



**Colorado Springs
Mineralogical Society**
Founded in 1936

**February 2014
PICK&PACK
Vol 54..... Number 1**

CSMS General Meeting

Thurs. February 20, 2014 7PM

Tonight's program will be a DVD presentation

**Rhodochrosite: Red Treasure of the Rockies
The Story of the Sweet Home Mine.**

Treats Provided by the Fossil Group

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MEMORIES OF ARKANSAS: COLLECTING PHOSPHATES AND BAUXITE

Mike Nelson csrockguy@yahoo.com

I have fond memories of Arkansas. Applied for a few jobs in universities and turned down some offers—wrong fit. Participated as a student on geology field trips and had a great time. Looked for diamonds but no luck. Later as a faculty member I attended professional geology meetings and always signed up for the field trips; again, learned much and had an interesting time.

I suspect many CSMS members have been to the State of Arkansas on a collecting trip, most likely to collect quartz crystals and dabble in the diamond mine (see December *Pick & Pack*). I actually would be interested in meeting someone who has collected a diamond in the State Park! However, there are many other really interesting minerals in Arkansas that offer some collecting opportunities.

One of these “minerals” is bauxite. Now, I don’t know much about bauxite except that it: 1) is an ore of aluminum; 2) forms in a tropical to subtropical environment; 3) occurs as small to large oolites; and 4) is mined in Arkansas. I learned all of these facts in a grade school geography class! What I later learned as a geology student is that bauxite is not really a “mineral” but is a composite of several different aluminum-rich minerals: [gibbsite— $\text{Al}(\text{OH})_3$, diaspore— $\text{AlO}(\text{OH})$, boehmite— $\text{AlO}(\text{OH})$], a couple of iron oxides [hematite— Fe_2O_3 , goethite— $\text{Fe}^3\text{O}(\text{OH})$], and a clay mineral [kaolinite— $\text{Al}_2(\text{Si}_2\text{O}_5)(\text{OH})_4$].

Bush (2007) described the formation of Arkansas bauxite as lateritic weathering and leaching of alumina and silica from intrusions of nepheline syenite (a rock with lots of nepheline and sodium/potassium feldspars) exposed during the Tertiary in what is now Pulaski and Saline Counties in the Gulf Coastal Plain. These rocks (nepheline syenite), rather rare in the U.S., are alumina-rich and quartz-poor and evidently were intruded during the Late Cretaceous as the old Reelfoot Rift was reactivated. Later in the Tertiary, intense weathering in a tropical environment allowed precipitation of the alumina-rich minerals. Actually bauxite is an ancient soil and Harder (1948) noted its stratigraphic importance as marking “long periods of emergence, quiescence, nondeposition, and subaerial weathering”.

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CSMS Calendar

February 2014

Sat., Feb 1—Lapidary, 10a.m.-2 p.m., Sharon Holte 217.5683.

Tue., Feb 4—Fossil Group, 7 p.m., Senior Center.

Thu., Feb 6—Board Meeting, 7 p.m., Senior Center.

Tue., Feb 11—Micromounts, 7 p.m., Senior Center. Dave Olsen, 719.495.8720

Thu., Feb 20—General Assembly, 7 p.m., Senior Center.

Pebble Pups & Juniors. 5:30 to 6:15 p.m., Steven Veatch, 719.748.5010

Thu., Feb 27—Crystal Group, 7 p.m., Senior Center. Kevin Witte, 719 638-7919

Faceting Group, 7 p.m., Senior Center. Paul Berry, 719.578.5466

Feb, Jewelry Group, By appointment. Call, Bill Arnson, 719.337.8070. 15610 Alta Plaza Cir., Peyton

March 2014

Sat., Mar 1—Lapidary, 10a.m.-2 p.m., Sharon Holte 217.5683.

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The Senior Center is located at 1514 North Hancock in Colorado Springs. For more information on any of the sub-groups, meetings, and other CSMS valuable information, go to our website, csms.us

Other Events of Interest to CSMS Members

USGS Rocky Mountain Science Seminars. 10:30 a.m. All interested persons are welcome to come to these lectures, held in the Building 25 auditorium, Denver Federal Center, Lakewood. Enter the Federal Center via the main gate (Gate 1) on Kipling St., and go north to the large parking lot (with overhead solar photovoltaic panels) east of Building 25; enter Bldg. 25 via the Security station at entrance E-14, near the center of the building.

Tues., Feb. 4, Volcanic Landslides: The Inside Story, by Carol Finn, USGS, Denver.

Tues., Feb. 18, How to Date Sedimentary Rocks, by John Aleinikoff, USGS, Denver.

