The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits. NUMBER1, (Witten for tile Mining and Scientific Press by James F. Talbott, Shady Run, Placer Co.)

The original purpose of this paper was to direct the attention of mining men to the unexplored and unprosecuted mining section of country between the North fork of the American river and Bear river, which in my opinion contains an ancient river channel aa rich as any in the county, and from which the gold in the hydraulic mines of Butch Flat and Gold Run had its source. To give my reasons for this opinion, I have outlined my theory of the gravel deposits and old river channels. The paper was prepared a year ago and left at the State Mining Bureau for publication. Owing to some misunderstanding, its publication has been delayed to the present time, when it is given to the Press. I was not aware that Prof, Hinke, or any one else, intended writing on this subject till I saw the first paper in the Press.

I lay no claim to scientific attainments or literary embellishments, but have aimed to express my views in a practical form; related facts that are obvious, and accounted for all of the condition, as appears to me, by the most reasonable and natural methods. With deference to Prof. Hanks' scientific eminence, I protest against his arguing both sides of this question. He is a decade or two behind the age in regard to the miners in this section of country. Some of the authors he refers to as being advocates of the river theory were as visionary as that very limited class of miners who left ounce diggings and rushed to Gold lake, believing there they would find the fountain-head of the rich deposits below. They possibly had a remote idea of his theory, and believed the lake had been scooped out by a glacier and they would get the coarse gold in its bed.

In point of intelligence the miners of this section of country will compare favorably with any in the State, and it is uncommon at the present time to find one who does not believe in the river theory. They consider it proven and well established from facts made known by developments within the past decade. I have been a firm advocate of the ancient river theory for the past 30 years; have been a close observer of all the conditions and deposits in the deep gravel beds and drift mines. I have stood in the uncovered channel of a hydraulic mine (and handled the pipe) and have swung a pick up the breast of a drift mine in California, and I have not seen or read anything that would cause me to doubt the correctness of it. I have seen nothing in all of my experience and observation within the gold belt, from the Calaveras river to the South Yuba, but what can be satisfactorily accounted for by the action of water and extensive landslides.

Prof. Hanks has failed to show wherein his theory possesses any practical advantage over the river theory in regard to the discovery of new mines, or working those already developed. That those gravel deposits, channels or basins are here as a fact no theorist will deny; and I think more valuable results will be obtained from a correct knowledge of just how they are, and an examination and study of the conditions and indications that denote their existence in unexplored localities, than any theory about how they came there, however scientific and interesting.

The Mining and Scientific Press is the only paper we look to now to bring our section of country into notice among mining men, and through your instrumentality, in the near future, this region will have as great a notoriety for its drift mines as it had last winter for snow during the blockade.

With this brief explanation, I will go on with my paper as originally written, considering, in due course, the hydraulic mines of Dutch Fiat and Gold Run, and the prospects of mining in an extensive unexplored and unprosecuted section of country.

There has been so much written about the " Citrus Belt of Northern California " that, for a change, I propose to write a chapter on the "Gold Belt of Northern California." This gold belt is on an average about 20 miles wide, extending from south to north, running through the counties of El Dorado,

Placer, Nevada and Sierra, in Townships Rings 10, 11 and 12 east, Mt. Diablo meridian. In some places it extends beyond the lines here indicated, on either side. In no portion of the world have as

Rich Gold Mines

Ever been discovered and worked, in as healthful a climate, with easy access and every facility at hand for working them. In the early days of mining, the richest ravine, canyon and river diggings were found within the limits of this gold belt. From numerous localities, from Hangtown to Downieville, on this belt, gold-dust was packed out by the mule-load.

From the character of the diggings and the thousands of. miners working them, it was apparent that a few years would exhaust this class of mines. In 1851-52 the miners began to realize the fact and feel the effects of the waning rich diggings.

The accidental discovery of gold on Georgia Hill, »t Yankee Jims, in the summer of 1851, marked

The Commencement of a New Era

In mining, and started a mining boom as big as the days of '49.

On a point high above Devil’s Canyon. on the south aide, near the trail leading from Yankee Jim's to Todd's Valley, a large tree una upturned by the roots, and exposed to view some fine gravel and decomposed bowlders. A company of experienced Georgia miners were at work in Devil's Canyon and had got big pay in the canyon, just below this gravel point on the hill. They prospected some dirt from about the roots of this tree, got a good prospect. located and worked the first hill diggings in Placer county. No claim of the kind and same extent in the State has produced more gold th4n this one on Georgia Hill.

When this company worked out their claim and left for the States, they loaded several mules with gold-dust, the proceeds of their work In Devil’s Canyon and on Georgia Hill. This discovery excited universal astonishment among the miners; heretofore the richest deposits were looked for in the deep gorges of the canyons and gulches.

Up to this time no particular theory had been advanced in regard to the source of the gold and method of deposit.

The great mystery and all absorbing topic of the day was to find out how tb^ gold got from Devil's Canyon up on Georgia Hilt. Some of the pioneer philosophers of the pick are always equal to any emergency, and they solved the problem in this instance to their own entire satisfaction. They pointed to the admitted fact that the same kind of gold was found on Georgia Hill that was in Devil’s Canyon, and that there was but one way by which it could possibly get from the canyon up on the hill, and that was it was "hove up." This " hove-up theory “prevailed for a short time. Every gravel deposit found on the bills bad been hove op there, according to their ideas.

The army of prospectors for hill diggings

soon developed the fact that

An Extensive Gravel Range

Extended northward along the western border of the gold belt. Rich strikes were made all along the line south and north. This gave rise to a new theory, the “cross channel." This class of theorists claim that the ancient river channels run across the country on a line with the extensive gravel deposits, and that the modern rivers cut them at right angles, A scientific writer of the times, following in the footprints of the practical miner as strikes and developments are made northward, thus expresses the ideas of this theory. Of Placer county he says: "It is traversed from south to north by one of the most extensive auriferous gravel leads in California. Commencing in the sooth at Todd's valley and extending northward through

Yankee Jim's, Wisconsin Hill, Iowa Hill, Indiana Hill and Gold Ran, from Gold Run the channel bears northeast to Dutch Flat; here it makes a short horseshoe curve and turns directly to the westward and enters Nevada county at Little York." There is a wide difference of opinion among the advocates of this theory. Que portion claim that the grade of the channels was originally from south to north, while in places where the bedrock has been reached and worked to, the present grades show this to be impossible. They tell ns the bedrock has been "hove up." The other portion contend that the channels ran from north to south. Both parties arguing from the same premises, point to the admitted fact that certain gravel deposits, channels, and the gold in them, are identical in Sierra, Nevada, Placer and El Dorado counties. A direct, imaginary connection is made between points 50 or 100 miles apart, over high, barren, bedrock ridges and deep canyons, where for miles there is not a vestige of gravel or a color of gold. This theory is but little better sustained by existing facts than the "hove-up" theory, although there are many good practical miners who still adhere to it.

This is an outline of the principal theories that prevailed in this section of country until the winter of 1852-53, when a company of miners working near the head of Jenny Lind canyon, south of Forest Hill, had their claim and tools covered up by a big slide from the bill caused by the heavy storms of that winter. After the storms let up, this company commenced washing off the slide to clear their claim of the debris and recover their tools, when, to their great surprise, they found this slide had uncovered a very rich lead of coarse gold and revealed its source. This accidental discovery turned the progressive miners' ideas into the right channel and added many millions to the stock of gold.

Tunnels Were Run In

Through the rimrock for miles above and below Forest Hill and all of them that were low enough struck rich gravel and established the fact that an extensive rich channel was buried deep beneath the lava-capped ridge. These developments originated what I shall term the progressive theory, which will now be considered. It is apparent that some great revolution of Nature has completely changed the condition of things from what they were at some remote period of time, and those extensive lava ridges point directly to the prime cause that produced this great change.

(To be Continued)

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The Gold Belt of Northern California, Ancient River Channels and Deposits, number II.

(Witten for tile Mining and Scientific Press by James F. Talbott, Shady Run, Placer Co.)

Mr. Amos Bowman, who was actively engaged in the geological survey of the State, and is scientific authority on the subject, wrote an article several years ago on the "Pliocene Rivera of California." He accounts for the changes from a scientific standpoint. He says: "The hundred transient volcanoes of the Sierra Nevada, associating themselves with things beyond. Aimed up for a period and marked the end of an epoch."

He divides the successive changes into corresponding periods of time:

1st. The Pliocene or ancient eroding period which continued uniform for many thousands of years, and the gravel making era followed in succession and lasted thousands of years more before the present canyons began.

2d. The Pliocene filling of the canyons and rivers with gravel, or the choking and damming period.

3d. The volcanic period of the Sierras, when the gravel was capped with lava.

4th, The cold or glacial period.

5th. The modern eroding period, when the present canyons were cut out.

In regard to the first period, it is evident those canyons were cut out and the gravel and gold deposited in them prior to the volcanic period. Geologists have established a period of time when those ancient rivers existed, and, as we may suppose, drained the western slope of the Sierras and deposited the gravel and gold in the same way as the present rivers, although on a much larger scale and from the primitive source.

It is a self evident fact that this period ended when a succeeding one commenced. Existing conditions and development of facts indicate beyond a doubt that the succeeding period was the volcanic, and that all the changes referred to by Mr. Bowman are accounted for during this one period, except “the cold or glacial period," which, with due deference, I ignore altogether. Facts will be adduced hereafter to establish conclusively the co-existence of the "Volcanic, the choking or damming, and the modern eroding periods" of Mr. Bowman.

The "Progressive Theory"

la based upon the views here expressed. In this connection, I will notice two conditions that have an important bearing on the modern erosions—grades, and a change of level. Geologists account for these changed conditions by uplift and subsidence. It must be evident that a change of level has taken place, or the present rivers and canyons could not be lower than the ancient ones. The geological ideas of the instability of the relations of land and sea may account for this change of level in this instance, by the uplift of the Coast Range, and concurrent subsidence of what is now the Sacramento and San Joaquin valleys, wherein the Pliocene gravels have sunk from 500 to 1000 feet.

Whatever the cause may have been, the fact remains. In regard to grades, in my opinion there has been no uplift of the Sierra Nevada that would perceptibly affect the grades of the Pliocene rivers within the gold belt since the gulden gravels were deposited in their channels.

Abstract theorizing on this subject is to the miner like a well-defined channel filled with nice-looking gravel and no gold in It. What most concerns the miners of the day are facts that point with a degree of certainty to the existence, extent and direction of those ancient river-channels, on which, in connection with quart?, mining in the future depends. To illustrate this progressive theory in detail, I will select all of the well-known section of country, within the gold belt, lying between the Middle Fork of the American river and the South Yuba river. This selection is made for a purpose; that is, the topography and developed facts show that there are two separate and independent ancient channels within these limits, and that there is no direct connection, at any point, between them, and that from each one of those channels a system of gravel deposits has been formed as separate and distinct as the channels themselves. The section of country between the Middle and North forks of American river contains one of those channels, and will be termed

The Middle Fork Divide

That portion between the North fork of American and South Yuba rivers. The others will be called the North Fork divide.

