

UNCLE SAM TUNNEL MAKER

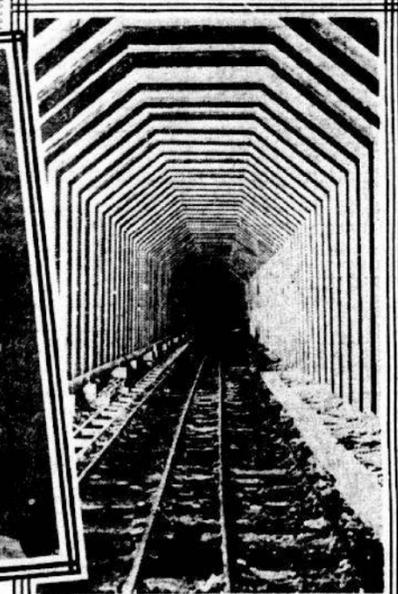
By William A. DuPay



Main Klamath Canal, Oregon, 60 Feet wide on the bottom and carrying Prosperity to 190,000 Acres



Will soon be Driven through the Gunnison Tunnel



The Gunnison Tunnel Timbered and waiting for the cement



The Crew that broke a World's Record by Driving the Gunnison Tunnel 7,500 Feet in a Single Year

WE HAVE stood aghast and wondered at the ingenuity of man and the marvels of engineering skill when of recent years we have watched private corporations marshal such forces as to go underground and build themselves roadways, here under a busy city, there beneath a murky river, and yonder through an intervening hill. These enterprises in the midst of populous centers and surrounded by the habitations of men, have been heralded as the most stupendous undertakings of the times and as accomplishments without a parallel.

Yet while these things are being done with much acclaim the national government is quietly going about such projects in the solitudes of the great west country as make these others pale into insignificance and appear commonplace in comparison. At one place a force of men has been taken into a canyon, the precipitous walls and roaring torrents of which had been pronounced impassable by the boldest hunters of the region, and are driving a tunnel six miles under a mountain into which they will harness and drive the torrent. Again, a canal that carries riches to a once barren desert is swung to a mountain side which it skirts, hanging here to its rim and plunging there into its depths. One tunnel extends beneath a plateau that is irrigated above through other tunnels. Many of the canals dip here and there into the darkness, while the flood gates of practically all the reservoirs that have been built for the storage of water are drilled through the solid rock.

The government reclamation service is doing these things as part of the day's work. They are being accomplished in remote regions untraced by railroads and often difficult of access in the crudest way. They are thousands of miles away from the sources of supplies, and there are no laborers in these regions to do the work in hand. They are breaking ground in a line of undertakings that the world has never known before and in which there is no precedent to follow. In most of the enterprises the service has stepped in after private contractors have failed, and the government is pushing to success under

takings so large as to require a policy extending through years to complete. The Gunnison tunnel in Colorado stands out as the prime difficulty in the history of accomplishment. When the first government engineer came to the upper end of the canyon of the Gunnison river six years ago and looked into its frothing rapids leading 20 miles into a chaos of peaks and precipices, he was told of the tragedies that had resulted from other attempts to go through it.

"That is what I am paid for, and I guess I will try it," he replied. The trip was made on a rubber raft and was successful. A map was drawn on olecloth as it progressed, and this was made the basis of the government's operations. An alcove was selected from which to base operations and start the tunnel. Three years were spent in surveying and flooding how to run a road into the canyon. With its completion came machinery and the men and the means of pushing the enterprise.

Gunnison canyon was an unthinkable wild and the waters running through it offered no benefit to the habitations of the men. Yet six miles to the west of it lay a valley that would blossom as the rose if those wasted waters could but be transferred to it. There intervened a rugged mountain range 2,000 feet high. The open valley of the Frenchburg invited and the tunnel was begun.

