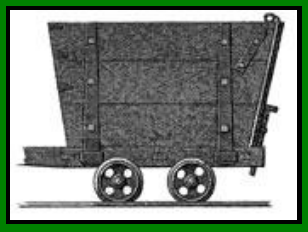
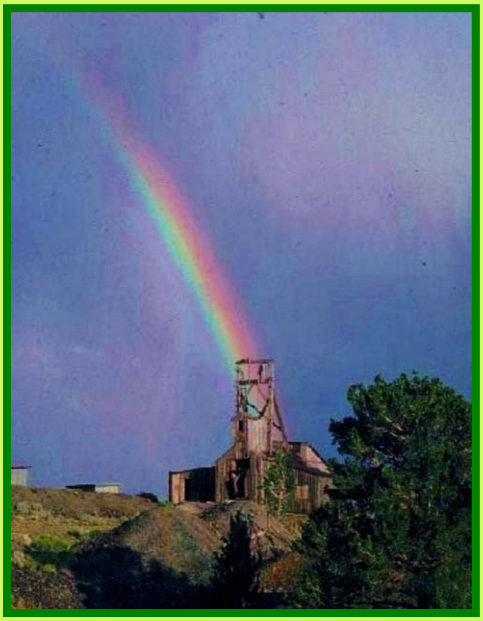
Gem Hunter – The Prospector's Newsletter



Vol 2, No 8, August 2010 *Newsletter from the GemHunter*

GOLD FEVER

Spring arrives: prospectors comb the hills in search of the yellow metal - GOLD! Many look and find nothing; others find traces of gold, a few find nuggets, others accidentally find hidden treasure: ruby, sapphire, benitoite, garnet, diamond. Then the plaque hits - an awful incurable disease: *'gold fever'*. It affects many – the inflicted surrender everything including common sense. In local pubs, con-men search out the inflicted to provide opportunities to invest in mines that are too good to be true. It is like Congress and taxes – the more you give, the more they take, and the more they lie. Mark Twain wrote, '*a gold mine is a hole in the grown with a liar standing over it,*' in reference to this infliction.



My favorite con-grandma was an elderly lady from Atlantic City. I always enjoyed seeing Nancy (RIP) (I changed her name to protect anyone who might be innocent), but then again, I never caught gold fever so I was immune to her scams. Soaking wet, she weighed 98 pounds – a tiny, bent over elderly lady who seemed totally harmless, yet she could drink anyone under the table – an important attribute for someone in her line of work. As told by my good friend Steve Gyorvary, she kept contracts in the trunk of her car along with bottles of fool's gold to sell to the gullible. In any gold district, gullible wanabe prospectors are found by the dozens and con-men are there to help them part with their money.

Steve and his family purchased the Mary Ellen gold mine years ago – this is how I met him. I was mapping the South Pass greenstone belt and all of the historical mines I could get access to. Steve's Mary Ellen was developed by an incline shaft with levels that followed a vein in a tonalite stock (tonalite is similar to quartz diorite and granite). Steve and I mapped the Mary Ellen mine, where, as sad as it sounds, I lost my assistant.

Some of you may be aware that I don't like the Federal abandoned mine reclamation program (AML) and feel the money should be used for something else (like a tax break).

While I'm dreaming, I also feel Congress should cut BLM's budget by 80% and the USFS budget by 100% and require all political debates to include lie detectors attached to the political contestants and hope they don't overheat.

I object to AML program because of the lack of common sense and cost. $billions have been spent on this program that is filled with questionable projects that reclaim old mines and prospect pits. In the 19th century and early 20th century, the Feds actually encouraged miners to mine and not to reclaim prospects. For decades the Feds required them to dig holes to legally hold a mining claim. Now they want to reclaim everything. There are a few cases where reclamation is needed. Take for instance a superfund site in Carthage Tennessee. This was kept so well under cover that I never heard anything about it until a friend (and relative of Al Gore) mentioned it to me years ago. It seems that one of the nation's top superfund sites was a zinc-lead mill and smelter located at Carthage that disseminated toxic metals into the environment and was left for taxpayers to clean up, while some of the elite collected royalty checks.

Over the years, I saw $millions in tax dollars wasted on AML projects. How much money is involved? Wyoming alone has around $600 million in an account in Washington earmarked for this program. In one example, I saw a few $million handed over to a land owner to reclaim personal property that was then subdivided for cabin sites. Another spent a $million to buy a K-mart plastic kiddy pool and bucket of manure to act as an ion exchange plant to extract minor amounts of copper from an old mine next to a stream that had significant amounts of copper since the beginning of time. Now, the AML program is rebuilding the historic mine buildings at Carissa mine on state property and similar construction is taking place at the old Duncan headframe and mill, which use to be private land. Did the state buy another mine?

