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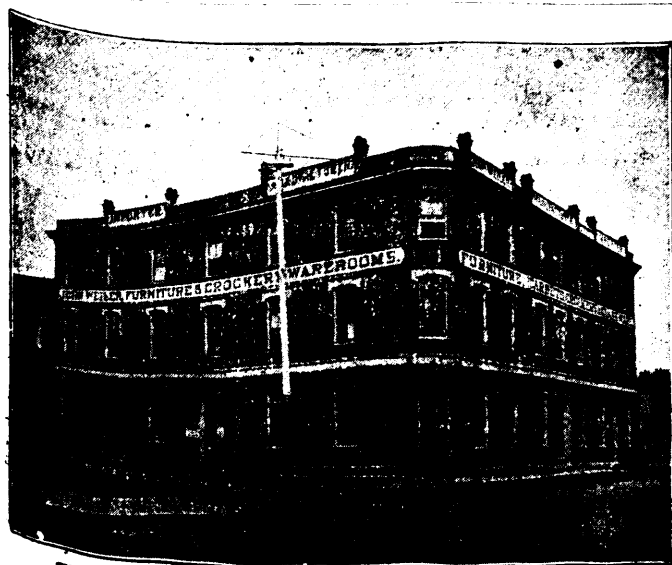
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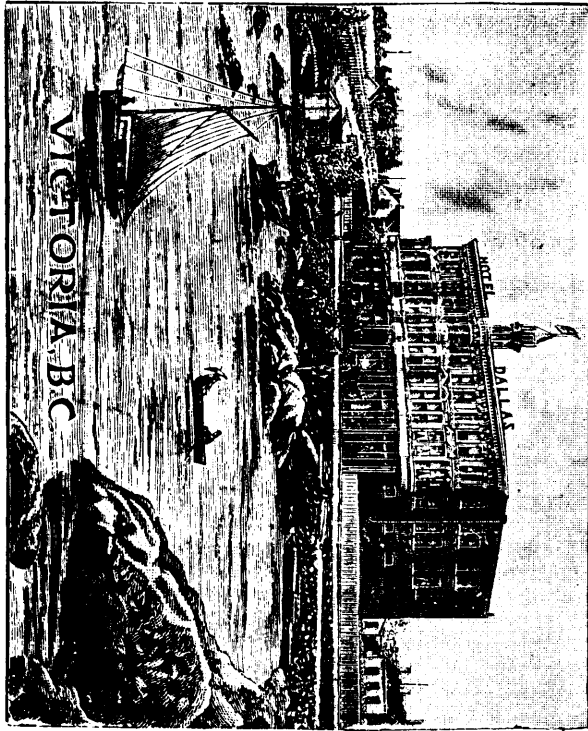
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ON HAVING LEARNED that many who desire to obtain the above Certificate do not feel sufficiently prepared for the examination it was proposed to hold here during the last of this month, the Hon. the Minister of Mines has decided to postpone said examination until the autumn, when it may be held in two or three places in the Province for the better convenience of the candidates: due notice to be given of the time, places, and examiners appointed by the Minister.

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VOL. II.

APRIL, 1896.

No. 4.

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VOL. 2.

APRIL, 1896.

No. 4

NOTICE.

We have organized the following departments in connection with the B. C. MINING RECORD, with the view of forwarding the interests of our many readers, especially those living in the mining districts.

ENQUIRY DEPARTMENT.

In connection with the B. C. MINING RECORD we have established an "Enquiry Department" for the purpose of furnishing information about the mining resources and mining industries of British Columbia to parties outside the Province who may desire to obtain the same. For this we make no charge, but, on the contrary, will only be too glad to reply to any communications addressed to

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Any of the following standard works on geology, mining, metallurgy, assaying, etc., issued by the Scientific Publishing Company of New York, can be procured by addressing the editor of the British Columbia MINING RECORD, P. O. Box 763, Vancouver, B. C., and enclosing the price thereof:—

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We are placing mineral exhibits in the offices of the B. C. MINING RECORD at Vancouver and Victoria, and invite visitors and others to inspect the same. Parties having mines or claims are asked to send in samples of their ores, with full particulars attached, in order to make these exhibits as representative of the whole Province as possible. The samples will be viewed by many passing through Vancouver during the coming season, and the co-operation of parties interested in mining in making a fine exhibit of our mineral wealth will well repay the trouble. All samples sent in to be addressed:—

