Place: Arden Community Club
Hall Rd
Arden, WA

Time 7:00 PM
Third Tuesday
April - September
6:00 PM October - March & August

The Panorama Prospector

June 2017

Panorama Gem and Mineral Club Minutes
May 16th

We continued our discussion of whether to include home-schooled applicants in the club's college scholarship program and decided to keep our current policy of only including the Kettle Falls, Colville and Chewelah public high schools as sources of applicants.

A committee was formed to revise the current application form. It includes the three current club trustees (see back of this newsletter) plus Becky Dobbs, (684-6931), Nina (563-9913), Bob Bristow and Jan Hurley. Bill Allen will mail paper copies of the current forms and talk about them after a regular meeting.

There is a motion ongoing to change the admission fee for the Rock Show to $1 for adults and nothing for children. We will vote on this idea in June.

Becky Dobbs reported that the field trip to Johnie and Ginger Pitman's that included a Thunderegg Hunt was a big success. She proposed that it might be a good field trip to go to the club rock shop and teach folks how to use the rock saw and other equipment. Since Gold Creek Rd. is closed it is best to call ahead to Gene Fisher for directions. With the current road situation we decided that a scheduled field trip is not a good idea.

A field trip is scheduled for June 10th to the upper Evans Quarry. Parties to meet at Super 1 in Colville at 9:00 AM. Becky is the leader.

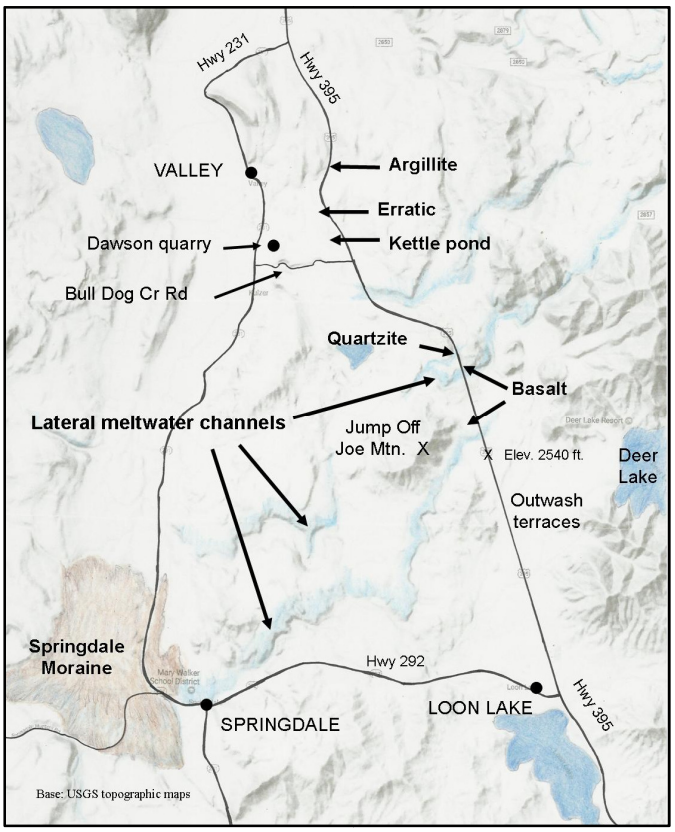
Joining a currently scheduled field trip with the Rock Rollers to Horseshoe Mountain was discussed for June 24th. It is gathering at the 2nd Chevron Station in Republic at 11:00 AM. The leader, Scott Jackson suggests that since the site is so small, our club should wait until a later date.

continued on page 2

Geology Snapshots - Hwy 395 from Arden to Deer Park

by Sharon Borgford

PART 6 Hwy 231 Junction to Loon Lake



At the junction of Hwy 395 and Hwy 231, the ice sheet above you was about 1900 ft. deep at its maximum (Carrara: surface elevation of ice sheet approx. 3608'). The height of the glacier has been estimated by plotting the elevation of glacial till on the hills surrounding the glacier filled valleys. The further south you travel the thinner the ice was, which means it didn't do as much gouging and scraping as under heavier, thicker ice to the north. Continuing south from the junction, glacial till is evident in numerous road cuts.