Feb. 1-15, Arizona Mineral & Fossil Show (Hotel Tucson City Center, formerly Inn Suites)

Feb. 13-16, Tucson Gem and Mineral Show (Tucson Convention Center)

Feb. 21-23, Denver Gem and Mineral Guild Show (Jefferson County Fair Grounds)

Mar. 28-30, Fort Collins Gem and Mineral Show (Larimer County Fair Grounds, Loveland)

Apr 18-20, Colorado Mineral & Fossil Show (Ramada Plaza-Denver Central)

May 3, Colorado Mineral Society Silent Auction, Holy Shepherd Lutheran Church, 920 Kipling St., Lakewood CO

May 10, FM Colorado Chapter, Silent Auction, Clements Community Center, 1580 Yarrow St., Lakewood CO

June 6-8, Pikes Peak Gem and Mineral Show (Western Museum of Mining & Industry)

Aug. 7-10, Contin-Tail Rock Show, Buena Vista Rodeo Grounds

Aug. 15-17, Lake George Gem and Mineral Show, Lake George, CO

Sep. 7-14, Colorado Mineral & Fossil Show, Ramada Plaza Hotel (formerly Holiday Inn), Denver

Sep. 12-14, Denver Gem and Mineral Show, Denver Mart (formerly the Denver Merchandise Mart)

MEMORIES OF ARKANSAS: continued

Bauxite ore has been mined in Arkansas since ~1896 and reached peaks during World Wars I and II. Major companies abandoned mining in ~1991 but a smaller company still operates a mine (I think).

I once collected several pieces of bauxite; however, I mostly added them to a university collection that was lacking specimens and only one small piece remains (Fig. 1).

OK, here is the story that goes with bauxite. The mineral nepheline ($\text{Na}_3\text{KAl}_4\text{Si}_4\text{O}_{16}$) is a feldspathoid, a fairly rare group of minerals with very low silica content. Nepheline is related to leucite, lazurite, sodalite and others. As I understand it, nepheline does/can not exist with free quartz in nature (as with all feldspathoids). Rockhounds usually find nepheline in the above-mentioned intrusive rock, nepheline syenite, and its extrusive equivalent, fine-grained phonolite. I really never understood, in my mineralogy and petrology classes, the genesis of nepheline-rich rocks! Were they the result of a segregated magma or did they form in a completely separate magma? Of course, I don't understand much about even stranger feldspathoid rocks such as the leucite-bearing, lamproite volcanic rocks in the Leucite Hills of southwestern Wyoming! A field trip leader tried to explain it to me one time in my youth. However, I recollect it was a very hot and windy day and my mind was on a cold adult beverage waiting for the group in Rock Springs. At any rate, the U.S. has those aluminum-rich rocks in Arkansas because of the presence of nepheline syenite.

The other related story concerns the Reelfoot Rift, an ancient rift system that is currently buried under what is



Fig. 1. Pisolitic bauxite from Pulaski County, Arkansas, collected late 1960's. Width ~6.5 cm.

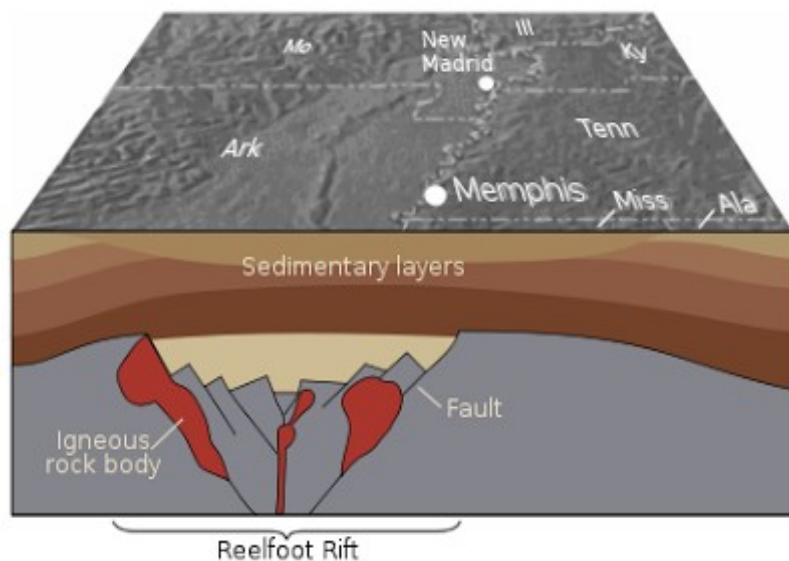


Fig. 2. Diagram Reelfoot Rift. Courtesy USGS.

bumped into the continent the rift area was squeezed and somewhat pushed up. Geologists know these bumps as the Taconic (mostly Ordovician), Acadian (mostly Devonian) and late Paleozoic Alleghenian (or Appalachian) orogenies. So, many of the mid- to late Paleozoic rocks are missing from the rift basin (absence also partially due to later erosion in the early/mid Cretaceous). Sometime in the mid- to late Cretaceous the rift was reactivated and marine waters reached far to the north (~Cairo, Illinois) and essentially received sediments, off and on, throughout the late Mesozoic and Cenozoic—the Mississippi Embayment or Mississippi trough was born. Paleocene (Midway) and Eocene (Wilcox, Claiborne, Jackson) marine incursions also reached far to the north while Oligocene, Miocene and Pliocene marine rocks are restricted to more southern states like Louisiana and the modern Gulf Coast.

