Pacific Northwest Chapter
FRIENDS OF MINERALOGY

September 2004 Bulletin

30th Annual Symposium Quickly Approaching
September 24 - 26

EARLY REGISTRATION UNTIL SEPTEMBER 15

"MINERALS OF SKARNS" is the theme for this year's Symposium and our speaker line-up and talks have shaped up well this year.

Peter Megaw will describe geology and mineralogy of skarns, illustrating why materials of interest to the collector occur in skarns.

Ray Grant will provide an overview of Dal'negorsk, Russia, one of the world's classic skarn deposits and specimen-producing localities. Jeff Scovil will follow with a photo-tour of some of the more spectacular mineral specimens from skarns.

The Sunday program will include a far northwest presentation on the Lost River Skarns of Alaska by Don Grybeck. Additional talks, which may be momentarily theme-related, are Ray Grant's talk on Collecting across Russia on Saturday afternoon and Jeff Scovil's talk on Minerals of the Houston Museum of Natural Science on Sunday morning.

In anticipation of our theme, also look for theme-related articles in this newsletter by Lanny Ream, Bart Cannon, and Aaron Wieting focusing on Pacific Northwest skarn occurrences. Many theme-related displays will also be in the main floor at the Symposium.

Read on for a few last-minute items and a couple of show highlights.

CONTESTS: We have two contest this year and they are:

1. Best Self-Collected Mineral Specimen—labels will be available for specimens included in a display case
2. Best Display—all displays are automatically entered (except for the contest chairperson….)

Winners will be determined by popular vote. Prizes this year are an issue of ExtraLapis English of the winners' choice. Alternatively, winners may choose an item of equal value from the Lapis International or Rocks & Minerals tables. Let's see your best specimens!

SPECIAL SHIRTS: This year we have something a little special for shirts for our 30th annual Symposium. Stylish polo shirts, suitable for the office, cocktail parties, casual dining, or the golf course will be available at the registration desk. Watch for FM members modeling shirts at the Symposium!

ROCKS & MINERALS and LAPIS INTERNATIONAL

Terry Huizing, Gloria Staebler, and Guenther Neumeier will be representing Lapis International and Rocks & Minerals on the main floor at our 30th annual Symposium. Items that Lapis will feature include:

- ExtraLapis English
- Mineralogical Record
- Various foreign language publications

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Pacific Northwest Chapter FM
2003 - 2005
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IN THIS ISSUE

President's Message

Amazing how time flies; summer's almost over, the Symposium's fast approaching, and I've been president for almost a year. As always, there never seems to be enough time to do everything we want to do, but it's still been a lot of fun and I've had the opportunity to work with some committed, capable, and enthusiastic mineral collectors.

Currently, we have several ongoing projects. Lorna Goebel is working on the ABC project and will have examples on display at the Symposium. John Lindell is spearheading the revision to the Washington locality index; John should be contacted regarding any new or obscure Washington mineral occurrences. I am currently working on the Oregon index and would welcome any information on Oregon localities. Essentially, if it's not in Rudy's book or the "mainstream" publications such as the Ore Bin, Oregon Geology, collecting guides, or the MicroProbe, I'd like to know about it!

There are several items I will bring up at the business meeting on Sunday of the Symposium, which I encourage members to attend, if possible. The first is that, for the first time, we have had to provide event insurance for our Symposium. Officers explored various options, and the ultimate cost was around $650 for insurance for the entire event. Since our group is in a strong financial position, this cost was not passed onto Symposium registrants this year through the registration fee. Next year, however, we will have to find a more economical alternative and pass on at least some costs to members as an increase in registration fees. This could be as much as $5-$10 per person. Therefore, I encourage members with ideas for other alternatives to provide input at the business meeting or contact a PNWFM officer.

The other primary item I will address is the healthy state of our finances and the opportunity to make financial contributions towards meeting the objectives of our organization. Since bringing this up in previous President's Messages, the only suggestions so far have been to support the Rice Museum both with a membership for our Chapter, and with a targeted donation for the completion of the Northwest Gallery. I plan to bring up the state of our finances during the business meeting with the intent of taking some sort of action.

The last item is to remind members of the FM case at the Rice Museum. We change this out every six months or so, and volunteers are always needed to provide great specimens for this display. Of course, the hope is that the Northwest Gallery will be completed sometime in the spring of 2005, so there will be a home for dusty old northwest specimens that haven't seen the light of day in years. I encourage members to support the museum by loaning or donating premier specimens to demonstrate what the northwest has to offer.