The country embraced la what is termed the Middle Fork divide is too widely known for its developments, workings and rich mines to require any notice now, but for comparison with the North Fork divide and for, the purpose of showing that all of the conditions, developments and facts are in perfect harmony in every detail with the theory here advanced. In making a practical application of this theory to the Middle Fork divide, the first inquiry will be, what conditions are observed that determine the existence, the extent and direction of an ancient channel in this divide?

It mil be noted here that the divide is separated into two prominent ridges by Shirt-tail canyon—Forest Hill ridge on the south and Iowa Hilt ridge on the north. Running up the divide, the two ridges come together above the brimstone planes, about south from Damascus.

The fact of the existence of an extensive and rich channel in the Forest Hill ridge is so well established by actual workings that I presume no miner has a doubt on the subject. The conditions observed here are a deposit of bowlders and gravel on the bottom containing the rich pay above this cement pipe clay, and in places thick stratas of small grave), with but little or DO tine gold in It; and over all, a heavy lava cap, from 100 to 500 feet thick, all enclosed within walls of bedrock. That these conditions are observed to exist along this divide for 26 miles or more is demonstrated to a certainty by deep shafts and long tunnels Inside the rim
rook from Spring Garden to near the Secret House, which determines the extent of this channel.

Where the bottom deposits are concealed within the bedrock walls, the lava cap Inside the rim Is the guide to determine the coarse, [lo this description the points of compass are not strictly observed.] On the south side of the divide, along the head branches of Secret Black and Eldorado canyons, and down the Middle Fork below Spring Garden is a high rim of bedrock, except at points where the present canyons and modern channels have cot it away.

It is obvious, from the character of much of the material at those points, that it could not have been deposited in the present form and condition, only inside of walls of bedrock.

On The North Side of the Divide.

Opposite the head of Secret Canyon, on the south branch of the north fork of American, is a high rim of bed-rook that extends along the river bluffs and Humbug canyon , down to Damascus. Leaving the Iowa Hill ridge out for the present, and passing to the southward, a short distance below Damascus, you come to the Brimstone Plains, a high bed-rock country that separates the two great ridges. Shirttail canyon, takes its source in this high bedrock country, and runs in high bedrock on a south-west course to its junction with the North Fork, below Yankee Jim's.

There are no gravel deposits on this side of the divide, A slight break id the rim at Damascus above, and where Brushy and Devil’s canyons cut through below, are the only outlets for gold from the bills on this side. Having traced the rim-rock on each side, without reference to the course from one point to another, it remains now to determine the course of the channel inside these rims, which is done approximately by following the course of the main lava flow or capping. It is an axiom that figures won't lie. In the N. E. Cor. of Town. 15N..R. 12 E., Mt, Diablo Mer., between the head of Secret canyon and the south branch of the North Fork of American river, is observed a heavy deposit or capping of lava at an altitude of 5400 feet, and about one mile wide from rim to rim. This main lava flow or capping can be traced on a continuous course within the line of rim-rook heretofore described through the Townships of 15 N., 11 E , UN., HE., 14N.,10E , where, near the center of the western line of 13 N., 10 E , below Spring Garden (altitude 2500 feet), the lava channel and everything has been carried away by the present Middle Fork. By looking over a map of this country it will be perceived that this is nearly a due southwest course from starting-point and near 3000 feet lower.

The Gray Eagle Co.'s shaft at Spring Garden, now 300 feet deep inside the bedrock walls; the deep workings of the Mayflower Co., the long tunnels through the rim at Damascus, Red Point and the G:>lden Fleece; the deep workings at the head of Black canyon; the Hazard on Volcano, and the long tunnels through the rim back into the rich gravel underlying the lava cap at Sunny South; the Breece & Wheeler claim at Bath, and the Dardanelles, with many others down to Todds valley, demonstrate to a certainty the existence and extent of the channel and the course of the main lava flow here indicated—

demonstrates with an equal degree of certainty the course of this channel through the gold belt on the Middle Fork Divide.

(To be Continued)

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The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits.

NUMBER III. (Witten for the Mining and Scientific Press by James F. Talbott, Shady Run, Placer Co.)

On the Middle Fork Divide.

In regard to the gravel deposits, I will follow up the line of illustration of this theory on the Middle Fork divide.

The invariable operation of natural laws throughout the universe most be admitted, and under the operation of those laws, causes that produce certain effects in one locality would, under like conditions, produce the same effects in other localities, however remote. This is as true in regard to all of those gravel deposits that have been formed since the commencement of the volcanic period aa in any other operation of nature.

The process by which those gravel deposits were formed was apparently very simple and natural, and commenced in the gold belt, after the Pliocene river channels were dammed up at some particular point, and continued to the end of the epoch. Where a dam is formed in a large river of sufficient strength and with material that will resist the pressure and force of the water above, it is obvious the accumulating waters must have an outlet.

To illustrate the principle, we will suppose an extensive volcano burst out at the head of the North Fork of American river; the lava would aa naturally flow down that liver as the water. In the course of time the lava would form a complete dam, from crest to crest, at Cape Horn. On the south, Indian and Shirt Tail canyons, and on the north, Bear river, heading high up on the ridges, would be free of lava. The bedrock country around this lava dam being less resistant would give way at some low sag on the south, toward Indian canyon.

Any person with a vivid imagination who has witnessed a cloudburst or an Immense reservoir break may have a remote miniature idea of the process and "catch on,"

Where this break is supposed to occur, there is a grade from the ridge to the bed of Indian canyon, of 1000 feet within a mile. As the break becomes deeper, the propelling force is increased and great masses of big bowlders and heavy material are carried down by the steep grade and deposited on the bottom where there is less grade, until the erosion above and filling in below equalizes the grade, so that the same quantity of water would carry nothing but the small gravel and light material, such as is found in the top strata of the existing gravel deposits.

Here then we would find a gravel deposit where Indian canyon was corresponding in every detail with the deposits seen in the hydraulic banks of to-day.

The illustration might be extended. While this modern channel followed the course of Indian canyon to the westward, a big slide might occur and change its course to the southward, where it would find a dumping ground in Shirt-Tail canyon and there form another gravel deposit. It will be observed here that this cutting out and gravel-depositing process is going on during the intervals between the lava flows, which are known to be at irregular periods. When a lava flow takes place after those gravel deposits are formed, the break in the rim that let this gravel out, being too small to carry the large quantity of lava, the result is, the gravel deposits are partially capped and the break completely blocked up. A

similar break might occur to the north toward Bear river, and under the same conditions would produce like results. It was by these methods that

The Modern Channels and Basins

Were cut out and filled up with bowlders and gravel. Only on this principle can we account for the numerous channels in the same locality running in opposite directions and gravel deposits many miles apart, having a common source.

In accordance with the foregoing views, then I assume that all of the gravel deposits between the North and Middle Forks of American river, within the gold belt, comprise one independent system and have one common source from the ancient river channel in the Middle Fork divide. It would not accord with the natural order of things for two or more Pliocene or ancient rivers to run unobstructed in close proximity in a mountain region like this. I conclude, then, that there was but one ancient river and its tributaries ran in this divide at the commencement of the volcanic period, and that its obstruction and entire obliteration can be traced directly to the lava flow as the prime cause daring that period.

Taking a Practical View

Of the whole subject, aside from geological theory, it must be obvious that the entire slope from the summit of the Sierras to the sea, and from the lava beds in the North, several hundred miles to the South, was involved in the great revolution by which a whole grand river system was obliterated and a new one established.

From the standpoint on some high lava ridge in the gold belt, the various existing conditions are accounted for.

The indications are that the volcanic period was ushered in by some great convulsion that gave existence to the coast line range of mountains, and sunk the intervening region between this range of mountains and the Sierra Nevada a thousand feet below sea level. To account for the various conditions observed throughout a large extent of Central and Northern California, in regard to this subject, the country between the coast line of mountains and the summit of the Sierras may be

Divided Into Five Sections.

Each one distinguished by conditions as peculiar and marked as if separated by a mountain range, but still holding inseparable relations with each other with reference to the final result.

1«t. This section includes what is now the Bay of San Francisco, the Sacramento and San Joaquin valleys.

2d. The lower foothill country, extending from the valley to an altitude of about 1500 feet ("the citrus belt").

3d. The upper foothill country; this section includes the country between the "citrus" and gold belts.

4:h. The gold belt.

5th. The mountain section extends from the gold belt to the summit of the Sierras,

In regard to the first section, it must be obvious that the sinking or subsistence here accounts for the change of level, and from the immense deposits of gravel—from 500 to 1000 feet deep—in these valleys below sea level, we conclude here is the center of the great depression, toward which the subsequent erosions converge.

This change of level effects a two-fold purpose, in giving the opportunity for erosion in the higher section, and forming a vast dump for the material brought down.

Whether these gravel deposits were brought down by the ancient or modern system, or not, is immaterial. The indications are that the lower foothill country was not materially affected, except by having the lower portion submerged by the accumulating waters in the landlocked section below.

These ancient rivers had been dumping their golden gravels along this lower foothill section much in the same way that tailings are dumped from the flume of a hydraulic claims, filling up deprecations, blocking up in one place and cutting nut in another, thousands of years before the Volcanic period was ushered in. It appears the flow from the first eruptions consisted, principally, of mud and slickens (similar to the material emitted from a volcano recently, in Japan). Immense quantiles were emitted before the lava began to flow to any great amount, filling op the ancient channels in the gold belt, in some places a mile wide and 200 feet deep, and following those channels down to their dumps in the lower section, miles in extent, to a considerable depth, was deposited in the valleys. In the gold belt this material generally overlies the bottom pay deposit in the ancient channels, and by most miners is called "mountain cement," In the valleys the same material from the same source is termed "hardpan."

It is evident that at some period of time the water covered the lower foothill section to an altitude of 400 to 500 feet above the present sea level.

That the Stationary Sea

Ever attained an altitude of 50O feet along this foothill section is improbable; and this condition is accounted for in a more natural and reason able way. By the uplift of the Coast Range from 500 to 1000 feet above the sea in a continuous, unbroken line, all communication between the sea and this inland depression was cut off. Coder these conditions, it must be obvious that the drainage-waters and detritus, from 300 miles in extent on the west slope of the Sierras, would in time form a great landlocked sea, whose waters would rise along the foothill section until they reached some low sag in the Coast Range. and there cut an outlet down to sea level. We can see to-day where this low sag was. Toe changed conditions here are more remarkable, if possible, than in the gold-belt section. The erosion at this sag has given us the world-renowned Golden Gate through which the largest ships afloat can securely pass into the largest and finest harbor in the world.