The work was let on contract and the company attempting it forfeited their bond and gave it up. Uncle Sam hired his own men and they have been blasting at the mountain ever since. Three shifts of men have worked night and day for three years. These men have come out into the shade of the steep canyon and have seen the sun but occasionally during that time, for it creeps in between the bluffs for but a few minutes every day, setting behind the western hills at 11:40 a. m. Five out of the six miles of the tunnel have been completed. A world's record has been established and the builders of the Simpson tunnel in the Alps beaten by a gang of laborers who drove this tunnel 7,500 feet in a single year. For long periods they advanced into the heart of the mountain at the rate of 2.5 feet per day. It was two

and three miles to the dump and it required 100-horsepower to run the ventilators along. Gas, heat, water, all matters of formation, were encountered, but the work went forward. Great subterranean lakes were found, and work had to be stopped until they were emptied.

But it will soon be completed and cemented and polished smooth and the torrents of the canyon turned through its 104x12 foot bore and delivered to the thirsty sands of the valley beyond where it has been demonstrated that 36.6 an acre can be made each year by planting apples. This over a sage brush stretch of 149,000 acres of barren desert.

Upper Klamath lake is situated near the borders of California and Oregon. Its waters have been accustomed to spill over and form other shallow lakes below that are in reality little more than swamps. A tunnel has been run 2,300 feet beneath a hill and will tap this lake and use its waters for irrigation. The lakes below will be relieved of that water and further drained and converted into fertile farms that will be irrigated by the waters that formerly submerged them but now bring productivity.

The greater part of this tunnel ran through a deposit of volcanic ash, subject to caving and treacherous in the extreme. Then suddenly in the mist of it was encountered 500 feet of basalt rock as hard as flint and not contemplated in the plan. The dangers and difficulties, however, failed to stop the progress of the government work, which is as sure as the passing of time.

The tunnel, 14x12, is now entirely completed and is emptying a flood of life-bearing water into an irrigation canal 60 feet wide on the bottom and destined to irrigate 190,000 acres of virgin land. The tunnel is lined throughout with cement, is all these viaducts, and is so carefully and thoroughly made that it will create no friction to interfere with the rushing water, and will at the same time resist the ripping and tugging of the turbulent stream to the end of time.

higher up the mountain side as it works downward, until finally it is suspended like a cable between earth and sky.

The main part of the canal for 12 miles is built as a huge cement trough bound to the mountain side, while 20 percent of its length is in tunnels that dip into the bowels of the earth. For considerable distances along the mountain there are perpendicular cliffs that may not be skirted, and these are of necessity tunneled into. At one point a tunnel is 2,000 feet long, and at North Fork it is 4,000 feet long. There are in addition innumerable short tunnels.

The formation is chiefly black basalt, hard and stubborn. Great quantities of dynamite are used, and this increases the danger. In the winter the dynamite freezes and is useless until thawed. An electrical heater was devised in one of the tunnels for keeping the dynamite above 42 degrees, where it freezes. With some hundreds of pounds of the explosive in the heater one day it short circuited and exploded. The whole mountain side disappeared into the stream below and the foreman gathered his men and called the roll. Fortunately there were none missing.

The power for doing all the work in this tunnel and canal building is gotten from a power canal built for the purpose. This plan is followed on many of the projects, notably on the Salt river scheme, where a canal 19 miles long leads a torrent to a point of vantage over the works where it may be utilized. Then a tunnel 600 feet long in the solid rock is built at a steep incline and the flood is set crashing through it and harnessed at the other end and made to perform such tasks as manufacturing wholesale cement and lifting stones weighing many tons into place in the great cañons.

Another tunnel that digs direct into the mountain side for a stretch of four miles is the Corbett tunnel, on the Shoshone project in Wyoming. The idea is similar to that at Teton, the object being to get the water to the surface from a precipitous canyon. In the face of an occasional cliff along the route the workers come to the surface and get a respite of daylight. In the broad valley below 100,000 acres of land of fecund fertility awaits the coming of the waters. On the plateau a thousand feet above the outside of the canal from another source winds out and irrigates the lands under which this tunnel runs.