We are looking forward to a great Symposium, and I hope to see as many members there as possible.

Aaron Wieting

2004 WASHINGTON PASS MEET

by Wes Gannaway – A grand total of 4 FM members showed up at Klipchuck Campground for the annual Washington Pass cleanup and collecting on August 7th and 8th. Yours truly prepared breakfast on Saturday morning and then we waited for the park ranger to show up as there was no camp host this year. We were assigned the job of trash pickup along the Cedar Creek trailhead road just east of the campground. After the chores were done we went up to the pass to collect.

Fresh material has come down along the highway at the Silver Star pullout so we proceeded to break rock and collect pockets. The day was clear and sunny (maybe the Friday rain had scared off other collectors) and soon everyone had a pile of keepers to take home and look at under the scope.

Our Saturday night potluck was a success with BBQ, potato salad, and fresh fruit from the local orchards. Everyone had a great time and then some went back up to the pass with shortwave lights to look for zektzerite crystals.

Richardson's Ranch Field Trip Report

by Aaron Wieting – Friends of Mineralogy members and several novice collectors met at the Richardson's Recreational Ranch on July 31 for a day of collecting at the renowned thunderegg beds north of Madras, Oregon. Collectors met at 10 am on Saturday at the Richardson's office to decide where to collect and to visit the gift shop to view examples of material that could be collected. Since the forecast was for scorching hot weather, the group decided to visit the Moss Beds first, since this locality required the most effort to recover the thundereggs.

Overburden had been recently bulldozed at the Moss Beds to expose the top of the thunderegg-bearing rhyolite flow, though hammers and chisels were still necessary to extract the thundereggs from the weathered rhyolite. The productive zone is approximately one foot thick and consists of three different types of thundereggs. The top portion of the zone consisted mostly of hollow thundereggs often lined with microcrystals. Under the microscope, these appear to be clear to slightly orange heulandite or clinoptilolite. The middle portion of the zone produces agate-filled thundereggs with little moss. The bottom portion of the zone which, of course, takes the most work to reach, produces agate-filled thundereggs with attractive green and red moss. Several collectors did quite well at this locality and moss agate-filled eggs were found up to 10 x 13 cm.

Next, collectors visited the Bed #6 which produces hollow thundereggs lined with orange to red clinoptilolite-Na up to 5 mm. This bed is not being actively worked at this time and is not shown on the map provided at the gift shop. Thus, Rudy Tschernich offered to lead the group to the old workings and show where some of the best material had been collected in the past. Small thundereggs up to 5 cm lined with clinoptilolite-Na were lying all over the place and collectors were able to find plenty of representative material. By this point, the temperature was starting to get uncomfortably warm, so collectors were not up to expending significant amounts of energy.

Several collectors continued on to the Blue Beds since the bed had been worked just that morning by Mr. Richardson; however, it was just way too warm to put much effort into digging. Collectors returned to the gift shop, paid for their thundereggs, and spent some time wandering the gift shop looking at material for sale and the Richardson's collection of rocks and minerals, local thundereggs, and Chinese soapstone carvings.

For collectors who wish to visit the Ranch, the gift shop is open year-round and the thunderegg beds are open when accessible. Since most of the ranch roads are in clay-rich soil from weathered volcanic rock, they become virtually impassable during extended periods of wet weather.

Collectors sizing up the collecting at Bed #6. From left, Al Liebetrau, Barbara Amen, Rudy Tschernich, the back side of Jade Wieting, Tom Wieting and Alexandra Amen.

For collectors who wish to visit Bed #6 with the clinoptilolite-Na lined thundereggs, the bed is located in the central portion of the map provided by the gift shop. Several miles from the gift shop, the main road enters a wide, flat valley. At the first junction, take the left turn towards the Blue, Red, and Moss Beds. After a short distance, the road comes to a "Y" with a low ridge ahead in the center of the "Y". At the summit of the ridge, an old broken-down bulldozer can be seen in the trees which marks the location of the workings in Bed #6. At the "Y", the left fork heads towards the Blue, Red, and Moss Beds, and the right fork heads towards some of the Richardson's agate beds. Take the right fork and keep left at the next "Y", then watch for a faint two-track road heading to the left through the sage-brush (which has been recently flattened by FM members….). The two-track road should only be traveled in high-clearance vehicles; otherwise, it is only a short walk to the locality. Follow the two-track road through the sage, across a gravel wash, and up the hill keeping left to the broken-down bulldozer. The pit at Bed #6 is to the left of the bulldozer. ■

The Skarns of Idaho

by Lanny Ream

INTRODUCTION: Fortunately for the mineral collector, there are several skarns in Idaho of which a few produce some fine mineral specimens. Along with the minerals commonly found in skarn deposits, such as andradite, grossular, epidote, diopside, quartz, hematite and magnetite; some of the skarns in Idaho produce less common minerals, such as ilvaite, hedenbergite and ludwigite.