The transformation was not complete till the waters of this great inland sea had subsided, through this outlet, to sea level, and left us two majestic rivers—one from the north, the other from the south—the Sacramento and San Joaquim, with their extensive valleys, containing thousands of acres of the richest lands the sun shines upon, made from the detritus and slickens from the high mountain sections. If this theory is correct, the point of elevation where this outlet commenced cutting away at the Golden Gate will determine the high-water line along the lower foothill section and account for the extensive subaqueous gravel deposits observed in the valley section.

The Changed Conditions

Have been outlined and accounted for in the valley section. Its important relation to the other sections is apparent when we consider the vast dump formed for their outlets and the vantage given for modern erosion. As before stated, the Indications are in the early stages of the volcanic period the flow consisted chiefly of mud and ashes which only filled np and widened out the ancient channels in placers; then afterward the lava and heavy material was carried down at interval', and where the conditions were favorable formed permanent dams, blocked up the rivers and diverted the water into some lateral depression or tributary unaffected by the lava, and by this method, from the change of level, commenced the modern erosion.

(To be Continued)

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The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits.

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A short distance above is Prospect Cut (so named from the men working in the cut in grading the road, prospecting the gravel on their shovels and finding colors of gold). The view of the deposit in this cut, from the cars, is now obstructed by the snowshed over the track.

The lower end of the cut is in bedrock, which rises 100 feet above the railroad in a short distance to the south. The deposit consists of seven distinct layers deposited with great regularity in horizontal strata, each one of which is composed of different materials, with lines of connection as definitely marked as if made with a painter's brush in different colors, all forming the bank on the north side of the cut, 100 feet above the track.

About midday the cut is seen the first or bottorn a ratuo on the bedrock, level with the track, composed of a solid light blue clay 15 feet thick, with many large volcanic bowlders imbedded in it. The next stratum above is a lava wash forming a kind of cement of rotten cobbles and bowlders about 20 feet thick. The deposit above this is a granite wash—and, gravel, cobbles and bowlders, 20 feet thick. Some of the granite bowlders in this stratum are from five to ten feet in diameter.

This is suggestive of the time when this ancient channel was filling up from the granite country beyond Bear valley, for it is a well known fact that there is not a foot of granite bedrock in place within 15 or 20 miles in any direction from this point.

On top of this granite wash is a deposit of a reddish-yellow clay, 15 feet thick, without^ gravel or bowlder in it. Above this is a thin layer of white pipeclay. The next stratum is a mixture of coarse gray sand and light-colored clay ten feet thick. On top of this comes the main lava capping that cape the climax. The margin of the lava has been graded off back to the depth of 20 or 30 feet. The character of the deposits Inside the rimrock, aa seen in the railroad cuts here described, is proof positive of the existence of a deep and extensive ancient channel in this ridge; and the method of deposit indicates in terms as positive the co-existence of the volcanic, the damming or blocking up and the eroding periods—alternating lava flows and floods. Here is seen the volcanic mud flow that forma the cement, a lava deposit on top of it. Then the water-worn gravel and bowlders, brought down by the succeeding flood and deposited on top of the lava. Then comes a commingled rush of lava flood that completely blocked up the channel below Prospect Cut.

The indications are that the lava ceased to flow for a time, and during this interval the floods got in their work, the result of which is Been in the deposits at Prospect Cut, and the numerous steep gulches, some of which have cut back inside the rimrock and carried away a portion of the deposits, leaving almost perpendicular cliffs of cement and lava. These and the deep gorge through which Blue Canyon now runs, are the unmistakable evidences of the modern erosions in action at the same time.

From Prospect Cut the railroad runs through bedrock cuts to within about a mile below the station of Blue Canyon, where it strikes into the lava, through a bluff point of which it runs in u tunnel about 500 feet in length. There are but few indications along here that would attract the notice of a superficial observer. Some quartz gravel and bowlders with a light sprinkle oi gold, have been shoved over the rim, a little below the railroad track at China Ranch. A short distance above, where the railroad crosses the Cedar creek ditch, the cement is seen to crop out at the last point on this aide the ridge.

This is a significant fact in support of the theory here advanced, when considered in connection with the surrounding conditions.

Here the Lava Flow

That is seen to cap the cement all along this ridge for miles below this point, crosses through to the North or Bear river aide of the ridge. In exactly the same way, and through corresponding sections, three

townships or about 20 miles to the south, the lava flow above Michigan Bluff crosses through the Forest Hill ridge to Damascus.

From the town of Blue Canyon the railroad curves around and cuts through high barren bedrock points, all the way to Emigrant Gap, where it leaves the gold belt of this section and climbs the steep and rugged mountains of bedrock and lava, to bring to view the wonders beyond.

To the south and intervening between this point where the lava crosses through the Shady Run ridge and Damascus, are Bine Canyon, the north and south branches of the North Fork, three deep canyons and two high barren bedrock ridges, and not a vestige of lava is seen between the two points. This fact alone precludes the possibility of any ancient channel crossing from this ridge to Damascus, as a great many mining experts have heretofore theorized. Before commencing a description of the north, or Canyon creek side of the ridge, I will briefly notice that portion of the channel that extends from the Hogsbacks, where the C. P. R. R. crosses through the ridge to Bogus Point (so named from a few rich spots, but no regular pay being found). This portion of the channel is about three miles in length, confined in a narrow gorge known as Moody ridge, between Canyon creek and the North Fork. A heavy lava cap covers the gravel and bowlder deposit as shown at Bogus Point, where the channel gravel and lava have all been carried away by the present North Fork, similar to the channel of the Forest Hill ridge by the Middle Fork, below Spring Garden, as no traces of lava are found below this point. The high bluff of bedrock to the north of Giant's Gap, forms the south rim of the channel. On the Canyon creek side the rim rock extends well up to the top of the ridge in places, showing a lava deposit, at the widest point, about a mile in width and 500 or 600 feet in depth, inside the bedrock walls. Tracing the rim rock up on the south side of Canyon creek, we find just before reaching the Hogsback a narrow break from the ridge that lets out some of the gravel which formed a small deposit about Alta. A short distance above this break the bedrock rises above the C, P. R. R.. as seen where it crosses the Canyon creek at Towles.

Following the same method, from the same motives adopted on the other side of the ridge, though not quite so comfortable, but with better opportunity for observation, we will put some dry goods boxes for seats on a flat car, take aboard the commission of geologists and mining experts to examine the north, or Canyon creek and Bear river, side of the Shady Run ridge, along Towle's narrow-gauge road. You will observe before we start that the track is on solid bedrock about 30 feet above the 0, P, track, and a glance to the westward will show you that a spur of the same rises 100 feet above the track and extends half-way down to Alta. All aboard, off breaks, and we follow this spur of bedrock up on the

North Side of Canyon Creek,

About a mile, where it dips under a deposit of cement at Dimaguard's old sawmill. Some small patches of nice-looking, fine gravel show along here. This body of cement undoubtedly extends through the ridge to Shady Run. as it is near the same level and capped with 500 or 600 feet of lava, as seen from this point on the south side of Canyon creek. The distance through is just a mile, or across one section. The indications are that at this point is an extensive break in the rim to the west, the outlet from which formed the gravel deposit of the Alta mine. This outlet unites with the one from the Hogsback, somewhere about Alta. And takes *a northwest course toward Little Bear river, and formed the deposit at Nary Red. From this break-up to Towle's old Alabama mill, about a mile, the upper rim appears to have been carried away a little below the level of Canyon creek and considerable gravel carried over it and deposited about the head of Little Bear river. It is observed here that a spur of bedrock runs up between Little and the main Bear rivers. At the Alabama mill a deep and extensive break has occurred. A heavy body of cement is seen, capped with a spur of lava that has been cut off from the main ridge by Canyon creek. The outlet of this break extends in a northwest course to the main Bear river above the spur of bedrock referred to. On the

south side of Bear river, on the line of the Gold Run branch of the South Yuba ditch, is seen a wall of cement and lava 200 feet high, Only a short distance from this point, above and below, the ditch runs in bedrock. The biggest pay ever found on Bear river was at Buffalo Slide, in the vicinity of this outlet.

A Short Distance Above

The Alabama mill, we come to where the Cedar creek ditch dumps the water into Canyon creek from the tunnel through the ridge just below Prospect Cut. Here we are about on a level with, and not more than half a mile from, the C, P. K R., and a solid lava ridge 300 or 400 feet high is all that intervenes between the two roads. From this point, Towle's road runs to the northward some distance up Canyon creek, then ascends the bedrock ridge between Canyon creek and Bear river, crosses the summit and descends, in its serpentine course, over deep gulches and through abrupt bedrock spurs, to Bear River mill. From the mill, it climbs the steep, rough mountain of bedrock that forms the south rim of the channel in the Nevada ridge, north of Bear river. From where Towle's road descends the north side of the ridge between Canyon creek and Bear river, you will follow the Gold Run branch of the South Yuba ditch, or Culbertson's wagon road which is several hundred feet above the ditch, to get a correct idea of the high bedrock country lying between the Shady Run ridge and Bear river. For five or six miles along here there is not a trace of channel gravel or lava north of Canyon creek. The first appearance of any gravel or lava above is about the head of Dry creek. Some fine-looking gravel is seen on the South Yuba ditch and in some of the ravines. Here is a very

Extensive Break In the Rim

To the west—the last break on this side of the ridge—the outlet of which is into Bear river, about the old emigrant crossing. Many rich spots-of pay, in coarse gold, have been found below, in the old channels of Bear river, some 20 or 30 feet below the present bed of the river. No pay has ever been found in the river above emigrant creasing. About the head of Dry creek, in one ravine, some pay was got, nuggets worth from $5 to $10 being found. A tunnel baa been run here 500 or 600 feet, in a southeast course toward the lava ridge. The deposit on the bedrock is principally quartz gravel and small-sized bowlders intermixed with small pieces of float slate bedrock, indicating beyond a doubt a deposit from a break, from the channel in the ridge, through the rimrock. From Dry creek, the Yuba ditch runs in bedrock to Bear valley—distance about three miles—and the Culbertson road, high above the ditch, rune on bedrock also. Scarcely a color of gold can be found in any gulch or ravine between Dry creek and bear valley. It is from about the head of Dry creek where the channel runs through to the south side of the ridge^ where it appears below Blue Canyon.

The Present Bear River

For several miles along here appears to have been cut out through a high barren bedrock country, lying between, or, that formed west rim of the Shady Run and Nevada Ridge channels. The bedrock rises abruptly from the river on either side. Oa the south, above Dry creek, it rises several hundred feet above the Culbertson road, and extends up to the lower end of bear valley, where it dips to the east under a bed of lava, aa seen on the south side of the valley.