At Strawberry valley in Utah is the newest of the tunnel undertakings of the government, and next to the Gunnison the longest, having an unbroken extent of four miles. It taps the DeShane river, and diverts those waters that had already set out on a journey to the Pacific coast in the great basin, which never leads to the outside world and offers only the salt lakes of its depths as an ultimate goal. This tunnel is built but 1,000 feet at present, but the work is being rapidly pushed.

There are many other lesser tunnels built in the west by the government, but these are the chief ones. Short ones are the rule about the great reservoirs, as in the case of the Roosevelt dam in Arizona, where the mere gate that watches over one of these, used as a flood outlet, weighs 800,000 pounds. Often tunnels are drilled through points of mountains in building the roads that reach with great difficulty the sites of the dams. Such is the case at Shoshone, where one such tunnel is 30 feet long, and there are many short ones.

Altogether the government has built some 15 miles of these tunnels in the

last four years, and has about four miles of them to build. Her engineers regard this as a mere incident in the whole great work of reclamation, yet they challenge those builders in the east to show any plan that compares with a half score of these for daring, difficulty or unflinching accomplishment.

The men who are bringing New York's water supply from the Catskills, for instance, have probably the biggest such task in the east, yet they are within three hours of the greatest supply center in America, with labor and every conceivable resource at their beck and call. The man in charge of a project in the west has to overcome the difficulties as he finds them, and even a consultation with his chief is out of the question, as it would take a month to bring it about. He works out the problems as he finds them and takes the responsibility.

In these reclamation works the advantage of the government over individual enterprise is also strongly exemplified. The west is dotted with reclamation projects that have failed. They are expensive and require vast sums of money that can wait years for returns in their accomplishment. They require such backing as will not be affected by hard times, financial flurries or labor scarcity to the extent of forcing a giving over of the work.

The operation of the reclamation service has shown a certainty of accomplishment never before exemplified. Having started on a project it is pushed steadily, surely, year after year, and its completion, with the nation back of it, is no misleading conjecture to the settler. It is sure. There is an absence in these governmental works of that element of enforced economy that is often so necessary in private enterprise to satisfy directors and stockholders. There are sufficient funds to take the jobs to insure thoroughness, and the engineer is a thorough man when allowed these. His errors are usually forced upon him by the necessity of haste or economy.

Altogether, while abounding in spectacular difficulties, these works in the untamed west are proving models of engineering accomplishment and further, that Uncle Sam is in all no slouch as a builder.

It takes 140,000 16-candlepower tungsten lamp filaments to weight a pound.

NEWS OF THE MINES

Spokane, Aug. 21.—The Idaho Mining company, operating in the Pierce City district, is completing a second dredge for the high placers adjoining the town of Pierce, and it expects to begin operations in a short time. This property was acquired four years ago, and the first dredge was placed in operation in 1907. The results have been highly satisfactory. While the exact amount secured has been kept from the public, large shipments of gold dust have been made each month, and the installation of the second dredge confirms the reports that rich ground has been opened through the agency of the dredge boat. During the pioneer days of placer mining in the Pierce district, when thousands of men inhabited the camp and millions of dollars were extracted by the use of the pan and the rocker, the high bars were untouched because of the primitive methods of placer mining, but modern inventions have provided the way for saving the gold from the high lands where water is only available in small quantities.

The Consolidated Mining company is making preparations to begin active development work on the Sunrise group, where it will put two shafts at work, sinking the present shaft on an incline to the 40-foot level. The company will run a cross-cut 400 feet west at the 20-foot level, to tap the submer ledge, where a shaft is also to be sunk to the 20-foot level for ventilation purposes. Some 200 feet is being taken out and it is believed that the ore extracted will pay for the development work. The ledge is six and one-half feet wide and is 2 1/2 high grade copper ore. The ledge has never been exposed to the hanging wall, so the extent of the ore body is not known.

L. F. Williams of Lewiston, Idaho, has sold to the Bradley brothers of the Bunker Hill and Sullivan Mining & Smelting company, for \$500,000, the Black Lead property in the Lake Park country, 12 miles east of Lewiston. The property was located by Mr. Williams 15 years ago, since which time he has done considerable development work. It is given out that the buyers will take immediate steps to develop the property, which means that the entire district will be opened. Reports show that the property is fairly well developed for a prospect. There are heavy veins of rich copper ore and indications of silver and lead at a great depth.