Carissa mine under construction.

Yes, I support reconstruction of old mines and related buildings and would like to apply to Wyoming for a few $tens of millions to reconstruct the Tabor Mansion and build it in Arizona, or maybe at Vail. I may not have much of a chance even though this would be a worthy project – I would even volunteer to live in the mansion.

When I worked for the Geological Survey, I reviewed USFS, USBLM and State AML projects. It puzzled me how mines that were previously reclaimed by AML could be reclaimed again and again. And the majority of the reclamation seemed to focus on shallow prospect pits. The only good use for this money

(earmarked for mine reclamation) was several $million that went to build the University of Wyoming Geology Building that had absolutely nothing to do with mine reclamation.

So why reclaim old mines? As far as I'm aware, no one ever fell down a mine shaft in Wyoming. So why so much money to bury potential resources? Just in case someone thinks about falling down a shaft, Wyoming is way ahead of them by earmarking $600 million to bury every mine shaft, horizontal adit and every prospect pit.

Back to the Mary Ellen mine. I lost my assistant in that mine; but not the way you think. The Mary Ellen shaft is 240 feet deep with 5 levels. The mine was dug on a quartz vein 3 feet wide that narrows to 6 inches in places. In some stopes and drifts, miners only removed as much rock as necessary, characteristic of 19th century hardrock gold mines.

Thus Steve, my assistant, and I crawled through these narrow tunnels. And some were narrow. At the end of the day, we climbed the ladder from the bottom of the shaft. My assistant was the last to come up the ladder. Near the top of the ladder, he froze. He and I had mapped other mines with no problem. But now, he was sweating profusely and would not budge – he developed a serious case of claustrophobia. No matter how much I tried, I couldn't convince him to move. I didn't know what to do as I couldn't carry him. Finally, I said we were leaving and would be back to pick him up after dinner and beer. This gave him the impetus to climb the last several feet of the ladder. I never thought much about him freezing on the ladder until he changed professions from geology to electrical engineering, and I lost the best assistant I ever had to engineering.

Steve's dad decided to visit the Mary Ellen. Unlike the slovenly of the 60s and 70s, his father dressed to travel – wearing a suit to fly from St. Louis to Wyoming to visit his son and the family mine. Upon arriving in Atlantic City, he stopped in the Mercantile, a local pub where everyone sooner or later ended up in this tiny town of 47 people and 30 dogs. Sitting at the bar, Nancy's eyes lit up – one could read her mind – *'a rich sucker just walked through the door - a man wearing a suit in a gold district with no paved roads had to be rich'*. She latched onto him, bought him a drink and found out he did indeed have an interest in gold! *"I have a mine I can sell you at a very low price"*, she announced, *"all you have to do is sign here, and you will be the proud owner of the Mary Ellen mine"*. Steve's Dad's response to Nancy, "*Why I believe I already own that mine*".

I heard that Nancy periodically sold the same mine or claim 2 or 3 times a year. She met one wanabe prospector who couldn't believe his luck. A bottle full of gold. *"No, I don't want to sell it, I plan to keep this gold"*, she told him. But after many drinks, he was light-headed and Nancy looked as if she would slide under the table. He continued to press her and she finally capitulated and sold the gold for 85% of spot price. Later, proudly displaying his gold in the Mercantile until one knowledgeable prospector pointed out the bottle seemed awful light for gold, and the gold rolled around suspended in the water when agitated. "*It looks like mica!*"

The Atlantic City volunteer fire department later responded to an alarm. Nancy's Cadillac was on fire – someone had poured gas on the car and set it on fire.

PROSPECTING FOR GOLD

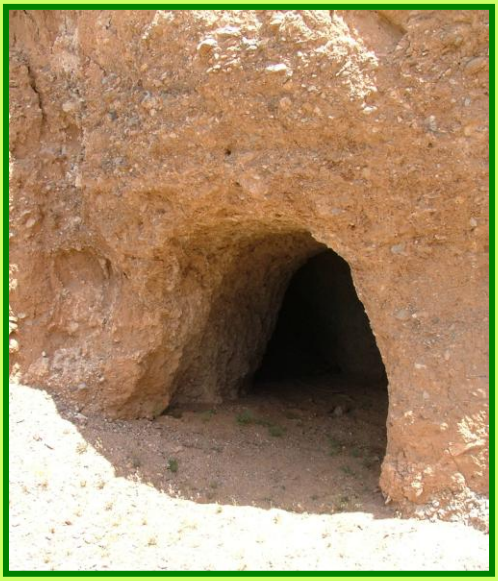
Last year, I wrote about the different types of gold: on a recent field trip, I had several questions about gold, how to recognize gold, and where to find it. So I decided to expand on that newsletter to answer some questions that came up at South Pass.

