Nature Notes

Volume 11, Number 3 Summer 2012

Newsletter of the Pajarito Environmental Education Center

Your Nature Center in Los Alamos

President's Message: by Rebecca Shankland

In May Los Alamos newspapers carried an ad headlined "A New Nature Center for Los Alamos?" Happily, we can now change that pesky question mark to an ecstatic exclamation point:

"A New Nature Center for Los Alamos!"

The twelve-year dream of many of us came true, thanks to a County Council vote of approval, on May 16. It's time to thank those who helped it happen:

❖ The amazing PEEC Board of Directors and staff, who worked tirelessly to educate the public on why a nature center would enhance life for Los Alamos citizens and visitors—and whipped up gourmet goodies for those who attended the CIP meetings (that were always held during dinner hour).

❖ Chick Keller for starting this project going, enduring long board meetings of planning and strategizing, using up his frequent flyer miles for an inconveniently scheduled meeting, and only rarely losing his equanimity.

❖ The County staff, who helped us through the Phase 1 and 2 CIP (Capital Improvement Plan) process, not easy for us amateurs. Special thanks to Steve Huebner, the project manager, who kept us grounded and realistic—and who knows the difference between a soffit and a clerestory.

❖ Nature center supporters who spoke eloquently and wrote passionately to the County Council even after writing to the CIP Committee for Phase 1 and again for Phase 2. Thank goodness for the high rate of eloquence and literacy in Los Alamos.

❖ One nature center opponent who wrote "Shut this project down!"—showing the consideration of pros and cons that is always necessary for decisions in Los Alamos.

❖ Catalyst Architecture, who led us through four preliminary designs to arrive at the dramatic final design after reading every one of the hundreds of e-mail and sticky-note comments—did they know how opinionated this community is?.

❖ The kids of Los Alamos, who christened this design "the Dragonfly".

❖ The County Council, who wisely saw that this nature center would fit the image of Los Alamos as a place "where discoveries are made" and cast their votes in a spectacular whirlwind session that actually ended before midnight.

What's next? The County will put out an RFP (Request for Proposals) for a design-build contractor, choose one, and start the construction at the chosen site on Canyon Road between the Aquatic Center and the Jewish Center. Another RFP will go out for a contractor to operate the nature center, and of course PEEC will respond to that RFP. Until that happens, we are hard at work brainstorming ideas for fund-raising for interactive educational exhibits that will reflect the wonders of the Pajarito Plateau.

Please come to our special Thank-You event — our annual PEECnic on October 14 — so that we can thank all of you who helped make this extraordinary event happen.

Nature Notes is the quarterly newsletter of the Pajarito Environmental Education Center, Los Alamos, New Mexico 87544

New Faces to Join PEEC

After bidding a sad farewell to Diane Noveroske (staff) and Kelly Larson (Board of Directors and Environmental Educator), we've welcomed Angelique Harshman (Office Manager and Lead Environmental Educator) and Beth Cortright, Americorps Public Ally. Stop by and say hello to Angelique and Beth.☼

PEECnic Oct. 14: Oh Happy Day!

You are invited to our annual PEECnic! Bring your smiles for helping us celebrate the County's decision to fund a new Nature Center for Los Alamos. The programs insert in this newsletter has more information about activities, talks and fun. ☼

Election of PEEC Board Members

Board members serve two-year terms. The following board members have another year to go: Michele Altherr, Bob Dryja, Terry Foxx, Jennifer Macke, Felicia Orth, Selvi Viswanathan, Sue Watts.

The following members' two-year terms expire:

Paul Arendt, Chick Keller, Siobhan Niklasson, Rebecca Shankland, Mary Carol Williams, Dave Yeamans, and one student advisory position. There are two vacancies. Nominations are encouraged.

New board members will be elected at the PEECnic.☼

In Print or Online, It's Still *Nature Notes*

Would you like to see *Nature Notes* in color? There are two ways to do it.

Look for *Nature Notes* on the PEEC web site and see photos in color, with print the size you want, and its location always known. Each issue is posted on the web site about two weeks after it has been mailed. Go to www.PajaritoEEC.org and pull down the list under "Publications." Click on "Nature Notes Newsletter." You'll find all issues of the newsletter beginning with the first one in 2002!

