crops. They had little need for buying what they already had at hand. And high-powered nitrogen fertilizers weren't available even if they were inclined to buy it. Still, their plants grew.

If you live on or near a farm, it is still possible to compost fresh manure. Let it rot outside until it is sufficiently decomposed to add to your potting soil. Avoid chicken manure; it has a tendency to burn plant roots unless it is very diluted.

Space and a little work are all that is required to form compost from kitchen scraps and lawn clippings. Any organic waste material, from eggsHELLS to old lettuce leaves, can be left outdoors to rot. You can pile the stuff in a corner of your yard, stack it in a window box or even seal it (tightly) in a garbage bag in your kitchen. The broken-down stuff that results can be added directly to your potting mix as soon as it is completely decomposed. You'll know that the time has arrived when you no longer can recognize any of the items you started with.

But remember, compost isn't fertilizer. It is a slightly nitrogen-rich soil conditioner that has many excellent qualities. But it won't give your plants a "shot in the arm" with nitrogen.

Chemistry

Now that organic materials are in short supply, they aren't the cheapest fertilizers around. In fact, dehydrated manure and other processed organic fertilizers are relatively expensive commodities. As in the case of fabrics such as nylon and rayon, the synthetic product is cheaper than the real thing. And, as with such fabrics, in many cases they do a better job.

Since World War II, despite the organic gardening movement, the use of synthetically combined fertilizer compounds has skyrocketed. Over 90% of the plant foods sold today are "inorganic." And there's a reason for this.

By concocting fertilizers from scratch, combining chemicals as he sees fit, a manufacturer is not limited to whatever nutrients the natural mate-
of plant food are present to fertilizer. The remaining 38% of the product consists chiefly of chemically plant food that actually goes into feed—don't be surprised over the amount of 16-30-16 for a total of 62% of the nutrients on the label of a fertilizer, needs. This is a balanced plant food. Like a balanced fertilizer that includes the main three nutrients in the ratio 1-2-1 or 1-3-1 "balanced" refers to. A history of quantities of nitrogen, phosphorus and potassium, this is not what the term assume these fertilizers offer equal nutrients. Nevertheless, in the fertilizer world, "complete" has a rather limited, even incomplete, meaning. Although plants need thirteen soil nutrients to grow, "complete plant foods" consist of only the three main nutrients: nitrogen, phosphorus and potassium. So, a phosphorus-potash fertilizer formulated to encourage flowering is designated an "incomplete" fertilizer because it has no nitrogen.

Another baffling label, "balanced plant food," is found on many products. Though you logically could assume these fertilizers offer equal quantities of nitrogen, phosphorus and potassium, this is not what the term "balanced" refers to. A history of repeated usage dictates that any fertilizer that includes the main three nutrients in the ratio 1-2-1 or 1-3-1 is a balanced plant food. Like a balanced meal, they give a plant a little bit of each of the basic nutrients it needs.

When you add the percentage of nutrients on the label of a fertilizer, don't be surprised over the amount of plant food that actually goes into feeding plants. Even the strongest, most concentrated plant food may read only 16-30-16 for a total of 62% of the fertilizer. The remaining 38% of the product consists chiefly of chemically inert filler. The nonnutritious components of plant food are present to stabilize the product to increase its shelf-life, not to trick the public into thinking it is buying more than is actually being sold.

**Soluble**

Most chemical fertilizers are dry powders or crystals that must be mixed with water before being applied to the soil. These fertilizer salts often are dyed odd colors such as pink, green or blue to prevent you from mistaking a fertilizing mixture for plain water. These dry plant foods are, potentially, the strongest, most concentrated fertilizers you can buy. They also may be the weakest. In their undiluted state they may contain 50-60% chemical nutrients. Because they are so concentrated, a small jar of such a plant food may last you for years. But, since they have to be mixed with water before being used, you can adjust their strength. Just add a little less fertilizer to your gallon of water and you have a milder fertilizer. This flexibility makes such plant foods very popular. It also makes them dangerous. A miscalculation may burn your plants' roots, killing them.