On the north side of the river, just above Liberty Hill, the bedrock runs to the top of the ridge about on a level with the lava capping and extends unbroken (except one point where there is a break in the rim that formed a small gravel deposit known as Kinders diggins) np to the lower end of Bear valley, where it dips —as on the south side—to the east under the wall of lava 800 feet high. This is seen just back of Jim Davies' house, on the north side of the valley. Near the lower end of the valley will be observed a reef of bedrock extending across from hill to hill. Going up the valley about half a mile one can see the decaying remains of a prospect plant. Here, 25 or 30 years ago, a company spent $10,000 to

get down 80 feet into a bed of bowlders, for a little fine gold. Bedrock was not reached. Going up to the valley about half a mile farther you come to Jim Divies'. If you are dry you can get a glass of clear, cold water, that comes from 100 feet beneath the surface, out of the well in front of his house. No bedrock found here. I was told by Mr. Tompkins, who formerly owned the place and sunk this well, that the material passed through in sinking is a dark sandy loam, and from a few feet below the surface could be easily removed with a shovel. The most remarkable thing is the entire absence of any gravel or bowlders. A short distance above this well, you can see a few bedrock reefs crop out above the surface, running across the valley. Further up and to the east you will see spurs projecting out from either aide, and rising from 50 to 100 feet above the valley. From those spurs to the east, the bedrock rises gradually for some distance, then ascends abruptly to the top of the hill, where it can be traced from Emigrant Gap, along the C. P. R. R. and north to and far beyond the South Yuba river 1000 feet above Bear valley and east of any gravel mines in this portion of the gold belt, Having traced

The Rimrock of the Channel

In the Shady Run Ridge, from Bogus Point to Bear valley, shown its extent and given the facts in regard to the conditions observed, I will now give the figures that define its course. Following the main lava flow inside the rimrock walls we see on the south side of Bear valley, in the southeast corner of Township 17 North, Range 11 East, altitude 4400 feet, a deposit of lava from 800 to 1000 feet high, above the level of the valley. This lava capping or flow enters from this point into the northeast corner of Township 16 North, Range 11 East, crosses diagonally through and oat at the southwest corner, where it enters the northeast corner of Township 15 North, Range 10 East, about where the C. P. R R. cuts through the ridge at Hogsback. From this point the flow continues the same course to Bogus Point, about the center of the last named township, altitude about 3000 feet. Where the lava channel and everything was carried away by the present North Fork, this lava flow can be definitely traced all the way from Bear valley to Bogus Point, within the lateral limits of every section through which it passes. There are but few places on the ridge where it is more than a mile in width, Several lateral spurs project from the main flow toward Bear river and Canyon creek, but the main flow is continuous in the course above stated, except a gap where the C. P. R. R. outs through the ridge, there all of the lava and a portion of the cement has been carried away, on the south towards Green valley, on the north towards Alta. The conditions observed at Bear valley require more than a passing notice on account of the connection of the two ridges. The term "Divide," as used in this article, includes the country drained by one of the ancient rivers and tributaries, and the gravel deposits connected with them, independent of any other one. It will be perceived then, that the North Fork Divide is formed by the two main ridges unifying at Bear valley, there being no indication of any channel east of this point. The high bedrock country to the east and at the upper end of the valley, to the north, and the bedrock gorge through which Bear river now runs, to the west, has puzzled the moat intelligent and practical mining experts of the Nevada Ridge. There appears to be a missing link here that the gold-hunter, with his magic dowsing-rod and hazel crotch, has failed to discover. About midway in Bear valley no bedrock has been found at the depth of 100 feet. At this point, about half a mile apart, rises on either side of the valley a wall of lava, 800 feet high. Evidence is abundant on every hand of some mighty flood that cut the gap through this bed of lava. It is evident no great amount of flood waters could accumulate from the drainage slope of the present Bear river, aa it heads to the east in the gulches and ravines in the immediate vicinity, almost within rifle shot of the valley, at a standpoint where the south Yuba flame emerges from a gorge into the northeast portion of the valley. Looking to the northeast you can see coming toward you, on a direct line with the main Bear valley, the Barging waters of the South Yuba river, roaring through the narrow gorges, with perpendicular and overhanging walls of solid granite

hundreds of feet high. Leaping over and plunging around massive granite bowlders, the river comes down opposite, and but 200 or 300 feet beneath your feet, and here makes an abrupt bend to the northward and runs for miles in a gorge cut down 2000 feet in the solid bedrock. From all of the surroundings, it is obvious those floods were from the watershed, and that at no very remote period of time the waters of the South Yuba flowed down the channels in the Shady Run and Nevada Ridges.

(To be Continued)

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The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits.
NUMBER VII.
[Written for the Mining and Scientific Press by James F. Talbott, Blue Canyon, Placer Co.]

The North Fork divide system of gravel deposits in the gold belt extends from the South Yuba on the north to the North 'Fork of the American on the south, are formed by the same method as those on the Middle Fork divide, and like them, have a common source.

Owing to the peculiar topography and formation of the Nevada ridge, some of the gravel deposits from north to south, are many miles apart. The channel down this ridge, operating as a vast natural ground sluice, has dumped its tailings at the lower end about Nevada City and Grass Valley, and like a modern ground sluice when blocked up in one place, the tailings find an outlet at some other point, and thus all of the deposits on the ridge were formed.

On the north side of the South Yuba, some distance below Omega, is an extensive gravel deposit at Relief Hill, which belongs to the Moore's Flat and North Bloomfield system, and is not connected with this. It has been definitely shown heretofore, that the channel in the Shady Hun ridge extends from Bogus Point to Bear Valley, and from Bear Valley through the ridge to Diamond creek is but little more than two miles, thus showing the connection of the two channels about this point, and as a consequence, the common source of the gravel in the two ridges, and if the source of the gravel, it must be of the gold found in it.

The minute description of the Shady Run ridge was, first to show the source of the gold in the Dutch Flat and Gold Run mines, and secondly to show the certainty of rich drift mines in the ridge, under the lava cap, the direct source from which all of the gold in this basin came.

Gravel Deposits.

There are but few gravel deposits from the Shady Ran ridge, probably owing to the narrow and confined channel, which was rapidly filled. The principal deposit on the west is that at Dutch Flat and Gold Run, which is very extensive, commencing at Indiana Hill on the south, extending north and east about six miles to the upper or east end of the town of Dutch Flat, where it is cut off by Bear river, but ap pears to have been continuous up Bear river three or four miles farther, and at some time connected with Elmore, Liberty and Lowell Hills. The main deposit of Gold Run and Dutch Flat is an irregular basin, surrounded on all sides by high bedrock, except on the northeast at the inlet up Bear river, an outlet at Thompson's Hill on the west into Bear river, and an outlet at Indiana Hill on the south into the North Fork, The method by which this basin was formed, and subsequently filled up, is accounted for in the following way, that a small lateral tributary, unobstructed with lava, formed a junction with the main ancient river below Bogus Point, about Indiana Hill, and that the lava flow in the ridge at Bogus Point then extended down to or below this junction, thereby forming a complete dam at this outlet, which held back all of the detritus and material brought down by the floods from above.

The source of this tributary being in the section of country above Dutch Flat, when those breaks occurred at the Hogsback, on Canyon creek and Bear river, the flood waters from them followed the course of this tributary.

A Flood.

The gravel and detritus brought down from those breaks and the periodical floods in time filled this basin in places to a depth of 300 feet. The indications are, that about the time the country was all filled up with this deposit from Indiana Hill to Dutch Flat, an extreme high flood occurred, probably caused by one of those extensive breaks from the ridge above. This flood, coming down with a great rush, broke through on the south at Indiana Hill, swept the lava and main channel away as far up as Bogus Point, and cut out Canyon creek between the gravel deposit and the lava-capped ridge, leaving everything on this side about as we see it to-day; while on the other side to the north, these flood-waters broke through the west rim and cut down an outlet at Thompson Hill, which left the condition of the Dutch Flat portion more of a channel than a basin. From Indiana Hill to the Dutch Flat mines, nearly three miles, the grade of the bedrock rises about 40 feet per mile. From the curve at Dutch Flat to the east the grade is more than 200 feet to the mile. These figures are obtained from actual workings and survey At Indiana Hill the outlet channel is not more than 50 feet wide, with steep-rising bedrock on either aide several hundred feet high. From this point going north, the deposit gradually widens till it attains a width of a mile or more, where the C. P. R. R. crosses it. This is the Gold Run portion. The Dutch Flat portion baa an average width of about half a mile. At Indiana Hill the deposit is small gravel, cobble, and here and there a good-sized quartz bowlder on the bedrock. Going north, in the Gold Run portion, the fine gravel on top attains a depth of from 100 to 200 feet, interspersed in places with strata of sand and pipe-clay. Continuing on into the Dutch Flat portion, the fine top deposit decreases in depth, till at the upper or east end of the town on the south rim it is only a few feet deep on top of the underlying mass of bowlders. In the Dutch Flat portion the bottom deposit increases as the top decreases, in depth, till the bottom to the depth of from 100 to 200 feet, is such a mass and jam of bowlders there Is but little space for the fine gravel.

The Dutch Flat Deposit.

As heretofore stated, the north and east part of the Dutch Flat portion of the deposit, at the present time, has more the appearance of a channel than a basin, as is indicated by the high rim on the south and a continuous rim on the north, from the outlet on the west, along up Bear river to where the deposit is out off by the course of the present river. For ages the flood waters ran through this channel and outlet to the west, until a heavy slide, or vast rush came down and blocked up the narrow inlet, and turned Bear river into its present channel outside the gravel deposit. Positive evidences of this slide, or rush, are seen from the Polar Star and Southern Cross claims, all the way above, which show this inlet was suddenly blocked up, where masses of float bedrock, huge, angular bowlders, chunks of lava and all kinds of debris are jammed together in a confused mass, but slightly washed or rounded by the action of water. It is possible that when the lava dam at Bear valley was carried away, the vast flood which followed, and out the gorge for Bear river above—covered up the old channel below Dry creek, with 40 feet of debris, and swept away the gravel deposit that once connected Liberty and Elmore bills with Dutch Flat, blocked up this inlet and gave direction here to Bear river in its present channel. From the line of facts here presented, it is obvious this great gravel deposit baa come from the channel in the Shady Run ridge, through the breaks indicated. In connection with that from the Nevada ridge through the break at Lowell hill. And what has heretofore been considered the hub of all the mines in this section of the gold belt, is but an immense dumping ground (as are all of the extensive gravel deposits of this character) for the debris and tailings of the vast natural ground sluices which head in the ancient channels beneath the lava-capped ridges.