The glacial features being pointed out along the way have to do only with the most recent glaciation

period. This period consisted of more than one

Upcoming field trips with no exact date yet include:

- Flagstaff Barite Crystals - July
- Metaline Trilobites - August
- Knob Hill Fossils - September
- Sullivan Creek Gold Panning - ?

The door prize winner was Warren Buell.

We adjourned early because the video was over an hour long and we were already running late.

end

advance and retreat of the ice. It is often quite a detective job to figure out the order in which things happened. In addition to the massive continental ice sheets, the conditions also promoted the growth of alpine glaciers formed in individual mountains and mountain ranges, and they often combined and grew to the borders of the continental ice, thus covering areas in elevations higher than the main ice sheet, or in areas where a major continental ice sheet did not exist. Northeastern Washington was under what is called the Cordilleran Ice Sheet, a giant alpine glacier system originating in British Columbia. This repeated advance and retreat of ice means there were also associated glacial lakes and streams affected by that movement and which changed throughout the same time period. In addition, there were several previous glacial periods that left older evidences, often in the same areas. These are usually found further south of or more deeply buried than the most recent advance features, since each new advance tends to wipe out anything on the surface from before.

The first road cut to expose bedrock consists of a dark argillite**.** The name of the formation is McHale Slate; however, "the formation is almost entirely argillite" (Miller 2001). Argillite is a low grade metamorphosed mudstone or clay stone that can have the appearance of slate but does not break like slate. This formation is also described as "phyllitic" argillite, meaning that is has a silky sheen due to the alignment of certain of its mineral components.

Approximately 1 mile beyond the end of the road cut, keep watch to the west side of the road where there is a large boulder sitting by itself in a field. This is a glacial erratic, a rock that has been transported from its origin and deposited as the glacier melted.

This also is approximately the place that the previously named "Jump Off Joe Fault" crossed the highway. The Jump Off Joe Fault was considered the dividing line between the Kootenai Arc material and the Old North American Continent. As stated in Part 5, this fault location has been revised and it is proposed that the dividing line is actually about 3 miles west in the valley floor. So while traveling south on Hwy 395, you crossed onto the Old North American Continent either just west of the town of Chewelah, or here.

Another glacial feature seen in this area are kettles. Kettles are formed when a large chunk of glacier ice gets buried within a moraine as the glacier retreats, and later melts away, leaving a depression. These often fill with water and are called kettle ponds.

When picturing what happens as a glacier melts, it helps to remember that when an area of land is free of the actual ice, it still is in the path of future outwash as the glacier continues to retreat - the water has nowhere else to go but away from the changing ice front.

For the next few miles you are traveling over a somewhat level area that consists of glacial outwash

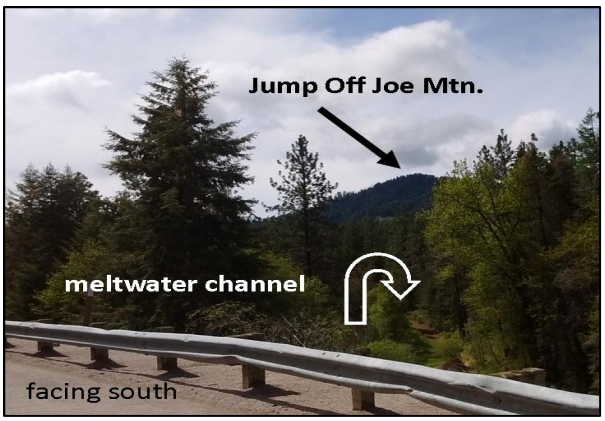
and deep till left behind as the glaciers melted. Between Hwy 395 and the Colville River valley to the west (out of sight), a large kame terrace exists. A kame terrace is "a flat-topped mound or hill composed of sorted sand and gravel... Kame terraces form when sediment accumulates in ponds and lakes trapped between lobes of glacier ice or between a glacier and the valley side." *(www.landforms.eu).*

A short side trip down Bull Dog Creek Road to Hwy 231 will reveal a cross section of this deposit and a couple more kettle ponds, as well as a big quarry in the valley below that lets you see just how deep this deposit is.