Geologists recognize many types of gold deposits: hydrothermal, mesothermal, epithermal, replacement, structural, etc., but prospectors focus on two: (1) placer and (2) lode. Famous placers include Nome and Flat, Alaska and Alder Gulch, Montana. At Nome, one can still pan gold out of beach sands. Lode deposits are found in outcrop, such as the classical gold veins. Famous lodes include the Mother Lode, California and the great Homestake in South Dakota.

Eluvial Gold

Unfortunately, a clear distinction between lode and placer cannot always be made. The great Witwatersrand (Rand) gold deposits of South Africa (the most productive in the world) are classified geologically as paleoplacers. Because they occur in brittle, consolidated rock (mined to depths >13,000 feet), most prospectors would consider these as lodes (and so would the 1872 mining law). However, geologists classify Rand deposits as fossil (paleo) placers, since the gold was deposited in streams and rivers more than 2.5 billion years ago.

Right- adit (mine entrance) dug in alluvium and eluvium at the



Vulture mine, Arizona. This material apparently was rich enough to mine by tunnel. Left- a nearby adit dug on intersecting veins: note the eluvial material sitting over the vein on the upper left side of the adit.

Another not so clear distinction arises with *eluvial deposits*. Eluvial deposits are composed of detrital material weathered in place from an underlying source. Gold from an eluvial deposit would show little or no evidence of transport.

In an article published in the July 2010 issue of *Lost Treasure Magazine*, *a* prospector reported finding a large nugget on the top of a hill with his metal detector, but he thought it was odd for a nugget to occur on the hill top. Actually, it's not odd: it is likely that the nugget was found in eluvium eroded from an underlying auriferous vein. Personally, I would have rented a backhoe after finding such a nugget.

When we speak of *eluvium*, we speak of detrital material eroded in place above a vein or outcrop that has not moved downhill. The lithic fragments in eluvium are usually rough and angular; whereas *alluvium* has detrital material that moved downslope whether in an alluvial fan, landslide, or stream and many lithic fragments are rounded due to transport downslope.

Since eluvial deposits are unconsolidated, some prospectors would consider them as placers, even though they may directly overlie a lode. There are many examples of eluvial gold in Arizona where the arid environment is favorable for formation of such deposits due to lack of active streams. There are so many reported eluvial gold deposits in Arizona that one could make a living searching for the source of the eluvial deposits. I'm sure that some of the readers are wondering why no one has done this. Probably has been tried in a few places, but I suspect the majority have remained unexplored at depth, just like the Rattlesnake Hills in Wyoming remained untouched until very recently. But now it appears Evolving Gold has identified a major gold deposit at a location where no one bothered to look at for decades. Just because a prospect is obvious doesn't mean that it has been explored.

Placer Gold

Placers consist of detrital gold and other valuable minerals transported in streams or by wave action where such valuable minerals are concentrated with other heavy minerals known as black sands. These black sands consist of mostly of dark opaque minerals with greater than average specific gravity and may include magnetite, pyroxene, amphibole, ilmenite, garnet, sphene, chromite and monazite, as well as some rare light-colored minerals with relatively high specific gravity such as cassiterite, scheelite and even diamond.

If you ever panned near Wilson Bar or Wilson Gulch at South Pass, you may have found some heavy, nagging, white material that you thought was quartz but was nearly impossible to pan out. It probably wasn't quartz. Using a shortwave ultraviolet light, this heavy quartz may fluoresce blue-white. If it does, it is not quartz, but instead scheelite, a tungsten ore found in with gold at the Burr and Hidden Hand mines.

Other minerals of potential economic interest with moderate specific gravity are sometimes found in gold placers or just when panning. While prospecting for diamonds in the Laramie

Mountains, southeastern Wyoming, several panned samples yielded trace ruby and sapphire. These were eroded from nearby, undiscovered, corundum (sapphire, ruby) mica schists and gneisses. How do you tell if you have ruby or sapphire in your pan? Look at crystal habit (common form of the crystal). The common habit for ruby and sapphire is that of hexagonal crystals bounded by pinacoids (flat surfaces) that have distinctive crystal cleavage and parting.

