

Borealis

the newsletter of the



PO Box 141613, Anchorage, Alaska

December 2017 – January 2018

Join us at our Next Meetings!

Monday, December 4, 7:00 p.m

Main Topic: *Honoring Verna*

Speakers: Members of the Plant Community – Please Share

Mini –Botany: *“What botanists need to know to do Facebook”*

Presenter: Dennis Ronsee

Roseacea Family: *Dryas*

Presenter: Zoe Meade

Monday, January 8, 7:00 p.m

Main Topic: *“The relationship between hydric soils and hydrophytic vegetation in some south-central wetlands”*

Speaker: Lorene Lynn, Soil Scientist, Restoration Ecologist

Mini-Botany:

Roseaceae Family Plant: *Amelanchier*

Presenter: Annie Ronsse

For the latest information about ANPS events and field trips, go to www.aknps.org/

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In Memoriam

Honoring Verna Pratt (1930-2017)

It has been just about a year since the Alaska plant world lost one of its greatest treasures, Verna Pratt. While we all speak with one voice about the sorrow of Verna’s passing and great appreciation for her as a leader of our organization and most other plant organizations in Alaska for decades, there are many individual stories to tell. Our December monthly meeting will be a commemoration of Verna. Everyone will be given an opportunity to share. As you will see and hear, her impact was across the spectrum, from the mundane tasks to the most precise botanical details. She was a leader, but it was the WAY she led that really touched our hearts and endeared her to us.

Dennis Ronsee begins: “I have heard from several members of our organization and was asked to pass along great memories of Verna. One of our members, Kathi Baldwin, said it well, “When I think of Verna here’s what comes to mind – Verna never made someone feel dumb or ignorant or stupid about their lack of plant knowledge. She could talk at whatever level the person she was with needed. She could talk about colors, common names, and scientific names – whatever the audience required. She was not trying to impress people; she was trying to germinate interest in plants and a love for nature. She was a person who touched you to the cord. When you were around her you were aware of that magic. She will be missed but NOT FORGOTTEN”. It is also clear that we’ll all have to step up our game, as it will take all our combined efforts to continue what she started. She expects that of us.”

There will be many stories to share at the December meeting. Bring yours. Meanwhile, in the bleak mid- winter you can be inspired by this poem of Verna’s:

*Alaska summers cast their spell
On those with strength and power
To explore the vast horizons,
And the tiny mountain flowers.*

*Alaska has its fields and streams,
Its mountains, snow and showers,
But the fondest of my memories
Were formed amongst the flowers.*



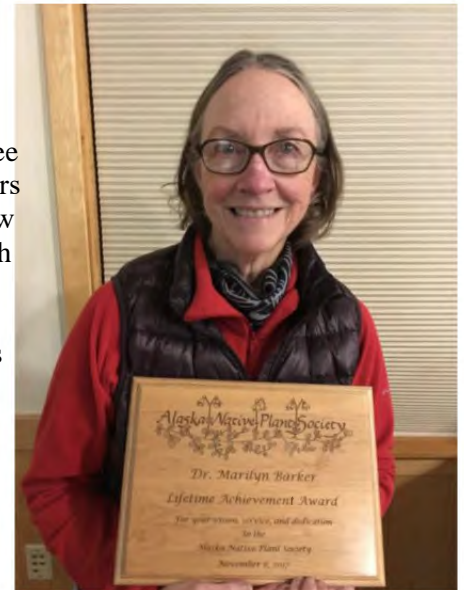
Marilyn Barker Receives 1st ANPS Lifetime Achievement Award

At the November monthly meeting, President Beth Baker presented a Lifetime Achievement Award dedication to Dr Marilyn Barker. Beth's comments in presenting the award are below. CONGRATULATIONS, MARILYN!

"I am not sure where to put this in the meeting agenda—it is old business as it has been going on since 1982...but it is new business as going on today and hopefully for years to come. Losing Verna made us realize, like the Joni Mitchell song, "you don't know what you've got 'til it's gone." But her loss also made us be more appreciative of what we do have.

One society member, who has been here since the club's inception, has led countless hikes and outings, given a zillion main talks, mini-botanics, and plant families. She has organized our hiking schedule and helped choose the plant families and mini-botany topics. She regularly attends board meetings and by remembering the past helps steer our organization toward a better future. She has taken us all out into the field to enjoy our lovely Alaskan flora. With a doctorate and BA in botany and a minor in plant pathology, she brings scholastic vigor with an ability to be argumentative and precise. In the process she teaches us all how to be more analytical and better botanists.