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The following papers are kept on file at the office of the B. C. MINING RECORD, for the use of visitors who may wish to consult their columns:—

The Mining Journal	London, England
The Engineer and Mining Journal	New York
Mining and Scientific Press	San Francisco, Cal.
Canadian Electrical News	Toronto, Ont.
The Commercial	Winnipeg, Man.
Mine and Quarry	Chicago, Ill.
Pacific Coast Bullion	Los Angeles, Cal.
Canada Lumberman	Toronto, Ont.
Western Mining World	Butte, Montana
Spokane Miner	Spokane, Wash.
Inland Sentinel	Kamloops, B. C.
The Golden Era	Golden, B. C.
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NOTICE TO SUBSCRIBERS.

On the 1st of May all unpaid subscriptions will be scored off our books and the paper discontinued to those parties who have not paid. In future all subscriptions must be paid in advance and there will be no deviation from that rule. Subscribers who have not paid will please, therefore, take notice and remit amount due on or before 1st May next.

Editorial Notes.

The Provincial Government have amended their Assessment Bill as we supposed they would when they discovered that the original draft was not likely to work advantageously.

When the Act as amended is put in force, it is more than probable that further amendments will be found necessary, and we have every confidence that the Government will then do whatever is deemed best in the interests of the mining community.

An Act of this kind cannot be made wholly satisfactory at one session of the Legislature and only when its effects upon the various mining industries will have been ascertained by a practical application of its provisions, can the bill in question be properly judged.

While speaking on the subject of amendments, we suggest one for the consideration of the Government which we think would be only an act of justice to a worthy class of men.

We allude to Miner's Licenses which are not objected to so far as they apply to prospectors or parties who are mining for their own benefit. But where a man who is working merely for wages has to pay a tax for so doing, it seems like an act of unfairness to that individual.

Why should a miner who receives only wages have to pay a tax for the privilege of working at his calling any more than the ordinary artisan in other pursuits. The license is no benefit to him. He has the right to be protected in the collection of his wages just as much as any other workingman without having to pay specially for it.

Where a man is prospecting or mining in his own interest there can be but little objection to his paying his license fee. Indeed we do not think there is any objection to miner's licenses of this description. But in the case of the wage-earning miner it is different, and the fee demanded from him is regarded as an injustice.

Our mining laws in British Columbia are acknowledged to be liberal, and the doing away with licenses such as we have described, would not only make them more so, but it would be an act of justice to the parties concerned.

At a time when it is so difficult to obtain sufficient revenue to meet the provincial expenditure, it is possible our suggestion may not meet with the favor we wish for it, but this does not affect our plea against unduly pressing upon the wage-earning miner.

The deplorable accident at Rossland the other day, when several miners lost their lives, would indicate that some better provisions should be insisted upon by the Government for the preservation of men's lives while working in the quartz mines. In the case to which we allude it would seem to have arisen from carelessness, but it appears to us that mine owners should be obliged to follow certain rules and to rigidly enforce them for the prevention of accidents.

Mining is often necessarily dangerous, and men then take their lives in their hands when following it, but the adoption of certain set rules might, if insisted upon, prevent carelessness, which too frequently causes loss of life. This matter is worthy of attention.

The holding of leases by the mere payment of money to the Government is a system which is leading to the locking up of much good mining land by speculators. The lessee should in each case, be made to do the improvement work, as required by law, or forfeit his lease. Miles of country are staked off by men who can afford to pay the Government fee, but who will not improve the property, their object being merely to hold it on speculation until a buyer comes along who will pay the price they want.

This is retarding development in the country. Miles of river leases for dredging purposes, have also been taken up and are not being worked. In collecting revenue from leases, the Government should see that the mere payment of the money is not allowed to stand as an excuse for shirking development work, or one of those days there will be a general outcry against the whole system, which will bring discredit upon the administration of affairs.

Where a man places improvements upon his lease, he should be entitled to either a crown grant or be recompensed for his outlay. Often a man after spending considerable money, is obliged to abandon his lease, and all that he has expended is lost. His successor derives the benefit. This does not seem just, and some provision should be made to protect men from such losses.

