soon as the necessary buildings can be erected, Capt. Trethewey is at present engaged in opening up the company's copper property at Cape Maimaise.

THE BEAVER MINING AND MILLING COMPANY.—Extensive improvements have been made recently to the mill, four new vanners have been placed in position, three of which are the invention of the superintendent, and are doing excellent service in saving the fine silver from the slimers. The last shipment was made on the 27th ultimo. It consisted of 17 tons of concentrates and smelting ore, valued at $25,000. They have at the present writing 37 tons of concentrates on hand at the mill and at the C. P. R. warehouse at Murilla station.

Mr. Richard R. Paulison returned this week from a two months trip along the Bessemer Iron Range, contiguous to the Port Arthur, Duluth & Western Railway, now under active construction to the Minnesota boundary, 84 miles from Port Arthur, 40 miles of the road already having been completed this season.

Mr. Paulison also examined the vertical deposits on Hunter's Island. The most favorably known deposit of merchantable ore lies one and a half miles across the boundary in Minnesota, and consists of 160 acres of land belonging to the Milwaukee Iron Company. Commencing at the breakoff to the north, the ore lies nearly horizontal with a dip of only 5 degress. A trench about two feet deep has been dug along the iron about 500 feet, and pits sunk passing through seven feet of ore, the top two feet of which certainly will average 67% of metallic iron, and the entire horizontal deposit produce large quantities of good shipping ore.

Two miles west from this property the Chicago Iron Company own a valuable location, and which they favourably tested last winter with a diamond drill. This range has been traced from these deposits in a northeasterly direetion to the Canadian Pacific Railroad at Kaministiquia, a distance of nearly 80 miles, and on its course are located the Caldtwell, Segwick and Paulison properties. The ore is disiinctly different in appearance from that of the Vermillion and Hunter's Island ranges, and comes within the class of steel producing ores, and is black in colour, while the ranges immediately north carry the red and grey hemitites. The entire range juts against the gneiss or so called granite overflow, and has a horizontal tendency. At the Caldwell and Segwick tracts, north of Gunflint Lake, several test pi's have been put down, and prove conclusively the presence of ore in large quantities. This also applies to the thirty odd miles of deposits belonging to Mr. Paulison, north of North Aarow and Whitefish Lakes, where the most prominineni exposures of ore in place are found on 77 A., 88 A., 38 A., and numerous locations north of Round Lake. The "Wigwams" R. 257-258, in which the Sibley's, of Detroit, are interested with Mr. Paulison, have the largest body of ore in sight of any location on the range, and the essays average over 60%. Peewabic Mountain, still further to the north-east, has a good showing on its north and south face, but has not yet been thoroughly explored.

British Columbia.

At Illecillewaet the Selkirk Mining Company is running a 500-foot tunnel on the Lanark, the work being done by contract. This tunnel is expected to tap the ledge at a depth that will solve the problem.

The miners at the Union colleries, Comox, are very busy turning out good quantities of coal. The company's wharf is most favorably situated, and can accommodate as many as seven vessels at one time. The pits are turning out from 300 to 400 tons per diem.

The following are the official returns of the value of the exports of minerals from the ports of Victoria, Vancouver and Nanaimo for the three months ended 30th September :—

Minerals.	Victoria.	Vancouver.	Nanaimo.
	$ cts.	$ cts.	$
Coal	.....	18,511 oc	389,116
Lime	1,061 85	1,517 50	
Stone	.....	255 67	1,120

Returns of the value of coal exported from Nanaimo shows the following :—September, 1889, $397,497.55 ; December, 1889, $439,448.37 ; March, 1890, $385,528.17 ; June, 1890, $414,827 ; September, 1890, $389,116.

A trial shipment of 100 tons of coal from the mines of the Canada North-West Coal Company at Canmore has been sent down by S. S. Walla to San Francisco to be tested. The H.M.S. Espeigle also Saturday, before she left the harbour, took on 25 tons, and will make a test on the coal. The result of the experiment will be sent to the Admiralty for their consideration.

McKinnon has a few men at work on the Maple Leaf, a claim adjoining the Lanark, and has five horses packing ore to the railway, for shipment to the Revelstoke smelter.

In the Hot Springs district the main subject of discussion is the success or failure of the Best patent smelter. The patentee is on the ground clearing a site for a plant of 20 tons capacity. The location selected is at the mouth of Woodbury Creek, two miles north of Ainsworth.

The pump and hoist for the Little Donald was brought in from Bute this week, and contractor Northey is now engaged in getting it up to the ground and in place.

The machinery for the Krao was ordered from Chicago some time ago ; but the manufacturers made a mistake in shipping it, and a "tracer" found it down on a Southern Pacific sidetrack in Arizona. It is expected in next week.

In the Mountain District the only thing worthy of note is the ore shipments from the Silver King. Six days a week Joe Wilson's train of pack animals makes a round trip between the steamboat landing and the mine. The estimated value of the ore brought down daily is from $1,000 to $1,200, each sack of 100 pounds being worth $15. The Surprise and barge transports the ore from Nelson to Bonner's Ferry making two trips a week.

At Eagle Creek, the Poorman Company is at work making preparations to start a tunnel that will tap the ledge at a depth of 300 feet. A Pelton wheel is being placed in position, and a Burleigh drill has been ordered. This company means business, and everything under taken is carried out successfully. The Royal Canadian has been examined by a number of "experts," and a deal is now said to be in progress, which, if made, will place that property in the hands of men backed up by Ontario capitalists who are not afraid to invest a few thousands in gold prospects.

Gold Mining in Australia.

Theodore West, Darlington, Eng., read before Cleveland Institute of Engineers.

