READING A STREAM

This is an extract from a book written by Matt Thornton. It is really informative and covers just about everything you could think of about reading a stream. For more on this get his book.

Perhaps the trickiest theories yet to confront the beginning gold-dredger are those that relate to placer geology, also known as "the science of stream deposition." Placer geology concerns the varying conditions which cause gold and other heavy materials to be deposited in a stream flow environment. Without a doubt, the best way to learn the ins and outs of gold deposition is to place yourself at the feet of a genuine "old-timer", but unfortunately not too many of us have access to such a person; we will therefore have to study the facts relating to placer geology from books. The many types of currents, eddies, and backwashes that cause gold to be deposited in streams may seem a bit mysterious at first, but with a bit of study they will become quite clear. In fact, you'll even find yourself taking a much closer look at that river or creek you cross over every day on your way to work.

There are four principal types of placer gold deposits that will be of interest to the underwater, or for that matter, any other prospector-these are residual, eluvial, stream, and bench placers. Before we actually get into the geology of river-borne gold deposits, let's take a look at how gold finds its way into a river system. We shall start at the outcropping of a hypothetical gold vein on the wall of a river canyon and work our way downwards until we finally come to the watercourse; this process will be explained through definitions of residual and eluvial placer deposits.

The first type of placer gold deposit will occur at the surface of the ground where a gold vein crops out. This type of placer is called a residual deposit and is formed when the original host rock (usually quartz) erodes away, leaving pure metallic gold in place at the point of the outcrop. Gold-bearing veins located in a moist climate with heavy rainfall (southern Oregon would be an outstanding example) will erode away very quickly once being exposed to the action of the surface elements, and the resulting residual placers will often extend to tens of feet in depth due to extremely deep weathering of the original vein. Such deposits were referred to as "seam diggin's" during the old days.

The next type of placer deposit is called an eluvial placer, and is formed after gold has traveled downward as little as a few feet from the point of its residual outcrop. (The opposite of eluvial is alluvial, which signifies gold that has been carried many miles from its original source.) A good example of an eluvial placer deposit would be gold that originally cropped out at the rim of 1,000-foot-deep river canyon and has been carried by the forces of gravity and running water five hundred feet downward, with five hundred feet still remaining before it actually enters the stream flow at the bottom.

The next two types of placer deposits - bench and stream - are interrelated, and we will first discuss the deposit that will occur next along the line - this is a stream placer. Stream placers will be of greatest interest to the individual interested in gold-dredging, as this type of placer occurs at, near, or else under the surface of a river. There are many different types of stream placers, ranging from gravel bars just barely above the surface of the water to deeply buried bedrock deposits at the bottom of the river which generally hold more gold than the rest of the river environment.

A bench placer is nothing more than a stream placer that has been left high and dry by the stream that originally created it. Bench placers are created when a large land area, usually consisting of thousands of square mils, is "rejuvenated" over a period of hundreds of thousands of years and uplifted due to pressures from the earth's

interior. If the land is uplifted enough, any streams in the area will start to cut downward until they reach their new "base level," which will be that of sea level. As a river cuts downward over a long period of time, the bed it originally occupied before the uplift will be left stranded above the new stream level. Bench placers (also known as "terrace" deposits) are often very rich in gold, only these gravels are out of reach as far as the gold-dredger is concerned. (See Figure 17, which illustrates the "basic four" placer deposits.)

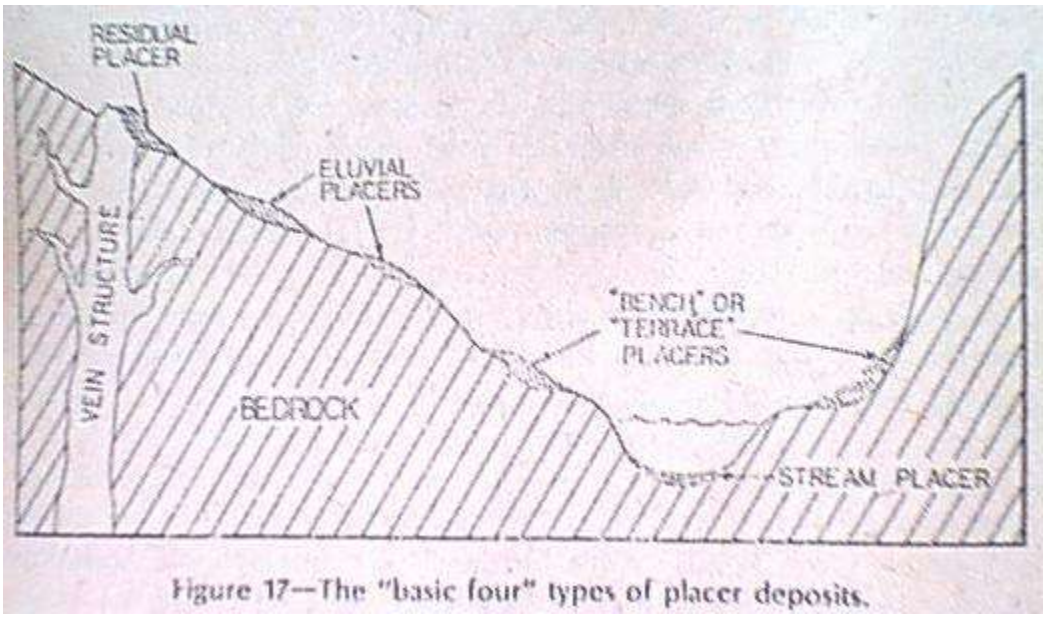


Figure 17—The "basic four" types of placer deposits.

The factors governing the occurrence of placer gold in a river environment are many, and quite often complex. There are so many variables involved in the science of placer geology it would be virtually impossible to mention all of them, but basically, the deposition of heavy materials in a stream is based upon the speed and volume of water flow coupled with the shape and slope of the river channel. Throw in obstructions such as large boulders, bedrock outcroppings, etc., and you have a whole new ball game.

Gold is transported in a stream principally during periods of high water, such as during the yearly spring runoff. Because gold is heavy and tends to settle in cracks and crevices at the bottom of a river, the speed of a runoff current has to be very great in order for transportation to occur. An ideal situation for heavy flooding and runoff would be as follows....

The mountains in the high country where "River X" is born are covered with one to two feet of snow, and a warm, rain-bearing storm moves in. Heavy rain starts to fall - one inch, two inches, five, ten - and in a matter of hours River X starts to rise from its banks with extreme rapidity. But River X is not merely rising from the heavy rains - the warm rains, as they fall on the shallow snowpack, turn that snow into water which also goes into the river. (It is a known fact that heavy rains falling on a shallow snowpack will melt it rapidly, whereas a deeper layer of snow will often absorb large amounts of rainfall.)

It has been 12 hours since the storm front moved in, and River X is raging like the mighty Mississippi during one of her frequent fits of rage. If you could observe Rive X at this time, you could study firsthand the conditions that lead to the deposition of placer gold. You would see a river that is flowing a filthy, muddy brown from tons of suspended silt. You would see branches, twigs, and even entire trees floating downstream with the swift current. If

you dared to stick your head under the surface, you would see huge boulders bouncing along the bottom of the river as if they were mere pebbles. But if you knew what to look for, you would notice other things as well. For example, in the midst of the mighty turbulence you might see areas where the swift current gives way to quiet pools. Perhaps you would see large sections of bedrock projecting into the turbulence that cause the current to swirl around in an "eddy" motion. Or what about that large boulder out in the middle of the stream - is it your imagination, or is the current really "standing still" on its downstream side?

"River X," as I'm sure you realize, is hypothetical, yet the three stream flow characteristics just mentioned are real and may be encountered in any river or creek. These three conditions are variations of the two basic principles of placer geology: (1) Gold and other heavy materials will settle wherever a stream current slows and drops its load, or (2) wherever heavy materials encounter an obstruction which causes them to "hang up."

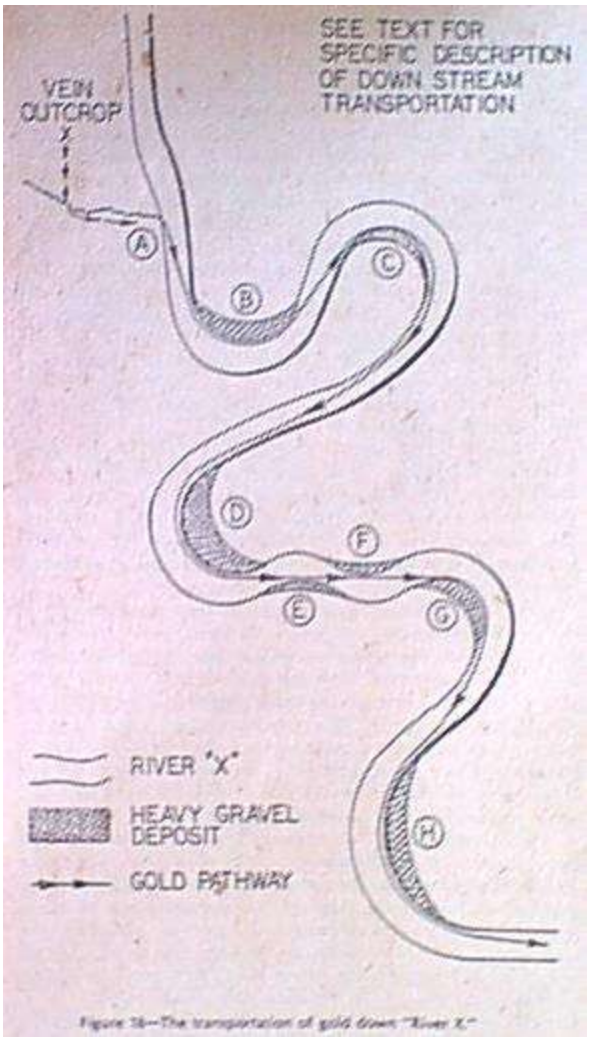
One of the big factors affecting the speed of a stream current - and thereby the deposition of gold - is the degree of slope of the stream's channel. The slope of a stream channel (known commonly as "gradient") may range from extremely steep to almost flat. In general, the closer you are to the headwaters of a stream the steeper the gradient will be. A steeply sloping channel with cause a river to flow very swiftly, usually gold to be carried along with little deposition. There are exceptions, of course. If there are major obstructions on the bottom of a stream channel, gold will be trapped no matter how steep the gradient (or swift the current.)

As a stream leaves its headwaters and approaches its middle range, the gradient of the channel will decrease. As the slope of a stream channels decreases the current will run considerably slower, creating conditions more favorable for the deposition of heavy materials. The slope of the channel in the headwater area may have been as great as a couple of hundred feet per mile, but it will now average around thirty or forty feet per mile. The former figure seems to be the ideal gradient for the deposition of placer gold.

The speed of the current and gradient of the stream channel also have a great deal to do with the amount of unwanted overburden that will be deposited in a river. There are variables, but for the most part a steep gradient (coupled with a swift current such as that found near the headwaters) will result in the deposition of relatively little overburden. The further downstream you go the gentler the gradient will become, causing slower currents and the deposition of more overburden. (The middle ranges of a river are the most popular with gold-dredgers, as the depth of the overburden rarely exceeds twenty feet.) If you venture further downstream towards the mouth of a river, the gradient becomes even gentler, and sometimes approaches a level plane. An example of this would be the point where a river empties into a large valley upon its emergence from mountainous terrain. The overburden at the mouth of a river often will be hundreds of feet in depth, completely beyond the reach of conventional suction dredges.

Gold is an extremely heavy metal, and when it enters a river channel, it will travel very grudgingly. Larger and heavier pieces of gold will always travel the path of least resistance in their journey downstream. Let us study this curious phenomenon as it is portrayed in Figure 18.

Let us assume that a very rich gold vein is cropping out on the side of a hill above the small gulley shown in the upper left portion of Figure 18. As the gold vein is eroded by the elements, the gold will be released from its quartz matrix and travel down the hill and enter the gulley; the gulley eventually pours its golden treasure into the drainage of River X.



The gold in our small gulley enters River X at Point A, and will rest at that location until sometime in the future when a major flood creates enough current to lift the gold from its resting place and start the downstream transportation process. When such a swift water period occurs, the gold will move from Point A across the river to the sharp inside bend at Point B. The transportation of gold in a river is simple to understand if you'll just remember this one basic fact - "Because of its weight, gold will travel downstream in a straight line following the shortest possible path from inside bend to inside bend." But back, now, to Fig 18.

At Point B you will notice there is a shaded area at the inside tip of the bend. This is a gravel bar, and it was formed at this location because the current of the stream slowed down when it rounded the inside bend of the curve. Whenever a stream current slows down, the river loses its power to transport the material it is carrying in suspension at times of flooding. In the case of the sharp inside bend at Point B, the current would slow considerably, causing larger boulders and heavy gravel components to drop almost immediately: one of those heavy gravel components would be gold.

After rounding the inside of the bend at Point B, our hypothetical gold nuggets would shoot across River X to the head of the next large gravel bar at Point C. Poin C is actually a long, arc like curve with a gentle inside bend, and in a case such as this the gold and other heavy materials would be deposited along the entire length of the curve.