T. T. Hertzell, who has been active in mine development in the Chewelah district, Washington, for 25 years, has brought samples to Spokane from the

property of a new incorporation at Chewelah, known as the High Grade Silver & Copper Mining company, with a capital of \$1,000,000, of which he is president and W. W. Dickinson, secretary and treasurer. The ore consists of brittle silver, copper and lead, testing 250 ounces in silver, 15 per cent copper and 15 per cent lead. The ore came from the shaft, which is now down a distance of 100 feet. The management intends to continue to the 200-foot level within the next 30 days.

The Nabob Mining company, owning 21 claims of which two are patented, three miles from Wariner, Idaho, has more than \$500,000 worth of ore on the dump awaiting a mill. There is much ore in sight. The property is dormant, and it is now up to the stockholders to come through voluntarily or stand for the loss of a greater part of the company's holdings. One million shares of stock are on the market, and of this amount 10 per cent is now available. The treasury stock, having been deposited with the annual assessors, need not be paid on 10 out of the 21 claims until January 1, or the property will revert to the government.

The Edgemont Parallel Mining company, near Oroville, Wash., is taking out some high copper ore in the course of development work. The shaft is down to the 100-foot level, and the ledge is 10 feet high, and is 2 1/2 feet wide. It is being developed by the Standard Mining company, which is getting a large force of men to develop the property. The ledge is six and one-half feet wide and is 2 1/2 high grade copper ore. The ledge has never been exposed to the hanging wall, so the extent of the ore body is not known.

M. Woods, president of the Tungsten King Mining company at Deer Park, Wash., announces that the ledge has been cut in No. 1 tunnel, thus giving 1,000 feet of stopping ground and showing a large amount of concentrated ore, which will net from \$300 to \$400 a ton. It is also given out that a mill will be placed on the property within 30 days. The various ore will supply the mill for several years. In addition to the tungsten ore there is a four-foot ledge of hematite ore, which assays \$1.50 of hematite, \$15 in silver and \$10 of gold.

Miners' day in connection with the seventeenth National Irrigation congress in Spokane, August 2 to 14, when there was a parade which showed the development of the various camps in the days of the prospector and the barrier to the mine owner in its administration.

There were hundreds of vehicles and horsemen, led by the Fourteenth cavalry band and the Boise high school band. The paraders were cheered all along the route.

Arrangements are now being made to reorganize the Panhandle Smelting & Refining company and resume operations at Ponderay, Idaho, within 60 days. Present plans call for doubling the capacity of the smelter plant and the building of a branch from the Spokane International railway to the works. J. Herbert Anderson announces that the work of reorganizing is progressing, adding that several of the wealthiest men in the northwest are interested and are ready to become identified with the company. He asked that the names of his associates in the new deal be withheld for a few days, when an official announcement will be made, giving all further details of the project.

From another source it was learned that the controversy between Mr. Anderson and the stockholders and their associates is at an end, and that the two former factions are now working in harmony. The opening of the smelter means that 1,000 tons or more of ore produced in the Idaho Empire, chiefly in the Coeur d'Alenes, will be treated daily at the plant.

Reports in Spokane are that the Montana Miners' association has withdrawn from the directorate by the resignation of Albert Wenderlich of Butte, W. L. Hewlett, W. A. Clark, W. J. Conrad and A. E. Springs of Montana. It is also announced that the company will be reformed. Directors to fill the places of those resigned will be elected in a short time.

Fred J. Rowlands, president of the Nabob Mining company, operating in the Coeur d'Alenes, will issue the following statement to stockholders in a few days:

"The company is free from debt and there is no treasury stock. The whole of the original capitalization of 1,000,000 shares being in the hands of the public. The large bodies of ore proved up on the property was done by money furnished by Messrs. Halahan and Rowlands, who were endeavoring to secure control, which they would have done had the panic of 1907 not overtaken them."