The first part of this paper is descriptive of the colonies of New South Wales, Victoria, South Australia, Queensland, and West Australia, particularly with regard to their mineralogical characteristics. These colonies, the author states, are highly advanced, socially and politically, attributable mainly to the discovery of gold and other valuable minerals, as well as to the many other resources within them—the development of which affords employment for many of our surplus population.

He states that soon after the discovery of gold, nearly all the most productive spots were pitched on, specially where the metal was easily worked, and exhausted by the simplest of contrivances in the hands of men who knew little or nothing of mining or minerals.

The following is a section of the deposit in which the gold is usually found :—

On the surface is a thin layer of top soil, thin strong ferruginous sand, fine gravel, then alternating layers of sand and gravel, coarser and coarser the deeper one goes, then large pebbles, and, lastly, boulders resting on the rock. It is in the latter stratum that the largest finds were obtained, or in the chinks and holds of the bed rock. Sometimes the gravel and pebbles were naturally bedded together with clay which, on exposure to the weather, readily fell into pieces, whilst at other points it was found to be bedded hard with what was called cement, probably due to the lime, iron, or silica contained in it.

In estimating as to the probabilities of ground paying for gold working, the yield of gold per ton of material handled is only one of the elements which have to be taken into account, as it will greatly depend on whether the material is hard or soft, near the surface or requiring to be raised from a depth, wash-dirt scarce or plentiful, and a good supply of water obtainable near the site of the operations.

The process of washing the alluvial gold is next gone into and depends on the well-known theory that the heavier substances always sink to the bottom, consequently all the apparatus used in this operation is designed and constructed on the principle that, while water has the power to wash away the base material, the metal is almost entirely left behind. The processes described and illustrated are :—(1.) By means of the "hand cradle," which is very tedious and laborious ; (2) The "Tom," which better enabled poorer ground to be worked to pay than what could be done by the cradle ; (3) By "sluice boxes ;" (4) The "puddling machine," for clay wash-dirt ; and (5) By "hydraulic sluicing," an American process, which is objectionable on account of the large amount of *debris* that was washed into the streams and water-course, and deposited on the low lying lands. It is stated that, as the alluvial deposits operated on were exhausted, and owing to the finding of small pieces of quartz with gold adhering to them, the attention of miners was directed to the quartz veins which were found traversing the various districts, some of them for miles. They are usually found to dip at an angle of 40°, although at times a flat-lying reef, several feet in thickness, is found extending over a considerable area, but generally poor in metal.

The veins are found to vary in colour from pure white to black ; the clear white are usually barren.

In the mining of the veins, a depth of about 330 fathoms has been reached, necessitating the employment of experienced miners and the use of costly machinery and other plant for the purpose of raising the ore to the surface, and skilful application of refined chemical process, to be used for wholly extracting the gold from it.

The author gives a sketch of a ten-stamp battery used for crushing the ore, also of "Chilian Wheels," and many of the other machines in use many years ago, as well as descriptions of the various mechanical and chemical processes now in use—such as the Cassell's patent, acting on the principle of decomposition of common salt and crushed ore by galvanic action, dissolving the gold, which is filtered through asbestos cloth and precipitated ; and also the MacArthur-Forest Amalgamator, by which the ore, after being firmly ground, is mixed with the cyanide of potassium stirred for 8 or 10 hours by a four-bladed propeller, then filtered through fine zinc, and deposited as a cyanide of gold.

How to Manage Steam-Engines.*

It is rather a difficult matter to write about the management and repairing of engines, as nearly all the repairs are what should be a machinist's job, as nearly all would require machine work to properly complete it, therefore it cannot be classed as a part of an engineer's business.

As regards the management of steam engines, it will be necessary to begin at the foundation, and give a minute description of the manner of setting up and adjusting work, which every engineer should understand in order that he may know what his engine needs when not doing its work properly. Every foundation for an engine requires the skill of a stone or brick mason to build, and when that is properly done then the engineer's duties begin, the first thing being to place the frame or engine bed upon the foundation, seeing that it is banded up and firmly held in its proper position. The next thing in order is to place the shaft in its bearings, seeing that it is on a proper level, and fits its bearings properly, to run easy and smooth. Then place the fly-wheel in position upon the shaft, taking care that it runs true (as it should be properly fitted when made), placing it equal distance between the shaft bearings, so that the weight will be alike on each. Next in order is the placing of the cylinder on the bed in its proper position ; there should be no mistake about this, as there should be what are termed steady pins to hold it in its place.

To prove that the shaft and cylinder are properly placed, attach to the outer end of the cylinder a small piece of board, long enough to reach across its end and fastened with one of the bolts which holds the head on. Attach to this piece a fine strong cord or wire that will not break on being drawn tight, fasten on the farther end of the bed another piece of board, leaving enough to stand up as high as the center of cylinder, attach the other end of the cord to the latter piece, bringing it exactly to the center of cylinder, which can be done by calipers. Turn the fly-wheel over, bring the wrist pin to the line, and be particular that it is exactly in the center of the bearing on the pin ; then reverse the fly-wheel, bring it to the line of the other center. If the line is on the center of cylinder, also on center of wrist-pin when turned on both centers, then your engine is on line ; but if not then the cylinder must be out of line, or else the shaft is not square with the cylinder, in which case it must be brought to a perfect line, either by moving the cylinder, or pillow block the outer end of shaft. When these points are in a perfect line, put in the piston and attach the connecting rod to the cross head, being sure that the cross-head comes in a perfect line with the center of cylinder.

When this is accomplished, all is ready for connecting the smaller parts, such as cut-off, rod-valve, &c. This brings us to an important part of the work, viz., the setting of the valve, of whatever kind it may be. I find this the most simple way to adjust in a slide-valve engine. Turn the fly-wheel to its furthest point, or in other words, to its center point, which will bring the piston