Dry fertilizers last indefinitely in their packages as long as they are protected from moisture. Make small batches of dilute plant food whenever you need it so that you can use up your entire mixture within a month. Be sure to measure the powder precisely and to mix it thoroughly with warm water until it is completely dissolved. Never, absolutely never, mix a dry inorganic fertilizer directly in to the soil surface.

**pH**

There is a rather complex relationship in the soil between water and nutrients. One of the most important aspects of this relationship crucially affects the acidity or alkalinity of the soil. That is, how sweet or how sour the soil is. Some plants, such as miniature roses, camellias, gardenias and potted azaleas cannot extract nutrients from the soil unless it is quite acidic. To keep such acid-loving plants happy, some fertilizers contain chemicals that acidify the soil as they feed the plants.

The acid strength of a fertilizer is measured by how much calcium carbonate (an alkaline substance that sweetens soil) must be added to the fertilizer to make a ton of it neutral. For example, more than one thousand pounds of calcium carbonate may be required to neutralize a ton of an acidifying fertilizer, while only a couple of hundred pounds may be sufficient to neutralize a regular fertilizer.

On the other hand, many house plants prefer a soil that is only slightly acidic. Since many potting soils contain significant quantities of acid peat, it's a good idea to add an alkaline substance to such soils before potting in them. Both bone meal and ground-up eggshells can take the edge off an acid mix.

The acidity or alkalinity of a soil is crucial to the health of a plant. The right fertilizer, the proper mixture of potting media and careful soil testing are all important in keeping a soil's pH at the right level for a particular plant.

**Liquids**

Partially diluted, liquid concentrates are relatively new forms of house plant fertilizer. They reduce the risk of overfeeding and burning your plants by being very dilute to begin with. To be blunt, they contain very little fertilizer in the first place. These low-analysis products may be only 5% nitrogen, 5% phosphorus and 5% potash.

The major value of these is that they are gentle fertilizers when properly mixed with water. A failure to follow the directions on the bottle precisely doesn't mean risking your plants' health because the fertilizer is quite mild, even in its concentrated form. Although such plant foods are more expensive in the long run than the dry stuff, you may find liquid concentrates more convenient and reassuring to work with.

**Straight**

Ready-to-use fertilizers boast that they allow no room for error: as long as you follow the simple directions on their labels, there's nothing to worry about. All you have to do is pour these prediluted fertilizers onto your plants. The boasts are legitimate. These generally weak solutions can be applied right to the soil, just as if you'd whipped up your own batch of liquid fertilizer from a dry powder or liquid concentrate. Needless to say, since prediluted fertilizers are about 95% water, you end up buying a lot of water and relatively...
little fertilizer. But you get a safe, no-hassle bottle of stuff that can’t seriously harm your plants and that will feed them if used correctly.

But premixed plant foods operate on the premise that the fertilizer salts they contain will be diluted further by moisture in a potted plant’s soil. So you always should water the soil both before and after you apply a ready-to-use fertilizer to avoid harming your plant’s roots.

One caution should be mentioned. Resist the temptation to squirt a little extra plant food onto your potted beauties. Add only as much fertilizer as the package suggests for a pot of a specified diameter. And don’t splash the liquid on leaves or stems. Fertilizer salts will eat away at green tissue, damaging both stems and leaves.

**Time Pills**

Even applications of premixed liquid fertilizers require repetition every few weeks. Therefore, such feeding methods may not be the best for plants belonging to a forgetful sort of person. The absent-minded should investigate time-release fertilizers. After one application of these plant foods, you can forget about feeding your foliage for months.

Time-release plants dissolve a little every time you water your plants. Thus, they are designed to give a mild feeding at every watering. You pay for the convenience by relinquishing control over the dosage your plants receive with every feeding. You have to rely on the product to release fertilizer at a rate that is slow enough to avoid burning plant roots.