In short this person has done everything that has ever been done or could be done for this organization. The board decided that we as an organization were way over due in honoring her the way she deserves. So it is an honor for me to present Dr. Marilyn Barker with a life time achievement award, which I believe is the first time this organization has ever given such an award."



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the newsletter of the
Alaska Native Plant Society

ALASKA NATIVE PLANT SOCIETY

State and Anchorage Chapter Officers

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Plant Family	Dennis Ronsse
Mini-Botany	Dennis Ronsse
Field Trips	Dennis Ronsse

Newsletter ("Borealis")

Editor	Ginny Moore
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Borealis is published bi-monthly, fall through spring. Articles may be sent to Ginny Moore, , Anchorage, AK 99516. Phone or FAX: , E-mail: elfinwood@gmail.com

IT WORKS!

IN THE LAST 3 MONTHS ALONE, ANPS HAS EARNED OVER \$70 FROM JUST 14 MEMBERS SHOPPING AT FREDDY'S!

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Fred Meyer is donating \$2.5 million per year to non-profits in Alaska, Idaho, Oregon and Washington, based on where their customers tell them to give. Here's how the program works:

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- **You still earn your Rewards Points, Fuel Points, and Rebates, just as you do today.**
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- For more information, please visit www.fredmeyer.com/communityrewards.

Honoring Verna –

Beth Baker, President

I never dreamed it would be Verna Pratt's last botany hike at Eagle River Nature. One thinks (or hopes) that good things will go on forever. She used a cane that August day but her mind was so sharp naming, with ease in English and Latin, the plants that she so loved. No one would have guessed that in a few months after that happy hike she would be gone.

But in a way authors never die. Verna and her high school sweetheart husband wrote 5 books. Field Guide to the Alaskan Wildflowers (published 1989), Wildflowers Along the Alaska Highway (1991), Wildflowers of Denali National Park (1993), a book on berries, and a book for children, Linnaea's World which describes wildflowers during the changing of the seasons. Books live forever.



In 1992, Verna talked to the Anchorage Daily News about how she came by her encyclopedic knowledge through years of observations and assiduous note taking. "A lot of people say "you should get a degree; people would pay more attention." She said "What's the point: so I can say I have a degree? I feel I've worked hard at what I've done." She didn't need a college degree for people to pay attention. She became a renowned teacher, leading scores of popular hikes identifying wild plants from local parks to Barrow. She taught children in the Anchorage school, at garden conferences, and at Denali Park to smiling students glad to be learning from her. The Eagle River Nature Center had to have a signup sheet to limit the numbers or the group would become too huge. Everyone wanted to be out with Verna seeing the plants through her eyes. They called her the "mountain goat" due to her climbing to high rocky places to the alpine plants she loved. Others struggling up these steep scree fields were rarely able to keep up with her even in her 70's.

It is only since her death that I have come to understand her deep connectedness to all things botanical. She founded the Alaska Native Plant Society in 1982 and served as its president until 1988. She volunteered many hours at the Alaska Botanical Garden and helped to build their lovely rock garden from the ground up to its delicate plants. She helped to plan and weed the gardens outside the Campbell Creek Science Center. BLM honored her in July and again in September when a memorial plaque was placed in the gardens there. She co-founded the Alaska Chapter of the North American Rock Garden Society and received the Carleton R. Worth Award for distinguished writings about rock garden plants. She served on the board of directors of the North American Rock Garden Society in 2015 and was vice-president of the Anchorage Rock Garden Society at the time of her death. She spoke at the International Rock Garden Plant Conference in Edinburgh, Scotland in 2001. In 2002 she helped to organize the annual meeting of the North American Rock Garden Society in Anchorage.

The Joni Mitchell song says "you don't know what you've got 'til it's gone". Luckily we KNEW what we had BEFORE she was gone. She and her husband Frank were the first recipients of the lifetime achievement award from the Anchorage Chapter of the Alaska Master Gardeners. The ABG was gifted with a Pratt Family bench by the Rock Garden Society. She was inducted into the Alaska Women's Hall of Fame in 2014. She received an honorary degree from UAA.

I remember on a hike someone saying to Verna "what are we going to do when you are gone?" Without a pause she shot back "It will not be a problem. There are lots of folks that know their plants now. "Yes, Verna, they know the plants mostly because of YOU. Lots of her knowledgeable students will go on channeling Verna's knowledge as best they can. The clubs she spearheaded will continue to thrive and connect people to Alaska's botanical world. 20 year olds will wander into Tidal Wave and buy the book that Verna and her high school sweetheart wrote. They will stuff it into their backpacks. On their hands and knees they will figure out that the little pink one is a twinflower.