While prospecting for diamonds in the Sierra Nevada of California, sapphires and benitoite were recovered near Poker Flat. Prospectors searching for gold at DeCource, Alaska, discovered native mercury in the stream. The mercury was traced to outcrops coated with cinnabar (mercury-sulfide) that had fractures filled with natural native mercury. In Wyoming, a prospector (Paul Boden) found a couple of excellent gem-quality octahedral diamonds while searching for gold on Cortez Creek in the Medicine Bow Mountains. In Colorado, another prospector (Frank Yaussi) found dozens of diamonds in Rabbit Creek while searching for gold. In this same stream, members of DiamonEx Ltd recovered hundreds of gem-quality spessartine and pyrope garnets and gem-quality chrome diopside and enstatite.

During erosion of bedrock, heavy minerals mix with light-colored, glassy, transparent to opaque minerals with low to average specific gravity such as quartz, apatite, feldspar and mica. All of these minerals are slowly moved in streams through time. The sediment carrying capacity of streams diminishes with decreased velocity, thus allowing heavy minerals to first settle. Heavy minerals tend to concentrate at the bottom of a stream, along the leading edge of stream meanders, behind obstructions, at waterfalls, and with larger cobbles and boulders carried by periodic flash floods. Since many streams lack sufficient velocity to carry gold for great distances, much gold in these streams (particularly where it is concentrated in pay streaks) is probably transported during flash flooding events or during heavy spring runoff and found with the black sands.

The distances heavy minerals are transported is not known with accuracy. Some minerals can be transported great distances; for instance, diamond is 6000 to 8000 times harder than any other mineral and is not very heavy (specific gravity of 3.52 compared to 2.87 for quartz) although it will pan out with black sands. There are cases where transport distances for diamonds have exceeded 600 miles. In southern Africa, diamonds are found in kimberlite pipes in the Kimberley region of South Africa along the Orange River. They are also found downstream from Kimberley all the way to the West Coast where extremely rich beach diamond placers are found along the coast of the continent more than 600 miles west of Kimberley.

Such great transportation distances for gold are not possible. Gold is too heavy (specific gravity of 15 to 19.3) and too malleable. So when found in streams gold is thought to have been derived from a nearby source. In some unusual cases, gold may be transported greater than normal distances in solution. In Alaska, geologist Paul Graff showed evidence of gold crystallizing in nuggets downstream but relatively near some lode sources. Maximum transportation distances for gold in solution is unknown, but could be relatively great.

The color change (upper arrows) more than 1 foot above the gold pan (circled) mark the site of a pay streak in Smith Gulch explored by prospectors Hank Hudspeth and Buddy Presgrove. This streak was produced during a flash flooding event. A second pay streak was found at the base of the open cut near the standing water (lower arrow). Even though this placer was located in a dry drainage when mined, it was immediately downslope from several lode deposits that provided a favorable site for gold concentration. The prospectors later encountered a third paystreak on bedrock.

Flash flooding events appear to be important in forming pay streaks. Pay streaks, or lenses of gold-enriched gravel, are often found in zones of coarser-grained pebbles and cobbles. The pay streaks may be scattered over one or more intervals in a vertical column of gravel.

Schematic showing development of a stream meander. Where the stream begins to meander, water velocity decreases & minerals with higher specific gravity (stippled areas) fall out first with lighter minerals being carried further downstream. Through time, meanders mature, leaving gold on the inside banks as the stream migrates. Material in the stream as well as the adjacent bank (which may be high and dry after episodes of flooding and high water) will contain heavy minerals & possibly gold and diamond.

Where meanders form in streams, gold may concentrate on the inside of the initial curve in the channel. Through time, the stream will leave the adjacent inner banks (point bar) high and dry. One of my favorite places to take field trips for prospecting courses was near the Bobbie Thompson campground in the Douglas Creek placer district. Here gravel in the bank lies adjacent to the active stream and has enough gold to keep the interest of students.

In addition to modern placers, some regions have paleoplacers – particularly Wyoming and Arizona. The Witwatersrand (Rand) of South Africa is famous for paleoplacers. In the Rand paleoplacers are so important that they have produced nearly 50% of all of the gold mined in human history. In Wyoming, paleoplacers remain mostly unexplored with only minor portions explored, even though it is a safe bet that economic gold deposits occur in some of these. Paleoplacers are simply fossil placers that were deposited by streams and rivers in the geological past. In most cases, these may not lie anywhere near active streams today; thus, mining would either require transporting water to the paleoplacer, or transporting material from the paleoplacer to water.