2. If you would like to read each issue in color as soon as it is ready and/or stop receiving the printed version by mail, send a message to Jennifer Macke at Webmaster@PajaritoEEC.org. She will send you an e-mail notice when each issue is ready for you to download, and your name will come off the list for snail mail.

We will continue to print and mail the newsletter to those who prefer paper. Either way, thanks for being a *Nature Notes* reader.

The list of programs for the coming quarter, which is an insert in the printed newsletter, also can be read on the web site. Go to "Programs," pull down and click on "Calendar." There are descriptions, photos, and links for registering. ☼

Got a Smart Phone?

Just use the QR code on page 8 to connect with the PEEC web site. ☼

Sparkling Rocks

by Siobhan Niklasson

What makes a rock sparkle in the sun?

Sometimes a flash of something bright and shiny on a trail will catch our eye, or an entire rock face will glitter as we pass by. But what gives a stone its sparkle, and why do some rocks shine more than others?

Rocks are composed of minerals, as a Lego house is composed of Lego blocks. Rocks may be made up of a single kind of mineral, but often they include several different kinds Each mineral has a distinct chemical composition and a specific arrangement of atoms in a regular, three-dimensional repeating pattern.

Since each mineral has a distinct composition and arrangement of atoms, it presents a characteristic pattern of ions, bonds, and molecular structures to an incoming beam of light. These crystalline motifs can all interact with the light to create optical effects.

When white light (sunlight, for example) strikes the surface of a mineral, it may be transmitted through the mineral, reflected from the surface, scattered by substructures within the mineral, refracted or slowed down, and/or absorbed by the mineral. A mineral's visual appearance, including its color and sheen, is determined by how the mineral's crystalline structure interacts with light.

White light contains all wavelengths of light in the visible spectrum. If some wavelengths are absorbed by the mineral, the remaining ones give the mineral a color. If no wavelengths are absorbed, the mineral is colorless.

The *luster* of a mineral describes how the mineral shines in reflected light, including light that is reflected or scattered from structures near the surface. One of the factors determining the luster of a mineral is the smoothness of its surface. An irregular, rough surface diffuses reflected light, or sends it in all directions, resulting in an overall dull appearance. The ash flow tuffs that are common in Los Alamos' mesas generally have tiny, randomly-oriented crystals that reflect light diffusely, so the tuffs tend to be very drab in appearance.

Artificially, we can polish rocks to make them shinier, but in the natural state, certain minerals tend to form smooth surfaces even when unpolished. Some minerals naturally break, or cleave, along flat planes when they are stressed. This can happen if the chemical bonds in one direction of the crystal are much weaker than the bonds in other directions. For example, micas and feldspars, common rock-forming minerals that we can see in Los Alamos an elsewhere, tend to cleave in this way, creating smooth, flat surfaces that readily reflect light.

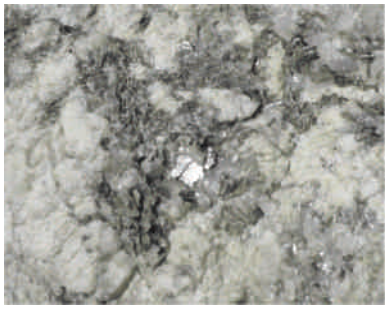


Photo by Kaity Burke

If you see a glint of light coming from a rock, look closely and you can usually see that a smooth mineral surface is acting like a tiny mirror. When the angle is right between the sun, the mineral, and your eye, you will see a flash. As you pass by a rock containing many of these tiny reflecting surfaces, or turn it in your hand, the sun catches these crystals in turn, and the whole rock seems to sparkle. ☼

Reference: Manual of Mineralogy, Klein and Hurlbut, 1993.

Note: Look for sparkles when the sun is shining on the cliff as you're driving east from the roundabout.

Should I Add Earthworms to My Garden?

by Jennifer Macke

We've all heard how beneficial earthworms are for a healthy garden. Worms aerate the soil, break down old plant material, and produce excellent compost. Many gardeners think that it might be a good idea to try adding earthworms to their gardens in order to benefit the plants. Should we?

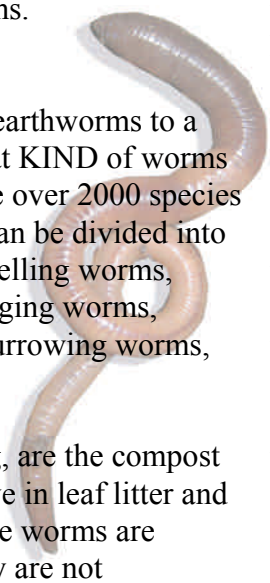
Benefits of worms to gardens

Earthworms do a lot to improve garden soil, and we can categorize these improvements into three types: physical, chemical, and biological.