now the Mississippi River from about Cairo, Illinois, south to the Gulf (Fig. 2). The rifting of the early Paleozoic proto-North American continent was probably most active in the Cambrian. The exact cause of rifting is not well understood but perhaps that area of the continent was situated over a hot spot—a mantle-derived plume developed along the boundary of two old Precambrian terranes (Csontos and others, 2008). As the continent split the resulting down-dropped rift basin filled with several thousand feet of Early Cambrian clastic, non-marine sediments overlain by a thick sequence of Cambrian and Ordovician marine rocks. Then some weird things begin to happen and these “things” lasted throughout the Paleozoic. Although the rift seemed to fail in the early Paleozoic, the basin still accumulated Paleozoic marine sediments during times of continental “quietness” but every time some tectonic mass along the east coast

There are a number of faults associated with the rift system and they seem the cause of the many seismic events in the region (for example the New Madrid earthquake). In addition, the faults allowed magma to rise toward the surface and some of that magma cooled into nepheline syenite. So, if it were not for a failed rift my grade school geography class would not have produced a lesson on mining aluminum in the U.S. Although this factoid may seem trivial, lessons like this whetted my appetite for learning more about rocks and minerals and eventually resulted in a career.

Arkansas rocks also yield several collectable phosphate minerals that are green (commonly) in color a due to vanadium chromophores. Color in minerals seems a very complex event and often is beyond my comprehension! Bob Jones has written a series of recent articles in *Rock & Gem* that go into great detail explaining the color of minerals and I would point interested readers in that direction. For this article I would simply state that some minerals (idiochromatic coloration) exhibit certain colors due to the chemical composition of the minerals—Cuprous copper, Cu^+ , gives a green color to malachite ($\text{Cu}_2\text{CO}_3(\text{OH})_2$). Other minerals only have trace amounts of impurities that impart the color (allochromatic coloration)—Titanium, Ti, imparts a blue color to sapphire (Al_2O_3). Vanadium (V) is a common impurity and an important allochromatic chromophore.

The mineral that may be the second most popular species to collect in Arkansas (after quartz) is wavellite. This



Fig. 3. Wavellite. Width specimen ~12 cm. Color due to vanadium +3 chromophore.



Fig. 4. Wavellite with broken spherules, “Cat’s Eye.” Width individual spherules ~.50-.75 cm.

fascinating mineral is a hydrated aluminum phosphate $[\text{Al}_3(\text{PO}_4)_2(\text{OH},\text{F})_3 \cdot 5\text{H}_2\text{O}]$ that commonly appears in botryoidal and radial aggregates, a trait that makes specimens quite interesting. Fairly soft at ~3.5-5.0 (Mohs), the mineral has a vitreous to silky luster and is translucent. Although the green color is most impressive to me, it may occur as colorless to yellow and light blue. On the piece in my collection several green spherules were broken and therefore the radiating fibers are clearly visible (cat’s eye to collectors) (Figs. 3, 4). Wavellite is most often a secondary and low temperature mineral found in vugs and fissures of the associated host rock—in this case, at Mauldin Mountain, the Bigfoot Chert of Ordovician age. The green color (most common) of wavellite is mostly due to the presence of vanadium. Vanadium has five different oxidation states (2-5 are accessible in aqueous solution) with three of them imparting some color to wavellite: +3 giving it a green color, +4 imparts a blue color while +5 furnishes a yellow color. The absence of vanadium will leave wavellite



Fig. 5. Broken wavellite spherules without color (due to absence of vanadium chromophore). Width ~3.2 cm.

white or colorless (Fig. 5) (Foster and Schaller, 1966; Holt, 1972).

My specimens of wavellite were collected at the Mauldin Mountain Quarries, Montgomery County, Arkansas, a fairly "famous" collecting locality near Mt Idaum chromophore). Width ~3.2 cm.



Fig. 6. Crust of variscite, width ~5.5 cm.

I have second specimen of a green phosphate mineral collected at or near Dug Hill (Garland County, previously part of Montgomery County) that was labeled as variscite (Fig. 6), another hydrated aluminum phosphate $[\text{AlPO}_2 \cdot 2\text{H}_2\text{O}]$ that commonly is found in the same localities as wavellite (Smith, date unknown). It does not look anything like the variscite that I have collected in Utah so I looked at other possibilities. Another similar-looking hydrated aluminum phosphate is planerite $[\text{Al}_6(\text{PO}_4)_2(\text{HPO}_4)_2(\text{OH})_8 \cdot 4\text{H}_2\text{O}]$, a member of the turquoise group. Like variscite and wavellite, planerite is found in botryoidal masses. However, in planerite the individual balls are quite tiny, a millimeter or so. In addition, variscite occurs as more of a bright-green crust than the pale-green masses of planerite. It is a tough call but will stay with variscite (partially influenced by the photograph of variscite on www.mifind.com that seems identical to my specimen). I love phosphate

minerals; however, they often confuse me---something that is not really hard to do!

Another phosphate mineral that is collectable and found in Arkansas is known as cacoxenite $[\text{Fe}_{24}\text{Al}(\text{PO}_4)_{17}\text{O}_6(\text{OH})_{12} \cdot 17\text{H}_2\text{O}]$, where the hydrated aluminum phosphate has added some iron (Figs. 7, 8). It seems to be rarer than many other phosphates, and has a different morphology than wavellite and variscite. In most instances cacoxenite displays crystals that are acicular and found as radial bundles or radial aggregates and are yellow to brownish yellow to orange in color. Cacoxenite is found in phosphorous-rich igneous rocks, in novaculite, and in a few other phosphatic rocks. My specimen came from the Coon Creek Mine (York Mine), Polk County, Arkansas, a former open pit manganese mine with mineralization in the Arkansas Novaculite. This rock unit is Devonian in age and is a form of chert that was subjected to some low grade metamorphism. The cacoxenite owes its origin to circulating ground water containing iron and phosphate (Howard, 2011) and seems to be one of the last phosphates to form (Smith, unknown date).