In the absence of any data on the subject, some views expressed in accounting for certain existing conditions, may seem somewhat speculative. Bat whether correct or not, the conditions and facts remain all the same, and must be accounted for in accord with the operation of universal natural laws. There is no mystery about it.

The Hydraulic Mines.

The hydraulic mines of Gold Run and Dutch Plat are among the leading ones of this class in the State in richness and extent. Many millions of gold have been taken out of these mines, and millions remain burled in the bottom deposit that should be taken out and put in circulation. From the character of material and method of deposit, those mines can be worked now in no way but by the hydraulic process, with the improved appliances and giant powder. Many of the miners thought good drift mines could be opened out, after the hydraulic raining was stopped. A great deal of prospecting has been done, with no satisfactory results. After getting back a certain distance, it is found the gold is commingled all through the deposit, and not concentrated on the bottom any place as it was on the outside at some points. In early days of mining here, the idea prevailed that a rich channel ran through from Indiana Hill to Thompson Hill at Dutch Fiat. In the spring of 1852, I discovered Indiana Rill ('.be first diggings struck between the North Folk and Bear river). My company worked the outlet channel from the break-off, about 400 feet back, where the gold was largely concentrated. In the season of 1853-54, having water about Ave months, with six men we took out $25,000 by the old process of ground sluice, pick and shovel. While, the same season, the company adjoining us back in the hill, working the same way, barely made wages above their water bill (water sold for $1 per inch).

Shortly after the discovery at Indiana Hill the strike was made at Thompson Hill, which originated the idea that a rich channel ran from Indiana Hill north to Dutch Flat and Little York. The outlet channel at Thompson Hill proved to be about the same as that at Indiana Hill, except in the former there was a heavy deposit of big bowlders, and the rich pay extended farther back into the deposit. Subsequent workings show that there is no such channel. If there were, several hundred miners would be working on it to-day in the richest drift mines in the State. It is evident, then, that this is exclusively hydraulic ground and can be worked In no other way,

Equalizing: Grades-

Let any commission examine the conditions here, and from the character of the materials and the forces by which it must have been deposited, it will be apparent what a vast quantity of debris can be held back by some permanent obstruction. The conditions indicate that, In the first stages of the deposit, the high floods that swept over the steep grade in the Dutch Flat portion did not carry the bowlders and heavy bottom material as far as Indiana Hill, a distance of five miles. Then each succeeding flood built up and widened the deposit, thereby lessening the grade so that the same flood force would not carry the heavy material as far as the preceding one, the lighter material being carried ahead and deposited on the top. By this method, the grade has become equalized and the deposit leveled up, the heavy bottom material increasing and the lighter top decreasing ID depth aa the bead or source is approached. A large percentage of this fine top gravel deposit appears to be of modern make, probably having its source from the big slides that occurred during the modern erosions, which are not likely to occur. It will b« particularly observed here that nearly all of this 6ae gravel and light material on top has been washed off in former years with the old hydraulic appliances, that would be useless now on the bottom deposit of bowlders and bard, heavy material, which can be easily worked by the Improved method..

By adapting the principles involved in the natural method of deposit, as observed here, a location could be selected on the North Fork, where a permanent dam could be constructed that would retain every

foot of the heavy bot torn material of this extensive deposit, within the limits of ten miles from the dump; and all the lighter material passing the dam would affect the navigable streams but little, If any more than the natural wash from the plowed lands on the big ranches in a high flood season.

Protecting the Miner.

There is a great deal of talk about protection. If there is anything in this country that needs protection It is the great mining industry. Not protection from foreign pauper labor bat from the Government itself. The present policy adopted by It is a monstrous wrong to an industrious class of its citizens. By a decree of its courts, they are deprived of the right to use their own rightfully acquired property. And if extended to the extreme limit, the principles laid down as a precedent by the courts to be followed for centuries regardless of changed conditions. If one class can be restrained, others can be where the results differ only in degree.

The drift and quartz miners loosen the material

hundreds of feet beneath the surface, and the rancher loosens it on the surface, and it is all carried Into the rivers alike. What is the difference whether the material is loosened with the pick or the plow? The Government infringes on right and justice by appropriating the public money to be need against a legitimate industry, and by its hirelings lo hunting down as outlaws and moonshiners a law-abiding class of its citizens. It has reversed the great republican principle upon which it was established—"the greatest good to the greatest number." It used to be the almighty silver dollar, now it is the supreme $20 gold piece that moves the world. Gold is an actual necessary of life to the State, the nation and the mercantile world. Here then are millions directly interested, besides those engaged in its production, on the one side, who are to be deprived of this necessary of life, an that a few individuals in a comparatively small locality on the other side may enjoy the privilege of raising a few tons of wheat and potatoes.

To think this great mining industry has no protection—no recognized rights in our statute; an industry that sent out its product in hundreds of millions of gold, which sustained the credit and possibly preserved a united government. The Government should aid and protect the industry that laid the foundation and built up a prosperous State, that shines a bright, golden star in the firmament of her sister States,

The Great Blue Lead.

The “Great Blue Lead," according to all the writers and talkers. Is found in most all of the mines as a separate and distinct lead or deposit and wherever found la Invariably rich. None of them, so far as we know, have attempted to give any idea in regard to its source or account for its reputed exclusive richness. Running north and south through Nevada and Placer counties about on the course of the bedrock, near the township line between township Ranges 10 and II East, and just above most of the extensive gravel deposits along here, is an extensive belt of serpentine formation from one to three miles in width. On the Middle Fork divide, the Brimstone plains is a prominent point on this formation.

As a natural result this formation gives character to the deposit below. We accordingly find this peculiar deposit of bine gravel In all of the deposits below, or to the west of the Serpentine, whereas It is not found above or east of it which is also corroborative proof of the course of the ancient channels.

In the locality of Gold Run and Dutch Flat, Just below the western border of the Serpentine, is an extensive body of this blue cemented gravel, which has been worked on and opened nut, so that It can be traced continuously from Indiana hill to the upper end of the Dutch Flat portion of the deposit. The blue gravel here, as in all other localities in proximity to the Serpentine, forms the bottom strata on the bedrock, and the extent depends on the forces operating and the length of time continued, just the, same as in all other deposits.

(To be Continued.)

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The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits.

NUMBER VIII,

[Written for the Mining and Scientific Press by James P. Talbott, Blue Canyon, Placer Co.]

There was no trace of blue gravel in our claim at Indiana Hill in the outlet channel, but on going back into the hill several hundred feet it set in, first in small patches of fine gravel, then a thin stratum of the same, a few inches thick, covering the bedrock and filling up the crevices. This gradually increases in thickness as you go back, till the whole basin is filled to a depth of from 50 to 100 feet, the bottom generally being the hardest kind of blue cement, probably formed by a combination of minerals derived from the serpentine. The top is very compact, but not cemented; it has the same peculiar blue color, but appears to be wanting in the mineral substances that form the hard cement of the bottom. As the Dutch Flat portion is approached, the bowlders and coarser material take the place of the finer gravel. When the Polar Star claim is reached, we find a mass of rough angular serpentine bowlders intermixed with gravel-quartz bowlders and all kinds of material I found in this section of country, the whole mass being tinged with that peculiar blue.

Deposits Above the Serpentine.

In the channels and gravel deposits above the serpentine, at Sunny South, Damascus, Rad Point, on the Middle Fork Divide, and Shady Run, Lost Camo. Omega and Diamond Creek on the North Fork Divide (Michigan Bluff on the former and Lowell Hill on the latter, right on the eastern border, might be included), none of this peculiar blue cemented gravel has ever been found. It must be obvious from these facts that the world-renowned “Great Blue Lead" originates in and from the great Serpentine belt formation. The conditions observed here in regard to this "blue lead" will apply to any other locality all the same. As the general character of all deposits is about the same, differing only in detail from some local influences. The general belief in the universal richness of "the blue lead" has no more foundation in fact than it is a distinct deposit. Many an old miner at this late day thinks if he can “strike blue gravel and the bedrock pitching," he has a “bonanza." We have seen hundreds of tons of this blue gravel with scarcely a color of gold in it. Where, by the action of water, the gold is concentrated In the blue gravel, it is rich, and not otherwise, just the same as any other colored gravel; hence the conclusion is that the existence of a distinct deposit, known as the “big blue lead" is a myth, and the idea of its universal richness a great mistake.

With reference to the theory here advanced, the main ideas to be kept in view are, that there is but one ancient channel and tributaries within a certain defined locality, and, like the present rivers, is independent and separate from any other. Within those bounds all of the gold found in the present rivers, canyons, modern channel and gravel deposits has come directly from the ancient channel in that certain locality, except that which during the floods and flows was broken from quartz ledges and ground to fine dust, and that which was melted into nuggets by the molten lava, as a considerable amount of It has been, we believe. The main flow of lava through that locality indicates approximately the course of the ancient channel.

First Lava Flow.

The first flow of lava into the ancient river system ended the old and commenced the new. The great changes first observed in the order of the new, are the cutting out of the modern channels and forming the gravel deposits from them in the early stages, of which they are supposed to be in a position

midway between the ancient and the present rivers. Subsequently the displaced waters from the ancient rivers have out the present ones down from a level with the gravel deposits to their present bed, several hundred feet below. The process of filling up and cutting out here commenced and continued till the change was complete, a description of which has heretofore been given. In the practical application of this theory, it is found to be in perfect harmony with all of the conditions and natural methods. The most important consideration in regard to any channel or gravel deposit is the conditions for pay.

With reference to the ancient channels, which contained all of the original deposits of gold, there can be no doubt about the pay, as is shown wherever they have been penetrated.

Modern Channels and Deposits,

There are many modern channels and gravel deposits that are rich and have big pay in them, and many others with comparatively nothing of value in them. It is obvious if all of the conditions were the same, all deposits would be alike. In all of those rich channels and deposits that have been developed the conditions are apparently well defined, and in those only developed on the surface they are supposed to be the same, and the natural methods of formation and results may be illustrated by the process in a hydraulic mine. First, a cut or opening is made through the outside rim back into the pay deposit; a proper grade is given to retain the gold; a good dump or outlet is important to prevent the tailings from blocking up the work, and with all of these, a long run is essential for a big cleanup. It is observed here that any break or outlet from the ancient channels subsequent to the period when they commenced filling up, is termed a modern channel. A break or opening deep enough to let out a portion of the gold from the original deposit, the right grade to retain it, a free outlet and a period of long duration are the favorable conditions for forming rich modern channels and deposits from them. In some localities these channels may run directly from their source to the outlet into the present rivers, which is probably the case at Michigan Bluff, Bath and other points on the Forest Hill ridge. In other localities a number of those breaks may unite in a common channel and form an extensive deposit, as at Dutch Flat and Gold Run. The extensive deposit at Todd's valley is probably of this character. These latter are more in the form of basins than channels. That the most of those channels and deposits were formed under the favorable conditions, on the southern slope of the Forest Hill ridge, it is only necessary to mention the fact that from many single claims on them, of comparatively small area, from $50,000 to $1,000,000 in gold has been taken out. On the opposite side of the ridge are the deposits at Yankee Jim's and Brushy canyon from breaks to the west. There are no breaks through the high rim on the north towards Shirt-tail canyon, consequently there are no deposits on that side. The deposits at Yankee Jim's and Brushy canyon, but a short distance apart, present a remarkable contrast in regard to richness, and show the importance of an unobstructed outlet. In the former no richer deposit of this character has been found in this portion of the State. Two of the favorable conditions are recognized here, outlet and a long run, both of which appear to be wanting in the latter, which is of little value, the fine gold being intermixed all through too much gravel. With a good outlet and a long run the gold world have been concentrated here the same as at Yankee Jim's. The conditions observed in the Brushy canyon deposit might be compared to that in a hydraulic mine where the water is turned off just after a big cave comes down.