Time-release products come in several forms and some are more gentle to roots than others. The best of them are formulated into granules. These can be sprinkled into the soil surface or mixed directly into the growing medium. Because they are applied in many small units, such fertilizers generally release their nutrients evenly into the soil. With each watering, the coating on the granules disintegrates enough to emit just a small, measured dose of fertilizer.

Other, more concentrated forms of time-release plant foods are less reliable. Tablets and spikes may be convenient, but they produce a very high concentration of fertilizer in their immediate vicinity when a plant is watered. And this strong plant food can burn roots. The obvious remedy to this problem is to disperse the nutrient source. Cut up spikes if you have them and sprinkle them on the soil. If you have large tablets, grind them up before applying them to your plants.

When using a time-release fertilizer in the winter, cut the recommended dosage in half. Remember that plants are dormant during the winter and so absorb less fertilizer than they do in the summer. Luckily, watering should be reduced in the winter too, so time-release fertilizers shouldn’t be released so often during this season.

All plant foods work. They are all products that release nutrients to the soil where they can be absorbed by plants. A product can’t be called a plant food or a fertilizer unless it has this effect. It’s the law. But there are lots of different foods, each with a slightly different make-up and purpose. Different substances have different effects and each is more or less suitable to specific plants. They all will provide food, but not necessarily as you wish they would.

For a plant food to work for you it must suit your plants, the season and you. Each grower must understand what it is he is using and how it is designed to help plants grow. Only study and experimentation can tell you exactly which foods to use and how to use them on your plants. But, at least now you can begin with an intelligent reading of any plant fertilizer label in the world.

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**Soil acidifiers are designed for plants such as azaleas and roses. They make certain nutrients more available to these demanding plants.**

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2. Section Cuneifolia

Balfour.

The Section Cuneifolia contains several small, semi-woody species with densely branched rootstock. These Primroses do well in rich soil — the best mix is half leafmold and half grit. Abundant moisture in spring and summer is necessary, while in fall and winter the plants need nearly complete drying, conditions difficult for most of us to provide. All species of this section are easy from seeds, which retain their viability for several years if kept cool and not too dry. Since all the species are tuft-forming it is easy to divide them. Both seedlings and cuttings dislike the closed atmosphere of a frame where they are attacked by fungi and rot easily. They are suitable for culture in the alpine house or a large frame, if one can provide good air circulation. If they have enough moisture, they can be grown on full sun.

P. cuneifolia Ledeb., grows in, Northern Asia, in Alaska, on the Aleutian Islands and Kamchatka together with species of the genera Cassiope, Phylloclad considers, Diapensia, Silene and many others. Cuneifolia is a tiny caespitose plant with woody, shortly-branched rootstock, forming small cushion-like tufts. The leaves — not too numerous and bunched in a rosette — are short, leathery, about 6cm long and 2cm wide, shortly petiolate, rhombic, with dentate blade. The stem reaches to 10cm, with a head-like umbel of 1 to 12 flowers on short pedicels which stay upright. The corolla is up to 3cm in diameter. Germination is reliable from seeds, but seedlings increase slowly, and the first solitary flowers appear only after 3 or more years. Only older plants have several flowers on a stem.

var. saxifragiifolia /Lehm./Pax is smaller in all aspects. The stem is to 6cm high, flowers 1 to 3 per head and leaves short-petioled.