Brief Descriptions of Skarns and Their Mineralogy:

SEVEN DEVILS MINING DISTRICT: One of the largest skarn areas in the state is at the Seven Devils Mining District in western Adams County. The mining district overlooks the spectacular Hells Canyon a few miles north of Cuprum. There are several distinct skarn bodies in the district which have been prospected and mined for copper and tungsten. The district is abandoned, and the mines are becoming slumped and overgrown, limiting exposure of the skarns.

The skarns of the district are dominated by garnet, mostly brown andradite, with some grossular. In some areas, especially around the Peacock mines, lustrous crystals of brown andradite have been collected. These garnet bodies also contain epidote, and during mining operations, spectacular lustrous crystals to several inches in length were produced (or at least mined and sent to the crusher with the ore).

Other minerals include powellite (type locality), lindgrenite and copper secondary minerals. There also is some quartz and hematite of interest to the collector.

IRON MOUNTAIN: This mining district is located northwest of Weiser on upper Fourth of July Creek, off the Mann Creek road. There are a few mine workings in the skarns, including one pit.

Brown grossular forms large masses in the pit and these masses have a few cavities. Most of the cavities are irregular and filled with loose powdery brown Fe-Mn oxides. Some of these cavities also contain small books of chlorite (species not known), small brown grossular crystals and rough, pitted pseudomorphs of chlorite and other minerals after unknown minerals.

Larger cavities in the massive garnet are sometimes lined with large grossular crystals, but most of these are shattered and if removed, crumble to sand-size pieces. Specimen recovery from this zone is rare.

One small magnetite pod in the pit contains a few cavities with magnetite crystals, but most of these are oxidized and have brown surfaces. Those that are not oxidized, have dull surfaces. The uncommon magnetite crystals in these cavities are dodecahedrons.

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Nevada Field Trip Report

by Wes Gannaway – Since I am the VP of the NW Chapter of FM I am supposed to arrange for the occasional outing for the group. With this in mind I set up a one week micro mineral collecting trip to Nevada and Utah for the last week of June. Our initial meeting point was at Winnemucca, Nevada, and nine members and family members met on the morning of the 21st.

Our first collecting location was the Silver Coin mine, located just north of I-80 between Winnemucca and Battle Mountain in Humboldt County. We were equipped with the latest mineral list for this locality by Doug Merson. William Wise and Richard Thomssen had worked on the minerals of the Silver Coin in conjunction with the meeting in Northern California that was being held on the 26th of June (Doug has updated the list on the www.mindat.org website). Everyone took turns collecting from the small stopes just inside the mine portal. A nice collection of phosphates and arsenates were found, including turquoise, alunite, and wavellite.

Our next stop was the Willard mine in Pershing County near Lovelock. This was an open pit gold mine that has been reclaimed. The main collecting area is a small outcrop of compressed shales on the pit floor containing a nice suite of phosphate minerals including cacoxinite, wavellite, and fluellite. Doug found a nice 8”x10” plate covered with wavellite sprays to 1/8”. Josh Gannaway found a nice pocket of fluellite crystals to ¼”.

The next collecting site was down at Chalk Mountain in Churchill County near Middlegate. The Chalk Mountain mine is known for the endiclite, descloizite and wulfenite specimens found on the 550 level and on the newest portion of the dumps. Several members collected some nice descloizite and endiclite specimens and Leo Plas collected some nice gemmy wulfenites. The group also had a fantastic supper prepared by Jonathan Ream, a chef at an upscale restaurant in Spokane.

The fourth stop was at the Linka mine just east of Austin in Lander County. The Linka was mined for the scheelite. The group collected specimens of pottsite, clinobisvanite, scheelite and the associated skarn minerals of epidote and garnet.