Exploring a dry paleoplacer at Dickie Springs at the south edge of South Pass. Note the rounded boulders typically found in active streams, rivers and alluvial fans.

Where a paleoplacer consists of relatively unconsolidated gravel, it can be mined in a manner similar to a sand and gravel operation. If the operation is located near a road, the sand and gravel by-product can be used in road construction. Conversely, gold can be extracted as a by-product of sand and gravel operations: gold was found in several sand and gravel operations and placers adjacent to Interstate 80 in southern Wyoming and was even panned from an old channel in the Laramie landfill. During reconnaissance, a 19th century hydraulic gold mine was also found adjacent to Interstate 80 just 1 mile west of the Arlington turnoff that is actually visible from the Interstate.

In the South Pass greenstone belt, giant paleoplacers surround the belt and are located at McGraw Flats to the north and at Oregon Buttes-Dickie Springs to the south. Smaller paleoplacers are found in between. In fact, one gold-bearing paleoplacer lies within a couple of miles east of Atlantic City and remains unmined and untested.

The Oregon Buttes paleoplacer was reported by the US Geological Survey to contain more than 28.5 million ounces of gold (that's $34 billion!), yet most of that area remains unexplored. Along the northern flank of the Seminoe Mountains greenstone belt, the Miracle Mile paleoplacer is unexplored even though gold was found in the dry paleoplacer nearly everywhere that it was sampled. This paleoplacer was discovered by Charlie and Donna Kortes. In addition to gold, the paleoplacer also has dozens of G10 pyrope garnets that indicate somewhere in the region is a very rich diamond deposit(s). Paleoplacers in the Medicine Bow and Sierra Madre Mountains in southern Wyoming are much older, but also yielded some gold and diamonds. These also have anomalous uranium and thorium.

Lode Deposits

When we think of lodes, we think of veins. But any valuable ore in consolidated rock is

considered a lode, whether in a vein, fault, shear zone or disseminated sulfides or massive sulfides in replaced rock. Veins often form linear to tabular masses of quartz in country rock. One important characteristic of many productive veins is the presence of sulfides, such as pyrite (fool's gold), arsenopyrite (arsenic-pyrite), chalcopyrite (copper-iron-sulfide) or other mineral sulfides.

Left - The auriferous quartz vein (lode) at the Mary Ellen mine, South Pass was offset along a reverse fault. Right - Massive sulfide vein from the Pickwick mine, Kirwin district. This vein, like the Mary Ellen, has gold and silver, but unlike the Mary Ellen vein, it has no appreciable quartz, just massive sulfides.

Pyrite, better known as *fool's gold*, is simply iron sulfide that has common crystal habits which include massive, cubes and pyritohedrons. Many people mistaken pyrite for gold, yet it is nothing like gold. Pyrite is brass colored (instead of warm yellow) and nearly 4 times lighter than gold. It is brittle (gold is malleable) and if you suspect pyrite, you can streak a white tile (streak plate) with the mineral or just crush it.

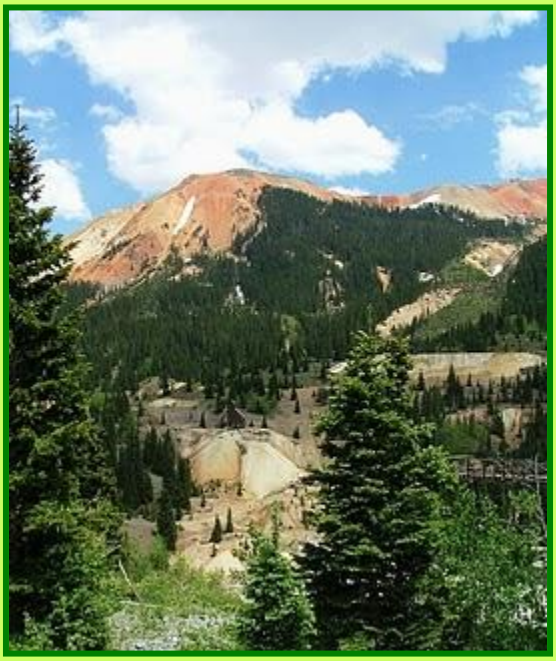
Pyrite (far left) showing several crystals with cubic habit next to a photo of gold (with penny). Right - streaking a mineral on a tile.

If gold, it will flatten if you try to crush it. It will leave a gold colored streak on the streak plate. If pyrite, it will crush to a greenish black powder or leave a greenish black color on a streak plate. But don't throw that pyrite away yet.