After leaving Point C our nuggets will again shoot across the river, this time over to Point D. Upon traveling around this bend our gold encounters a series of curves whose inside bends form an exact straight line. In a case such as this, gold will travel the line between inside bends as if someone got out and marked a pathway with a straightedge. Our nuggets will touch Points E, F, and G and then swinging around the latter bend and over to Point H where they will again accumulate; from here, they leave the scene once and for all. Study this illustration as well, friends, particularly the inside bends where deposits of heavy gravel material are indicated. Even though "River X" is purely fictitious, the depositional spots portrayed here are one hundred percent genuine!

At this time i'd like to point out the gravel bars at the tips of inside bends aren't the only places for gold to be deposited. Placer gold and heavy gravels will accumulate any place where a stream current slackens. Examples would be at the tail end of rapids where currents change from swift to placid, the upper end of deep pools which often act as "gravel dumps," and places in a river canyon where the channel widens out upon emergence from "narrows." When you finally get around to visiting a genuine mountain gold stream, you'll undoubtedly spot many more depository areas yourself. The practice will do you good!

To search for dredging locations in areas where heavy stream materials have been deposited may sound like fun and games, but if you expect to find enough gold to make your mining efforts worthwhile, you will have to do much more than make a casual surveillance. Just because you've found a nice, wide gravel bar or a deep, still pool doesn't mean you'll hit the proverbial jackpot. The gold you can expect to recover will depend upon the nature of the bedrock at the bottom of the deposit.

As placer gold is being carried downstream by the action of currents, the pieces of any substantial weight will gradually work their way downward through the overburden until they reach bedrock, which forms a solid, usually impenetrable obstacle to their further downward progress. Notice how I use the word usually. bedrock will act as an absolute base-level for gold's downward motion if it is smooth and uniform, but smooth bedrock will frequently give way to stretches containing crevices extending down into the rock "basement." Heavy pieces of gold moving downward through the overburden will find their way into these crevices, and again start their downward movement until they have reached the absolute bottom. here they will stay, sometimes for thousands of years, unless a dredger with the proper knowledge comes along to recover them.

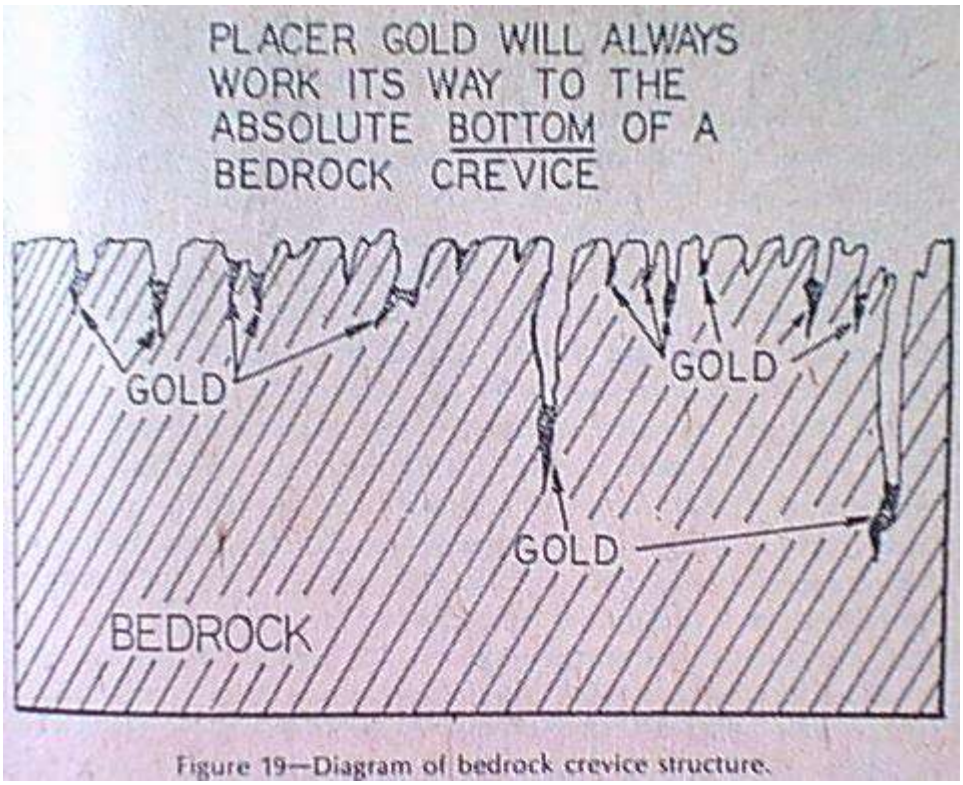


Figure 19—Diagram of bedrock crevice structure.

If the idea of a piece of gold staying in one crevice for thousands of years sounds somewhat "final," that's because it is. Once a heavy gold nugget gets lodged tightly in the bottom of a bedrock crevice, it will take a magnitude "ten" earthquake to uplift the bedrock enough so that the stream current can completely wash away the overburden and eventually wear away at the bare bedrock itself, thereby releasing the gold.

After you have located a section of river where heavy materials have been deposited, you should make a careful inspection of any visible bedrock for evidence of crevice structure. In general, bedrocks composed of slate-phyllite are most apt to develop crevices because of their "cleavage planes." In the case of slate-phyllite, cleavage is best defined as the tendency of a rock to break off into "sheets." When slate-phyllite form the bedrock of a river, it will frequently break off along its cleavage planes upon subjection to pounding from large boulders during times of flooding. When pieces of slate-phyllite bedrock break off, crevices that trap gold will remain between the sheets that still protrude. (Figure20)

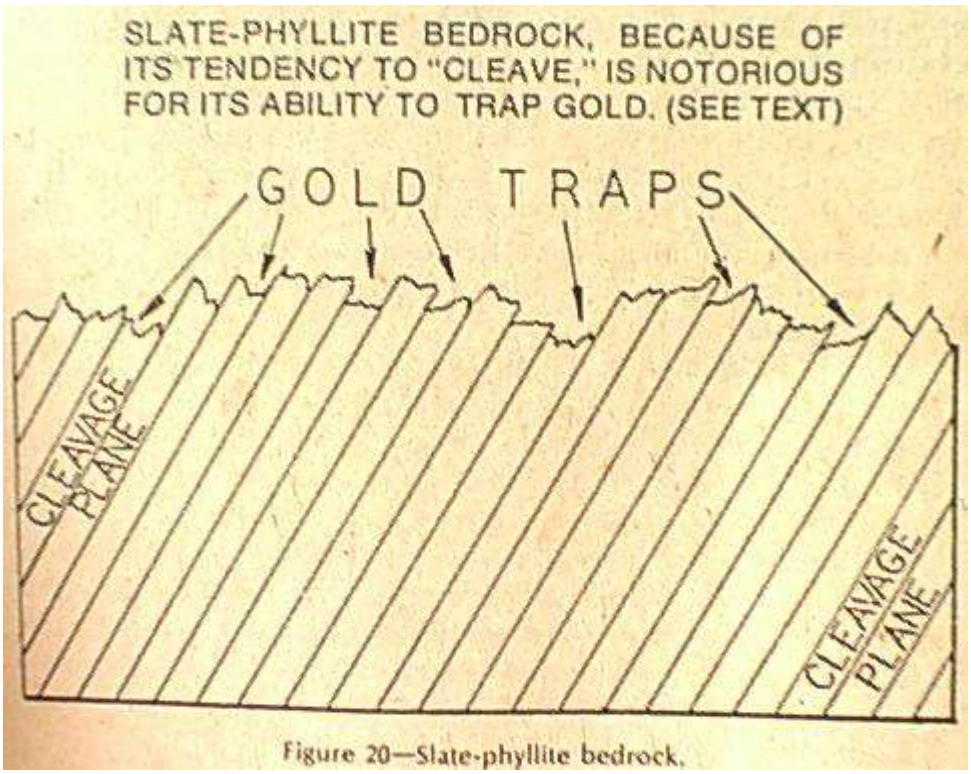


Figure 20—Slate-phyllite bedrock.

Under certain conditions granite will act as favorable bedrock, but all too often this very resistant rock will develop a "tabletop" polish that will allow even the heaviest of gold nuggets to wash right on over. If you desire to prospect in a granite area, look for "joints" where large blocks of this material come together; there will often be crevices at such points. (Figure21)

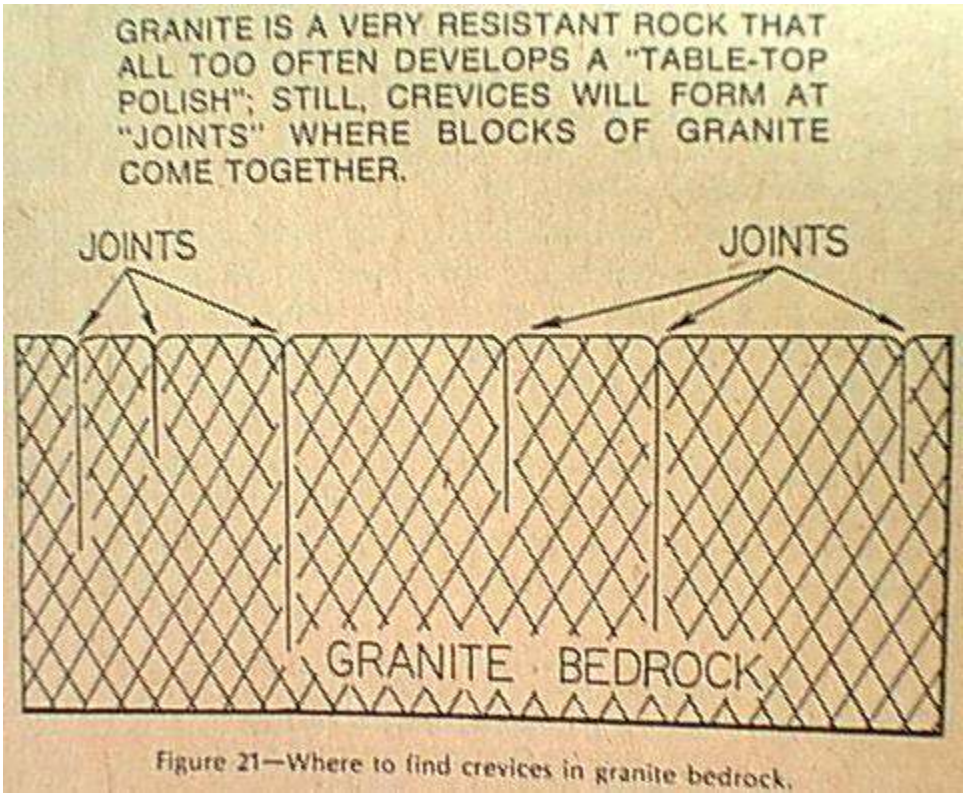


Figure 21—Where to find crevices in granite bedrock.

(i have to interject into the story here. in my own experience, granite will in most cases "decompose" under pressure and crumble under the weight on the stream and overburden. the main bedrock in the areas of my claims are granite, and it is so soft you can suction directly into the bedrock floor with no effort. REMEBER: when gold hits this sort of decomposed bedrock (granite) it will STILL continue to work its way down until it hits a piece that's not as soft. always remember to clean/cut decomposed bedrock until you get to the point where it is hardened . gold will work its way right down into this soft rock, and at first glance, the bedrock can look clean, but just under the surface there can be a large amount of gold. Furthermore, i have actually found granite to be a "host rock" for gold on more than one occasion. we ran into an actual stringer of gold directly in the granite up out of another county. The saying is that generally, for gold to be present, quartz also must be. this is rule of thumb but not the exception. i have found gold in granite, quartz, country rock, green rock, and a host of others....remember that))

Another type of crevice that is particularly excellent for trapping gold is that which whenever a bedrock quartz vein erodes, leaving a jagged depression in the bedrock surface. (Figure22)