Continuing south, Highway 395 gains more elevation. A Washington State highway department shop and quarry on the north side of the highway at Roitz road takes advantage of the glacial till. Mines in the hills to the northeast produced primarily copper, and some barite and silver.

About 1/4 mile past the highway shop is a wide turnout area, and two features can be seen from this parking area that are hard to see if you just stay on the highway. The first one is an outcrop of quartzite, moderately visible across the highway as

well as in the form of a rounded knob to the north of the turnout. This is Addy Quartzite/Quartzite of Chewelah.



The other feature is west of the guard rail: a lateral meltwater channel.
A short distance past the turnout, you will begin to occasionally see dark rock peeking out from the glacial till. This is Columbia River Basalt, the farthest north that it is visible along the highway.

Google Earth photo - basalt

Google Earth photo - moraine

Glacial till makes up the road cuts for the next mile, labeled the Grouse Creek Moraine.

You will cross over more channels perpendicular to the highway. They are called lateral meltwater channels. These are "a channel or a valley formed or followed by a glacial meltwater stream...In general they form along or just beneath and roughly parallel to the margin of the ice. They occur in groups or single channels oriented sub parallel to the contour of the land." The furthest one south is considered the indicator of the edge of the latest ice sheet. The location in the photo below is showing the Grouse Creek channel looking east from the highway.

When you reach the highest elevation of the highway, you are just beyond the probable edge of the ice sheet. It did not cover the top of Jump Off Joe Mountain visible to the west, but did leave till and moraines around it. Jump Off Joe Mountain is composed of Old North American Continent rocks.

As you descend, you are no longer looking at glacial till dropped from beneath of or the edge of the glacier itself, but a series of glacial outwash terraces. The source of the underlying gravels and silts came from a previous glaciation. This large volume of outwash formed natural dams that created both Deer Lake and Loon Lake. Then the most recent glaciation contributed even more outwash and left behind shallow terraces and channels that drained towards Loon Lake and down Sheep Creek to the west of Loon Lake. Sheep Creek becomes the Colville River west of the town of Springdale.

We are almost to Loon Lake, an area with a geological story as unique as the section we have just traveled through.

References:

Carrara,P., Kiver,E., Stradling,D., The southern limit of Cordilleran ice in the Colville and Pend Oreille valleys of northeastern Washington during the Late Wisconsin glaciation, Canadian Journal of Earth Sciences, Feb. 1996

Cheney, E., Buddington, A., 2012, Geology of the Continental Margin of Ancestral North America: Laurentia in Northeastern Washington, field trip guide.

Encyclopedia of Snow, Ice and Glaciers, Encyclopedia of Earth Sciences Series, Springer 2011 p 724

Hyndman, D.W., Alt, D.D., 1984, Roadside Geology of Washington.

McLucas, G., 1980, Surficial Geology of the Springdale and Forest Center Quadrangles, Stevens County, Washington, Washington Div. of Geology and Earth Resources, Open file report of 80-3.

Miller, F.K., 2001, Geologic map of the Chewelah 30'x60' quadrangle, Washington and Oregon: U.S.G.S. Misc. Field Studies Map MF-2354.

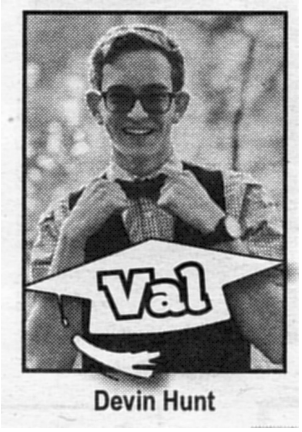
Wikipedia, Wisconsin glaciation/Cordilleran glaciation/

All photographs and illustrations by Sharon Borgford unless otherwise noted.