Some pyrite can hide gold in its crystal lattice. In fact, some pyrite may have as much as 2000 ppm gold (~60 ounces/ton) hidden within the pyrite that can be detected by assay. In the 19th century, it was also common for prospectors to crush pyrite to a very fine powder

and pan it for gold. If rich in gold, some of the yellow metal would appear in the gold pan after crushing and panning.

When pyrite oxidizes, it produces sulfuric acid and rust resulting in a gossan at the surface with possible supergene enrichment several feet below the surface. If massive sulfide, you may even smell some hydrogen sulfide (rotten egg gas) or sulfur as the pyrite oxidizes to hematite, limonite and goethite to produce a gossan.



Gossans are the oxidized sulfide-rich parts of veins and other mineral deposits that simply look rusty and provide a wide range of rusty colors including yellow, tawny, brown and red. These rusty rocks offer excellent visual guides for gold and metal sulfide deposits. In any historic metal mining district, you will often find dozens, if not hundreds, of old prospect pits dug in rusty rocks. Prospectors learned to recognize gossans as guides to ore.

Gossan at Red Mountain in the San Juan Mountains, southern Colorado. Note the red to light yellow-colored rock found everywhere in the photo.

Gossans are good places to search for high-grade gold in lodes (as well as placers downstream from the gossans). Gossans produced from the leaching of pyrite are typically very rusty (reddish-brown) in appearance; gossans produced from arsenopyrite typically yield a greenish-yellow arsenic-bearing limonite known as scorodite. Arsenopyrite (arsenic-iron-sulfide) is also often found in close association with gold and will yield a black streak and crush to a black powder. It has a distinctive silver metallic color, may be massive or occur as tiny, prismatic mineral grains with striations. Most notable is the odor when the mineral is struck by a hammer. It will smell like garlic (the odor of arsenic). Just like pyrite, arsenopyrite can also hide gold within its crystal lattice – as much as 1,000 ppm (parts per million) or about 31 ounces per ton!

Large gossans that cover several acres may be situated over giant sulfide-enriched veins or massive sulfide deposits. These often contain gold and silver and/or valuable base metals (copper, zinc, lead, etc). One large gossan in the Hartville uplift near the town or Hartville in eastern Wyoming is so distinct that it is named *"Gossan Hill"*—and overlies a massive sulfide deposit with some gold.

One of the better places to look for specimen-grade gold samples is within gossans containing boxworks. A boxwork is a distinct vuggy and rusty rock produced from the weathering of sulfide minerals.

Previous page - specimen of arsenopyrite. Left - boxworks with pore spaces where sulfide minerals once occurred. The sulfide minerals were leached out. Gold, which often is found in pyrite, is inert, and may remain in place within the pore spaces, while some of the iron from pyrite stains the rock. At Bradley Peak in the Seminoe Mountains, I found nearly a dozen boxwork samples with visible gold and started a gold rush in 1981. Even so, this area remains essentially unexplored to this day!

Some faults and associated breccias may also be mineralized. Breccias are zones of broken rock with distinct angular rock clasts. When found, gold may occur in the matrix of the strongly limonite-stained gossan surrounding rock fragments. Other faults, known as shears, may also be mineralized. Shear zones consist of granulated rock with a distinct foliation.

Within many shears, gold is often found associated with rusty-stained quartz. Many shear zones, particularly those in greenstone belts, have been quite productive for gold. In some gold mining districts in the world, nearly every foot of the exposed shear zone has been prospected at the surface.

Gold bearing breccia from the Lake Marie area of the Snowy Range Wyoming (left), and malachite-quartz-breccia from a breccia pipe in Arizona (above right). Many giant porphyry copper deposits have numerous breccia pipes overlying the main mineralized ore body.

Ore Shoots

Many veins have minor gold values along much of their length with localized ore shoots enriched in gold. Some shoots may be enriched 100 to 1000 times the average value of the vein. The challenge for the prospector is to recognize these shoots.

Fold in amphibolite at South Pass (left). Note the open fractures at the fold nose. If mineralizing fluids accompanied folding, quartz and gold would have filled these spaces to produce an ore shoot. Far left, quartz rehealed many of the fractures at the Carissa mine.

Ore shoots can be structurally and/or chemically controlled. Where pressures and/or temperatures dramatically drop during mineralizing events, structurally controlled ore shoots occur. Chemically controlled ore shoots may occur where there was a chemical reaction between mineralizing fluids and country rocks. When searching for structurally controlled ore shoots, look for places where you would expect fluid pressure to have decreased along vein systems prior to the vein solidifying. Some structurally controlled ore shoots are found in folds, vein intersections and faults.