The last stop for the group was the Gold Hill mine in Tooele County, Utah. This mine, located about 60 miles SE of Wendover, is the source for some of the world’s greatest arsenate minerals, including the type locality minerals juanitaite and austinite. Superb crystals of cuprian adamite, olivenite, mixite and austinite were collected, along with adamite, hidalgoite, pharmacosiderite, conichalcite, and cornwallite. The Gold Hill mine is slated for reclamation in the near future so this visit was special.

This trip was a lot of fun and I think everyone got some very nice material.

Also in the pit, is a pod of calcite that contains large spheroidal groups of green phlogopite. Although not particularly attractive or recoverable as good crystals, this is an interesting occurrence of this mica.

SPRING MOUNTAIN DISTRICT: Another interesting skarn is in the Spring Mountain District, southeast of Leadore. The skarn is exposed along Quartzite Canyon, upper Bruce Canyon and lower Lemhi Union Gulch. Most of the skarn is massive diopside with one zone of massive forsterite and small pods of magnetite.

The magnetite pods have cavities that are lined with magnetite crystals, but most are filled with calcite. Most of the crystals are only the typical druse lining cavities and not fully developed crystals, but in some areas there are better crystals. Many of the crystals have fractures and tend to fall apart, and all have dull faces. If a collector is willing to use a lot of HCl to dissolve calcite, a few good specimens may be found.

One pod of marble contains large crystals of ludwigite, up to a few inches in length. These are quite unusual in that most worldwide ludwigite occurrences are of fine acicular crystals frozen in rock. The crystals are partially altered so that the surfaces are brown; this is a Mn-Fe-B hydroxide, the identity has not been made. If it is removed with oxalic acid or Iron Out, the etched and pitted ludwigite is exposed. The ludwigite also has an abundance of fractures, so the crystals fall apart, and none of them are terminated. Even though the crystals are not terminated and in any recovered group most will show fractures, the specimens are interesting for the large size of the crystals.

Ludwigite is also common as fine crystals in the magnetite bodies and in some calcite bodies. This fine acicular ludwigite occurs in radial groups and scattered crystals. Typically it is black, but some of it is altered to a white szaibellyite and other minerals, or altered to the brown unknown. In one area, the ludwigite is in tiny radial groups that are quite fine and the ludwigite has a green/olive drab color.

Tiny to small octahedrons of black spinel are also present in the skarn, especially with the ludwigite and forsterite. In one area on Lemhi Union Gulch it also occurs with diopside. Most of the spinel is less than 1/8 inch across, but a few crystals are up to about 1/4 inch. It is always black, and the octahedrons have dull surfaces.

Forsterite is uncommon as euhedral crystals in cavities in a body of massive forsterite. The crystals are blocky and have a cream to tan color. Occasionally spinel crystals are perched on the forsterite. Diopside forms tiny or small green crystals in the cavities in the massive diopside, and in some areas these are accompanied by tiny spinel crystals.

MACKAY MINING DISTRICT: The Mackay Mining District, a few miles west of Mackay is a copper district that was developed in skarns. There are many mines in the district in the skarns, limestone and intrusive rock. Minerals present include massive garnet, epidote and magnetite. There are a few cavities, and a few small crystals of garnet, magnetite and epidote are known. Other minerals, including malachite, hemimorphite, chrysocolla and azurite occur, but few specimens have been collected due to the scarcity of cavities. A new mineral was described from one on the occurrences and named custerite. This was later proven to be the rare mineral cuspidine.

SOUTH MOUNTAIN: This mining district in the southwest corner of the state, accessible from Jordan Valley, Oregon is a copper-lead-zinc district. It is fairly well known for ilvaite and hedenbergite crystals. It has also produced good specimens of black sphalerite with pyrrhotite and quartz. The ilvaite is typically up to about 1 inch long and sometimes larger. Crystal faces are somewhat dull, but sharp and well formed. Hedenbergite is common, and may be the most abundant mineral making up the mass of the skarn deposits. Hedenbergite does sometimes form distinct crystalline groups or individuals, but most of it is compact radial masses of coarse crystals.

Tiny reddish orange garnets are uncommon, but do occur in some areas on terminations in vuggy hedenbergite masses. Other minerals include chalcopyrite in the ore zones and secondary minerals including pyromorphite, aurichalcite and hemimorphite.

SPRINGFIELD MINE: An unusual skarn is at the Springfield tungsten mine about 12 miles from the Johnson Creek Road, 14 miles southeast of Yellow Pine in west central Idaho. Access is difficult, the upper half of the access road is rough, rocky and steep. The deposit was mined for the scheelite that occurs in pyrrhotite.