The development made by the Mayflower Company, in this deposit, shows there is 400 feet in depth of light material and top gravel overlying the ancient pay channel here. We can account for this only in one way; that is, the floods have carried the lighter material from the higher grades above; there being no outlet, it has tilled in here till the floods were turned off by a lava flow.

The Ridges.

The Forest Hill ridge is so very wide that it is possible parallel channels may run a short distance in some localities in the lower portion. The Iowa Hill ridge Is quite narrow in the upper portion. The source of this channel has heretofore been described. Two of the favorable conditions are recognized here, outlet and a period of long duration in the lower portion, especially in the deposits and canyons heading in them. It is a well known fact to practical miners, that a big rush in the nature of a slide will carry gold with the gravel and debris a long distance and leave it high above the bedrock, if no water follows to settle and concentrate it; but if a big head of water follows, the heavy coarse gold settles to the bottom first and is concentrated in crevices and spots favorable for retaining it, while the finer gold is carried on below and deposited along, where the conditions are favorable, to the outlet, where it is largely concentrated on the rim by the lighter material being carried away.

We find something of a parallel to this in this channel and its deposits. At Iowa Hill, King's and Wisconsin Hills and Grizzly Flat, the outlets, very rich deposits of fine gold were found on the outside rim; but a short distance above, very rich spots and crevices were found at the head of Indian and Grizzly Canyons, containing principally coarse gold. A few miles up the ridge to the east, is Sucker Flat, where some scattering rich spots of big, coarse gold have been found. Some nuggets worth from $100 to $1000 have been taken out here.

Although there is an extensive body of gravel in the ridge all the way up to Damascus, we have never heard of any rich pay being found in this channel above Sucker Flat, These conditions may be accounted for from the source being narrow and the upper portion of the channel having a steep grade, whereby the floods during the gold depositing period have swept the greater portion of the gold down into the deposits below. And when the channel commenced filling, the source was blocked up and this body of top gravel from above has filled the upper portion of the channel. Probably the same conditions exist in many of the other modern channels. The upper portion of the channel in the Nevada ridge presents somewhat similar characteristics.

"Modern deposits," as used here, may be termed secondary, to distinguish them from the original deposits in the ancient rivers, and the more recent ones in the present rivers and canyons. Their connection with the latter is apparent and can be more readily demonstrated than with the former. Nevertheless they form the connecting link between the two.

The connection between the secondary deposits and the recent ones in the rivers and canyons can be practically Illustrated on the Middle Fork and numerous other places in the gold belt.

Rich Pay in Early Days.

In early days of river mining, some of the richest deposits in the State were found on the Middle Fork. In the summer of 1851 a number of companies united and constructed a continuous flume for several miles on the river, each company having a defined boundary to their claim corresponding with their section of flume. Old-timers who worked on the river that season well remember how some companies took out large fortunes from their claims, while others above and below them "busted up," not taking out enough to pay the heavy expenses incident to such operations in those days, when labor and everything was high.

The results here seemed to establish the prevailing idea that success in mining depended altogether on luck—a primitive idea. Ignored by the progressive miner of the period. It was subsequently ascertained that those rich deposits on the bars and in the river were in the immediate vicinity of where a portion of the gold from some rich secondary deposit on the hill had followed the erosion of the present river down to its present level, or where some rich canyon emptied that had out back into the deposits. It

was observed also that those points are mainly on the north side of the river and from the Forest Hill ridge, and that the pay diminishes on going down stream from the richest points.

Immediately below Indiana Hill were rich deposits in the river and on bars of the North Fork, which diminish in richness gradually down to opposite Iowa Hill, where some very rich deposits and bars were found. From a short distance below this last point the richness dwindles down till It becomes very thin.

Devil's canyon was very rich for a distance below from where it cut down from Georgia Hill and connecting deposits about Yankee Jim's.

(To be Continued)

Mining and Scientific Press, V. 61, 8/2/1890, p. 68

The Gold Belt -of Northern California, Ancient River Channels and Gravel Deposits. N.: X, [Written for the Mining and Scientific Press by James P. Talbott, Blue Canyon, Placer Co.]

All of these conditions certainly indicate the correctness of the theory in regard to there being but one main ancient river and tributaries within defied bounds of a certain locality, which contained the original deposit of gold—the source of all recent deposits in that locality. Another fact which tends directly to confirm this view is the discovery within the past decade of a channel deeper than any that has ever been worked or known to exist.

Very Deep Pay Channels.

The effect of this discovery on the future of mining and prospecting will be apparent when it receives the consideration its importance demands. Instead of thousands of dollars being thrown away under the old graveling ideas that every outside deep gravel deposit overlies an ancient river channel, and the result disappointment and the locality condemned as barren, capital will be intelligently directed, under the new and progressive ideas, toward prospecting for and developing the original source of these deep channels where good and permanent pay will always be found. This deep pay channel was first discovered by accident in the Mountain Gate mine, by a body of cement and top deposit of unknown depth overlying it, which cut off the channel above on which they had been working. The developments made in the deep channel here, indicating its course, induced the belief that it continued down the Forest Hill ridge, and owing to the great width of this ridge between the high rims, the immense depth and width of the overlying deposit, the certainty of a large volume of water and the uncertainty of the position of the channel within this wide scope, it might be on one side of the ridge in one locality and in another on the opposite side. With all of these adverse conditions staring the prospector full in the face, any attempt to discover this channel here required a degree of courage and faith possessed by few, even of this noted fraternity. B it one showed up equal to the task, and by his persistent energy Mr. Chappellet has demonstrated to the mining world the continuance of this deep rich channel down the Forest Hill ridge in the Mayflower mine, 15 miles below Damascus.

The success attained by Mr. Chappellet in discovering the channel at such a distance below gave confidence in its existence and extent and encouragement in localities above. After an examination of the surface indications, the lava cap inside the high rim-rook, and a correct knowledge of the developments in the Mountain Gate mine, and with all the resources needful to back their confidence, the French company struck the channel rich in the Golden River mine at Red Point, two miles above Damascus. This definitely settles the question in regard to one of the deep original ancient channels in the Middle Fork Divide.

Lava Indicates the River Course.

It is not claimed by this theory that the presence of lava at any given point indicates an underlying ancient river channel; but it is earnestly maintained that a continuous flow of lava for a long distance in a definite course, from half a mile to a mile or more wide, and several hundred feet in depth, within confined bedrock walls, positively indicates approximately the course of the ancient rivers, whose channels are buried hundreds of feet beneath. As branches from the trunk of a fallen tree, lateral spurs may project on either tide and form considerable deposits at the junction of some tributary or low depression, but these are off the course of the main flow and are easily distinguished from it.

The Distinguishing Characteristics

Observed in regard to the ancient and modern or secondary deposits are in the ancient deposits a continuous deep channel of a circumscribed width, varying from 300 to 700 feet, within which is found a regular compact stratum of gravel and bowlders on the bedrock, from 1 to 15 feet in depth. The gold is generally fine and the pay uniform in this stratum, which, in the portion of the gold belt here considered is covered with debris, cement and lava from 500 to 1000 feet in depth.

The surface Indications of these deposits are the overlying cement and lava with the bedrock points projecting at right angles from the main ridge.

The modern or secondary deposits, as a rule, are to one side or the other of the main ridges, and are distinguished by their great extent in width and depth in many places. The formation is irregular and composed of all kinds of material found in the surrounding country and deposited in Irregular strata of bowlders, gravel, sand and pipeclay to the depth of from 100 to 300 feet, and in the extensive basin-like deposits, are capped with from 50 to 100 feet of fine gravel.

In this class of deposits the gold is very fine and intermixed in certain strata, soma of which are 100 feet or more above the bedrock, while some of the intervening strata are entirely barren. It is obvious, then, where the gold is distributed through the deposits in this way that they can only be worked by the hydraulic process. There is another class of the secondary deposits where the channels are narrow and the overlying material not so wide or deep. In this class the gold is generally coarse, and found in crevices and spots. In some localities, strata of gravel are found, high above the bedrock, containing coarse gold.

The Surface Indications

Of this class are: They generally run on a direct course between parallel bedrock points, from where they break off into some modern canyon or river, to where they unite with the main ridge at a considerable angle. The lava frequently extends some distance from the main flow out over these lateral deposits.

To review, the practical points are, the tributaries coming from various directions in the mountain section united somewhere about the upper border of the gold belt and formed the main continuous rivers in the Pliocene period; and by the steep grades in the mountain sections, the greater portion of the gold was carried down into the gold halt, where all of the conditions were favorable for concentrating and retaining it in the original Pliocene channels. The regular deposits in these channels may be compared with the true fissure mineral veins which do not run out or diminish in contents, while the irregular secondary deposits are compared with segregated and pocket veins, which, though often very rich, cannot be relied on as permanent.

The Term " Divide,"

As used here, implies one independent river system of the Pliocene period, disconnected from any other, the same as the present rivers. In comparing the Middle Fork with the North Fork divide, we find a very striking resemblance in general outline and conformation of the country up to a certain point, above

which each d vide has its own local peculiarities. The Middle Fork divide is separated into two main ridges by a bedrock country through which Shirt Tail canyon runs. The North Fork divide is separated in exactly the same way by Bear river.

About Spring Garden, on the Forest Hill ridge, the gravel deposit runs up under the lava. About 12 miles distant to the northward the same conditions are observed on the Iowa Hill ridge at Iowa Hill. From these distant points, in a continuous course, the two lava capped ridges converge to a certain point above and unite on the main divide, which is not more than a mile in width. A. complete parallel to this is found on the North Fork divide, where, at Bogus Point, on the Shady Run ridge, the gravel crops out from under the lava and about 20 miles to the northwest, on the Nevada ridge, the extensive gravel deposit at Blue Tent runs up and dips under the lava cap on that ridge. From Bogus Point on the south and Blue Tent on the north, the two lava-capped ridges on a continuous course converge to a certain point above, where at one time they were evidently connected at Bear valley.