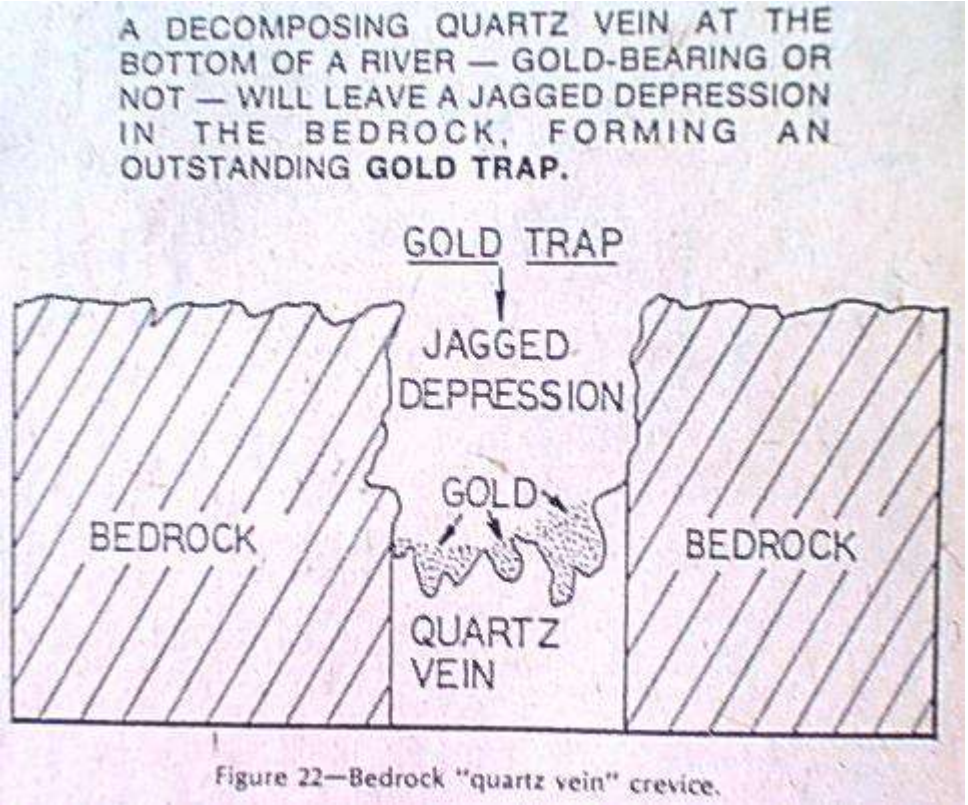
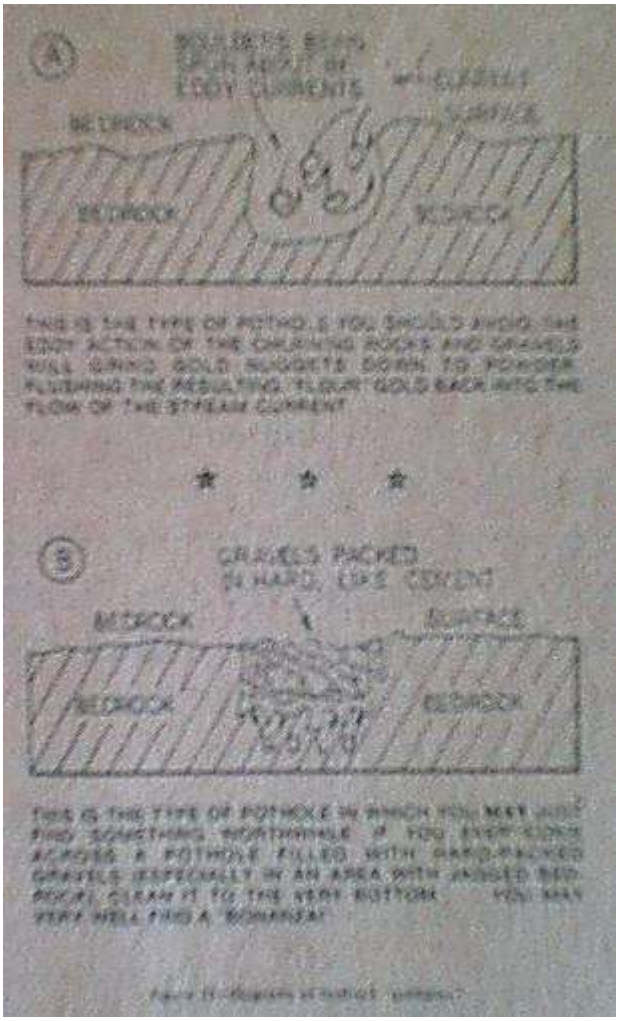


Figure 22—Bedrock "quartz vein" crevice.

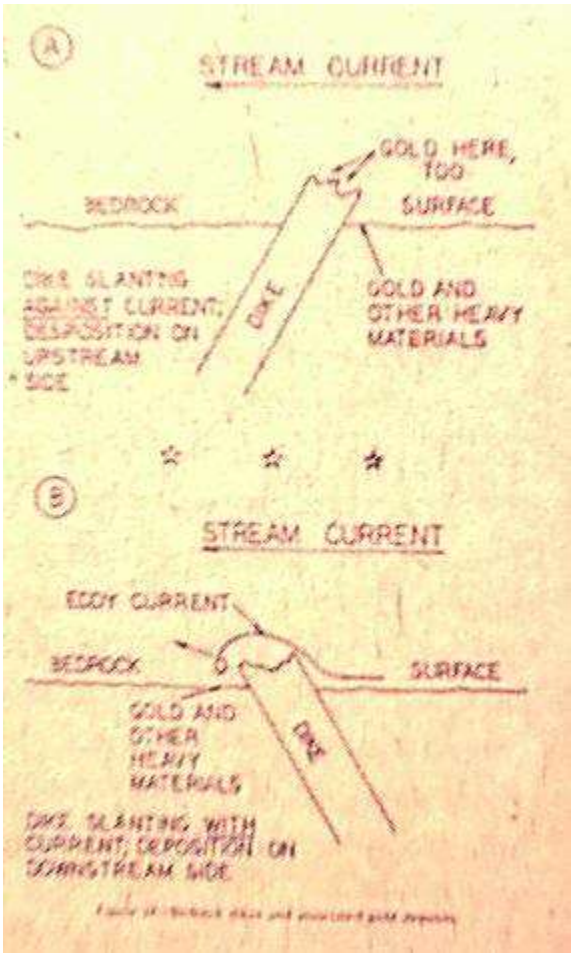
Bedrock quartz veins are often gold-bearing, and are the source for many gold-quartz nuggets still found in Western rivers to this date. This is a prize worth searching for!

A gold diver will often become excited upon discovery of a deep pothole in the bedrock of a river, but nine times out of ten these "glory holes" will turn out to be a complete Bust. Potholes are formed when complex currents cause heavy gravels and small boulders to spin around in small eddy-like motions, scouring deep holes in the bedrock. If a piece of gold falls into such a pothole (often referred to as a "boil hole"), it will most likely be ground up by the eddy action of the gravels. The fine, powdery gold that may once have been a beautiful specimen nugget before entering the pothole will now wash out with the current and continue its journey downstream.(Figure23-A)



But there are exceptions to every rule. If you should ever locate a pothole filled with large, coarse gravels packed in hard like cement, run - don't walk to the nearest available gold-dredge! You just might be onto one of those rare gold traps that was passed up by the original Gold Rushers back in the 1850's. Potholes of this nature have yielded pounds of gold, particularly if they occur in jagged, pockety bedrock.(Figure23-B)

So far I've talked about crevices and potholes that extend down into the bedrock, but there are also gold traps that protrude from the bedrock surface. A good example of this would be a "dike" of hard, resistant rock material that originally intruded its way up into softer, surrounding rock that eventually became the bottom of a river canyon. Over a period of thousands of years, the pounding of boulders on the bottom of the stream channel wore away much of the soft country rock leaving the harder dikes protruding from the bedrock. (See Figures 24-A and B)



If the dike has a good slant against the direction of the stream current, heavy materials will catch under the resulting overhang on the upstream side of the dike(24-A); when the dike slants downstream; the resulting overhang will often act as a natural riffle and cause an eddy current to form. The crevice systems in a bedrock are most apt to catch and hold placer gold when they cut at angles perpendicular to the flow of the stream.(Figure 25)

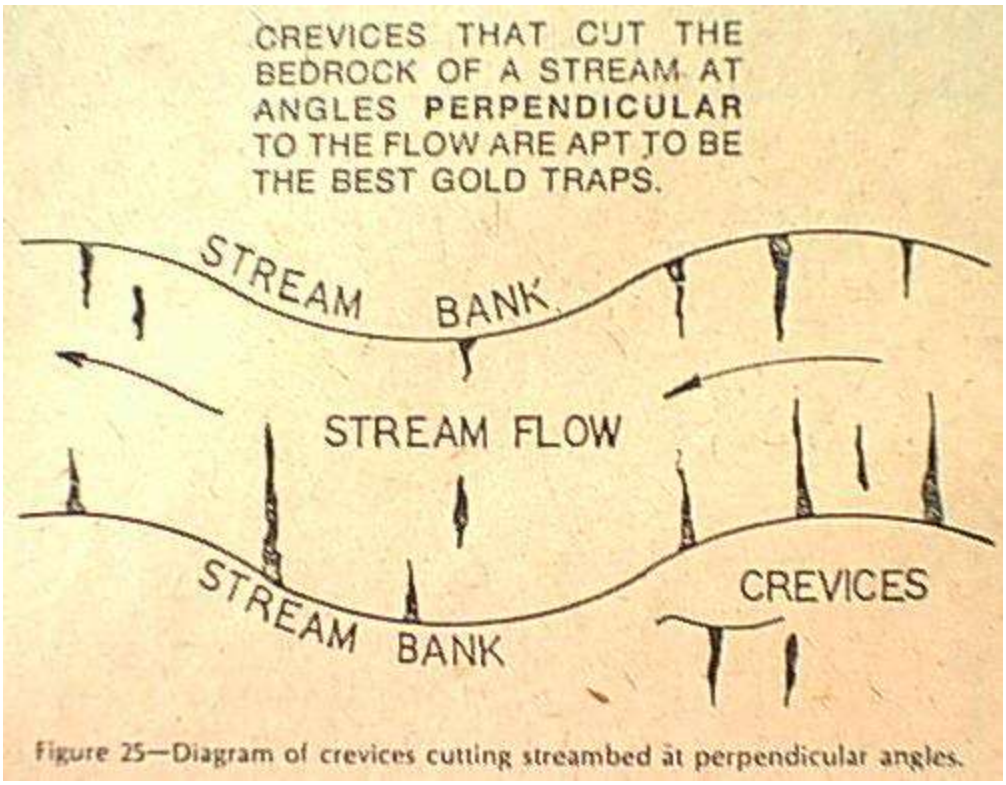
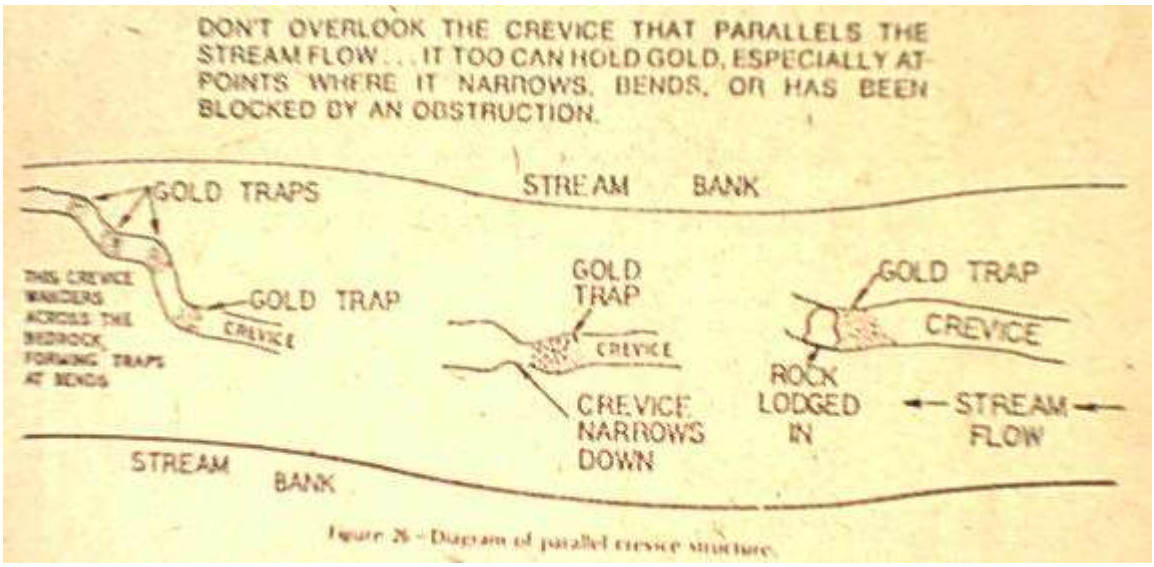


Figure 25—Diagram of crevices cutting streambed at perpendicular angles.

The closer the angle approaches 90 degrees, the better. If you can locate slate-phyllite bedrock, for example, with cleavage planes that slant against the flow of the current while cutting the stream at 90 degrees, you have located the "gold divers dream." but at the same time don't overlook long, narrow crevices that run parallel with the stream flow - they, too, can hold bonanzas. The width of the parallel crevices will usually vary, going from narrow to wide, wide to narrow, etc. The point where the crevice narrows down from a wide portion is an exceedingly good gold trap that is often overlooked buy the uninitiated. The same will hold true for crevices that wander across at irregular angles, such as forty-five degrees.(Figure 26)



It is a common misconception among many beginning gold-dredgers that if they vacuum their way down to bedrock and lay it bare, they can pick up the nuggets with their fingers. Unfortunately, this is not the case. True, there will often be small flakes of gold occurring on the bedrock surface, but larger nuggets will almost always be lodged tightly into the crevice structure. The only way of recovering all the gold from a given section of bedrock is to pry the crevices open and scrape them clean. (The recovery of gold from an underwater crevice is a fine art, and there is actually much more to it than I've mentioned here).