By physical burrowing, earthworms create small channels that make the soil more permeable to air, water and plant roots. Earthworms convert large pieces of organic matter, such as dead leaves, into humus, thus improving soil texture and quality.

Worms also perform several chemical benefits to soil. Their feces, known as worm casts, are particularly rich in plant nutrients. This is due, in part, to the worm's ability to break down chemical and organic constituents of soil into bio-available nutrients. For example, the worm has a special organ called the calciferous gland, which produces tiny particles of calcium carbonate, which are readily held by the soil and used by plants and by other soil micro-organisms. As another example, chemical breakdown of organic material by worms is generally more efficient (and better smelling!) than organic breakdown mediated by bacteria or fungi.

Worms also change the biological community in which they live, usually in beneficial ways. Certain types of beneficial bacteria are associated with worms, thus worms are able to discourage the growth of some types of fungi. When worms colonize an area, they bring with them a whole posse of micro-organisms that live in symbiosis with the worms. These micro-organisms are generally beneficial to plants as well as worms.



The three types of worms

Before we can think about adding earthworms to a garden, we need to understand what KIND of worms actually live in a garden. There are over 2000 species of earthworms on earth, and they can be divided into three general types: (1) surface-dwelling worms, known as epicecic, (2) shallow-digging worms, known as epigecic, and (3) deep-burrowing worms, known as anecic.

The first type, the surface-dwelling, are the compost worms. These worms generally live in leaf litter and rarely dig down into the soil. These worms are uncommon in New Mexico, as they are not drought-tolerant. While they are useful in indoor worm bins and moist compost piles, they are generally unsuitable in a typical New Mexican landscape or garden.

Worms of the second type, the shallow-diggers, are the ones we think of as "garden worms." They are typically small to medium in size, gray in color, and they live in the top 1-2 feet of the soil, right where the plant roots are. These are the worms that have the greatest benefits in gardens.

The third type, the deep-burrowing worms, are common in New Mexico. These are the huge worms we see out on the sidewalk after very heavy rains. Their burrows can extend as deep as 10 feet underground. For gardens, they have limited benefits. They will help to break down leafy debris and produce worm casts at the surface, but they do not dig in the layer of soil where plants live.

How to get worms into your garden

Is it possible to buy worms and add them to a new garden in order to immediately reap the benefits of earthworms? Unfortunately, the answer is generally "no." Two types of earthworms are commonly available for sale commercially: red wigglers, which are surface-dwelling compost worms, and Canadian nightcrawlers, which are deep-burrowing worms. The former require a thick layer of moist leaf litter in order to survive, so they aren't suitable. The nightcrawlers are able to dig, but their deep burrows will not give the kinds of plant benefits that the shallow-digging worms can. Also, most nightcrawlers that are displaced from their original home die before they are able to dig a new hole, so few or none of the introduced worms would be likely to successfully colonize the garden.

Perhaps the best way to colonize a garden with the "right" kind of earthworms is to follow the famous quote from the movie, *Field of Dreams*: "Build it and they will come." If a garden is well maintained, and the soil is properly supplemented with compost and organic material, the worms will find their way there. It is also important to avoid the use of strong chemical fertilizers and sprays, which kill worms. A gardener may be able to speed up the process of worm colonization a little by introducing earthworms that have been hand-dug from another healthy garden nearby. These would be the small gray worms that are found in shallow earth around plant roots.

Worms as invasive species

Another reason that it might be unwise to buy earthworms to release into a garden is the risk of introducing "foreign" worm species (and their

community of associated micro-organisms). While I cannot find any documented reports of problems with invasive earthworms in New Mexico, worms introduced by humans are having dramatic effects on some forest ecosystems of the northeastern United States. The introduction of red wigglers and nightcrawlers by humans has reduced the thickness of the forest leaf litter in many areas, thus particularly impacting native plants that require deep leaf litter in order to germinate. Surprisingly, the so-called Canadian nightcrawler, staple of the bait-worm market and common throughout North America, is not native. These worms were actually introduced into the New World by immigrants from Europe.