Whenever I walk at Eagle River Nature Center I will carry her flower book in my backpack... and even more importantly, I will carry Verna in my head and heart. How could I look at all those beautiful flowers without her being present with me in spirit? How lucky we were to have had her with us all those years!!

Alternation of Generations and Reduction of the Gametophyte

by Joe Arnett, Washington Natural Heritage Program

Unlike animals, whose parents and progeny have the same number of chromosomes, plants alternate between a generation with half the normal chromosome count and one with the regular number. In this alternation of generations, the amount of genetic material is different, and the generations are radically different in appearance. Through evolutionary time the generation with half the full chromosome number has progressively become smaller, through a process called reduction of the gametophyte.

These processes—alternation of generation and reduction of the gametophyte—are covered in every basic course in botany and sound technical. But the concepts are not that complicated and understanding them can open our eyes just a bit more to the wonders of nature.

Alternation of Generations

Imagine two independent cells of the same species (for example, an egg cell and a sperm cell), each with one set of chromosomes. We call the egg and sperm cells haploid, because they each have half of the full complement of chromosomes.

By some wonderful process these two cells unite and become one. We call this joining fertilization, and we call the resultant cell diploid because it now has two sets of chromosomes.

Now imagine this diploid cell growing and dividing by normal cell division. Each resulting cell is also diploid. Specialized tissue develops, differentiating into things such as stems and leaves and reproductive structures. We call this the diploid generation, because every cell in it is diploid.

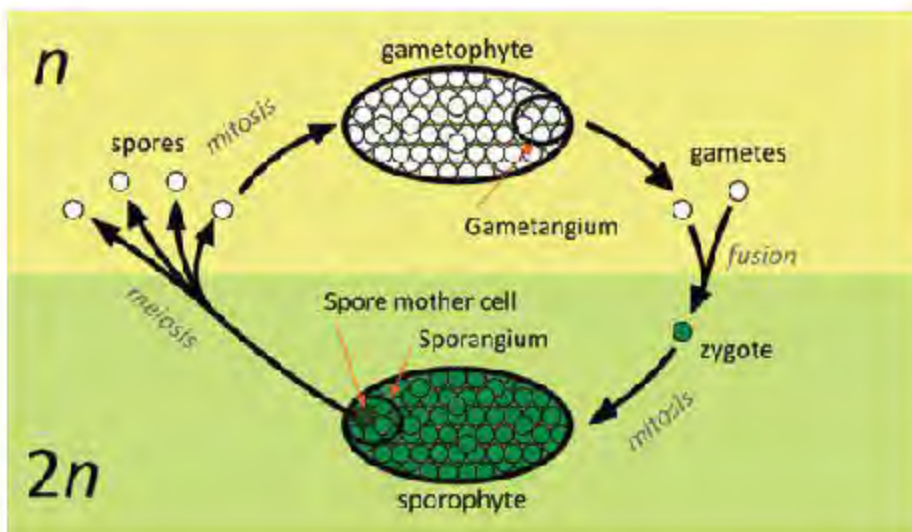
Then by a different kind of cell division, in very specific places, new cells are produced that have only one set of chromosomes. These cells can grow by normal cell division and develop into differentiated tissue in what we call the haploid generation. If things go well, eventually two haploid cells come together in fertilization, and we see the start of another diploid generation.

So that is all it takes to describe alternation of generations in plants: fertilization occurs, and a diploid generation is born.

It grows until a reductive cell division occurs and a haploid generation is born. That grows until fertilization happens and another diploid generation begins. And so these generations alternate (see Figure 1). The haploid generation is called the gametophyte because it produces egg and sperm cells, which we call gametes. The diploid generation is called the sporophyte because it produces spores. Spores are haploid, and the cycle starts again.

Reduction of the Gametophyte

Equipped with this basic understanding of the alternation of generations, we can now go out into nature and look with new eyes at the different forms that sporophytes and gametophytes take. This brings us to our second concept, the reduction of the gametophyte. Looking at the basic plant types, we can see the steps in what we understand as the evolutionary reduction of the gametophyte and the increasing dominance of the sporophyte.



In mosses, the leafy green stems you see are gametophytes (see Figure 2). The tissue is haploid, and it is making gametes, and egg and sperm cells. Fertilization happens within structures of the gametophyte, and the diploid sporophyte grows right there, embedded in the gametophyte and receiving nutrients from it.

The moss gametophyte is not very big, just a few inches tall, but the sporophyte is even smaller, with a thin, often brown or reddish stalk and a small capsule at the top. Its tissue is diploid. Spores are produced within the capsule, or sporangium. As you

Figure 1. Illustration of alternation of generations.