Rivers that flow through mountainous terrain rarely, if ever, have a free and easy pathway to follow on their long and eventual journey to a valley or sea. From star to finish, the channel of a mountain steam will resist the smooth flow of water by presenting one obstacle after another. An op-the-spot inspection of a mountain river will reveal such features as monstrous boulders, sections of bedrock jutting into the stream as if to choke off its life flow, perhaps even waterfalls that plunge dozens of feet into dark, mysterious pools below. In spite of its chaotic appearance, everything is in perfect order in a mountain stream flow environment, and we will have to study it for what it is - obstructions and all.

The most common obstruction to prevent the smooth flow of water in a mountainous river channel is the common boulder. Boulders come in all shapes and sizes, ranging from minor nuisances a foot or two across all the way up to gigantic masses of rock the size of a bungalow. Boulders that fall between these two extremes deserve the attention of the underwater prospector, because they will often concentrate huge amounts of gold near their bases - particularly if they rest on bedrock. Strange things happen when the gold-carrying flood current of a river encounters a large boulder. lets study Figure 27 to get the story.

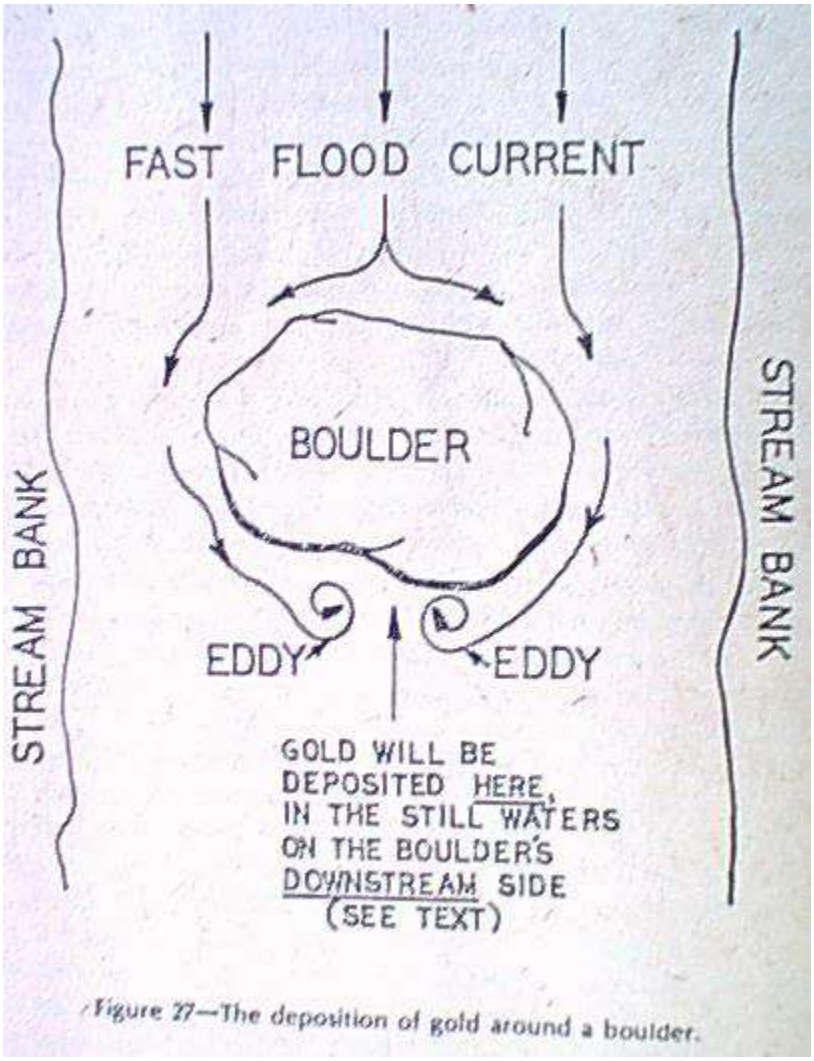


Figure 27—The deposition of gold around a boulder.

In this hypothetical situation we have a large, somewhat rounded boulder in the middle of a stream that is at the height of its yearly flood stage. The current is flowing at a frightening clip, and we surely wouldn't want to fall in at this time! As the swift current slams into the upstream side of the boulder, it is deflected around the outside perimeter due to the roundness of the rock mass. When the current "rounds the corner" and approaches the downstream side of the boulder, it will start to circulate in an eddy motion around the rear of the boulder and practically stand still. If the stream current happens to be transporting gold, the heavy yellow metal will be carried along the perimeter of the boulder to eventually settle in the still waters on the downstream side. It is possible for gold to be trapped on the upstream side of a boulder, but usually there will have to be a substantial fissure in the face of the rock mass to catch the gold as it is impaled against the boulder by the current. Boulders often have yielded large amounts of gold to the dredger who diligently cleans them down to the base, but which boulders, specifically, are most apt to hold the golden treasure? The answer is simple - look for large boulders in mid-stream that obstruct the flow of current as it travels from inside bend to inside bend. (Figure 2

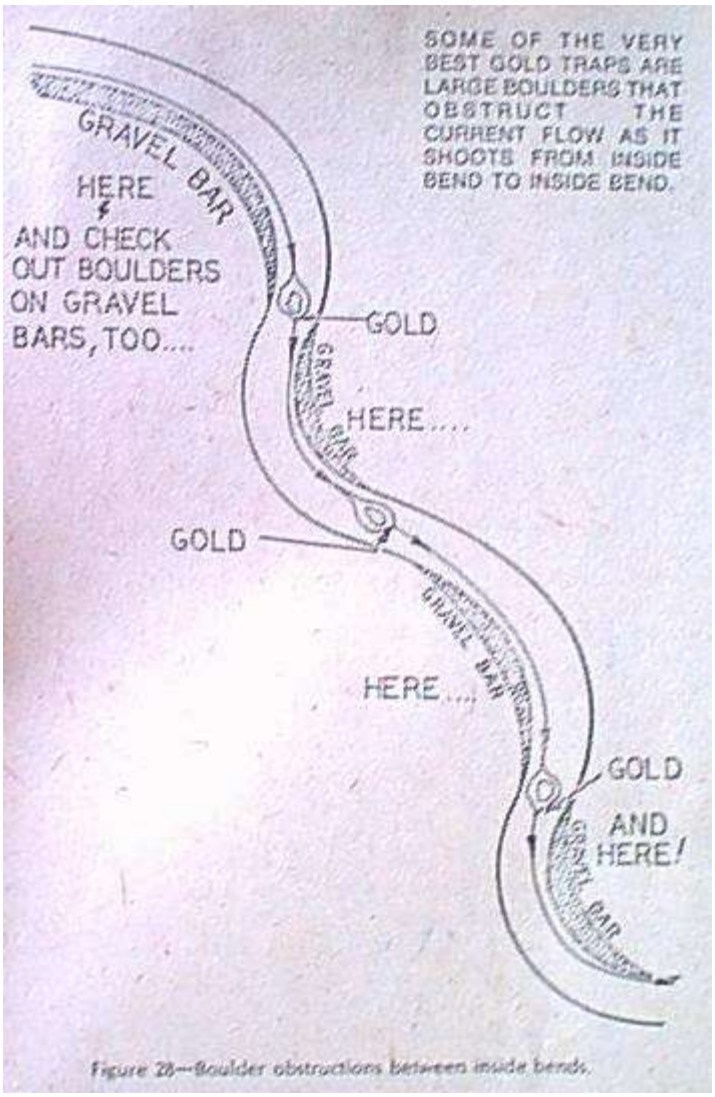


Figure 28—Boulder obstructions between inside bends.

As we already know, gold tends to travel from the tip of one inside bend to the other, but if there is an obstruction in the current flow as it shoots between bends (namely a boulder), some of the heavier gold will never make it to the inside of the next bend. Always keep an eye out for this type of condition, and check the downstream side of any large boulders that appear to be in the correct position. One of the best of all possible spots for the depostion of placer gold will be an accumulation of large boulders at a point where a stream channel widens.

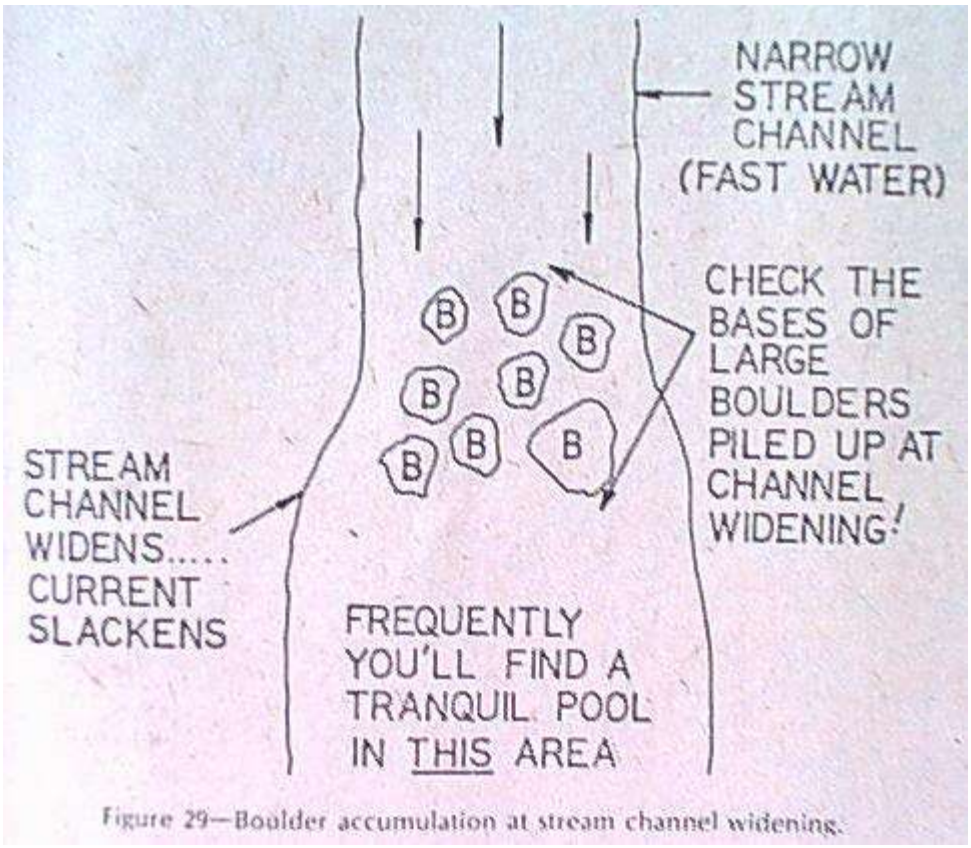
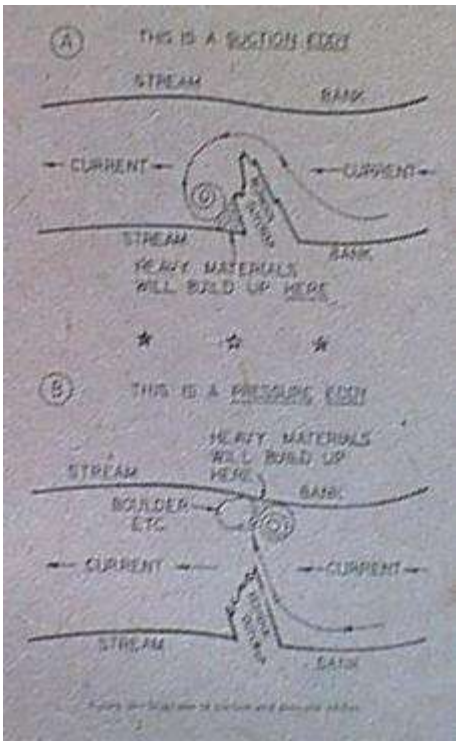


Figure 29—Boulder accumulation at stream channel widening.

In the upper part of Figure 29, the river is traveling through an extremely narrow gap , a channel condition which causes currents to flow at tremendous speeds. The water is so swift it even carries large boulders which don't get a chance to settle in the narrows. As soon as the stream emerges from the narrows, the large boulders will drop immediately at the beginning of the widening. If you really want to find a potential "super-spot", check the gravel on the downstream sides of boulders such as this.

Boulders are not the only objects to obstruct stream channels to the advantage of the gold-dredger. Another very favorable location will be an area where a large section of bedrock protrudes out into a stream, causing an eddy current to circulate around the outcropping. Whenever a chunk of bedrock sticks out into a river on an angle slanting with the current, an eddy will circulate on the downstream side of the obstruction causing a buildup of heavy material. This type of eddy is called a suction eddy. (Figure 30-A)



If the current flowing across the face of a downstream-slanted bedrock outcrop is fierce enough, it will sometimes shoot across the stream and cause an eddy to circulate around an object on the opposite bank; this condition is known as a pressure eddy. (Figure30-B) The nature of bedrock outcroppings that protrude into a channel against the flow of the current is tricky, and one would almost have to see the river in question at the height of its flood stage to get an idea of where the eddy currents will form. An outcropping that protrudes far out into the current (as shown in Figure 31-A) will most likely catch the current on the outermost projection of the bedrock and cause an eddy to swirl in toward the shore. The spot indicated by the "X" would be a possible depository area. If the outcropping is only a minor projection into the flow of the current (Figure 31-B), any number of things can happen. The stream current can bypass the projection entirely, it can partially flow against the outcrop with the major part running out toward the middle of the channel, or the major portion can flow against the outcrop and circulate in a "half-eddy," flushing the material in suspension back out into the middle of the stream. Now you can understand why I say an on-the-spot inspection of an upstream-slanted bedrock outcropping is a virtual necessity!