In Wyoming as well as in many greenstone belts worldwide, the principal lodes are located in shear zones – basically fault zones that exhibit ductile deformation such as foliation and folding. In many greenstone belts, such shear zones formed at the same time as regional metamorphism. The regional metamorphism provided hot fluids under pressure that leached gold out of the country rock and deposited the gold closely spaced fractures in shear zones.

Shear zone at the Carissa mine, South Pass, a potentially major gold deposit nationalized by the State of Wyoming. Based on drilling and geological models, this deposit likely hosts >1 ounces of gold from the surface to a few thousand feet deep. The mine was incorporated into the South Pass City state park following withdrawal of private land.

Shear zones typically have low-grade gold along much of their extent with periodic ore shoots that continue downward at depth for a few hundred to several thousand feet. At South Pass, more than 50,000 feet of shear zones were mapped by the author, yet less than 10% of the structures have been prospected suggesting that several rich ore shoots likely were overlooked.

Payne's Find gold mine in the Murchison greenstone belt, Australia showing every inch of the shear zone at the surface was prospected, unlike South Pass.

Identification of Gold

Most people have a difficult time identifying gold at first. Remember, gold is very heavy! So when you pan for gold, it will not float or suspend and roll around in water like mica. Mica is more often mistaken for gold than fool's gold. Gold is malleable (it will easily scratch with a pocket knife), and has a distinct gold color that does not tarnish. Most people mistaken mica, pyrite (fool's gold), or chalcopyrite (copper-fool's gold) for gold. Pyrite and chalcopyrite are brittle and will crush to a fine dark powder.

Right - Large specimen of mica (muscovite) with a mirror-like surface, bronze-color, and breaks into tiny flakes.

Below - gold flakes in a pan have a distinct yellow color and are heavy. Tiny mica flakes will easily move around in a gold pan while panning. As you pan, if the gold material stays flat on the surface of your pan and is very difficult to move with the typical panning motion in water, it may be gold. However, if it moves easily, suspends and spins in water, it is not gold.

Mica is hard to pan out of a gold pan simply because it is essentially 2-dimensional and will cut through the water like a knife. Whereas gold in a pan will lie flat on the pan and exhibit a brightly yellow-gold color.

Staking Your Claim

A lode claim can be staked on public land if the mineral estate has not been withdrawn. If you find something big, be sure to stake as much ground as possible as the Forest Service in particular has a peculiar habit of withdrawing large areas around new discoveries. Lode claims should be staked on veins, porphyries, etc, or valuable rock found in place in an outcrop. One of my favorite undeveloped porphyries was a small deposit between Laramie and Cheyenne known as the Copper King, a gold-copper deposit. Lodes will also include diamond pipes.

To find out if an area has already been claimed or is available for claiming, refer to the BLM Geocommunicator. This site is not always up to date and you will need to do further research in the State BLM office and the county courthouse – both places you will need to

visit to file mining claims on public land. If on state or private land, you will need to negotiate for a lease.

My first job as a geologist was staking claims for a mining company searching for cobalt in Idaho. That was many years ago and I have not filed any claims since, so I am far from an expert on claim staking. Your best bet is to talk to the recorder at the County Courthouse and also the BLM minerals specialist at the State Capital.

According to the *1872 mining law*, the maximum size of a lode mining claim is 600 by 1500 feet. Each state has slightly different requirements for corner posts and discovery monuments so be sure to contact the State BLM office for this information. In Wyoming, one needs to place 4 corner posts to mark a lode claim along with two center monuments (few other states require center monuments).

If a lode claim is staked on a vein, the vein should approximately divide the claim in half (*see diagram 'a' below*), with approximately 300 feet on either side of the vein. A discovery notice is required to be posted on the point of discovery. The claim notice should contain information about the claim including the name of the claim, the discoverer and locator, the date of discovery, the length of the claim along the vein measured each way from the center of the discovery shaft or point, the general course of the vein, minerals claimed, and a description of the claim by reference to natural or fixed objects. If the land is surveyed, a description by reference to section or quarter section corners should be noted. One side of each monument is marked to indicate which side of the monument faces the claim.