All the conditions and developments are so well known on the Middle Fork divide that it is unnecessary to refer to them further in comparison, and as all of the conditions are of the same character throughout the whole western slope of the Sierras, we conclude as is the Middle Pork divide so are all the other lava-capped divides.

In this article I have endeavored to

Outline a Systematic Theory,

By which all of the apparently mixed np and conflicting parts can be made to harmonize and form one comprehensive whole. It is the result of my personal observation and experience as a practical miner for nearly 40 years, and is based on observed facts and natural methods. In regard to the facts, I challenge an examination by any mining expert or scientist. As to the correctness of conclusions, I leave the practical progressive miner to decide.

The extensive, unexplored and unprospected section of country is the ridge extending from Bogus Point to Bear valley. This section occupies a position right on the gold belt, covering nearly its entire width from west to east, with rich drift mines both north and south of it. Here are present all of the favorable surface indications and surrounding characteristics of those lava-capped ridges where rich drift mines have been struck and are now being worked. No mining section in the State possesses anything like the same facilities of access for travel and transportation of supplies, as the C P. R. R. runs on this ridge nearly its entire length.

(To be Continued.)

Mining and Scientific Press, V. 61, 8/16/1890, p. 104

The Gold Belt of Northern California, Ancient River Channels and Gravel Deposits.

NUMBER XI—CONCLUDED.

[Written for the Mining and Scientific Press by James P. Talbott, Blue Canyon, Placer Co.]

Considering the present outlook for hydraulic mining, with all of the favorable indications staring the miner square in the face, and all of the advantages here presented, it is unaccountable that no effort is made to open our drift mines on the deep channel in this ridge. The great changes in the character of the gravel mines, from the pioneer days to the present time, were so gradual that the point where one class apparently led into the succeeding one was rarely observed at the time.

Classes of Gravel Claims.

There are three distinct classes of gravel mines recognized: First, the bars, rivers, ravine and canyon diggings; second, the deep gravel deposits on the hills; third, the deep channels underlying the lava-capped ridges.

With but few if any exceptions, each class was first discovered by accident, and afterward the discoveries in that class were extended by a comparison with the conditions observed where the deposits of pay were found. The first discovery of gold in California by Marshall was by accident, on a bar on the South Fork of the American river. There was nothing peculiar or different in the conditions of that bar from any other on the South Fork or any other river bar. All of the conditions were observed on the bar where the gold was first found. On comparison, other bars were found to be exactly similar. The natural conclusion was that all river bars in the gold region contained gold, the truth of which was subsequently verified.

There is no account of the first discovery in ravines and canyons. It was no doubt by accident, for in many places in pioneer days the gold lay exposed on the surface in the gulches and ravines, many of which proved to be very rich. From this it was inferred that all ravines and canyons were rich, which proved to be a mistake, as the conditions for pay were not so well known then as now. This class of diggings was the only one known for several years after the first discovery and it was apparent from their character that they would be exhausted in the course of a few years. But before any appreciable effects from this source were felt, the second class of deposits on the hills was disqnju [Missing Text] Georgia Mill. The discovery of this class gave promise of a more permanent character than the former and gave an impetus to prospecting that has never been equaled in the State. By a comparison with Georgia Hill the conclusion was jumped at that all gravel hills in the gold region contained rich deposits of gold. The result was the discovery and development of nearly all the hill diggings for 50 miles to the north on this gravel belt and added carloads to the product of gold. Previous to this, however, in a few places rich leads had been followed into the hill and were being worked, but these were considered as local peculiarities and had no general effect like the later discoveries.

Under Lava Ridges.

The third class comprises the channels under the lava ridges. An "accident" occasioned by a big slide on the south side of the ridges near Forest Hill revealed the conditions that led to the first discovery of this class here. By the same course of comparison in this class as in the others the discoveries were extended and the fact established of the existence of mines of a more permanent character than either of the others. The natural conclusion is that all lava-capped ridges of this character within the gold region contain similar mines, the correctness of which appears to be well sustained as far as developments and discoveries have been made up to the present time.

For the past 20 years or more I have entertained the views herein expressed; and following on this line of reasoning, by a comparison of the surface conditions observed on the Shady Run Ridge with those on the Forest Hill Ridge, the similarity is so striking that I believed the underlying conditions would be found to correspond, and that a deep channel could be found in the former similar to the one in the latter, running on the same course from northeast to southwest.

As an earnest of my confidence in the result about 15 years ago I bought and located mining ground of considerable extent, covering the lava-capped ridge, for the purpose of prospecting, to determine the correctness of my views. I located and started a tunnel with the resolution to see if there was a deep channel underlying the ridge, and if so, to find the bottom of it, if I lived long enough. The undertaking was termed by local mining experts, most of whom were “cross-channel theorist" as "a d--d fool operation," and predicted I would strike high bedrock before getting back 500 feet.

A Practical Example.

For the want of means but little more than the required annual expenditure was done for several years. All efforts to procure any assistance from local capital were unavailing. Persisting in my effort, I formed the acquaintance of an enterprising party of San Francisco who took a favorable view of the situation and was willing to put some money in the plant. Accordingly an adjoining location was made, and the claims consolidated under the name of the Elite Consolidated Mining Company. Work was then commenced and the tunnel that had been started was extended back into the ridge 1100 feet, from which point a shaft was sunk 158 feet to bedrock. [See engraving of section of ridge and gravel claim on another page of this number of the Press.—Eds. Press]

About 600 feet east from the station at Shady Run, at the head of a ravine, where the rimrock has been carried away and exposes the cement to the depth of 50 feet, overlying 5 or 6 feet of fine quartz gravel on the bedrock, the tunnel, six feet wide and six high, starts in the rimrock on a drainage grade and runs on an air line, north 70° west, the distance of 1100 feet. It was known this was not deep enough to bottom the channel, if there proved to be one, The calculation was that the tunnel could be run in the cement at this point and a shaft sunk to ascertain the depth—much cheaper than any other mode of prospecting—and if pay was found the mine could be operated through the present works, which are substantial and constructed with reference to such a contingency, until a tunnel could be run to bottom the channel. From where the present tunnel starts in, the bedrock pitches gradually to the northwest and dips under the cement about 200 feet hack. The tunnel passes abut 200 feet perpendicular under the railroad right at the station. The cement along in the tunnel here is as hard and solid as ordinary slate bedrock. After passing some distance beyond the railroad to the west, strata of coarse sand were encountered. Occasionally the whole face of the tunnel would be in a bed of sand. On this account 400 feet of the back portion of the tunnel was substantially timbered. When coming into a solid body of the cement again, the abaft was started. At the depth of 35 feet the cement gave out, and 20 successive distinct strata of sand, gravel, clay and lignite were passed through before bedrock was reached.

At the depth of 52 feet we came on to a stratum of solid, compact white clay. Immediately underlying this was found an unmixed bed of lignite three feet thick, composed apparently of a drift of wood, bark, leaves, grass and other vegetation, among which cedar bark and tamarack wood are readily distinguished. One of the curiosities found here might be of interest to the naturalist—that is, on the leaves of what appears to have been some kind of a water plant is found a small insect of a bright green color aa natural as life. In size and color it resembles very much a small insect often seen skipping along on the surface of still water In [missing Text] layers intermixed all through.

At the depth of 100 feet we passed through a bed of pipeclay 22 feet thick. Below this was a few feet of sand and drift. The next below was as fine a body of smooth washed quartz gravel and cobble as I ever saw; and here the first color of gold was found 1100 feet back from the outside rim and about 500 feet from the surface on the ridge. In every pan of this gravel, fine colors of gold can be got. Where the gravel was struck in the shaft, it dipped to the northwest into the ridge at about 15 degrees, while the bedrock 25 feet below pitched in the same direction on an angle of 35 degrees, which Induces the belief that this is the lower rim of the deep channel. When it is considered that the rimrock along on Canyon creek is about on the same level with the C. P. R. R,, that this tunnel runs about one-fifth the distance through the ridge toward that rim, and that the bedrock pitching steep in that direction at the end of the tunnel is 350 feet below the railroad track, the fact is established beyond a doubt of the existence of a deep channel, which fact is now generally admitted.

Admitting the existence of the channel, the pull now is, you don't know if there is any pay in it.

Pay In Deep Channels.

The indications are as favorable and the presumptive evidence as strong in regard to the pay as to the existence of the channel; and it is the present intention of our company to demonstrate the former in as positive a manner as we have the latter, by running a slope from the end of our tunnel on a grade that will reach the bedrock 300 feet beyond the shaft, where it is confidently believed we will strike the original deposit of gold in the deep channel of the North Fork Divide, that will develop as rich as any found in the Gold Belt. The fact of the two ridges that form this divide uniting, as heretofore described, evidently shows their contents were derived from the same source. Upon reliable authority, the figures show that $100,000,000 of the contents of this divide have been realized in the output of gold since 1849, from the gravel mines alone, between the South Yuba and the North Fork of the American, the greater portion of which came from the Nevada Ridge. Owing to the peculiarity of that ridge in spreading out over a wide extent of country that was easily prospected, many of the rich mimes were developed at small expense, which attracted the capital that subsequently developed the vast mineral resources of that section.

Shady Run Ridge.

The peculiarities of the Shady Run Ridge are Its narrow, confined condition, with but few gravel deposits connected with It. In regard to its contents, nothing directly is known, but from all of the surrounding conditions, the natural inference is that it contains rich deposits of gold. It is situated right in the center of the Gold Belt, with rich drift mines both on the north and the south, and for 15 miles or more on either side the ridge, where the rim has been out away to a certain depth, rich spots of pay have been found in the near vicinity and nowhere else. The millions of dollars in fine gold taken from the Dutch Flat and Gold Run mines unmistakably came principally from this ridge. With all of the favorable indications and advantages presented, with the exception of a few individuals gouging around In outside spots, there is not a drift mine between Bear river and the North Fork of the American. Why is this so? Simply because the drift mines of permanent value are buried deep beneath the lava-capped ridge, beyond the reach of the individual prospector's means, and companies with capital decline to take hold until something rich is developed.

Future Drift Mines,

The fact is now pretty well established that the future drift mines of permanent value will have to be sought for under the deep lava capped ridges that overlie the ancient channels, and from a careful observation of the surface conditions and following on the line of natural methods here indicated, it is confidently believed that every ancient channel on the western slope of the Sierras within the Gold Belt can be as definitely traced out as those of the Middle and North Fork of the American.

Causes of Failures.