Every so often you hear stories about how a gold-dredger recovered a fabulous amount of gold from the base of a waterfall. Before you start getting "waterfall happy," let's set the record straight once and for all. The average waterfall - -if it is of any substantial height - Creates downward currents of extreme ferocity and will tend to carve a deep, turbulent boil hole right at it's base. (See Figure 32)

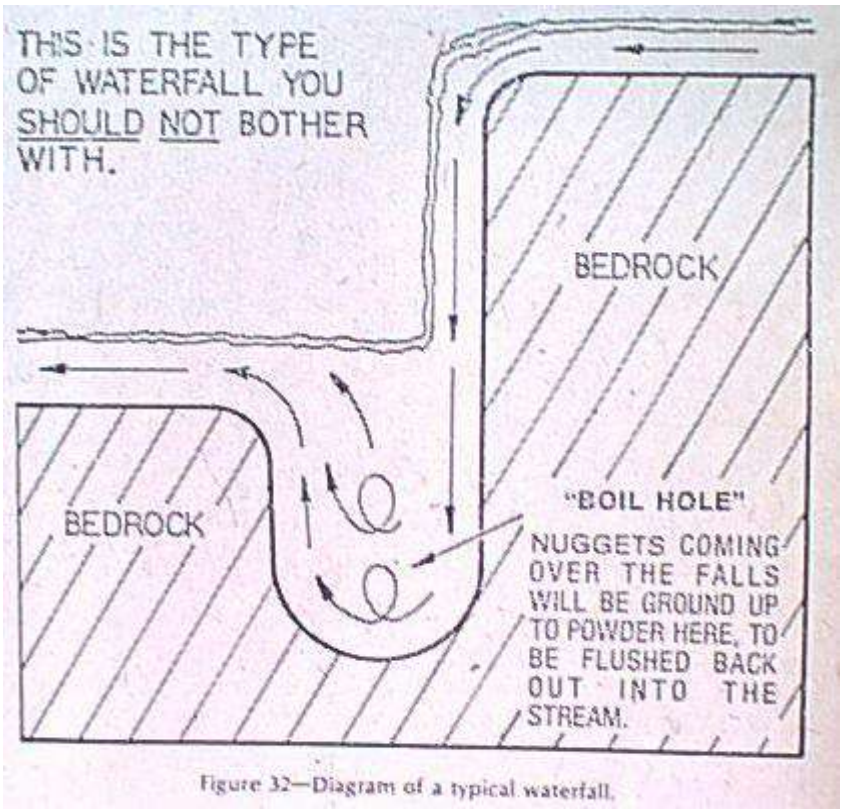
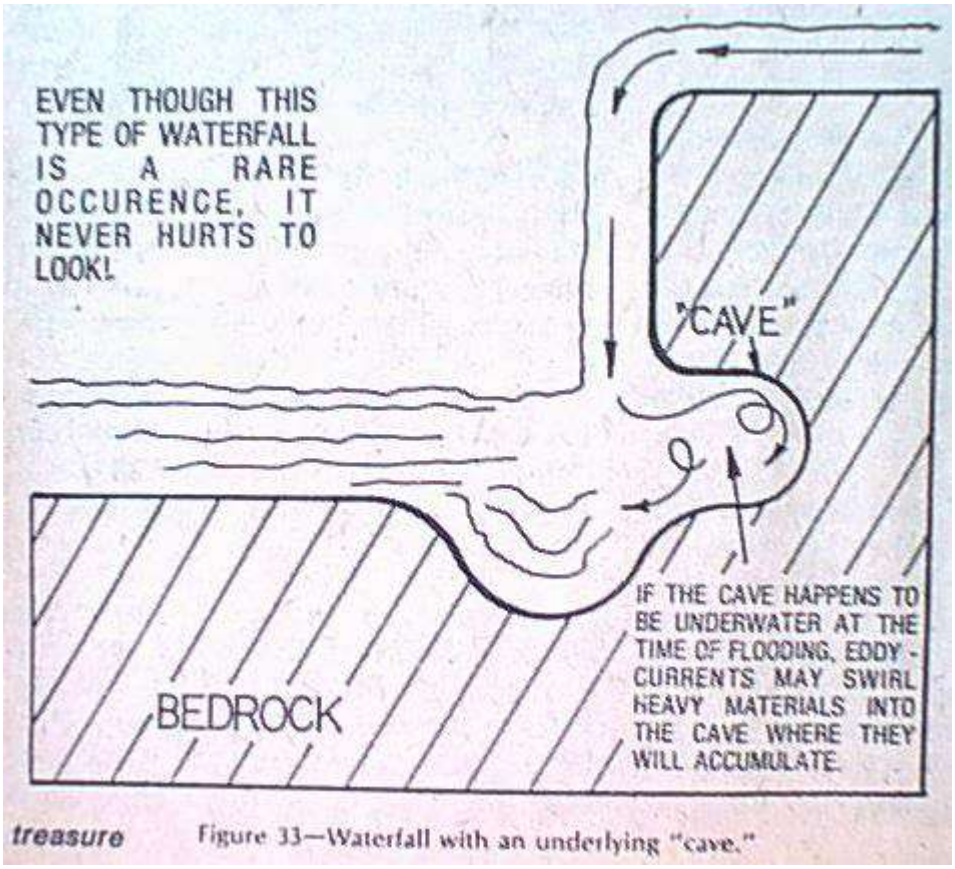


Figure 32—Diagram of a typical waterfall.

Nine times out of ten, any gold coming over the falls will drop into this boil hole to be ground up into flakes that will soon wash out with the current. So in this sense, anyway, waterfalls should be avoided when you're out looking for dredging spots. But as we have seen many times during the course of this text there are exceptions to every rule, and in this case the exception is a humdinger.

Every so often a waterfall will flow over a layer of extremely hard, weather-resistant rock that overlays softer rock beneath. As water goes over the falls, it will cause the underlying softer rock to erode back under the upper layer of harder material. This will create a kind if "cave" under the falls. (Figure 33)



treasure Figure 33—Waterfall with an underlying "cave."

If the cave happens to be below the water line at the time of flooding, a powerful eddy current may develop which will occasionally (and I do emphasize the word occasionally) cause heavy materials to swirl back into the cave and become entrapped. There have been a number of fabulously rich dredging finds taken from such locations, but you could count the grand total on the fingers of one hand. Even so, it will pay you to take no chances....investigate!

How to Read the Stream Banks

When looking at the banks of whatever creek, stream or river that you may be prospecting it is important to carry out a slow methodical survey of the watercourse. Spend some time just walking the creek traverse the distance a number of times, slowly picking you way along, do a little panning and get to know the creek and the banks along its' distance well. Pay attention to changes in the topography, has the creek been mined before, where and can you find evidence of the previous mining activities, pay attention to what the old time miners worked. Have you come across any low lying benches, 2-5 meters above the existing creek, check out the surface for evidence of old working, be careful as there could be old diggings and shafts that were not filled in and could present a hazard to life and limb.

Let's take a look at exposed gravels along the bank, is it fine sand and silt, if it is, you are probably going to be wasting your time panning this material as the size of gold particles are relative to the size of the sand and gravel particles. You will want to see reasonable amounts of cobble size rock (50 mm to 250 mm diameter) in a well sorted imbricated layering of gravels, the reason is that as it takes a fair bit of

force to move this size material into a deposit as it takes a similar amount of force to carry gold to a deposit like this. This type of deposit could have a varying amount of boulders in it also, if the gravels are all tightly packed and hard digging all the better. This tells us that the gravels haven't been worked before, any gravels that I have come across in my travels that where easy to dig were old tailing and while there might be some find gold in them I have found that the amount of values do not make it worth the effort required.

Now if you come across locations of piles of boulders with very little gravels it could be a couple of things, 1. It could be a Glacial Moraine, or 2. The waste heap of boulders from old workings, the Chinese miners were very methodical when mining and these rows of boulders that you will sometimes come across are generally acknowledged as having been built through the efforts of Chinese mining activities. If you happen to have a metal detector along with you gear it wouldn't hurt to dig it out and have a try with it, who knows what kind of bits and pieces of history you might just find.

When taking a closer look at the gravels in the creek bank, what is the general makeup of the main rock type schist, gneiss, gabbro, and quartzite? Is the material clastic or rounded alluvial type, if the answer is yes to most of these questions then you're on the right track, these are the most prevalent rock types that gold and other precious minerals have been found within the Cariboo region. In some of the creeks in the Cariboo it is quite common to find large boulders of conglomerate which is a combination of a number of rocks bonded together as a sedimentary rock, which also can be called cemented gravel. These boulders and cobbles come from very old tertiary alluvial deposits that formed millions of years before present and can be quite profitable to placer mine if one has the right equipment.

Let's say you come across some exposed bedrock, now on any creek that has been mined in the past the bedrock was most likely cleaned fairly well, but this doesn't mean that all the gold was picked up, and because of the years that have passed since it was originally mined there has been numerous spring runoffs and summer storms that could very well have washed freshet gold downstream to fill the cracks and crevices once more, do not pass up the chance to clean this bedrock again. With exposed bedrock at the creek level, let's take a look around, does the creek cut down through the bedrock, chances are it does. Now here's a place that I've found some very nice gold at times, the old time miners did not have the means to pump water up to the higher bedrock, and to build a flume to carry water high enough for washing the gravels would have required a lot of energy and money. So with this in mind, if there are trees and shrubs growing there, in the soil, on top of the gravels, these gravels have never be touched, and they are bedded on bedrock, what are you waiting for, set up the high banker and get washing.

The last and equally important aspect that the prospector should be aware of are dry gulches and wet seeps that will line the banks of any stream, creek or river, while they may not look all that significant they can be an important feature that may lead you to the discovery of a ancient buried channel higher up the slope from the existing watercourse. A prime example of a gulch that lead to a rich deposit would be Dancing Bills Gulch, discovered in 1859 by Bill Latham and partners, they drown the next season crossing the Quesnelle River back to their claim and so never knew what they really had. After that the Chinese worked the claims there for a number of years until being bought out by a consortium

that developed the claim along with a large number of others into the largest hydraulic pit in North America, The Bullion Pit.
Now just because you don't have running water to run a sluice with is not a problem today as it is possible to pump water uphill a couple hundred meters with fairly inexpensive gasoline powered pumps today, and pumping water across the hill side from a water source 300-400 meters away doesn't present all that big of a problem. So these dry gulches should be thoroughly prospected even if you have to pack your original samples out to wash them, be creative in your approach to the possibilities.

Hope some of you can make use of this info

Reading a River for Gold

How to Read a River for Gold Deposits

Rule #1: Let Mother Mature do the work for you whenever possible. Over thousands of years, rivers have meandered, flooded, and concentrated its heavier contents into what prospectors call "paystreaks".

Gold is heavy and it takes a lot of water and time to move it a significant distance from its source or resting place.

Tip: When the weather is bad and rain is pouring down, go out to your favorite gold bearing stream and watch the water action. Make notes on where the water runs fast and where it slows. Draw a simple map. Note obstacles like tree stumps, large boulders, or other obstructions in the path of the high water. Places where the river are slowed are the most likely places for gold to deposit. Why make a map? Simple, when the water recedes the landscape will look far different than in its high water or flood stage. That stump or large boulder in the normal path of the river that you figured would cause the gold to drop out may in fact not be any more worthy than any other spot. Why? The paystreaks or deposits may be hidden.

Remember, gold moves most during fast water events and during flood stages. That stump area up the hill a bit out of the water may actually contain far more gold than the one in the current path of the river.

Areas to focus on: Look for transition zones - areas where the water changes speed from fast to slow. The inside bend of rivers - the area just after and around a bend in a river or creek.