In the Kootenay and other mining districts of British Columbia, there is a class of men who endure toil and often hardships in their efforts to discover the hidden treasure. They are the pioneer prospectors, and without them our mineral wealth would remain hidden. They should have their reward, but it too often happens that they place such an extravagant value on their findings,

that it frightens capital away. This not only prevents the prospector from realizing a return for his labour, but it tends to retard active development.

The wise thing for the prospector to do is to place a fair valuation on his claim in the first instance; a valuation which will bear inspection, and the result in the end will be to his advantage. On the other hand, capitalists should not haggle over a fair price when a really good proposition is laid before them.

The chief difficulty in the way of smooth dealing between owners of mining property and capitalists often lies in the fact that a middle man is interested. Either he has secured a bond or he is acting as agent, and his percentage of commission which, sometimes is extravagant, blocks the way. Capitalists are wise who employ their own trusted men in treating for the purchase of mines, and prospectors or the owners of mining property will do well to consider carefully before placing themselves in the hands of agents or middle men. There are good men to be found and there are others who are unscrupulous. It is not difficult by proper enquiry to know whom to trust.

Victoria and Vancouver each has a stock exchange. An institution of this kind can do much good. If conducted merely for gambling in stocks it will do harm. In listing shares, the greatest care should be taken by the committee appointed for the purpose, to examine carefully into the condition of the companies applying, in order to see that no bogus concerns are foisted upon the public. If this is thoroughly attended to, the Stock Exchange will become of real benefit to the investor. We have at present a super-abundance of mining companies, a number of which are not entitled to public confidence. A weeding out is necessary and the Stock Exchange, if properly managed, will be a good medium in that direction.

The Columbia & Western Railway is a project which deserves encouragement. It will give an impetus to development in the southern part of Kootenay and afford an outlet for the mines which they need. It will place a rich agricultural part of the Province in direct connection with the mining country of Kootenay and will also cause much of the mineral wealth of the Province to remain in British Columbia instead of flowing into the United States. But it seems to us that the time asked for in which to complete the line is longer than necessary.

The promoters are asking as much time to build a road of less than 200 miles as it took the Canadian Pacific Railway to complete their transcontinental line. Long before the end of the next six years the mining country in Southern Kootenay will be in an advanced state of development and the traffic probably enough for

more than one railway. The Legislature, therefore, should be careful when granting any charters to guard against the development of the country being checked by monopoly.

So far as the Columbia & Western Railway is concerned there is this to be said. If in two years the promoters find that it will be a profitable undertaking to complete the whole of their line without delay they will very likely do so. But it is not the part of the Legislature to take chances. It is the duty of our legislators to make the best possible bargain now.

Then again there is another view of it. If the Columbia & Western Railway should be built in two years instead of six would it not be the means of causing a quicker development of the mines, etc., in its section of country. There are many things to be considered in connection with granting a railway charter and the time allowed for construction is one of the most important. On the whole we regard six years as too long a term to be allowed for the completion of the Columbia & Western Railway. By shortening the time allowance it will quicken the efforts of its promoters.

Now that the mining districts are likely to contribute a considerable sum to the revenue of the Province the mining community will have a stronger claim upon the Government for the expenditure of money in building roads and other improvements. The mineral tax about to be imposed strengthens the position of the mining districts immensely in that respect.

The mail service throughout the Kootenay continues to be a disgrace to the postal authorities. We can obtain an answer to a letter sent to England about as soon as we can get a reply by mail from Kootenay. Indeed when we send a communication to the latter place by post we are never certain when it will reach its destination. As soon as the present session of the Dominion Parliament is over we should prevail upon the Postmaster-General to take a trip through the mining districts and see for himself how matters stand. While on his tour of inspection in Kootenay he would certainly not be in complete touch with his colleagues at Ottawa. They could reach him by letter only at long intervals.

They have had an immigration convention at Winnipeg. Why should we not have a convention of British Columbia mining men. It would do good. It would bear fruit. It seems though as if our mining men in this Province were indifferent to the general welfare. Each one appears to be looking after the ducats in his own behalf without caring much about anything else. Spokane had a convention while we in British Columbia go grubbing along each one for himself. When will we get out of this selfish groove and our mining men act in a more public spirited manner.