The Coon Creek Mine has also produced another interesting phosphate mineral named rockbridgeite, a hydrated iron phosphate $[(\text{Fe}^{++}\text{Fe}^{+++}_4)(\text{PO}_4)_3(\text{OH})_5]$. (Fig. 9) Rockbridgeite then drops the aluminum but picks up the iron---both ferrous and ferric. As with the other phosphates described here, rockbridgeite is a secondary



Fig. 7. Cacoxenite, yellow-orange "streaks" labeled C. maximum width specimen ~2. cm.

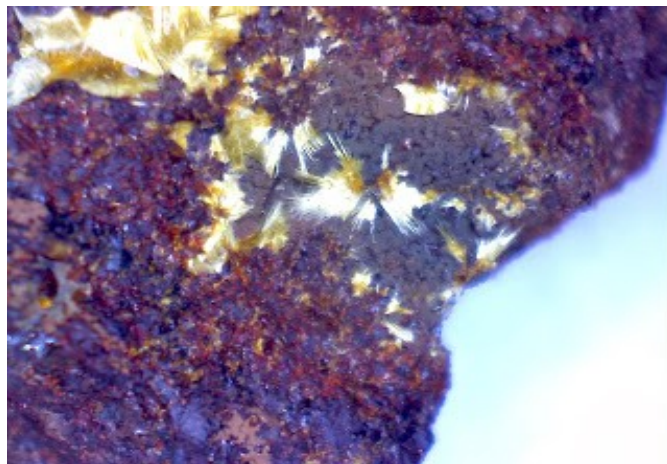


Fig. 8. Photomicrograph cacoxenite crystal bundles. Width of view 1.2 cm. Color somewhat skewed as matrix is dark (blackish) in color.



Fig. 9. Rockbridgeite spherules. Width view ~1.7 cm.



Fig. 10. Wavellite label "collected Colorado" width 3.5 cm.

mineral resulting from oxidation of other phosphate minerals and iron. The mineral has a botryoidal habit like other phosphates, and is similar to botryoidal limonite. Rockbridgeite in fresh exposures displays the "green" tones of other hydrated phosphates but also is found in brown and black colors. In fact, due to the iron, the mineral commonly oxidizes to a red-dish-brown to black color and surficially resembles limonite and/or goethite.

EPILOGUE

Wavellite is not a common mineral in Colorado but is randomly found in some of the turquoise mines and a few igneous centers. I had never seen Colorado wavellite or variscite until purchasing a specimen at an auction last spring. It was simply labeled "Wavellite, Colorado". I don't have the slightest idea where the specimen was collected (Fig. 10).

The element vanadium, the chromophore for wavellite and others, is found in 60-70 different minerals. It is probably best known as a major component of the mineral vanadinite [$\text{Pb}_5(\text{VO}_4)_3\text{Cl}$], that of the beautiful orange-red hexagonal crystals. Natural vanadium occurs in the human body but its biological use is unknown. However, vanadium is an important element in certain tunicates (Phylum Chordata) called sea squirts (Fig. 11). These marine filter feeders concentrate vanadium in their bodies to a level one million times higher than the concentration of vanadium in seawater (www.wou.edu)!



Fig.11. *Halocynthia* sp., a sea squirt. Public domain photo.

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- Bush, W. V., 2007, History of Bauxite in Arkansas: Arkansas Geological Survey AGES Brochure Series 003.
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**WESTERN MUSEUM OF MINING AND
INDUSTRY PRESENTS:**

Publish! History and Science Writing for Teachers and Learners of all Ages!

Saturday February 22nd 2014; 10 am and 1 pm!

Writing about nature, history and science offers exciting opportunities to learn, teach and be published!

Magazines, newspapers, bloggers, clubs, and schools are looking for articles to share with their audience, and Steven Veatch, geologist and educator, can teach YOU how to PUBLISH.

The Workshop will include:

Identifying and developing story ideas!

Discovering the difference between a subject and a story!

Outlining and structuring stories!

Strategies for opening leads and making transitions between your story and its larger contexts!

Understanding the role of editor in publication!

Practical session on using photography for articles!

How to approach formal scientific writing!

The amazing thing is, this program will be open to youth as young as 13 years! Steve's passion is to get young people excited about writing!

WESTERN MUSEUM OF MINING AND INDUSTRY

225 North Gate Blvd.
Colorado Springs, CO 80921

Phone: 719-488-0880
website: www.wmmi.org
Email: info@wmmi.org

This informative workshop will also include topics like basic research, writing techniques and tips, using illustrations, science photography and publication issues. Several ideas for publication of writing projects will be provided. A certificate of completion will be awarded upon completion of the workshop. All other course materials will be provided including morning snacks. A Writer's Resource Kit CD will be available for purchase for \$5. The course fee is \$20 for adults and \$10 for students (21 and under). WMMI Members receive \$5 off adult fee, and \$2 off student fee.