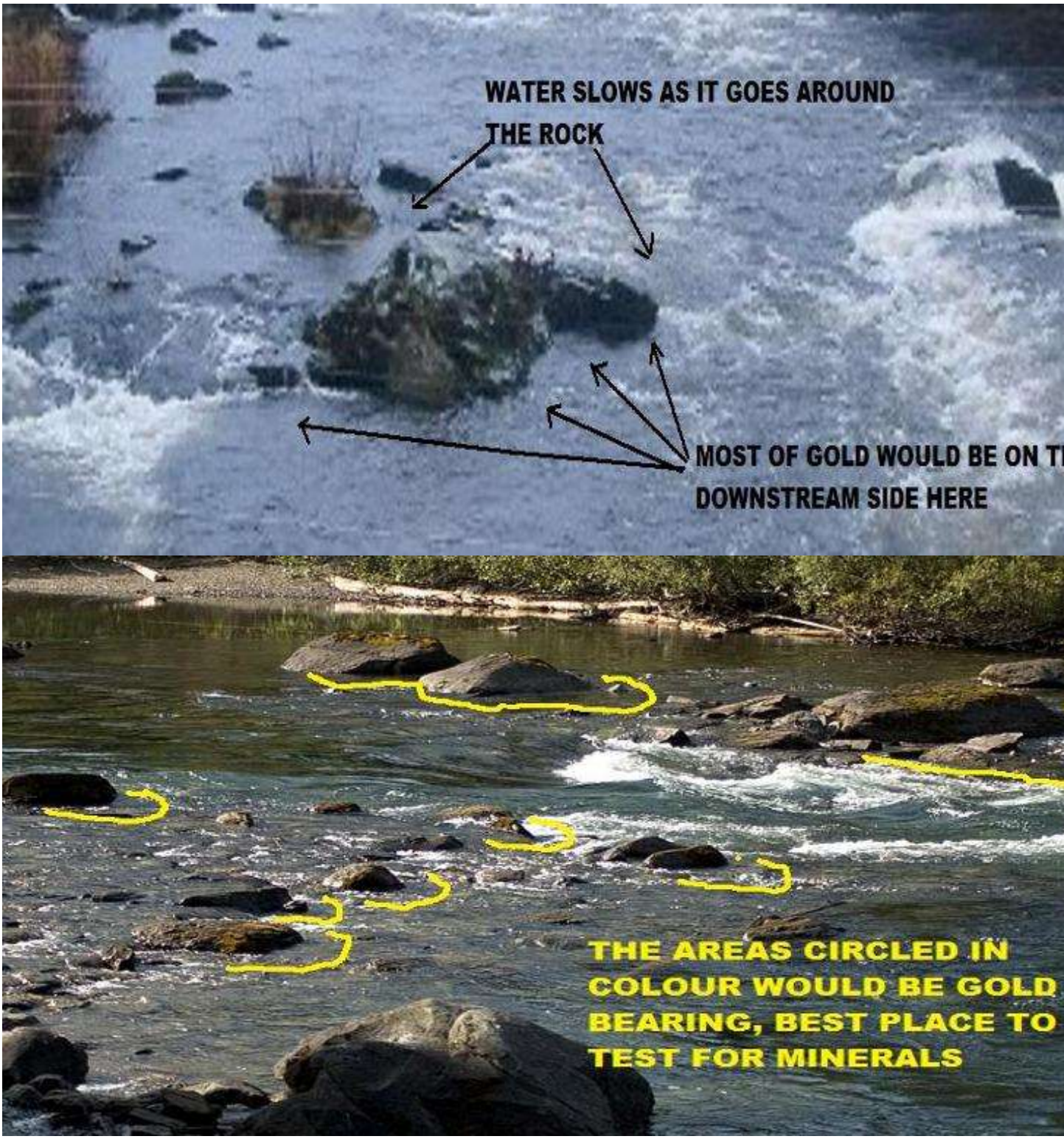
Locate those areas where the water slowed during a flood or high water time and prospect there. These are the likely drop out spots for gold and other potentially valuable heavy minerals and gem stones. Remember, sometimes the paystreak is not where you might expect. Let mother nature be your guide.

READING A STREAM

For over hundreds of thousands of years gold and other minerals have eroded from host rock and travelled downhill through slope creep and fluvial transportation to become alluvial deposits. Each year brings spring thawing, the resulting runoff creates high-water flooding conditions that erode old existing deposits sweeping gravels, rocks, and boulders as well as gold fines, flakes, and nuggets downstream. These will travel downstream until encountering any obstruction that slows the speed and force of the watercourse down, these natural and sometimes unnatural obstructions act as riffles in a sluice box. Learning to see and recognize these riffles will become a valuable skill for finding gold bearing deposits.

Because gold has a high Specific Gravity, it will fall to the stream bed were ever the water current slows down, over the years gold particles will be redeposited in very predictable areas/spots in a water course. Once there the gold will continue to settle toward the bottom until it reaches bedrock or false bedrock (a layer of impervious clay).

In a creek, stream or watercourse gold and other heavy minerals will follow the path of least resistance, the same as the water flow, slower water is capable of moving fine gold, and faster stronger flow is capable of moving flake and nugget gold. In any watercourse you will have obstructions, natural riffles, these act to slow the water movement down, this gives the gold a chance to fall out of suspension, rocks and boulders are natural riffles and gold will start to settle on the upstream side but the majority will settle on the down stream side of these natural riffles.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Now there are many that will tell you that you can not find gold in areas of swift running water, so not true, there is gold there as well, in is just harder to find. There will be very little fine gold in swift water, though this is actually the area where you will find nugget gold, but bear in mind that the amount of gold per yard of material will most likely be the same for fine or coarse, so you can see how this could become discouraging. You will only find the odd piece here and there and generally no colour, so it does take some perseverance and hard work.

Most fine gold will settle out as soon as the velocity of the stream is checked or obstructed in any mode, generally this a curve or bend, bedrock, or even a fallen tree in the stream. So lets take a bit of a look at the spots in a watercourse that would hold the best potential for finding fine gold.

- As water will take the path of least resistance so will gold, although gold will settle out of the water flow at the first obstructions.

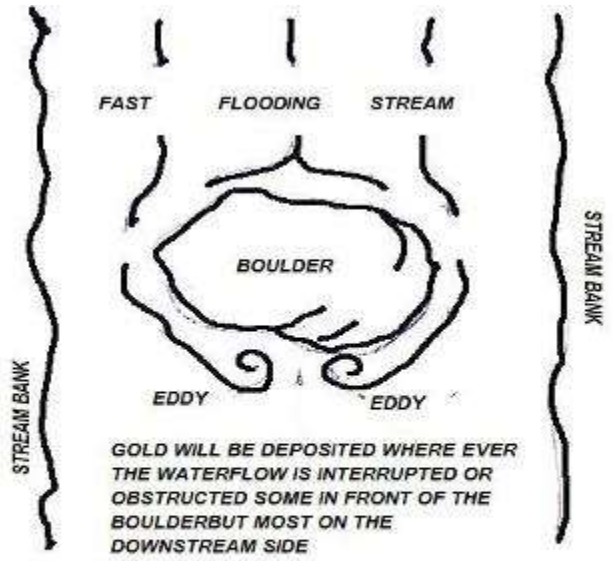
- Gold will settle on the inside of corners as the water flow decreases.

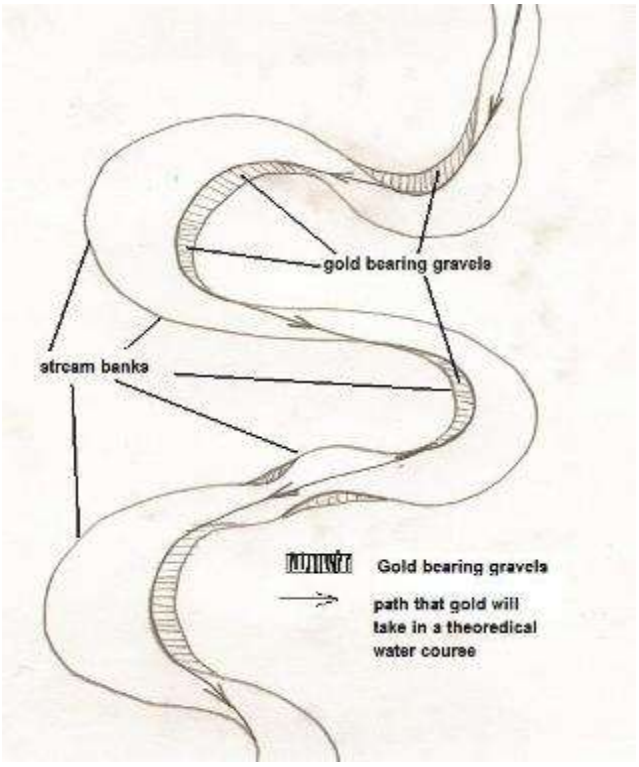
- The inside of a curve or bend is an area of deposition, while the outside of a curve or bend is an area of erosion.

- Gold will continue to travel down stream during periods of high water flooding, mainly during the spring runoff periods, but also to a lesser degree during summer or fall storms.

- Gold being the heaviest mineral (generally speaking) with settle into the gravels in a stream bed during high-water flooding, as during this time the gravels in the stream bed liquefy, similar to the action in a gold pan or sluice box.

- Where you find fine gold particles on the curves or bends of a stream bed, you will be able to find larger particles (nuggets) in deeper water off the edge of the bend.





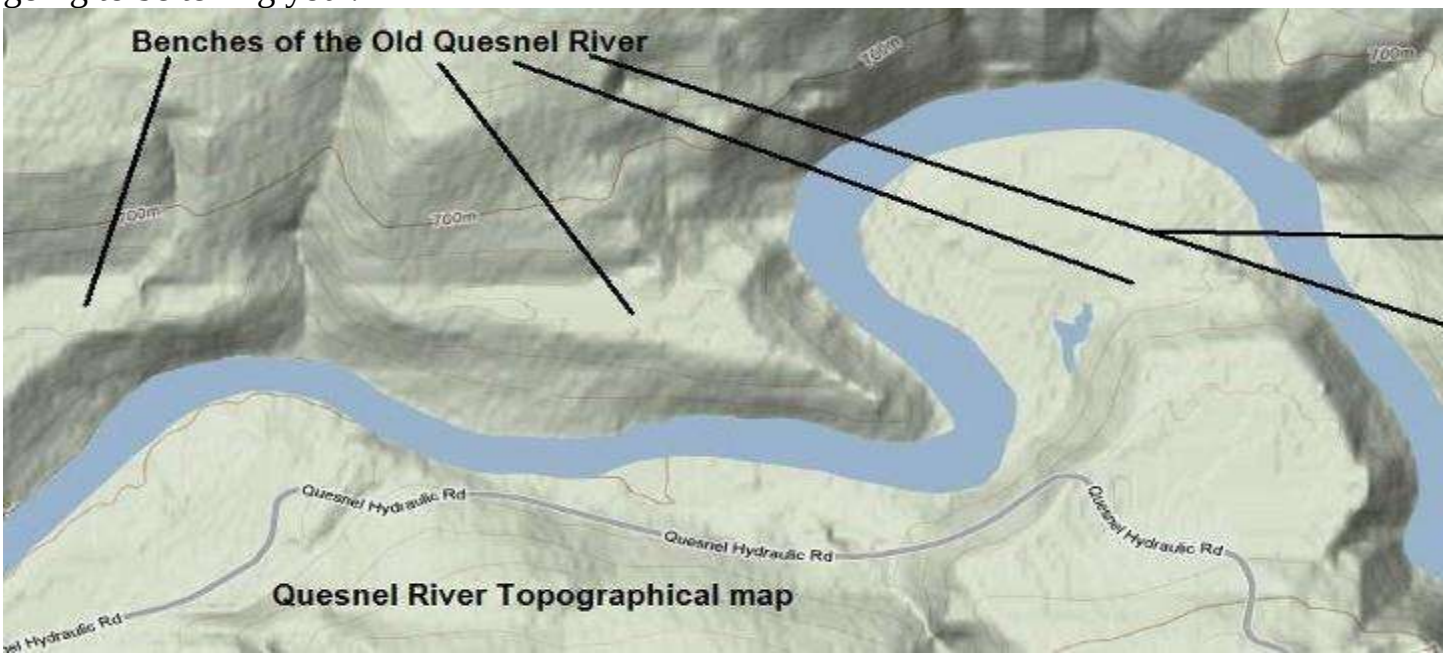
Chinese miner operating a rocker on the Quesnelle River around 1865

A nice area of bedrock on one of the claims, will be taking a closer look next summer, some easy pickin's