It has been proposed to increase the capitalization of the company from 1,000,000 shares and to issue 500,000 shares to purchase machinery and a concentrator. It requires a vote of two-thirds of the stock to legally make this increase, and a great deal of the stock has never been transferred on the books of the company under the company name. It has been impossible to get a quorum of stockholders.

It was reported recently that the

stockholders of the Nabob Mining company would have voluntarily put up the money to do the assessment work on 19 of their 21 claims by January 1, 1910, or lose their holdings.

Salem Mining company and the Saboran Mining company, opening two distinct groups of mining claims in the Metairie district, northeast of Spokane, have been incorporated for \$2,000,000 each for \$1,000,000. The incorporators in the two companies are: D. M. Drumheller and F. C. Robertson of Spokane and W. J. Tipton of Seattle, formerly of Spokane. The properties are the Sullivan, Huntley, Cliff, Alameda, Mocking Bird, Aldrich, Bobcat, E. Lee and several others in two distinct groups. The Sullivan is the first claim located in the Metairie country, and is said to show bright prospects. The mines are expected to be big producers of silver and lead. The company is planning extensive improvements on the property, and development work will soon start. Mr. Drumheller has been interested in this property for 25 years.

James W. Ferguson, manager of the Princess Panama Mining & Milling company, has come to Spokane with samples of high-grade ore which is being opened up in large quantities on the property. The lessor, Mr. Ferguson, said, have a large amount of ore blocked out and will make a shipment to the Tacoma smelter at once. He also reports that another rich vein has been discovered in the south crosscut from the mill. The ledge has now been uncovered for 4200 feet, showing a paystreak of sulphide ore nearly all the way. The property is being extensively developed by a series of tunnels, prospects and mines and a quantity of bonanza ground is being opened up to search the water level of Lake Pend d'Oreille.

A. E. Swanson of Barlow, N. D., has gone to Cronin, Wash., to oversee the preliminary operation of a 40-ton concentrator erected on the Calumet & Hecla property on Deep Creek. The plant is operated by water power from the creek, which is carried in a flume three feet wide, four feet deep and 2,800 feet in length to the mill. A turbine wheel furnishes 80-horsepower of energy. The development work will include more than 2,000 feet of tunnel and drifts upon a ledge of silver-lead ore, which carries good copper and gold. Thomas Rogers, who has charge of the prospecting of the property, says the combined values of the general run of the ledge matter will run more than \$20 to the ton. The property, which has been under development two years, will be worked for values.

Ellis Hale, master mechanic of the Federal Mining and Smelting company in the Coeur d'Alenes, and Miss Jessie Belle Shanahan of Ogden, Wash., were married at the Palmerston hotel here on August 4. After the ceremony

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at Saltese, owned by the Days, who are the main holders in the Hercules mine, and the Dominion mine near Taft begin to send ore to the smelters. The Bryan is a lead-silver property with considerable copper and gold. The Dominion carries chalcocite copper.

Kingsley Chemical Reduction company, with a capital stock of \$1,000,000 has filed articles of incorporation in the auditor's office of Spokane county. The incorporators are George W. McKee, Harvey Martin, H. S. Sims, H. P. Hewitt and A. Allen. The purpose is to deal in patent rights or secret processes of the United States and other countries, for the reduction, refining and concentrating of mineral-bearing ores, by deposit of patent rights or territorial rights, to use or sell the same; to operate mines of nitre and other minerals or chemicals and refine the products for commercial purposes.

Forty-five thousand dollars is the amount of the 143d dividend disbursed among the shareholders of the Bunker Hill and Sullivan Mining company, operating in the Coeur d'Alene, on August 3, bringing the total paid by the corporation to \$11,068,000, and \$435,000 paid since the first of the year. Frederick W. Bradley of San Francisco, president of the company, announced while in Spokane a short time ago that greater bodies of lead-silver ore are being blocked out in the mine than ever before, adding that there is every reason that the property will continue for at least 20 years to earn dividends fully as large as those paid in the past. The mine is the richest and most regular producer in northern Idaho.