Space is limited to 30 people. Advance registration is required. Please call (719) 488-0880 or email at rsvp@wmmi.org.

PEBBLE PUPS CORNER



Pebble Pups in the News

Four Pebble Pups published in the Current edition of Deposits Magazine
"Member's night at the Denver Museum of Nature and Science with Dr. Sampson"
by **Jack Shimon**

The poem "Colorado" by **Luke Sattler**

"New discovery of Ute artifacts in El Paso County" by **Luke Sattler**

"Glory" by **Zach Sepulveda**

Some Upcoming events for Pebble Pups

Feb 10, 2014 Canon City Geology Club--selected pebble pups present

Feb 22, 2014 Writing class, Western Museum of Mining & Industry 10am to 1 pm

End of Feb, 2014 Submissions for volume 2 of poetry chapbook.

Poems, Artwork (anything in nature), Photography (has to be geological items) March, 2014 Behind-the-Scenes at the DMNS

Andrey Atuchin: An Interview with a Natural History Illustrator

By Jack Shimon, Pikes Peak Pebble Pups
(Colorado Springs Mineralogical Society)



I met Andrey by email this summer when I requested permission to use a piece of his art in a story I was writing about *Nasutoceratops*. Of the images I found online his was my favorite. When I was finding a way to contact him I discovered that he has a whole online gallery of dinosaur artwork and it is very good. I was fascinated by the idea that this was his job. Andrey and his family, wife Svetlana and son Daniil (probably the youngest dinosaur expert in Russia), live in the provincial city Kemerovo, in South-Western Siberia, the center of Russia, which is a country very different than my own, although we both have dinosaurs. Being a curious 3rd grader I asked if I could interview him about

his job and how he got started in such a remote part of the world (I looked at his hometown on Google Maps). Like me, Andrey was fascinated by dinosaurs and science as a kid, but his career began with his imagination and love of art.

Andrey calls himself a Natural History Illustrator because of the wide range of subjects he illustrates. I have also learned that his skills aren't limited to traditional forms of art and that he also does ice sculpting, makes polymer clay dinosaurs, and preserves beetles, among other things. His official career began in 2004 when he got an offer from the British publisher Anness to illustrate Dougal Dixon's illustrated encyclopedias of dinosaurs. He loved painting encyclopedias, where a variety of animals are painted in the same style. And like many of us as little kids, like 5 and 6 years old, he had a fascination with dinosaurs and was given his first set of plastic toy dinosaurs by his sister who found them in Moscow. After that he relied on books and articles in magazines, although he didn't have the endless choices like we do here.

Following is my interview of Andrey conducted by email. He was very patient answering my questions, and then a second round of questions after I read his responses, and I had a lot of fun learning about what he does. I think you will really enjoy his story and after you read it you should go online to his gallery and check out his art.

What type of education did you have for this job?

I am a biologist by education. I graduated from university from the Department of Zoology and Ecology. Originally, I wanted to work as a Paleontologist, but at the university I had to study leaf beetles as there was no department of paleontology or related professions.

Before then I studied at an art school for children for a couple years. One day I brought my drawings to the art school and showed them to the teachers. I drew dinosaurs by pencil and gouache (paint similar to watercolor but the artist can control the opacity) and I painted beetles, which I collected. The teachers allowed me into the art

school without an exam. I also took personal lessons in drawing.

You mentioned a beetle collection, I really want to hear more about that.

When I was 13-14 years old I started to collect insects in the field. I liked to find new species (new for my collection) and define them by using a special book with a key. I mounted them on a pin and then I drew them with gouache (beetles mostly): leaf-beetles (Family Chrysomelidae), longhorn beetles (Family Cerambycidae), ladybugs (Family Coccinellidae), ground beetles (Family Carabidae), and many others. I even engaged myself in growing larvae (mainly leaf-beetles and ladybirds) and recorded in a notebook the dates and sketched larvae and pupae.

How did you learn English?

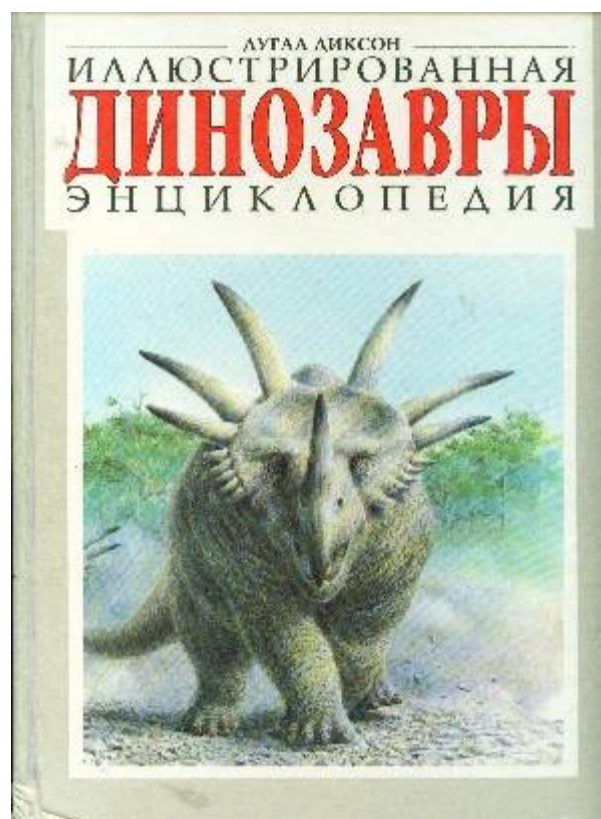
I learned English in school. At first, I was making great progress, but in high school we had a terrible teacher, a wicked witch. Because of this, I stopped my knowledge of English. The result is that I got a bad grade on the school certificate. Then I strongly improved my knowledge in college. At university I was again school certificate. Then I strongly improved my knowledge in college. At university I was again out of luck with the teacher. However, I have independently studied the language, read articles, and communicate on the internet.