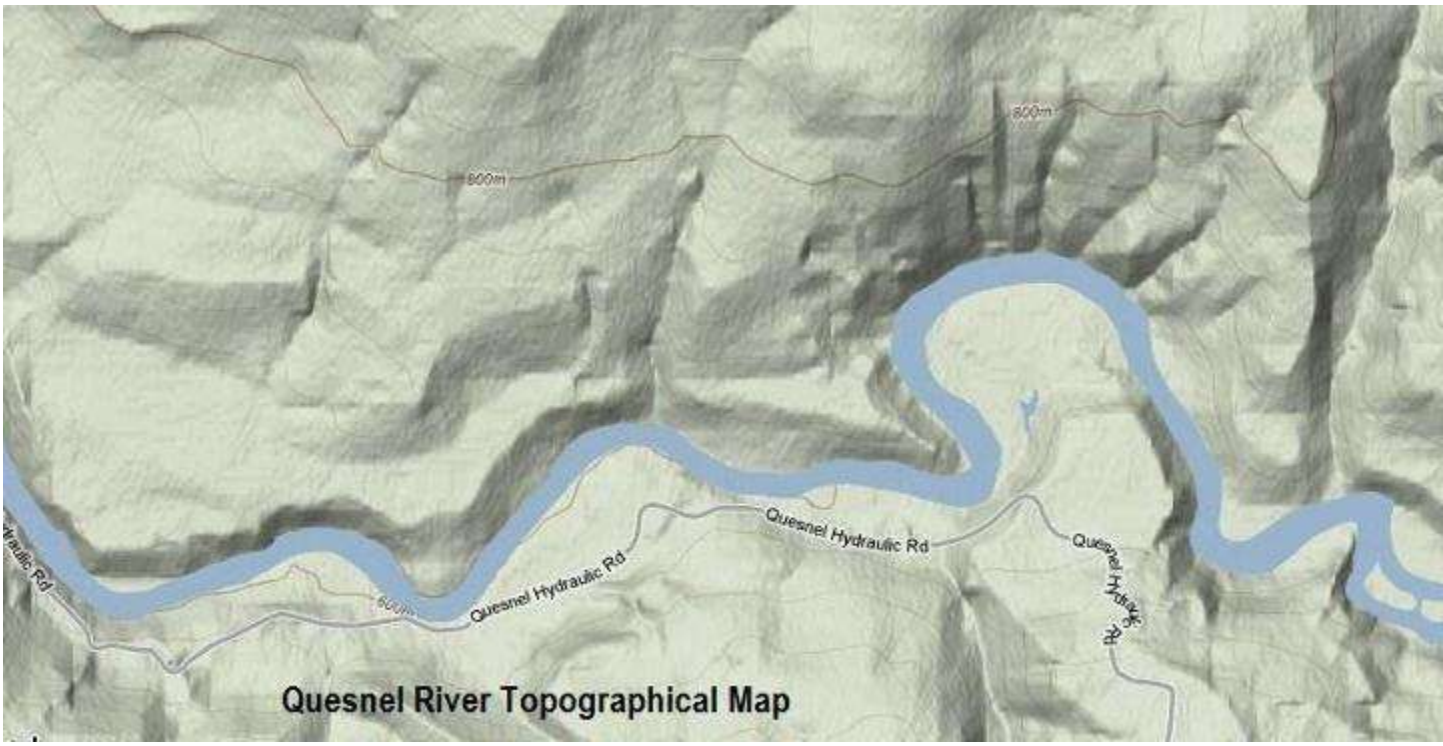
When ever the water flow is interrupted/obstructed gold being as heavy as mineral as it is, will drop out and settle into the gravels. Some will settle is the up stream side, but the vast majority will settle in the low pressure EDDY'S on the downstream side of these obstructions.

This applies to rocks. Boulder, bedrock out cropping's and even logs and trees that have fallen into the watercourses, so keep your eyes open for these items.

Moving along, what applies to streams, and rivers also is a general sense applies to the benches/terraces along side most existing watercourse today, the bigger the water course, say as in the Quesnel or Fraser River the easier to see what I am going to be telling you .



This is a topographical map of an area on the Quesnel River, as you can see that at one time in the long ago past (15,000 30,000 may 100,000 years ago the river was flowing at a higher level, cutting back and forth and eroding some areas and leaving bench deposits in others, these are the old bench deposit, some just above the existing river, other 100s of high higher, these are the places to prospect for gold bearing gravels that you can actually possibly set up a working gold placer mine.



This is another view of the same area, zoomed out, as you can see the old water course changed and moved around a fair bit, leaving a lot of benches and terrace that the mining in bygone days were unable to work as the technology of modern pumps and equipment did not exist, if you learn to read these types of maps, your odds of finding you gold mine will increase tenfold, so take the time to do your research and learn from it as well listen to some of the older prospectors, learn from them, they do have a bit of knowledge and some are more than willing to past it on…..

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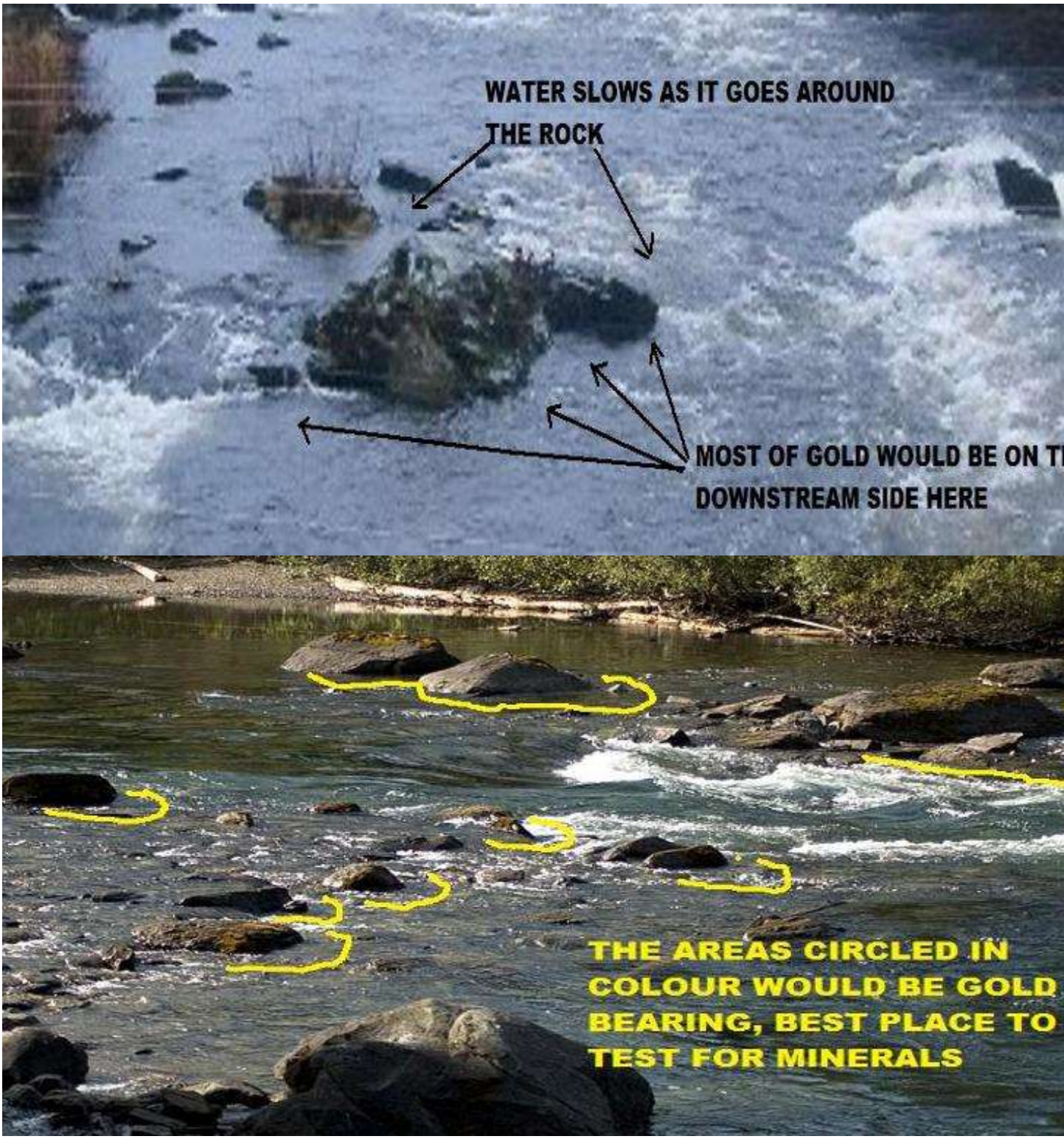
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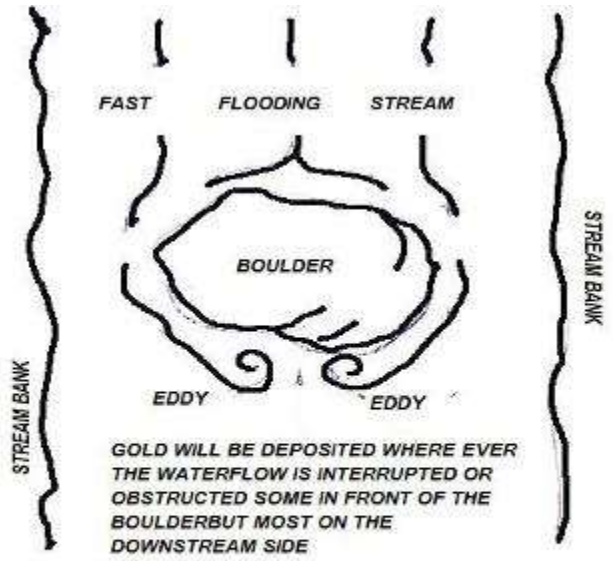

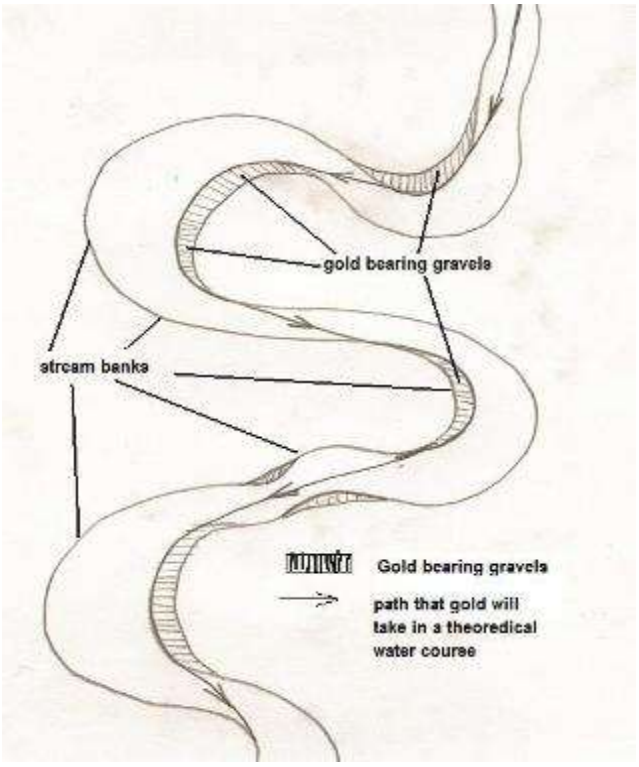

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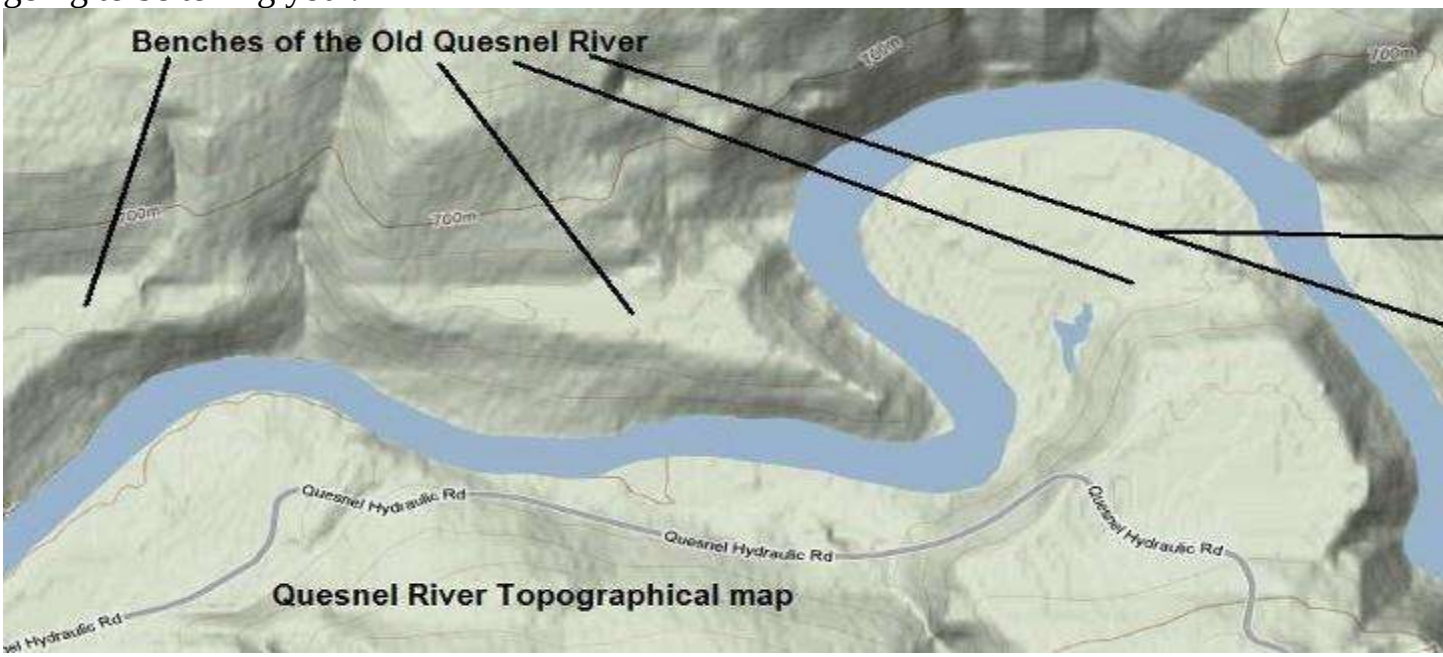