We call attention to an article from the pen of Mr. J. M. Buxton to be found on another page in this issue. Our readers in England and other parts of Europe and in the United States little know the treat that lies in store for them midst the mountains, the hills, and the valleys of this fair Province should they pay us a visit. The wealth of sport, the invigorating air of the mountains, and the many pleasures to be enjoyed in this delightful climate will well repay the tourist or health-seeker, and the seeker of wealth will find in our hills and our streams abundance on which to expend his energies.

The movement to secure the erection of smelting works at Vancouver is taking practical shape and now that the Canadian Pacific Railway are taking active steps to perfect the means of communication between the great Kootenay country and their main line the erection of smelters at the Terminal City cannot be delayed very long.

As will be seen by a perusal of the pages in this number of THE RECORD, the district of Alberni on Vancouver Island is destined to become a rich and prosperous mining camp within a short time. The existence there of gold in paying quantities has long been known, but the work of active development is only of recent date.

Now, however, we are on the eve of active operations in that part of the island in which some of the wealthiest men in Victoria are interested.

Amongst others Mr. James Dunsmuir and Mr. Kirk of Turner, Beeton, & Co., have shown their faith in the district by investing. The mines will be opened up at once, stamp mills erected, and other improvements undertaken.

Hydraulic works and placer mining will also be in full swing during the coming summer and if many of the unfortunate men who have gone treasure hunting in Alaska had turned their steps to Alberni it would have been to their advantage.

The Island of Vancouver has never been thoroughly prospected for precious metals although it is well known to be rich in minerals of all kinds. Many of the streams bear gold, and in quartz mining the indications are from the stories of Indians and fur hunters, that most valuable mines exist in many parts of the island. In coal, the very best article found in the whole Pacific coast is mined.

Now that Alberni is receiving so much attention, and its prospects so excellent we expect that other parts of the island will be fully explored and that before many months, Vancouver Island will rival the mainland as a gold producing country.

How comes it that the Governor of the North West Territories is the one to give permits for liquor selling in the Yukon? We should have thought that the Governor of British Columbia is the proper person. Is it because the North West Mounted Police have been utilized for the collection of revenue in the northern country? We in British Columbia have a good deal more interest in the Yukon than have the North West Territories. Why are we overlooked?

Another remarkable fact is (if we have been correctly informed, and we think we have), that American firms are the only fortunate possessors of licenses granted by the Mounted Police, while British Columbia firms who have a better right to the trade have been ignored and their goods rendered liable to seizure.

An investigation of this whole matter by the Ottawa authorities is required.

Our next issue will be a SPECIAL KOOTENAY NUMBER and will contain several original articles from well known writers as well as an exhaustive description of the whole district. It will be specially illustrated and our readers may expect to see a most interesting number.

Second Lecture on Chemistry.

BY HERBERT CARMICHAEL, PUBLIC ANALYST AND ASSAYER.

In my previous lecture I endeavored to give you an idea of the meaning which our modern science attaches to the word molecule.

I must attempt to convey as far as I am able the corresponding conception which the chemists expressed by the word atom. The term molecule and atom are constantly confounded; indeed have been used frequently as synonymous, but the chemistry of to-day gives to these words wholly different meanings.

We have already defined a molecule as the smallest mass into which a substance is capable of being subdivided without changing its chemical nature. To the chemist the molecules determine those differences which distinguish substances. Sugar, for example, has the qualities which we associate with that name, because it is an aggregate of the molecules which have those qualities. Divide up a lump of sugar as much as you please, the smallest mass that you can recognize has still the qualities of sugar, and so it must go, if you continue the division down to the molecule. The molecule of sugar is simply a very small piece of sugar.

Dissolve the sugar in water and we obtain a far greater degree of subdivision than is possible by mechanical means; a subdivision which we suppose extends as far as the molecules. The particles are distributed through a great mass of liquid and become invisible; still the qualities of the sugar are preserved; on evaporating the water we recover the sugar in its solid condition and according to the chemist the qualities are preserved because the molecules of sugar have remained all the while unchanged.

Consider in the second place a lump of salt; you do not alter its familiar qualities however greatly you may subdivide it and the molecules of salt must have all the

saline properties which we associate with this substance. Dissolve the salt in water and you simply divide the mass into molecules. Convert the salt into vapor, as you readily can, and again you isolate the molecules as before, but through all these changes the salt remains salt; it does not lose its savor because the individuality of the molecules is preserved and so it is with every substance.