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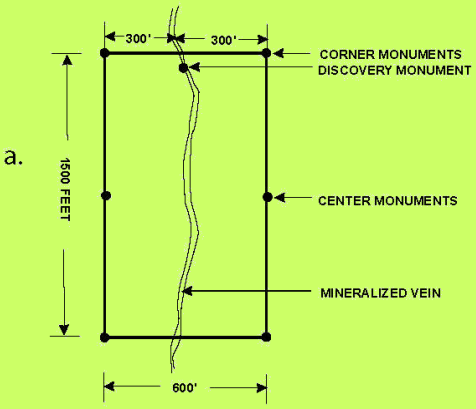
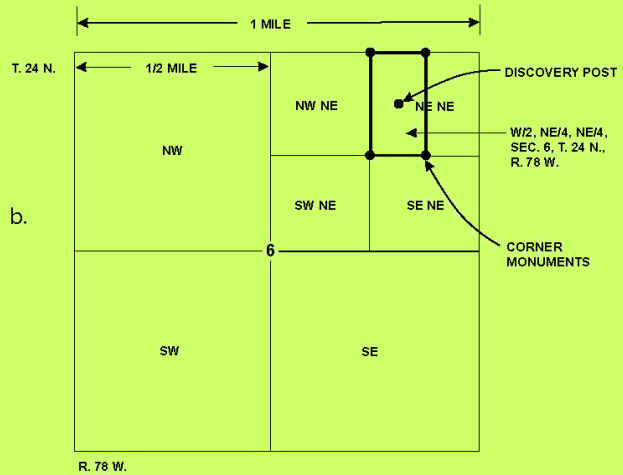


b.



Placer claims are required for valuable placer minerals (unconsolidated material in a stream or paleoplacer). These need to be marked by four corners. Placer claims are staked on detrital mineral deposits formed by concentration of valuable minerals from weathered debris. The most common placer deposits are those found in river gravels of active streams such as the Sweetwater River and Rock Creek in the Atlantic City-South Pass mining districts.

A placer claim typically covers 20 acres and located by legal subdivisions giving quarter sections, township and range. If the discovery is on unsurveyed land, it is located by refer-

ence to a natural or fixed object. Larger placer claims can be located by an association of locators, and these are limited to 160 acres for a total of eight prospectors, or a maximum of 20 acres per individual in the association.

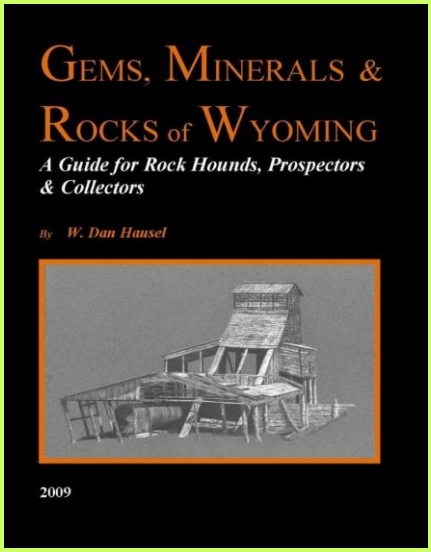
The claim must be marked with a securely fixed notice or sign containing the name of the claim (you must designate the claim as a placer claim, such as the Chicken-Nugget Placer), the name of the locator or locators, the discovery date, the number of square feet or acres claimed, and a description of the claim with reference to fixed or natural objects. All four corners of the placer claim are required to be marked by substantial monuments or posts. After a discovery is made and marked with a notice, the claimant has up to 60 days to file their discovery with the County Clerk, and 90 days to file with the U.S. Bureau of Land Management (BLM).

Summary

The search for productive gold deposits requires a good background in prospecting and economic geology as well as some luck. There are hundreds of occurrences and deposits in nearly every state in the West including Alaska. The best way to begin prospecting is to obtain a book that describes gold mines, ghost towns and placers of your state and visit these on weekends. In any gold mining district, there are always many deposits near old mines that have been overlooked. You might consider staking a claim on an old gold prospect that is now abandoned and then try to figure out what the old prospector was looking for. If you have a vein, try to figure out where the vein goes, where it is mineralized, etc. Learn about the associated minerals in your vein and the country rock.

A good understanding of geology helps tremendously. So, get books that describe where gold deposits are found and take a class in geology at your local community college. Search publications at your local state geological survey, US Geological Survey, your local library, and the internet. If you are in Wyoming, start out by getting copies of Wyoming State Geological Survey Bulletin 68 and 70 and Report of Investigations 44. If in Arizona, there are dozens of lode gold deposits that have been missed and many eluvial placers with no reported gold source (the gold came from somewhere!). Colorado and California have hundreds of possibilities, but personally, I would look in Arizona, Montana, Nevada, Wyoming and Alaska.

For more information, watch the following websites: (1) consulting, (2) gold prospecting and (3) gemstones.



BOOKS

Gems, Minerals and Rocks of Wyoming – A Guide for Rock Hounds, Prospectors and Collectors is available from Amazon.