Conclusion

Worms are wonderful! When you dig one up, take a moment to marvel at how a small, soft-bodied animal is able to till your garden. But like many things in nature, they don't necessarily cooperate when we try to manipulate them. The best way to get the "right" worms in your garden is to put out the welcome mat: enrich the soil and let them come! ☼

Suggested reading: Stewart, Amy. 2005. *The Earth Moved: On the Remarkable Achievements of Earthworms*. Chapel Hill: Algonquin Books.

Hummingbird Photography

by Bob Walker

I started doing high-speed hummingbird photography last summer with my camera, a telephoto lens, and three camera flashes mounted on poles that move them away from the camera. Always seeking better results, I am now up to using six off-camera flashes. Here is a photo of the 3-flash setup for the outdoor "studio" I was using last summer.

In the photo you see a view of the studio from the perspective of the camera that photographs the hummers. At the right is a blurry part of the barrel of the telephoto lens on the camera. It is pointing to where the hummer is going to come in – to some pink flowers (Red Rocks Penstemon) that are strapped to a tripod above a flower pot (which is there to attract the

hummers to the area in the first place). To the upper right and left of the flowers are a pair of off-camera flashes. Their job is to provide light to illuminate the hummingbird. In the far background is a third off-camera flash, whose job it is to light up that hibiscus bush in front of the fence, so the background of the photo has some texture.

So, I sit in a chair by the tripod and camera with the telephoto lens on it and wait for a hummer to fly in. When it does, and visits the flowers strapped onto the tripod, I take its picture. When I press the shutter, the flash on the camera fires, and its light in turn fires all the remote flashes you see in the picture. All the camera and flash exposure settings are done manually -- without the flashes, the picture I take would be almost completely dark. Since all the light comes from the flashes, and since they discharge in a VERY short amount of time, the resulting stroboscopic effect freezes the motion of the hummer's wings. The wings beat from 50-80 times per second and would, under normal circumstances, be blurred in an image. If you are lucky, you'll get a picture rather like the one of the female broad-tailed hummingbird below.

With more flashes, you have better control over the lighting details. With the additional brightness they provide, you can get sharper pictures (i.e., a faster "shutter" speed because the flash duration can be shorter).

The artistry comes in choosing the flowers and a pleasing background, finding a location where there are hummingbirds, and adjusting the lights on the bird to be pleasing.

It looks like we have a full contingent of hummers this summer. I've photographed a black-chinned hummingbird (male), broad-tailed hummingbird (male), rufous hummingbird (male), and calliope hummingbird (male). They have been posted on PEECbirders. ☼
(To join see PajaritoEEC.org/Outreach/birding.php)

A Moth by Any Other Name

During recent walks around town, and certainly with night lights near an outside screen, large moths have been fascinating local people. Some look like hummingbirds, almost as big and with the fast beat of wings. We at PEEC have large, active curiosities, and were asked in June to identify a certain moth in a photo taken near the ice rink.

First e-mail message with photo: "Can anyone ID this moth?"

Chick Keller had the first comment: "It's in the hawkmoth/ sphinx clan. These large narrow-winged moths are not uncommon, but this one defies identification because of its blue underwing and its dark brown chevrons on the upper wings. Several of our more common hawk moths arise from tomato horn worms (so-called because of the prominent erect "tail"/horn). But this one is definitely different."

Jennifer Macke found the answer on BugGuide.net: "Someone on BugGuide thinks that it is *Pachysphinx occidentalis*. See: bugguide.net/node/view/665207#1177240."

BugGuide added this information of note: "This is *Pachysphinx occidentalis*, although the image is a bit blurry. This record adds June to the guide for this species in NM." ☼

Birdscape Tour in June Finds Rare Birds

Note: The Birdscape tour in White Rock was success. More than 90 people spent time in five yards that have been planned and planted to attract birds. Positive testament: many species of birds were seen. Rather than list all the birds from the yards, here is an example by Dave Fox from his large acreage. His long veranda is a perfect place to eat meals, snack, and watch birds doing the same.