P. hakusanensis France., comes from Japan, where it grows on moist meadows at elevations of 2500m. The first plants described were from Mt. Hakusan. The entire plant is glabrous, not farinose, and leaves are up to 3cm long. These leaves have a wedge-shaped blade narrowing to a winged petiole; at the apex they are coarsely dentate; the blade is thin. The stem is up to 8cm high, with 1 to 5 flowers. The Corolla is a lovely rose-violet, up to 2.5 cm. across, with lobes obcordate. In our garden it grows well with P. minima on a brookside.
**P. nipponica** Yatabe, inhabits moist alpine meadows at elev. of 1500 to 1800 meters on Honshu. A Dwarf plant, and not farinose, it somewhat recalls a white flowered *P. farinosa*. The leaves in rosettes, to 4 cm long and 1.5 cm wide, thin, nearly membraneous, rounded wedge-shaped, with coarse teeth. The stem grows to 8 cm high with 1 to 8 flowers. Rarely these plant has two floral heads, one on the other like a candelabra. The white corolla with yellow eye has its lobes obcordate, and is 15mm in diameter. It grows easily in a heavy, moist soil, but takes 3 to 5 years to start blooming well.

**P. suffrutescens** A. Gray, comes from California, from the alpine zone of the Sierra Nevada. It is a typical subshrub with thick, woody rootstock and rich branching. In time the branches root along their full length. Branchlets have terminal rosettes of leathery leaves, not farinoise, up to 3cm long and less than 1cm wide. The leaf blade is wedge-shaped, bluntly toothed at the apex. The winged petioles have at their base an amplexicaule sheath. The stem is 10 to 15cm high with 1 to 15 upright flowers of dark rose to purple or mauve, on long pedicels. The corolla is up to 30mm in diameter, with lobes deeply dissected. It blooms from April to July. The species can be grown well, if we respect its vegetative cycles. At the beginning of vegetation, in spring, it needs plenty of water. During this period of active growth lasts only 3 to 4 months. Therefore, if in the lowlands it blooms in April, we do not water it till the beginning of August, except to see that it is not left completely overdry. After a period of summer resting growth starts again at the end of September or in October. At this time it should be given some moisture, and will produce one or two etages of new leaves, after which it resumes its resting and must be kept dry. I have grown several larger plants of this species outdoors and they lived well till we experienced two wet winters in sequence and plants were not protected by a snow layer. Several warmer periods in winter with thaws caused them to rot. For an alpine gardener who wants large plants, winter them under glass. Propagation is easy from seed, but the plant can also be propagated by layerings or cuttings. In my garden in the mountains it was sometimes damaged in winter by rabbits and deer.

### 3. Section Parryi W.W. Smith

Primroses of the section Parryi are often called “American Auriculas”, and like the European ones they have very special demands. The most hardy in our gardens are *P. ellisiae, parryi*, and *rusbyi*. These do not require any special soil — they do well in ordinary garden soil with some leafmold and grit added. It is only in a too-moist autumn that I protect them with a pane of glass against heavy rains. *P. angustifolia* seems to resemble in its cultural needs the European *P. auricula* — it requires very permeable soil, enough water when growing, and wants to be kept drier during autumn and winter. Under these circumstances a vertical or sloped crevice suits them best. *P. cusickiana* has the shortest period of active growth, after which it is very sensitive to moisture. It should, therefore, be planted in a place where we can control watering and the rain does not come, i.e. under an overhanging stone or in a crevice. In our garden it grows in the same place as *P. allionii* and *Lewisia rediviva* and does well.
**P. angustifolia** Torr., has its home in the Rocky Mountains from Colorado and Idaho to N. Mexico. Most often it is to be found on stony fields and alpine meadows where it forms a firm, more or less spreading rosette (to 10cm in diameter). Leaves are long, lanceolate, 2.5 to 5cm long and 1 cm. wide, dull glossy, with a distinct, wide, pale green midrib. The stem is 2 to 8 cm high, with 1 to 5 flowers. The corolla is 1.5 cm. in diameter, most often rose, rarely purple or even white, always with a yellow eye. It requires a place in full sun, in well-drained soil with gravel. It likes a good supply of food, so from time to time add mineral fertilizers. It blooms anytime from April to June, depending on the weather. While it is easy from seed, propagating by division of older plants is very slow. Seedlings bloom within 2 to 3 years.

This section (Parryi), will be continued in the Spring 1989 issue together with illustrations.

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