What was the first dinosaur you ever did?

Hmm... I really can't remember now. But I remember how and why I started to draw dinosaurs. The first drawings I made were in 1994 under the impression of the film "Jurassic Park". I think it was the *Tyrannosaurus* that attacks *Ornithomimids*. Translated foreign books about dinosaurs began to pass in our country, probably on a wave of popularity of dinosaurs after the movie. Encyclopedias! I love encyclopedias. But Russian books about dinosaurs were a rarity, especially in provincial regions. And in my town, I did not even know that there was such a wonderful book with pictures by Zdenek Burian (a Czech painter and book illustrator whose work played a central role in the development of paleontological reconstructions)² One day in the book store I saw an amazing and terrific book - an illustrated encyclopedia of dinosaurs by Dougal Dixon. I had never seen such a book. It included many different dinosaurs with their Latin names, colorful images, description, and most importantly - the figures of a skeletons and skulls. This book has been read so much by me that it is falling apart.

So you can understand my feelings when I received the offer to illustrate Dougal Dixon's new illustrated encyclopedia of dinosaurs in 2004. I didn't believe it... such an amazing coincidence.

The lack of books with quality illustrations prompted me to start drawing illustrations myself. I just wanted to read a good book about dinosaurs and started drawing dinosaurs how I wanted to see them in a book.



Russian Edition- Dougal Dixon's Illustrated Encyclopedia of Dinosaurs

What is your favorite dinosaur and have you drawn it for publication before?

In fact, I do not have a favorite dinosaur. Rather, I love groups of dinosaurs. I love *Hadrosaurs*, *Ceratopsians*, and *Abelisaurs* and some others. I often and gladly draw dinosaurs from these groups for publishing.

What do you use to make your art- paint, colored pencils, water colors, or is everything digital painting?

Earlier, I used a pencil, ink (for skeletons, bones), gouache, and watercolor. I did a lot of watercolor drawings for the books for Anness publishing: dinosaurs, prehistoric creatures, insects and flowers. Now I paint mainly in digital graphics, although I'm using a very similar style as if I was painting with a brush and paints. Digital graphics gives me freedom, more opportunities to do so as I would like, to correct some errors (watercolor does not forgive mistakes and I have to repaint again). Also in my spare time I sculpt dinosaurs by using polymer clay.

Since no one has ever seen a living non-avian dinosaur do you work with paleontologists or other scien-

tists to understand how they look? Such as how tall they are, frills, horns or ridges, etc? Or are you asked to illustrate a dinosaur and you have to figure out what you think it looks like?

I believe that if someone wants to be a professional illustrator then he must study the subject. For example, a good illustrator who specializes in drawing birds should be an ornithologist or a biologist. That is the best way to do professional artwork. My education helps me in my work as I know well the animals, their anatomy, behavior, evolution, ecology, and more. I study science books and original publications about dinosaurs. I also consult with paleontologists to collaborate and work together with them. Sometimes I study the real bones, take part in expeditions and excavations, and prepare fossils. In fact I am a research scientist first and foremost, and I have learned as an artist in the second turn to qualitatively depict animals. Often, I will illustrate the dinosaurs based on my own speculation which is based on my science background.

Where have you been on your excavating trips? Just within Russia? Have you found fossils of dinosaurs you have drawn?

Yes, just within Russia. I had never been abroad at all, with the exception of one city in China, on the border with Russia. It is very expensive for my budget to go abroad, and there are often difficulties with visas. I participated in excavations in Blagoveshchensk, Far East Russia which is the location of the bone-bed of Late Cretaceous dinosaurs, *Hadrosaurs* mainly. I drew dinosaurs from that place – *Amurosaurus riabinini* for example, *Olorotitan arharensis* (from another location – Kundur), *Kundurosaurus*, *Tyrannosaurids*. Also I studied the bones of *Amurosaurus* and *Olorotitan* and reconstruct them by making drawings of the skulls and the skeleton that appears in scientific publications.

I took part in one digging in Sharipovo. It's near the border of our region and has Middle Jurassic bone-beds that contain fish, turtles, crocodiles, mammals, *Stegosaurs*, sauropods, theropods and ornithischians. Do you know the *Kileskus* – the huge *Tyrannosauroid* similar to *Guanlong* and *Proceratosaurus*. I drew this one too.

Near my town we have the location of Early Cretaceous fauna with *Psittacosaurus sibiricus*.