Considering only the ordinary chemical relations of the two substances, a molecule of sugar differs from a molecule of salt in precisely the same way that a lump of sugar differs from a lump of salt. In a word, what is true of the substance in mass is true of its molecules.

But although the molecules are the limit of physical subdivisions of a substance the chemist carries the subdivision still further; but then, the parts obtained have no longer the quantities of the original substance, and one or more new substances result.

Of course the chemist cannot, any more than the physicist, experiment on individual molecules. By the physicist I mean the man who directs his attention to light, heat, sound, electricity, etc., and their accompanying phenomena. He must experiment on a mass of the substance and the division of the molecule must be an inference from the phenomena which ensue. Let me call your attention to a few experiments which will illustrate this point.

If we crush a lump of sugar in a mortar and reduce it to a fine powder, the microscope will show that it is simply smaller grains, in fact that they are of larger size compared to many objects viewed under the microscope. Each one of these grains is sugar and has all the essential qualities of the lump. If we next pour the sugar into water which simply separates the molecules, how are we to go further than this? Again we throw some lumps of sugar into a heated platinum crucible. Charcoal is at once formed which must have come from the sugar, so we have at last divided the molecule. Let me however enforce this conclusion by still another experiment which is even more striking.

If we add sulphuric acid to a mixture of sugar syrup, constantly stirring the mass as we pour in the acid, we find that the syrup at once blackens and immediately begins to swell and an enormous body of charcoal rises from the vessel.

On analysis we find that sugar is composed of carbon or charcoal united to oxygen and hydrogen in the proportion which form water, and this sulphuric acid which has a great attraction for water has simply caused the oxygen and hydrogen to unite to form water and then dragged them out, leaving the charcoal; and we find further, that if we take the weight of the charcoal formed and add to it the weight of the water produced we will have the exact weight of the sugar taken for the experiment. Thus we have decomposed the molecule of sugar.

Now in my first lecture I brought before your notice the molecules of water and I explained to you how when in the state of ice they were close together, but that under the action of heat they expanded first into water and then still further into steam. In these experiments we dealt solely with the molecule and did not attempt to go further, but we can divide this molecule of water chemically as the following experiment will prove.

We pass a current of electricity through some water acidulated with sulphuric acid. The instant contact is made bubbles of gas begin to ascend from each platinum plate and collect in the graduated tubes, which at first are filled with acidulated water. After a little time it will be seen that the plate which is connected with the zinc of the battery evolves more gas than the one which

is in contact with the platinum or carbon pole of the battery, and after the evolution has continued for a few minutes, one tube will be seen to contain twice as much gas as the other. On examination the larger volume of gas will be found to be hydrogen, because it takes fire and burns when a light is brought to the end of the tube in which it was collected, whilst the smaller volume of gas is seen to be oxygen, because a glowing chip of wood is rekindled when plunged into the gas.

It is evident that in the experiment which I have shown you, two new substances are evolved and the question arises where do they come from? If we examine carefully the conditions of the experiment we should find that of all the substances present the only one that underwent any permanent change was the water. The weight of the platinum poles remains unchanged but the weight of the water is diminished in exact proportion to the amount of gas evolved.

These gaseous substances are then derived from the material of the water. Moreover it has been proved that the water is completely resolved into these gases. The electric current is merely a form of energy, and of course can neither add or remove ponderable material, and the weight of oxygen and hydrogen formed is exactly equal to the weight of the water lost. As we say in chemistry, the electric current analyzes the water and these gases are its sole constituents.

Thus we have split up this molecule of water into the atoms of which it was formed, and we find that we have here two atoms of hydrogen, and one atom of oxygen weighing sixteen times as much as an atom of hydrogen.

I hope in my next Lecture to prove this more fully to you.

Third Lecture on Chemistry.

In my last lecture I showed you our first case of analysis, in which we analysed water by the aid of the electric current. By it we divided each molecule of water into one atom of oxygen and two atoms of hydrogen. Let us now see if we can, by causing these two gases to unite in the proper proportions, form or build up again a molecule of water.