Johnie's Jabber

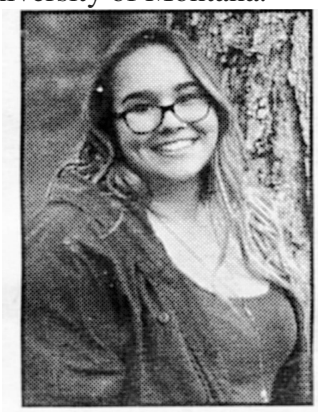
by Johnie Pitman

The scholarships have been awarded for this year. The winners are:

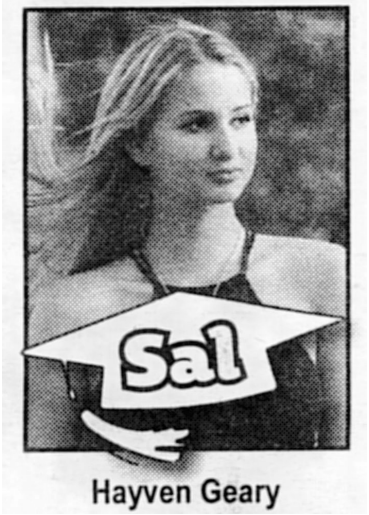


Devin Hunt

Colville, Devin Hunt, plans to pursue a degree in Human Biology from the University of Montana.


Emily Rowe

Chewelah, Emily Rowe, plans a career as an Art Teacher, the first two years will be at Spokane Falls Community College studying Graphic Design, then a four year college for the teaching degree.



Hayven Geary

Kettle Falls, Hayven Geary, will pursue a degree in International Business from the University of Washington and will study Spanish, Japanese and German. (You will note that one of our recipients is a class Valedictorian and another is a class Salutatorian. Good work committee!)

Folks be thinking of a time after the middle of July to work on cutting out tables that we need for our show.

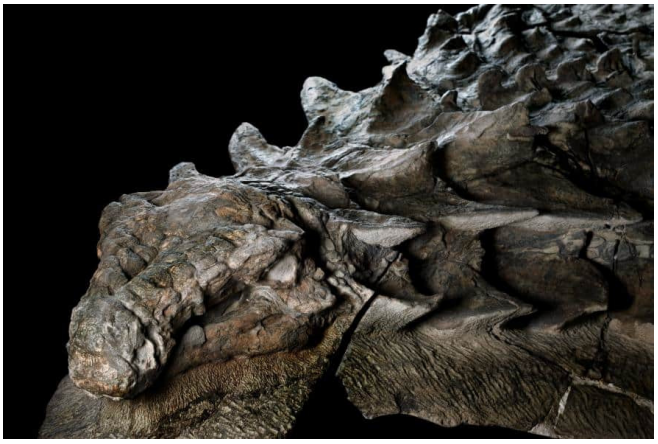
Chips From The Outcrop
By Bruce Hurley

Those who know me have likely heard me say that "It is often better to be lucky than good," when collecting fossils. But paying attention to unusual features of the rocks and being careful when you collect them are also really important, too. The following story is the happy tale of how some folks in Canada recently took advantage of all three circumstances to make one of the world's most spectacular fossil finds.

On March 21, 2011, Shawn Funk was excavating "tar sand" bitumen at Suncor's Millennium Mine north of Ft. McMurray, Alberta. As he pulled the bucket of his large excavating machine down the pit wall, it encountered something much harder than the surrounding sands, and of a walnut brown color. Realizing this was something unusual, Mr. Funk immediately stopped excavating. Soon he and his supervisor, Mike Gratton, were examining the brown material close-up, and began to notice that portions of the rock had scaly surface patterns and many similar humped projections. This was something they had never seen before, and soon they were in contact with Canada's famous Royal Tyrrell Museum, one of the world's premier facilities for the study of dinosaurs. And a dinosaur this was.

The remains in the Millenium Mine were of a 100-million-year-old nodosaur, an armored and spiked plant-eating dinosaur which likely weighed well over a ton. It is one of the best-preserved dinosaur fossils ever found. This land animal was likely drowned in a flood and washed into the Western Interior Seaway, which in Cretaceous time covered what is now the Ft. McMurray area. Floating on the surface, it eventually partially decomposed, then sank to the shallow seafloor. The nodosaur remains were then quickly encased in shallow marine sediments, which sealed the fossil away in a protective casing. In life, this animal was approximately 18 feet in length, with the front half being preserved in this find. Not only are the body armor and defensive spikes extremely well preserved, but skin patterns and even some skin color can also be distinguished. And after six years of excavation and preparation, this nodosaur is now on display at the Royal Tyrrell Museum in Drumheller, Alberta.