What about colors and design? Who decides what coloring each dinosaur has? Color wasn't preserved in fossils like the basic structure. Is it a guess? Do you ever want to do something really crazy with the color or design? Sort of like the pattern on *Sinoceratops zhuchengensis* (which we really like).

Excellent question. I use color exclusively for the more lively and naturalistic perception of the viewer. The human brain is accustomed to perceive the world in color, we see the colorful world. Therefore, colored drawing will look more natural for us. When we picture an animal that has been extinct for millions of years and it is not easy to find modern equivalent of it, it is very important that the audience believe that this is a real animal, so it is perceived plausible, natural and alive. To make the color more natural you can explore how modern animals are colored, relatives of dinosaurs, crocodiles, other reptiles, and birds. You can try to imagine what kind of lifestyle or habitat led to such coloration of a dinosaur and paint it accordingly. Ultimately this is a reconstruction of coloration- we still cannot claim it as truth. The aim is to look natural, for better perception as a once living animal. Also, I do color design so that the animal looked aesthetically beautiful.

However, in recent years many publications revealed remains of coloration of dinosaurs. For example the study of fossil melanosomes can answer how feathered dinosaurs were colored, the presence of spots, a striped tail and what color is it. It is also possible that patterns on the scales of mummies of *Hadrosaurs* and skin impressions may be indicative of color, and in this case they were striped or spotted. Traces of color were found in one fossilized *Psittacosaurus*. In these cases we can reconstruct the color and pattern and not only to look natural like a living being, but also to show the real color pattern. That's an amazing thing that science had brought to us



Excavations in Sharipovo

in recent years. As for the crazy color, I still prefer a more natural color and not too flashy, but with interesting design.

How many dinosaurs have you drawn? Who do you do the artwork for?

Oh, it's very hard to count them all, hundreds of them. I make drawings for books, encyclopedias, and magazine articles. Recently I painted birds, amphibians, insects and mammals of the Red Book of my region. Also, I create illustrations and murals for museums around the world. Sometimes I create textures for 3D animals which are created by a colleague 3d modeler and 3d artist Vlad Konstantinov³.

You said you have done murals for museums- any in the United States?

Yes, I have one in the new beautiful Natural History Museum of Utah in Salt Lake City. They made the mounted skeleton of the new (unpublished) *Tyrannosaur* from Utah and this exposition now has my new mural behind the skeleton⁴.



We looked at the image of *Psittacosaurus*⁵ in Vlad's gallery that you textured. It is AMAZING. But I do have a question about the things on the tail... are those quills like a porcupine? How did you know about those? I have a new appreciation for how you create and color your dinosaurs after learning about the fossil melanosomes (my mom explained those to me).

The fact is there is one great fossil *Psittacosaur* from China that has bristle-like structures on the base of the tail. Therefore you can usually see some *Psittacosaurus* from different artists who drew it with such bristles. Maybe they are like bristles, maybe like porcupine quills, but more thin and flexible I think.

The *Psittacosaurus sibiricus* created by Vlad and I has bristles because the customer asked us to do that.

Do you draw other things besides dinosaurs and insects? What is your favorite thing to draw?

Yes. I draw other animals, ancient and modern. I even painted Ediacaran organisms and Devonian fish, ammonites, trilobites, and much more. Ironically, among other things I have grown fond of astronomy. I love space, planets and stars. As a child I drew pictures on the theme of space. This fascination came in handy when I was asked to draw a spaceship for the GEO magazine. If you're an illustrator and live in Russia, then you should be able to draw a lot of things far from your specialization otherwise remain out of work and earnings.

How many drafts or works in progress does it take to come up with the final design for your dinoart?

In fact, I start working in my imagination where I create most of the sketches. There is a severe selection of sketches in my head. As a result, the paper gets 1-3 sketches. Often I already know what I want to paint and how, so I immediately start drawing a rough draft, which I continue to the finished artwork. I have very limited space to work with. I just have nowhere to work with a lot of sketches, so digital graphics - it's a good way out for me.

What would you like to tell kids interested in natural history illustration?

Just do what you love and what you are interested in, no matter what. Be amazed at this world, love it, learn and study. Study nature, watch, and be curious. And do not stop drawing. Drawing, drawing, drawing. Perhaps you will become professionals, and maybe it will be only a hobby, it's not important, as long as it makes you happy.

You can see why I had such a wonderful time with my interview of Andrey. I told him the digital painting of his was my favorite from his gallery and he sent me the image to share with all of you. Thank you Andrey!

About the author: Jack Shimon is a member of the Pikes Peak Pebble Pups in Colorado Springs, and is in the Colorado Springs Mineralogical Society Unit. He is in 3rd grade and also enjoys cub scouts, mountain biking and playing the drums.



Notes:

<http://dinoart1.narod.ru/>

http://en.wikipedia.org/wiki/Zden%C4%9Bk_Burian

<http://swordlord.cgsociety.org/gallery/1090073/>

Image provided courtesy of Andrey Atuchin.

<http://swordlord.cgsociety.org/gallery/1090073/>

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SECRETARY'S SPOT by Renee Swanson

MINUTES OF COLORADO SPRINGS MINERALOGICAL SOCIETY GENERAL MEETING DECEMBER 21, 2013

Called to order by Mark Lemesany at 7PM with the Pledge of Allegiance.