The skarn is dominantly pyrrhotite, marble and small amounts of calc-silicate minerals. Most of the "usual" skarn minerals are absent or present in small amounts only. There is some quartz as small colorless crystals, small milky crystals associated with pyrite and malformed milky crystals in masses. Reddish garnets occur as shattered and pitted euhedral crystals in the contacts of a coarse white marble body.

The contacts sometimes have layers of grains and masses of a black prismatic mineral (a tourmaline?), an unidentified green anhedral to subhedal mineral (probably diopside) and small masses of garnet. There also is a white acicular mineral in layers and masses. This skarn has a small potential for specimens of quartz and garnet, and some of the other minerals.

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In Search of the Elusive Oregon Skarn

by Aaron Wieting

As part of my work on the Oregon locality index and also as part of my search for new and lost Oregon localities in general, I have been researching geologic environments in Oregon where interesting minerals may occur. Given the conditions under which skarns form, there is always fair potential that mineral specimens of interest to the collector may be present. Skarns have been documented in the literature describing Oregon geology; however, it seems that very few of the occurrences have been explored by individuals with an eye for specimen minerals.

Only a few specimens of Oregon skarn minerals are on display in public places. These include a garnet specimen from the Frazer Mine in the Oregon Department of Geology and Mineral Industries (DOGAMI) Grants Pass office, various specimens of garnet, epidote, and molybdenite from the Wallowa Mtns. and Pedro Mtn. on display in the DOGAMI Baker City field office, epidote from the Pueblo Mtns. on display in the Crater Rock Museum, and a few specimens in the Baker County museum in Baker City. Unfortunately, except for the Frazer Mine specimen, localities given are very general, subsequently requiring varying levels of research in order to locate the occurrences.

Given that much of the geology of Oregon consists of younger volcanic and sedimentary rocks, there are limited areas where skarns may be found. However, there are several different environments in Oregon where skarn-type mineralization can be found. The most common are the typical felsic to intermediate intrusions in contact with calcareous sediments. Other more unusual skarns include andesite in contact with limestone, and intrusives in contact with ultramafic and Ca-rich volcanic rocks.

The majority of skarns in Oregon are in the NE quarter of the state, though there are isolated occurrences in other parts of the state. In SE Oregon, there are several iron prospects in the Denio area where magnetite and hematite have been found in contact zones between andesite and limestone. SE Oregon skarn specimens are also represented by a large plate of acicular sprays of epidote crystals up to 5 cm from an unreported locality in the Pueblo Mtns. This specimen is on display in the Crater Rock Museum collection and appears to be from a similar environment as the Denio area material.

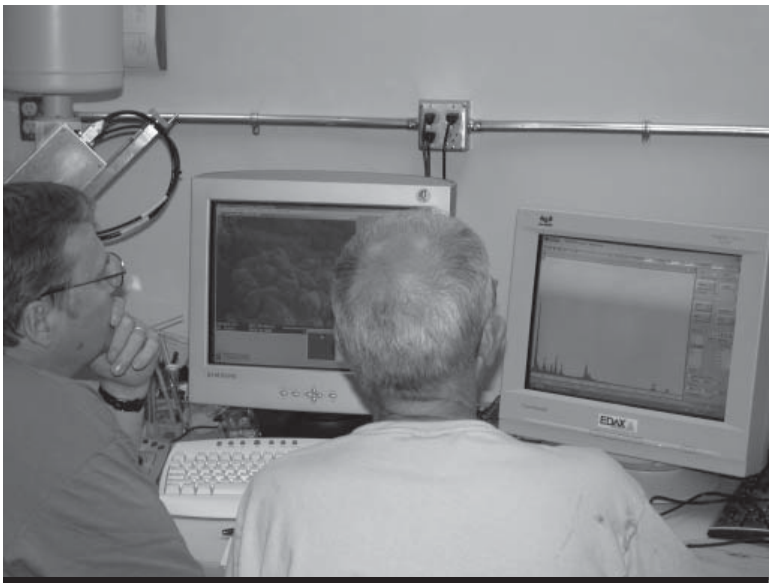
A few isolated reports of skarn-type mineralization associated with epithermal gold deposits have been documented in some of the small Western Cascade mining districts. Small amounts of garnet and epidote with hematite and magnetite, usually micros, are present in some of the districts and are sometimes mapped as hornfels.