(Top View of Fossil)



(Left Front View of Nodosaur)

The full story of the Millenium Mine nodosaur is detailed by the National Geographic Magazine at the website below:
http://www.nationalgeographic.com/magazine/2017/06/dinosaur-nodosaur-fossil-discovery/ . National Geographic provided support for the excavation and preparation of this dinosaur, and the accompanying photographs are from their above-mentioned article.

From this story, it is easy to see how keen observation of the rocks and careful excavation

Membership Dues:
$20.00 per **household** per year is due to the club Treasurer Johnie Pitman (address below) on the third Tuesday of November for regular members.
Webpage: http://panoramagem.com/
Contact: Bruce Hurley, President, 509-413-2768.

We**, The Panorama Gem and Mineral Club**, are a multi-faceted group of mineral-minded people. Our proud members include some real gems, a few fossils, and even some diamonds in the rough. A few have lost some of their marbles, but they know where to get more! A few need to polish their coordination because they are always tumbling! And some are miners who use the "silver pick" as their tool of choice! It should be crystal clear, that we all enjoy this unique conglomeration and above all else we strive to **HAVE FUN.** And we never throw stones (away).

June Meeting 7 PM

Bruce Hurley, our intrepid president, will bring a PBS documentary called Treasures of the Earth: Power. It explores the various sources of power we have recovered from the earth. We did not get around to showing it at the last meeting so hopefully we will this time.

We will doubtless have lots of goodies to eat and some lively discussions on when and where for field trips etc.

Thanks to the writers: Sharon Borford, Lucie Bristow, Johnie & Ginger Pitman and Bruce Hurley for this issue.

Please visit Rex Barrans at the Veterans Hospital in Spokane.

played major parts in the discovery and preservation of this nodosaur. But where did luck come into play? This fantastic fossil was found very close to the outer boundary of the Millenium Mine property. Had this ancient animal come to rest on the seafloor a hundred or so feet from the spot it was accidentally found, 110 million years later, it would likely have never been discovered!

Field Trip to the Upper Evans Quarry

pictures from Ginger Pitman

A small group of rock hounds gathered at Super 1 on June 10th to follow Becky Dobbs to the upper Evans Quarry, a site the club has not visited as a group. The limestone in this quarry was mined in the building of Grand Coulee Dam.

The group found dogtooth calcite crystals such as these and everyone had a bucket full on the ride home.

Panorama Gem and Mineral Club: Organizational Chart

Officers:			
President:	Bruce Hurley	10617 W. Lakeside Lane, Nine Mile Falls, WA 99026	509-413-2768
Vice-President:	Bob Bristow	PO Box 1165; 2567 Mud Lake Rd. Chewelah WA 99109	509-935-4375
Secretary:	Anni Sebright	POB 293, Clayton, WA 99110	509-276-2693
Treasurer:	Johnie Pitman	701 B Williams Lake Rd, Colville, WA 99114	509-684-8887
Trustee 2:	Gene Fisher	294 Gold Creek Loop Rd, Colville, WA 99114	509-684-8546
Trustee 3:	Bill Allen	2633 Highline Rd, Chewelah, WA 99109	935-8779, 936-2446
Trustee 1:	Sherryl Sinn	725 S. Chester, Colville, WA 99114	509-684-6093
Committee Chairs			
Program Coordinator:	Bev Bockman	1750 N Havichur Loop, Post Falls, ID 83854	208-773-5384
Hospitality:	Sherryl Sinn	725 S. Chester, Colville, WA 99114	509-684-6093
Club Shop:	Gene Fisher	295 Gold Creek Loop Rd, Colville, WA 99114	509-684-8546
Historian:	Carol Price	PO Box 77, Laurier, WA 99146	509-684-2857
Newsletter:	Joseph Barreca	2109 Hwy 25 South, Kettle Falls, WA 99141	509-738-6155
Show Chair	Bill Allen	2633 Highline Rd, Chewelah, WA 99109	935-8779, 936-2446