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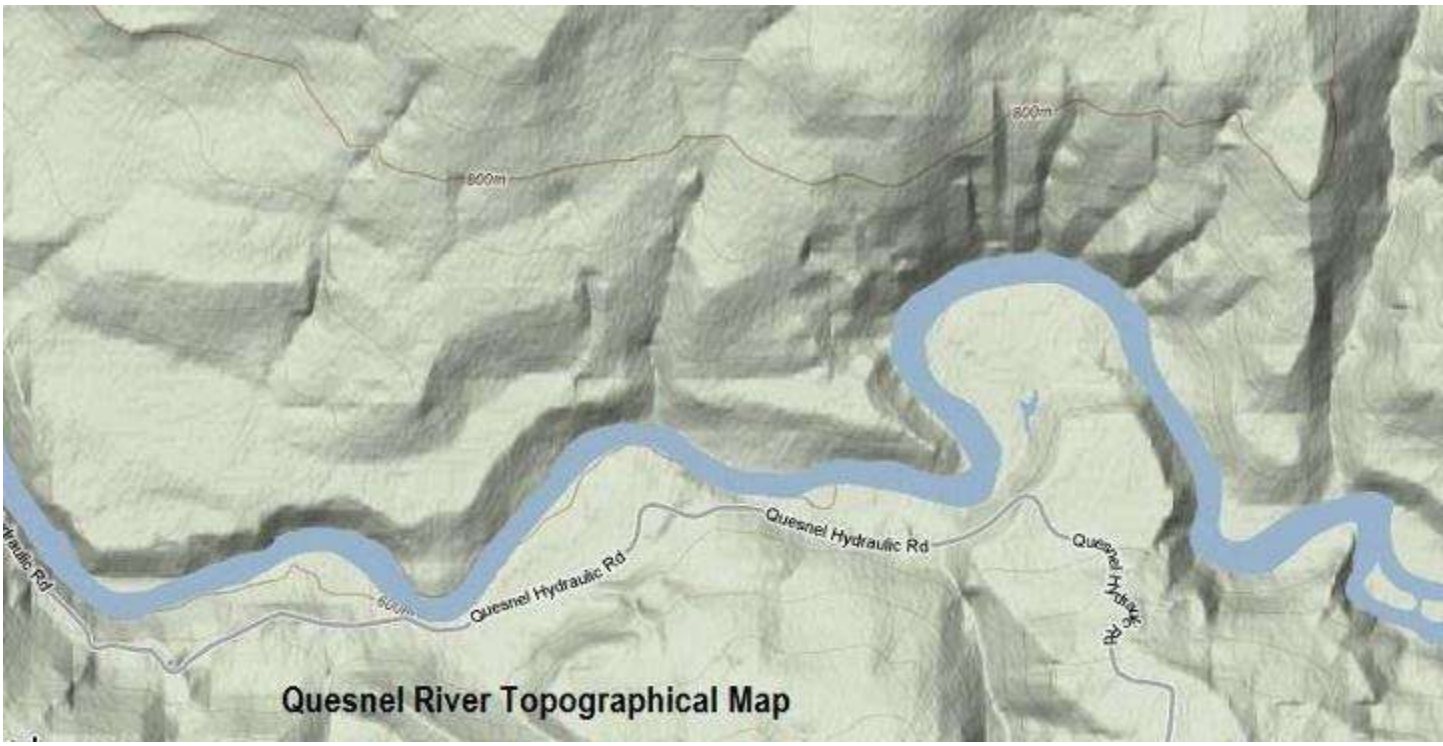

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How to find Gold | Reading Streams

How to read a stream and where to find gold have given a lot beginner prospectors and recreational gold panners a hard time. Let's face it, it's not the easiest thing to find. There are a couple ways to go about finding gold and I'll share one method that works best for me!

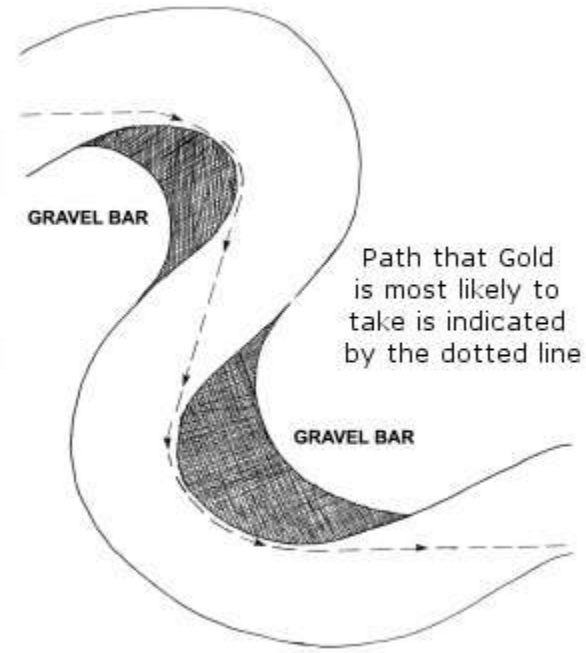
So.. **Where do you find gold**?? Well, creeks, rivers, and water run off's are some of the best places! That's not to say that they are the only places though! There's ancient rivers that are long dried up now that are known to carry VAST amounts of very course gold... more on that in another post perhaps. For now lets focus on finding gold in rivers and creeks.
First things first. The rivers and creeks are not where the gold is coming from! They are where the gold collects! The water from spring run off, floods and landslides all wash gold into the stream bed for you to find later. The gold we find in streams are called "placer deposits". Placer

gold is gold that's traveled from its original source - AKA the lode. The further the gold travels the more rounded and smaller the pieces become. With that in mind you can zero in on "new" course gold. If you're finding quartz stone mixed in or even attached to the gold you are very, very close to the source.

Some people like running around with a shovel and gold pan like a chicken with their head cut off! It's not the best method in my eyes, but it can be an adventure and it's not a boring systematic way of doing things. It's a "fly by the seat of your pants" way of doing it and if you've got the prior knowledge and some good intuition it can pay off! I think every newbie tries this once before getting frustrated with poor returns or hit and miss gold finds that don't make any sense.
If you really want to locate a pay streak, the best way is to do a grid system or at least keep it linear. Try the following and see if it works for you.
Find a section of a creek you believe to be gold bearing and look for the high water mark. The high water mark is a good indicator of where the water was during the spring flood season. Those spring floods load and shuffle the creek (hopefully) with gold.
Highlighted in red is where the high-water mark ends. Highlighted in blue is a good place to look for gold. There's lots of roots and it's on an inside bend just after the apex where the water tends to move slowest and even pool around the peninsula.

Once you've located the high water mark grab your shovel and gold pan, take a sample, pan it out and note how much black sand you've found. You can be a little quick and sloppy because we're only monitoring the black sand amounts for now. Continue in this fashion while working towards the center of the creek and taking samples ever foot or two. Note the black sands in each pan... how much... how little.. and where the most concentrations are.

Here you can see the path that gold and the heavier materials will follow along a



stream. Once you have a rough idea where all the concentrations of black sand are grab your pan and shovel again. Go to the spot in the creek (or outside of it if the water is low) and begin panning the area closest to the center of the creek where the black sand levels began to drop significantly.
If the creek is an active gold bearing creek this will be your most likely spot for a pay streak! Continue sampling with your gold pan, and if thing are beginning to look good it's time to move in the heavier equipment like a sluice box where permitted.

If you're not finding much or anything in that spot move down or upstream to another spot and repeat the process. Several factors might be causing the gold not to collect there. For instance there could be a slow spot in the creek up stream where the water loses its momentum and most of the gold gets deposited there! It's also possible that in the spot you checked the water was moving too fast, however if that is the case there should be very little black sand present.
...And remember the old saying: "Gold is where you find it"! It's worth mentioning though that it's best to start looking in areas where other people have found it before!!

How to Find Gold in A River: A Gold Prospecting Guide

When gold prospecting a new stretch of river, it can at times be difficult to pick a place to start gold panning. There are a number of places that are good starting points for any search. I will cover how to read a river for gold and how to sample a stretch of river.

Placer gold tends to deposit in areas of low water pressure. By this, I mean that anywhere the water slows, gold will try to find a resting place, while lighter gravels continue to wash down a river. When searching for these low pressure areas it is important to visualize the river during the runoff season as this is the time when the gold moves the most. If you are not able to visit the river during high water season, look for the high water mark. Look for the highest points on the bank where drift wood has been deposited. This is probably close to the high water mark.

Gold often travels down the gut of the river, taking the shortest path possible. This can be visualized by looking from the inside edge of a bend in the river up or down to the edge of the next bend. Look for anything that might obstruct the flow of water along this path. There might be a large boulder or other object that can break the flow of water. The down stream side of the object can catch gold.

Look for sections of bedrock that cross the river. If there are cracks or crevices crossing the flow of water, they can act as natural riffles in a sluice box. Surprisingly large pieces of gold can work their way into what appear to be small cracks. When a river widens, the water pressure decreases. This can allow gold to deposit.

The inside bend of a river causes water to slow enough that gold can be deposited on the bend along with other gravels that form a bar. Depending on the bar, placer gold can be concentrated on the up-river and down-river sections of the bar.

It can also be deposited in pockets throughout the bar. Flood gold, the gold that is easily moved during floods, can be scattered in the top layers of gravel thoughout the river with pockets forming in spotty locations. These are not the only places that placer gold can deposit, but they are some good places to start.

Now I highly recommend that you try sampling rather than just picking a spot and going for it. The goal of sampling is to locate a more richer section of gravel before you start gold panning. It is well worth the time and effort to sample so that you can find the pockets or paystreaks of gold. A paystreak is often a somewhat narrow stretch of river that has a higher concentration of gold than the rest of the river bed.

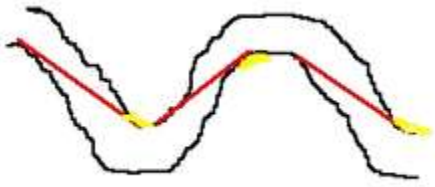
When sampling, don’t wast time trying to extract every flake or speck of gold from your gold pan. Look for a promising spot and pan it down until you can get a good idea of the number of pieces of gold that came from the hole. Make a note of the spot and move onto another

promising spot. Continue to make note of the concentration of gold in each spot. Then, after sampling several spots, go back and work the spot that was producing the most gold.

If while sampling you discover a really good deposit. Take some samples upstream, downstream, and on the sides to find the boundaries of the deposit. This will let you know the general area of the gold deposit and you might just discover an even richer part of the deposit. I know that I would rather work the richest part of the deposit, if I was limited on time.

Once you have located a good spot, now is the time to slow down and really work the area. Pan the material down until you only have about a half a cup of material in your gold pan. At this point, you can see some of the gold and know whether or not you are still in a productive spot. Rather than spend a lot of time separating the gold from the other gravel, place it in a small bucket or container to cleanup at home. This way you spend more time getting the gold.

Gold in a River



Finding Gold in a River

Gold: Where is it in the River?

Gold is found in lode deposits, residual deposits, alluvial deposits, bench deposits, streambed deposits, ancient rivers, and flood layers. A lode deposit is a crack or fissure in hardrock that's full of gold. This is the original source of placer deposits.

Residual deposits are pieces of ore that have eroded away from a lode. They are usually directly under the lode that they broke away from.

Alluvial deposits are pieces of ore that have eroded away from a lode, but haven't been deposited in a stream. The hill that they came from may no longer exist, or may even be further downhill.

Bench deposits are found on the banks of a stream, and streambed deposits are found under the water. You can start your exploration in the streambed. If you don't see any signs there, chances are that the entire basin is bare.

Look for cracks or crevices in the rock at the bottom of the stream. Gold will settle into them. Any rough or irregular bedrock surface will act as a gold trap. Potholes in the bedrock will trap gold, so dig until you find the hard edges of the hole. Smooth and polished surfaces don't trap gold well.

Dikes in the bedrock will trap gold in different ways. If it angles downstream, gold will to collect on the downstream side. If it angles upstream, it will tend to collect on the upstream side. Rock

outcroppings from the stream sides work about this same way.

Any sudden drop-off into a deeper and larger volume of water is a good place to look. Boulders at the base of a waterfall will protect gold deposits from being boiled away by the falling water. Sometimes the gold will settle out just beyond the boilout point. If the slope of the streambed lessens and smoothes out, there may be a good sized deposit there. Look on topographical maps for places where the grade levels off and check it out.

Gold tends to follow the shortest route between bends.

Boulders in the stream may trap gold on the downstream side. Of course, if they are in the shortest path, they are even more likely to do so.

During the Tertiary period, about 2 million years ago, the mountains underwent a lot of twisting and faulting. Many streams were formed, most of which ran in a South-East direction. The benches of these ancient rivers and streams are well known for the rich deposits they contain. These deposits often have a deep blue color, and are called 'Blue lead', which turns a rusty reddish brown after being dug up and exposed to the air. They are often very hard and compacted.

Flood gold can be found at the bottom of flood layers where heavy storms with enough force to move large amounts of gold will produce concentrations. Watch for layers of differing color, hardness and consistency. Some hard layers may masquerade as bedrock, so don't give up if the going gets a little hard. The shortest route idea applies here, also. Sharp bends may show good return in the inside edges quite far from the normal water line.