A few skarns are in SW Oregon, particularly in the Ashland area and are associated with small mines and prospects; unfortunately, the majority of these are on private property. Reported skarns include the Bratcher Property near Ashland, and Foots Creek Tungsten Property near Gold Hill. One skarn is reportedly located in a roadcut of Interstate 5 between Ashland and Siskiyou Pass (Freeway Tungsten Prospect).

Many skarns are located in NE Oregon, with the majority located along the contact of the Wallowa Batholith and Martin Bridge Limestone. Unfortunately, most of these are currently located within the Eagle Cap Wilderness, though some are located on the periphery outside the boundaries. Skarns are documented east of Wallowa Lake, and in the Hurricane Creek and Lostine River canyons. Skarns in the southeast-central area of the Wallowas include the Frazer Mine which includes some patented ground near Eagle Cap, and several occurrences in the unnamed creek canyons and ridge tops south of, and near the headwaters of the Imnaha River. Almost all of the documented skarns in the Wallowas are associated with mines and prospects for copper, tungsten, molybdenum, and gold, and virtually all require hiking anywhere from 2 to 15 miles one-way to reach. Several skarns have also been documented in the southeast area of the Wallowas on the ridge between Fish Lake and Clear Creek. These are located along the boundary of the granodiorite of the Clear Creek Stock and decent specimens of epidote and andradite-grossularite garnet have been reported.

Many precious metal deposits in NE Oregon are associated with granodiorite intrusions of varying sizes and isolated skarn occurrences can be found in many of the mining districts. Some of these include garnet and wolframite from a prospect on Pedro Mtn., a small skarn a couple miles west of the Conner Creek Mine in the Conner Creek District, the Myrtle Mine in the Susanville District, the Frisco Tungsten and Broken Pick Prospects in the Mormon Basin District, possibly the Lazy Jim Mine in the Sumpter area, and an endoskarn currently being worked in the vicinity of the Record Mine southeast of Unity.

As demonstrated by the various occurrences listed here, much work still needs to be done to document what minerals occur in Oregon and where some of the good specimen-producing localities are. Very little has been documented and most of the references are included in old USGS and DOGAMI Bulletins, assorted publications, and geologists' theses. Based on research that I've conducted so far, I anticipate a lot of hiking in NE Oregon over the next few years. ■



Wes Gannaway and George Mustoe working on the SEM at the July meeting in Bellingham, Washington.

Symposium Quickly Approaching (continued)

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Items that Rocks & Minerals will feature include:

- Rocks & Minerals including various PNW-focused back issues including a few copies of the Washington issues
- Mineralogical Almanac
- Books including "Grandmasters of Mineral Photography" and "Geology of Gems" edited by PNWFM's own Art Soregoli
- Show special of free issue with each new or renewal subscription plus 20% discount for each multi-year subscription

A great opportunity to expand the library of any mineral collector! ■

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The Skarns of Idaho

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VULCAN MINE: An old gold mine northeast of Lakeview on the east side of Lake Pend Oreille in northern Idaho is partially in a skarn. The main mine working is in the adjoining diorite intrusive, but on the upper road, a large skarn is exposed in roadcuts. Two small prospects are exposed in the cuts.

The skarn is dominantly diopside and garnet. Locally it is vuggy with small crystals of diopside and orange-brown garnets. Crystals are mostly under 1/4 inch for both. In some areas, tiny crystals of colorless to orangish scheelite occurs on the diopside and garnet. The scheelite crystals are crude octahedrons. A little pyrite is also present as crumbly masses or tiny crystals.

DEEP CREEK, WARREN WAGON ROAD: Several miles north of McCall on the road to Warren along the west side of Payette Lake the road was cut through a small skarn at Deep Creek. Epidote was reported in crystals to over an inch in the fresh cut, but only traces are visible now. There are tiny crystals of spinel octahedrons of green and purple colors. Tiny books of an orange micaceous mineral are also present.

In the area, there are other reported occurrences with epidote, but these are not well documented. To the west, in the granite lake area, small zones in the metamorphic rock (gneiss and migmatite textures) contain reddish brown garnets and massive epidote, but not in skarns. ■

The Skarns of Washington State

by Bart Cannon

Skarn is an antique Swedish mining term which roughly equates to garbage rock. It often means the opposite to mineral collectors and Washington State hosts a half dozen skarn deposits which contain treasure rather than "garbage".