There are few localities in the mining region but what have been cursed with some bogus prospecting and mining operation managed by a class of "pedro" miners more for the purpose of the five or ten dollar a day salary than to obtain valuable results. The method is to make a haphazard location of a claim aa near the town as circumstances will permit, or bargain with a silent partner for a worked-out claim at a rcnad [sic] price. A forced and unnatural connection Is made between the claim and every rich mine within the circumference of 40 miles. Some rich friend Is taken into the secret of this hidden wealth and supplies the means to obtain it. After spending a few thousand dollars and getting nothing but favorable reports, the rich friend gets a "clue" and takes in the situation, curses the claim, the management and the whole section of country, and permanently retires from the business. Any other kind of business in the country besides mining, based and conducted on this principle, would result in failure, The principle of home rule will have to be adopted, so that each locality will have to stand on its own

merits of [Missing Section] find many serious obstacles to overcome in their efforts to run every rich channel in the country through their claims. I would suggest a less difficult method, one with greater possibilities of valuable results—that is, to trace out the channels first, then make the location with reference to them. “In the days of old" all that was required to prospect and develop a rich mine was a mule-load of grub, a pick and pan. The changed conditions now demand considerable money, abundance of muscle and the power of steam. Where these are directed by honest, intelligent, practical miners, on sound business principles, the business of mining will be as successful aa any other business in the country.

Mining and Scientific Press, V. 61, 8/23/1890, p. 120

(Reply to:) The Gold Belt of California, The Gold Belt of California Ancient River Channels and Gravel Deposits [Written for the Mining and Scientific Press by Stephon Barton of Kernville, Cal]

I have been very much charmed by the articles from the pens of H. C Hanks and J. F. Talbott on the ancient placer deposits of California. Mr. Hinke appears as an honest inquirer searching for truth, fearless of the established dictum of scientific lore. Mr, Talbott appears as a plain and unpretending miner, who has the modest courage to give his observations to the world and the reasoning fairly deducible therefrom. Both writers have done much to awaken an interest in gravel mining.

The subject was well worthy all the investigating Mr. Hanks was able to give as to whether glacial deposits ever present the phenomena of a continuous flow of water-worn gravel, or whether much of it presents the appearance of fragmentary rocks set in sockets of ice while one side was being planed down. There are several objections to the theory of a glacial deposit suggested by my observation. The first of these objections is that the flower which adorned the banks of these ancient streams was the same as that met with in California to-day. The manzinita, the alder, the yellow pine and the black oak, flourished upon their banks, formed drifts upon the pay gravel and were afterward covered with cement, which in its turn was covered with a lava flaw, I have followed the track of some of the most noted ancient glaciers ever known to have had an existence in California, and have found no moraine clearly glacial in character extending below an altitude of 7000 feet above the level of the sea.

A second objection to the glacial theory is that the gold is generally deposited on about the same slope of bedrock met with in the rivers or in an artificial ground-sluice which is run partly bare.

A third objection to this theory is that after the lava flow—after the bed of the stream had been raised 200 feet above the bedrock—and before the stream had cut a new channel in softer ground, some of the lateral tributaries continued to send down auriferous gravels and deposit them on top of the lava, showing that placer gold came from the country traversed by the lava flow, instead of being transported an interminable distance by a glacier.

But it seems to me that if the first objection can be sustained, then the glacial theory must fall. We must appeal, then, to the observations of the thousands of truthful and energetic men who set commerce in motion by tearing down the ancient hills. Beneath Cedar hill, just south of the village of Placerville, in El Dorado county, an immense amount of timber was found lodged on the gravel, and generally of the varieties I have mentioned. This hill was capped with what would be termed brecciated lava. This form of lava is most common in the central portion of the mines and was evidently formed by a crust forming on the surface of the stream and then breaking into fragments and partially sinking in the half-congealed mass. At Gold Hill, just west of Columbia, Tuolumne county, where only the cement and gravel were left, trees of valley oak and yellow pine were unearthed, also at the Buchanan tunnel beneath Table mountain,

a mile and a half northwest of Columbia. In a channel known as the Fox Head, rising in the flat one mile west of Columbia and descending to the southwest beneath Table mountain, alder and manzanita leaves were found. But it is useless to enlarge on this branch of the subject. The banks of the ancient rivers were clad with a verdure semi-tropical in Its nature, and for millions of years after the rivers had sought their present beds the mastodon maximus found a favorite resort in the placer mines of Tuolumne.

During all these centuries this huge animal and the Indian evidently watered at the same spring, and up into the post-pliocene age the bones of the mammoth were buried beneath calcareous tufa on the same bedrock where the Indian woman had ground her acorns.

Scientists are too apt to hurry np nature by the employment of cataclysms. Time will plow out the channels, and mathematics will give the time, without betraying the age of the world.

Mr. Talbott mentions the fact that two of these ancient channels evidently descend from the same source. This would be pretty good evidence that the stream was nearing its delta, and as a corollary, that it met the ocean at a higher level than now. My observations have tended to the conviction that there have been two periods of volcanic activity in the region of the placer mines, and that during the first of these periods the rivers met the ocean at an altitude of 2000 feet above their present level. I think it susceptible of geological demonstration, that after volcanic action had ceased on the western slope of the Sierra Nevada mountain, Kern river met the ocean 1200 feet above the Tulare valley.

Mining and Scientific Press, V. 61, 9/13/1890, p. 176

The Gold Belt of California, Ancient River Channels and Gravel Deposits.
NUMBER III. Deposits [Written for the Mining and Scientific Press by Stephon Barton of Kernville, Cal]

The discussion of the form of crystallization and the fineness of gold, as a prime subject of inquiry, would be aside from the purpose of these articles, and they are only referred to as auxiliary to the question as to where the gold came from. Though the gravel of the ancient, lava-capped hills is nearly all quartz, enough is discernible to enable us to determine that in many cases it came from lodes formed between slate walls. Greenstone, hornblende, slate and mica slate are associated with most of these deposits. but the levity of the latter generally leaves it on top. At Fairplay Hill, in the south part of El Dorado county, I have seen very heavy little chestnut>brown pebbles the size of beans, probably oxide of tin. These would be deep down in the fissures and were a sure criterion of a prospect of from 50 cents to $1 to the pan. A man might work all day, however, without getting more than five pans showing the pebbles. At this point there was more evidence of great force of current than any place I have seen in these ancient deposits.

First the current had concentrated in a groove in the bedrock sloping to the south; at the bottom of this groove it had struck a detached piece of granite some ten feet in diameter and had bored a round hole entirely through it some five feet in diameter. The polish on these water-worn surfaces was as hard as glass, not withstanding that the mass could be broken into fragments and pounded into sand with the side of the pick. The hard polish seemed to be no thicker, however, than an egg shell. At this point, as well as at a point west of Columbia, Tuolumne county, I noticed heavy deposits of water-worn pebbles of lava. At the latter place a hill composed of this form of deposit rises more than 100 feet above the great stream of basaltic lava which forms Table mountain. I have said that it seems to me that there had been two periods of volcanic activity on the Pacific Coast, and I believe this basalt was erupted after the rivers had cut channels 200 feet deep among the lava-capped hills. Since basaltic columns are rather rare

in California, I will digress enough to say that six-sided columns 100 feet high, standing perpendicular, may be seen overlooking the Stanislaus, three miles northwest of Columbia.

While on the subject of deposits of different ages, I will say that on the bluffs of the Tuolumne, below the mouth of the South Fork, there is a gravel deposit some 2000 feet above the bed of the adjacent stream, and not more than300 feet below the grade of the oldest gravel deposits. This deposit corresponds with the grade of what Is called Big Gap, in the dividing ridge between the Tuolumne and Merced. In following this grade and turning to the south for three miles we trace this ancient channel among the bluffs of the headwaters of the North Fork of the Merced. At La Grange on the Tuolumne, we are presented with a series of channels of different ages, one bench rising above another in regular terraces, so that the Tuolumne alone presents us a whole volume of past geological history, without a chapter missing, from the Miocene down to the very present.

I have often said to myself, what a fund of information Prof. Whitney could have given the mining world while paid to thread these deep solitudes, if he could only have brought his mind for a me vlety of the time to abatsiu from dilating upon the wonders of the insect world. Bogology is all very good in its place, and doubtless there is money in it, but it is sadly out of place in a mining community. As it is, our most trustworthy information in regard to the mining region is obtained from men who made their observations with a roll of blankets and sack of flour on their backs.

I have spoken of a Pliocene deposit at the mouth of Kern river canyon and running thence to White river, along the edge of the Tulare valley. There are a few places where auriferous gravels have been worked beneath this cretaceous deposit, and I think it may yet develop mines of some value; but the depth of the chalk, the rapid dip of the bedrock beneath the valley and the great difficulty in obtaining a water supply prevent it from becoming the site of an extended industry.

We thus see that by beginning with the oldest forms of gravel deposit we are able to descend by one unbroken series of events to the present, with a retiring ocean constantly before us, and the channels of our rivers constantly growing deeper. This change was not limited to this side of the mountains. At the beginning of the era of ancient-gravel deposit, the evidence is that the Great Basin was an immense inland sea rising to the ancient beach above Salt Lake City; that this sea received the drainage of a vast region now outturning through the Columbia; and that a powerful stream descended through Owens River valley and reached the Colorado east of Mt. San Bernardino, leaving also a Miocene deposit west of that mountain several hundred feet above the sea.

There is no use of trying to theorize away from the facts. One stubborn fact is worth a thousand theories which are not known to have a foundation. I have mentioned the finding of a conch shell in the ancient gravels of Tuolumne. It was in the possession of a miner by the name of John Chass and was found by him near Columbia. 1 had forgotten that he also had the shell of a cardium or salt-water clam found there of apparently the same species now found on Long Island. This shell was, however, very much petrified and had endured the ravages of time too much for its species to be certainly and accurately determined. I had also forgotten to mention that while I was mining at Columbia, two skeletons, supposed to be human, were unearthed in the Stanahan tunnel in Table mountain, and that they were given in charge of the Geological Society of Sonora. To this I must add that John Huntley, Federal internal revenue collector after the war, found a number of shark's teeth in the chalk hills north of Kern river. Hence we see that in the ancient gravels there was a mingling of land and salt-water fossils. The sea was constantly surrendering to the land.

Back of the Miocene there seems to be a tremendous gap in the geological history of the western slope of the Sierra Nevada range. The only fossils I have met with in the older formations were at Mineral

King, in Tulare county, and they were probably referable to the Silurian, or at latest not later than the Clinton sandstone. Still it has been claimed that the westernmost or main gold belt was of formations referable to the age of the Jura rocks. I have failed to see a single fossil from them.

{ To Continued)

Mining and Scientific Press, V. 61, 10/4/1890, p. 225