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they left for Seattle to visit the Alaska-Yukon-Pacific exposition, after which they will go to Vancouver, Tacoma, Victoria and other coast cities. Thence they will go to Treadwell, Alaska, to visit Edward Bennett, formerly master mechanic at the Frisco mine at Gen. Idaho.

Charles Sawley, manager of the Montana Gold Mining & Milling company's property, located near Heron, Mont., has returned to Spokane, bringing with him samples of rich free milling ore, in which the gold was visible to the naked eye. A contract for 100 feet of work was made a short time ago, and the drift is now in 75 feet. At 45 feet a stringer of ore was cut, but the miners will drift 20 feet further to strike the ledge found on the surface. There are four distinct ledges on the property, and the lowest assays show returns of \$125 a ton in gold.

M. Brockway of Boulder, Colo., who has been inspecting the Tungsten King mine at Deer Park, Wash., reports there is enough ore in sight as a result of a recent find to last five years at 70 tons a day. High grade ore was encountered on the lower cross tunnel, giving the company 1,000 feet of stopping ground and changing the property from a prospect to a mine. The ore in the tunnel was encountered at 190 feet. Active work is going on and arrangements have been made to put in a concentrator within the next 60 days. The plant will be of sufficient capacity to handle all the tungsten ore mined in that district.

Ray P. Davis and C. V. McDowell have taken a bond on the Blinn property in the Red Mountain district near Hewlett, Wash., and will develop it. The property was developed in the 80s and \$50,000 was spent at that time in development. The death of Colonel Blinn in 1885 put a stop to the Blinn and since that time the property has been tied up in the settlement of the estate. The new proprietors also have taken a lease on the Washington Meteor property.

H. P. Samuels of Wallace, Idaho, has acquired controlling interest in the Buffalo Mining company's property, consisting of 28 claims near the Monitor and Success properties in the Coeur d'Alenes, the price being \$300,000 or 20 cents a share for 1,500,000 shares. The Buffalo has passed the prospect stage and has three tunnels of 1,100, 700 and 200 feet, respectively, and three shafts. In all of which good ore has been found. The longest tunnel cut four ledges and two other ledges are known to be ahead. The success, Monitor and Buffalo can be worked together.

W. F. McDougall, owner of the McDougall group of claims four miles from the northeast, Ore., has bonded that

property to W. B. Fisher of Salt Lake, manager of the Salt Lake Copper company, also one of the owners of a large copper property in Box Elder county, Utah. Mr. Fisher represents large eastern capital interested in mining. Actual mining work, including diamond drilling, will be started on the property as soon as machinery can be installed. The property has an exceptionally fine showing of high-grade copper ore.

Seven hundred feet of air pipe has been installed in the Clear Grit mine, near Delta, Idaho, under the direction of H. B. Bohannon, manager. The face of the drift is in a body of low grade galena ore, assaying 20 ounces in silver and 26 per cent in lead to the ton. Dr. P. C. Ross, D. M. McQuinn and John Rosenberg of Walla Walla, Wash., who passed a week at the property in which they are stockholders, say they are well pleased with the work and showing.

The Hercules property in the Elk City district is undergoing development work, which should result in much ore being blocked out. A tunnel has been started at a point 50 feet below the apex of the hill, and will be run 150 feet to get above the ore in the lower tunnel. An upraise will be made to connect this tunnel and the lower tunnel, a distance of 220 feet. The mine has recently been equipped with steel rails and cars. The property has one of the best showings in the district.

Frank Davy, who has recently leased the Frankana property near Rossburg, Wash., has started work with two shafts to clean out the old workings. A hoisting plant will be installed and a shaft sunk through the upper end of the property to reach the ore at a depth of 200 feet. This property is owned by the Deer Trail Consolidated Mining company, and has been idle more than three months.

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An English street railway official has patented a signal which notifies a motorist to stop by the switching on of a light whenever a passenger steps on the foot-board. As soon as the passenger alights, the light is extinguished.