ILLUSTRATION: PETER COXHEAD: SOURCE: WIKIMEDIA COMMONS

may have figured, the spores are haploid, and they will grow into new moss gametophytes. Because the gametophyte is so much larger than the sporophyte, we say that mosses have dominant gametophytes.

In ferns, we see a stage in the reduction of the gametophyte alluded to above. Instead of the leafy green stems of mosses, a fern gametophyte is nearly microscopic, but it still produces gametes that still come together in fertilization, and the diploid sporophyte still grows right out of the gametophyte (see Figure 3). But the fern sporophyte soon develops roots, escapes dependency on the gametophyte, and, relative to it, grows to be enormous. The sporophyte is what we typically see when we look at a fern. Consequently, we say that ferns have a dominant sporophyte.

In flowering plants, the gametophyte is reduced to its smallest extent. A pollen grain germinates on the stigma and grows within the pistil of the flower into a male gametophyte, consisting entirely of three haploid cells. The female gametophyte, contained fully within the ovary of the sporophyte, consists entirely of seven haploid cells. The gametophytes still produce gametes, fertilization still happens, and the new sporophyte begins as an embryo wrapped in the interior of a seed. But the gametophyte does not grow independently from the sporophyte. The seed will grow into a sporophyte, the dominant generation. In flowering plants the evolutionary trend of reduction of the gametophyte reaches its extreme.

Field exercise: Go into the woods or your backyard and look at the maple trees, sword ferns, or dandelions in the lawn. Every one of those plants is a sporophyte. Look at your salad, the fruit in the bowl on the table, or the potatoes on your plate, and every cell you are about to eat is diploid. Sporophytes are the dominant generation in most plants in the world.

Now look outside more closely at the mosses on your roof, in the cracks in the sidewalk, or festooning the maples in the park. Those are gametophytes. If you look even closer at those mosses, you may see small reddish stalks topped with sporangia. Those are the sporophytes. Imagine haploid spores being produced in the sporangia, ready to grow into new moss gametophytes.

If you think about size—mosses versus maple trees—it appears that being diploid brings advantages. Scientists hypothesize that having two sets of chromosomes gives sporophytes a great advantage in the capacity to evolve.

Mental exercise: Think about where the gametophytes are in those maple trees, sword ferns, or dandelions out back, or in the plants that we rely on for food: what role do they play in the life cycle of those plants? Contrast

that with the role the gametophytes have in mosses. There are so many different forms and strategies in nature!

Alternation of generations and reduction of the gametophyte are fundamental characteristics of plant life. Each generation depends on the previous one, and however different they appear, each is essential in the life of a plant.



Figure 2. Photo of a moss with both sporophyte and gametophyte. PHOTO: BOB BLAYLOCK; SOURCE: WIKIMEDIA COMMONS



Figure 3. Photo of fern gametophyte. PHOTO: VL MASTRA; SOURCE: WIKIMEDIA COMMONS

This article was reprinted, with permission, from the Fall 2016 Douglasia, a quarterly publication of the Washington State Native Plant Society.

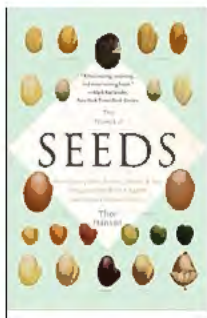
FROM OUR BOOKSHELVES



Plant Evolution: An Introduction to the History of Life
by **Karl J. Niklas**
University Of Chicago Press
2016

Although plants comprise more than 90% of all visible life, and land plants and algae collectively make up the most morphologically, physiologically, and ecologically diverse group of organisms on earth, books on evolution instead tend to focus on animals. This organismal bias has led to an incomplete and often erroneous understanding of evolutionary theory. Because plants grow and reproduce differently than animals, they have evolved differently, and generally accepted evolutionary views—as, for example, the standard models of speciation—often fail to hold when applied to them.

Tapping such wide-ranging topics as genetics, gene regulatory networks, phenotype mapping, and multicellularity, as well as paleobotany, Karl J. Niklas's *Plant Evolution* offers fresh insight into these differences. Following up on his landmark book *The Evolutionary Biology of Plants*—in which he drew on cutting-edge computer simulations that used plants as models to illuminate key evolutionary theories—Niklas incorporates data from more than a decade of new research in the flourishing field of molecular biology, conveying not only why the study of evolution is so important, but also why the study of plants is essential to our understanding of evolutionary processes. Niklas shows us that investigating the intricacies of plant development, the diversification of early vascular land plants, and larger patterns in plant evolution is not just a botanical pursuit: it is vital to our comprehension of the history of all life on this green planet.