Geologically, skarns are contact metamorphic deposits in which heat, pressure and hydrothermal solutions associated with nearby younger intrusive rocks convert reactive older carbonate rocks into skarn rocks containing quartz and calcium silicates such as garnet, diopside, and epidote.

Skarns show two types of mineralization. The primary mineralization consists of calcium silicates such as grossular or andradite garnet, epidote, diopside, augite, axinite and titanite. Many skarns also show a late stage or retrograde mineralization suite associated with hydrothermal fluids derived from the late stages of the interaction between the magma and the carbonate rock body.

Complex bedrock geology is a required environment for the skarn mineral association to occur. Washington state hosts hundreds of square miles of such geology in North central and North eastern Washington in King, Snohomish, Skagit, Whatcom, Okanogan, Chelan, Kittitas, Ferry, Stevens, Pend Oreille, and Lincoln counties.

King County

DENNY CANYON: The Denny Canyon skarn area is 45 miles East of Seattle near Snoqualmie Pass in King County. It is home to the State's most celebrated skarn deposit. This area contains mediocre specimens of grossular, epidote and altered diopside, but of most interest are the specimens from solution cavities created during the retrograde phase of the skarn. Large crystal plates of whitish quartz stems exhibiting colored scepter heads up to 5 inches in length represent some of the World's most desirable mineral specimens. The coloration of the scepter heads is of two types. Both are beautiful. One type consists of a typical amethyst hue of medium intensity. These are known locally as "raspberries". The other scepter type is more unusual and shows a pinkish hue due to thin reddish plates of diffusely included hematite. An additional appeal is furnished from clouds of micro acicular lepidocrocite inclusions which lend the scepters a sparkling metal-flake appearance. Locals refer to this scepter type as "strawberries".

The scepter zone is very localized within the skarn, but more pervasive and numerous are the solution cavities containing milky quartz crystals which sometimes exceed 12 inches in length. The simple prisms are often arranged in artful clusters, but are generally not much sought for except when adorned with japan law twins. One remarkable example collected in the 1950s contains a milky twin which measures 16 inches across.

BESSEMER CLAIM: Closer to Seattle, but also in King County is the Bessemer skarn zone near the North summit of Green Mountain. The primary skarn contains brown red andradite with little else. The retrograde skarn is of two types. The first type has dull milky quartz lined pockets of up to one foot in diameter. Rare japan law twins of up to 2 inches occur. Some pockets contain one inch dark brown andradite traphezohedrons and dark brown ferroaxinite crystals up to 1.5 inches in length. Rare corroded danburite crystals up 3/8 inch are sometimes found.

The most notable skarn mineralization is related to a very late stage retrograde event in which sugary quartz and mica-like plates of hematite have completely replaced the primary skarn leaving pockets up to 6 feet in length. The quartz in these pockets has faithfully replaced spectacular crystals of an unknown mineral which may have once been epidote or possibly scapolite. No trace of the original mineral remains. Some of the pseudomorph clusters show sharp columnar crystal forms of up to a foot in length which bristle with tiny euhedral quartz crystals. The spiny clusters are reminiscent of a well developed saguaro cactus.

OTHER SKARNS IN KING COUNTY: King County hosts other interesting, but un-remarkable skarns near Chair Peak, Guye Peak, Maloney Mountain, and Denny Falls. The Guye Peak location has well formed dodecahedral magnetites of up to one inch in diameter.

Snohomish County

VESPER PEAK: The Vesper Peak skarn is exposed 800 feet below the summit of Vesper Peak, about 30 miles East of Everett. Here, a small limestone lens within Jurassic ribbon cherts has been converted to a grossular, hedenbergite skarn. The deep orange to orange brown grossular crystals are sharp and lustrous and form continuous crystal druses, but also form very aesthetic displays consisting of isolated grossular crystals studding prismatic hedenbergite crystals which resemble the equally famous Eden Mills, Vermont specimens of the same type. The grossular crystals at Vesper range in size from 0.3 inch in diameter to over 0.7 inch in diameter and often show well developed "cube" faces.

Associated with the grossular in the primary skarn are well formed honey colored titanite crystals to over an inch in length, and grayish green apatite crystals which reach two inches in length. Very coarse cleavage blocks of wollastonite group min-

erals occur along the margins of the skarn where it contacts the enclosing ribbon cherts.

Some of the hedenbergite forms attractive specimens in their own right. The best show color zonation in which light green translucent caps terminate the dark green 0.5 to 1.0 inch prisms.