An award was given to Kim and Bodie for the great job they did on the June Show.

The meeting was adjourned at 7:20. And the Christmas Party started. Great food. Excellent gift exchange. A good time was had by all.

Respectfully submitted,
Renee Swanson

Sub-Group Responsibilities for Refreshments for General Assembly Meetings

Feb. Fossil	Mar. Jewelry	Apr. Lapidary
May Micromount	June Board	July Crystal
Aug. Picnic	Sept. Faceting	Oct. Fossil
Nov. Jewelry	Dec. Christmas Party	



Our Staff...

Ellie Rosenberg—Editor

We encourage everyone to submit articles, photos, illustrations or observations. Share your experiences, your new finds, or simply your experience at our last field trip.

Handwrite it, type it, or email it. Format does not matter. All submissions are welcomed. The DEADLINE for items to be included in the next Pick & Pack, is the **21st of the month**

To submit an item:

For hardcopy photos or articles, mail to the address below or bring them to the General Meeting. All hardcopy photos remain the property of the submitter and will be returned. Electronic photos should be submitted at resolutions above 200 dpi in TIF, BMP, JPG, or PIC format. Articles are preferred in word. Editors will correct font

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csmseditor@hotmail.com

Mail to:

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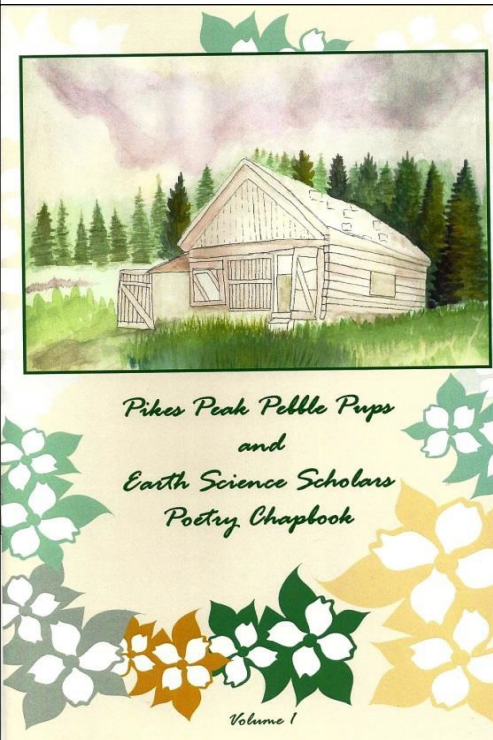
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Classifieds

Pikes Peak Pebble Pups and Earth Science Scholars Publish First Poetry Chapbook



The Colorado Springs Mineralogical Society and the Lake George Gem and Mineral Club both host a junior program. The first volume of their collected poems about Earth science has been published and may be purchased for \$4.00. Shipping and handling is \$1.00. These chapbooks are limited in number and if you plan on buying one you should do it soon. Each book sold will provide each club with \$4. These will be for sale at the Denver Gem and Mineral Show in September. A second volume is being planned now and will be available later this year. To order, please send \$5 to:

Steven Veatch

1823 South Mountain Estates Road

Florissant, CO 80816

In the memo section of the check put the club you belong to so that the club will receive the \$4. Make your check payable to: Veatch GeoScience, LLC. Be sure and act quickly as these books will soon be gone. This also helps the two clubs support the work of the Pebble Pups and Earth Science Scholars. Each month Veatch GeoScience, LLC. will issue a check to each club for the sales of the chapbooks.

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CSMS is an incorporated nonprofit organization with these goals:

To promote and disseminate knowledge of the earth sciences, especially as they relate to mineralogy, lapidary, and fossils.

To encourage study, collection, and fashioning of minerals.

To accomplish the same through social meetings, lectures, programs, displays, shows, and field trips.

The Pick & Pack is published 10 times each year to assist and promote the above.

Joining the Colorado Springs Mineralogical Society (CSMS)

Meetings are held the **third (3rd) Thursday of each month**, except January & August, 7:00 p.m. at the Colorado Springs Senior Center, 1514 North Hancock Ave., Colorado Springs, CO. **Visitors are always welcome.**

CSMS also offers Satellite Group meetings that allow more focused attention in specific areas of our members' interests. Our current Satellite Groups consist of the following: Crystal Study Group, Faceting Group, Fossil Group, Jewelry Group, Lapidary Group, Micromounts Group, and Pebble Pups/Juniors. For details on Satellite Group meetings, check out the calendars on page 2 and the web site.

Yearly dues include 10 issues of the *PICK&PACK*, all field trips (additional fees may be required on some field trips, and members are responsible for all transportation to and from), participation in all Satellite Groups (some groups may request additional fees to help cover resource costs), free admission to the *Western Museum of Mining & Industry*, a year of learning and enjoyment, plus a lifetime of memories.

Individuals—\$30, Family—\$40, Juniors—\$15, Corporate—\$100, *****Application is on the web site.

If you are interested in joining CSMS or would like more information, we encourage you to attend our next General Meeting or visit our web site: www.csms.us.

CSMS is a Member of: the following:

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