The Triumph of Seeds: How Grains, Nuts, Kernels, Pulses, and Pips Conquered the Plant Kingdom and Shaped Human History Paperback – March 8, 2016

by **Thor Hanson**
Basic Books
2015

We live in a world of seeds. From our morning toast to the cotton in our clothes, they are quite literally the stuff and staff of life: supporting diets, economies, and civilizations around the globe. Just as the search for nutmeg and pepper drove the Age of Discovery, coffee beans fueled the Enlightenment and cottonseed sparked the Industrial Revolution. Seeds are fundamental objects of beauty, evolutionary wonders, and simple fascinations. Yet, despite their importance, seeds are often seen as commonplace, their extraordinary natural and human histories overlooked. Thanks to this stunning new book, they can be overlooked no more. This is a book of knowledge, adventure, and wonder, spun by an award-winning writer with both the charm of a fireside story-teller and the hard-won expertise of a field biologist.

Hanson, the author of "Feathers" and "The Impenetrable Forest," takes one of the least-impressive-looking natural objects and reveals a life of elegance and wonder. These little pods can fly, spin, bury themselves, float across oceans, sleep for a thousand years, poison or seduce — a nearly infinite variety of poetic solutions to the hard and gritty question of survival. This is, in fact, the natural order at its most thrilling — seeds taking on the same issues of evolution and survival as a tiger, a whale or, let's not forget, a human.

Hanson admonishes us to read all the endnotes. "They are the only place in the book," he tells us with great urgency, "where you will hear about gomphotheres, slippery water or the piper's maggot." He apologizes for stashing so much good material in the notes but says they are nuggets that did not fit in the narrative. The overarching tale is one of survival: how these seeds through trial and error have developed an incredibly complex and varied assortment of survival strategies for a singular obsession — to ensure the continuation of the species. A fascinating scientific adventure, it is essential reading for anyone who loves to see a plant grow.

Fairbanks Group Begins Winter Meetings

The Fairbanks group of the Native Plant Society held their 1st meeting of the winter season on Wednesday November 8th at the UAF Pub. Their presenter was Sue Bishop, who talked about Alaska Yellow Cedar and its unfortunate decline. Yellow-cedar (*Callitropsis nootkatensis*) is an important tree species in the coastal rainforest of Southeast Alaska and British Columbia, and is highly valued for both traditional cultural uses and modern commercial forestry. At least since the 1920's, patches with large numbers of dead trees have been observed; these are conspicuous on the landscape because the dead trees remain standing for up to 80 years. Researchers in Alaska and Canada have been working for several decades to figure out what was killing these trees, and the mechanism is now pretty well understood. While Sue has not been actively involved in the research she had the recent opportunity to do a literature review and thought it was a great example of scientific mystery solving. For more information about the activities of the group, contact Jeff Mason jdotmason@gmail.com. The next meeting will be held on December 13.

The Fairbanks Challenge

From Dr. Patricia S. Holloway, Professor Emerita, Horticulture, University of Alaska Fairbanks hortalaska@gmail.com

Greetings all: While completing an archival research project, I found a print of these wildflowers from one of the most famous turn-of-the-last century photographers in Alaska. Your challenge, should you accept it, is to try and identify as many of the wildflowers, ferns, foliage, etc. in this photo as you can! Submit your list (including scientific names where you can) back to me before the December native plant meeting. The winner, who must be present (at the Fairbanks monthly meeting, Dec. 13) to win, will get their favorite Alaska made/grown beverage: beer, wine, coffee (other suggestions). Others are welcome to guess, but no beverage, only glory. The photographer worked mostly in Southeast, Juneau/Sitka areas. Send your list to me plus your suggestion for beverage! Have fun!



ANNUAL MEMBERSHIP APPLICATION/RENEWAL

The Alaska Native Plant Society was organized in 1982 by an enthusiastic group of amateur and professional botanists. It is a non-profit educational organization with the goal of uniting all persons interested in the flora of Alaska. Membership is open to any interested individual or organization. If you wish to join us, please indicate the category of membership you desire, fill in the form below and mail it with the appropriate remittance to:

**Alaska Native Plant Society,
P.O. Box 141613,
Anchorage, AK 99514**

STATUS New RENEWAL

CATEGORY

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|--------------------------|-------------------|------|
| <input type="checkbox"/> | Full-time Student | \$12 |
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Membership is on a calendar year basis.

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