Vesper also has a retrograde quartz zone. Quartz crystals up to 6 inches in length and partially coated with orange to green grossular are highly prized specimens. One tubular shaped 10 foot long pocket hosted nodular aggregates of coca-cola colored grossular crystals with individual crystals to over an inch in diameter. These crystals often showed cube faces of nearly a half an inch across.

THE TEENAGE CRUSH: This was a 10 foot in diameter limestone pod hosted in the same ribbon cherts as the main Vesper skarn which is located about a quarter of a mile to the northwest.

Mineralization here consisted of bright orange grossular, brownish gray axinite, slender quartz quartz crystals and granular emerald green diopside. A dozen fine specimens of erect axinite crystals on druses of grossular were collected by the author in 1982. The axinite crystals reached two inches in length. The smaller crystals were completely transparent and very pleasing in appearance.

BONANZA QUEEN: A quarter of a mile northeast of the Bonanza Queen Mine near Silverton, is a commercial gold-copper skarn. A quarter of a mile North of the mine's skarn zone is another skarn in which small, but lustrous brownish orange grossular crystals are scattered on medium yellow green diopside crystals. This is a difficult area to collect and the rewards are not likely to be great.

Okanogan County

BUCKHORN MOUNTAIN: The Crown Jewel Gold Deposit on Buckhorn Mountain, about 25 miles East of Oroville is the most economically important skarn deposit in the state. There is little display specimen potential here, but a number of rare species occur as fine grained inclusions in the grossular-diopside skarn. Native gold, cobaltite, erythrite, hedleyite, joseite group tellurides and bismuth have been identified using electron microprobe analysis.

The mine is not in production at this time and specimens of the rare species are difficult to find in the field. Once the mine is in operation sometime in the next few years, high grade samples may become available.

DUTCH JOHN MINE: This area near the town of Carlton at the South end of the Methow Valley has been prospected for tungsten since the 1940s. Scheelite occurs as disseminations in a grossular-andradite skarn. The reddish brown grossular crystals are usually porous and corroded, but the olive colored andradite crystals which reach 0.6 inches in diameter are often sharp and make fair specimens. Some areas of retrograde skarn occur which host large, but poorly formed milky quartz crystals, scheelite, and micaceous hematite.

CHIEF JO MINE: The Chief Jo has been prospected for scheelite-bearing tungsten ores. A black light examination of the numerous open cuts in the area near Goose Lake, East of Brewster will reveal rather rich specimens of scheelite in grossular. Dissolving the calcite filling between the grossular crystals exposes many well formed micro crystals of titanite as well as small scheelite crystals.

FOUR METALS MINE: Lustrous dark red brown crystals of grossular and dark green epidote crystals of fair quality occur on the dumps of these copper and gold prospects a few miles West of Nighthawk.

Ferry County

KELLY CAMP: The Kelly Camp is another tungsten bearing skarn which is located about 15 miles North of Republic. Coarse cleavable masses of dark green hedenbergite and titanite contain anhedral segregations of scheelite up to 1.5 inches in diameter. Microscopic inclusions of bismuth and bismuth tellurides such as tellurobismuthite are associated.

Stevens County

READ IRON MINE: The Read Iron Mine is located near Hunters in Southwest Stevens County. Here, magnetite and minor scheelite are associated with black fibrous masses of ludwigite and light green crystal spherules of brucite which occur thickly scattered in dolomite. The brucite spherules average about 0.25 inches in diameter.

CALISPELL PEAK: About a mile West of the summit of Calispell Peak, 20 miles Northeast of Chewelah, is an interesting skarn which is exposed near a uranium and beryllium-bearing pegmatite prospect.

Lustrous grossular crystals over an inch in diameter occur with olive-colored vesuvianite crystals. The vesuviante crystals are sharp, lustrous, and up to an inch in length, but are seldom terminated. ■

2005 DUES

For those of you who are unable to attend the Symposium but need to pay dues, here's another opportunity. The Pacific NW Chapter's fiscal year runs from July 1 through June 30. Dues are $15 annually, of which $5 goes to the National FM. Those members who paid for 2004 by July 1, 2004, will be current with both the Chapter and the National FM through December 31 this year (and will probably receive the first newsletter next year). Dues for 2005 are payable anytime between July 1, 2004 and June 30, 2005. For last year, we ended up with 85 members.

To insure we have current information with which to contact you please return the form to the right if any of your contact information has changed.

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