Birds observed in the Fox dining room in earlier years:
The Long-lipped Milk Sucker
Food-spewing Laugh Cackler
Splatter-breasted Lap Catcher
Red-feathered Table Pounder
I-Took-A-Bite Liar Bird (juv.)
Elbow-hanging Wrist Flipper
Motor-mouthed Starveling
Lesser Eating Day Dreamer
The Greater-dreaming Food Cooler

As time passed, fledgling behavior changed:
Blue-faced Chunk Choker
Double-bellied Teen Bird
(Related species) Hollow-legged Teen Bird
Cross-billed Morsel Snatcher
Krossenfusser's Picky Bird
Shiny-jowled Burger Burper

Birdscape tour leaders snacked outside their diets and a rare bird was noted:

Thoroughly Grossbeaked Blubber Builder

And, the bird that oversees this avian splendor:
The Purple Plumed Polite Bird ☼

"Birds of the Table Gather Together: So Many Birds," by Dave Fox. © 2010 Used with permission.

Aspen, Ducks, and a Note from theProgram Director, Katie Watson

Hello, and welcome to all our new members! Our Summer Family Evenings have been a great success. Did you get a chance to attend one? It was so wonderful to see the families hanging out in the exhibit room with Betty and Elf (frog and turtle), the many kids rolling down the hill outside, and, of course, everyone soaking up new information from our great presenters.

Over 25 families have become members at these programs. Members are so important to PEEC, because they support our organization and show potential donors that we have a strong community base of support.

We'll continue to offer special family programs that are free to members. On August 7th, we'll have the final Summer Family Evening, and it looks to be a great one. Sallye Sibbit from the Duck Buddies, volunteers who monitor the ducks at Ashley Pond, will bring information about ducks, duck crafts, giveaways, and live ducks! If you are interested in the history of Duck Buddies, see www.youtube.com/watch?v=2Xsarf6GWHo

On October 31st, the Harrell House of Natural Oddities will return for a Creepy Crawly Halloween. We'll also have games, crafts, learning stations, and more set up inside PEEC all afternoon. Fill the time between school and trick-or-treating with a visit with some scary creatures!

On September 30th, it's an Aspen Party on deck at Pajarito Mountain. Search for leaves, do crafts and activities, listen to stories, just enjoy the beautiful fall sights and celebrate aspen trees.

As always, I'm open to your suggestions for programs. Feel free to shoot me a line at Programs@PajaritoEEC.org, or post your ideas on our Facebook wall. ☼

Photo by Esta Lee Albright

Celebrate Aspen – the first trees to grow after a fire. They need full sun and bare soil to sprout. An aspen grove is a group of trees on the same root system, so all the trees in a grove are genetically alike. Groves may merge into extensive stands. Pioneers made saddles and buckets from aspen wood and powdered aspen charcoal for gunpowder. Indians used the wood for arrows and chewed the bark to prevent scurvy, though the tree does not contain any Vitamin C. The bark does have salicin, an aspirin precursor. Some Indians used aspen for food. It also provides food for animals. The trees are the staple in the diet of beavers and deer, and elk browse the young shoots and chew on the bark.
(Source: *Los Alamos Outdoors*, Dorothy Hoard, Los Alamos Historical Society, 1993)

PEEC
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PEEC This Week
are weekly e-mail alerts about classes, events, nature and the environment. Anyone who has an e-mail account can receive them. To start, send a message to Webmaster@pajaritoeec.org. These weekly e-mail alerts always include PEEC activities and local information about nature. You also can contribute appropriate notices.

	General Membership	**$35**
	Living Lightly	**$20**
	Penstemon	**$60**
	Sunflower	**$100**
	Wild Iris Donor	**$250**
	Skyrocket Gilia Donor	**$500**
	Wood Lily Donor	**$1000**

	Non-Profit Membership *One newsletter plus PEEC This Week for up*	**$75**
	Corporate Membership *One newsletter plus PEEC This Week for up to 3 organizational members.*	**$100**

PEEC's Mission Statement: To provide a nature center and outdoor education programs that allow people of all ages to explore the rich natural and cultural heritage of the Pajarito Plateau and to appreciate our connection to the natural world.

Joining or Renewing Is Easy!

Fill out this form and mail it in with your check or go to the website www.PajaritoEEC.org. Do it today! Thank you.

Name(s): _____ Address: _____

Phone: _____ E-mail to send receipt: _____

Subscribe this email address to PEEC This Week (circle): YES / NO / Already subscribed

PEEC is a non-profit 501(c)3 organization. *Donations are tax-deductible.*

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Mail checks to: PEEC PO Box 547 Los Alamos, NM 87544 Att: Membership

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