I have here a soap bubble in which are the two gases hydrogen and oxygen mixed in the proper proportion to form, we will apply a light to the bubble and you hear the loud explosion which is the result. The two gases have combined to form a minute quantity of water, but you will notice in combining how much force is given out in forming even this minute quantity of water. In this we have a case of synthesis, or the building of a molecule of water from the three atoms, viz.: one of oxygen and two of hydrogen.

We have here burning a flame of ordinary coal gas, and you will notice when we hold over it this cold glass shade the drops of water which collect on the inside of the glass. This water is formed by the union of the hydrogen gas of the flame with the oxygen of the air, and energy in the form of heat is developed.

The following experiment exemplifies this further: This is a blow-pipe constructed for using two gases, and we have connected it with our oxygen and hydrogen bags. Now we have a stream of oxygen flowing through the hydrogen, and with apparently very little result, but this steel file which we have introduced into the flame and which is burning so rapidly will show the great heat which exists in the flame. This piece of lime which you see heated to such whiteness also shows the heat made manifest by the intense light.

Who could believe that such power was concealed in the familiar liquid which is so intimately connected with our daily life? Between the qualities of water and the

qualities of these gases, there is not the most distant resemblance. When the water is decomposed the qualities of the water are wholly lost in the qualities of the two gases produced from it and a certain amount of energy is absorbed. When the water is formed, the qualities of oxygen and hydrogen are wholly merged in those of the resulting liquid, while the same amount of energy is set free.

Now the only theory which has as yet succeeded in giving an intelligible explanation of the facts, assumes that the oxygen and hydrogen do exist as such in water, preserving each its individuality, that each molecule of water consists of three particles, two of hydrogen and one of oxygen; that when the water is decomposed the molecules are broken up and that then the oxygen particles associate themselves together to form molecules of oxygen gas, and the hydrogen particles to form molecules of hydrogen gas; that, on the other hand when the gases recombine the reverse takes place, each particle of oxygen uniting to itself two particles of hydrogen to form a molecule of water. These parts of molecules (these particles into which the molecules break up under various chemical processes) are what we call atoms, and this is the famous atomic theory which has played such prominent part in our modern chemistry.

The elements of every chemical change are these:—
1st. One or more substances called the factors, with which the change begins. 2nd. One or more substances called the products, with which the change ends. The chemical change may be accompanied with the manifestation of striking physical phenomena, as the burning of gunpowder with the rush of a cannon ball, the burning of coal with the development of heat, or the solution of zinc in the acid of a volatile battery with the flow of an electric current.

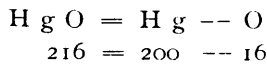
When a new process is discovered, the chemist is not content until he can clearly point out all the substances which enter into the process, as well as all the substances which are formed by it. At first sight chemical processes are frequently very obscure, for instance, a burning candle will give an apt illustration. At first sight the candle appears to be burning away and gradually disappearing out of sight, but there is really no part of the substance of the candle being lost, we have here both the factors and the products, and in both cases the weight of either will balance. The carbon which composes the candle uniting with the oxygen of the air and forming, as I illustrated to you in the case of the Bunsen burner, water, which disappears as aqueous vapor, and the carbon of the hydro-carbon uniting with a portion of the oxygen of the air and form carbon dioxide, which likewise escapes as an invisible gas. If we weigh the candle before we light it and weigh the oxygen which unites with it in burning, we will have the weight of the factors, and if we weigh the carbon dioxide gas and aqueous vapor which is given off, we will have the weight of the products, and this, by most careful experiment, we find to be exactly the same.

I hope you will begin to see now one great enunciation of our modern chemistry, and that is, as far as we know now, no matter what process we subject matter to, and no matter how we change its form, there is none of the material which composed it lost, this is, in fact, the law of the conservation of mass. But this great law of the conservation of mass is by no means as might at first appear, self evident, and it is only lately that it has become an accepted principle of science. For centuries chemists believed in a kind of matter called phlogiston, which not only could be removed from a substance without diminishing its weight, but whose subtraction actually added to the weight. It is the great merit of the chemist, Lavoisier, that he clearly conceived the

principle of the conservation of mass and insisted on its application in chemistry. He was the first to see clearly that in every chemical process increase of weight means increase of material, and loss of weight, loss of material. Iron, in rusting, gains in weight, hence, said Levoisier, it has combined with some material. No, said the defenders of the phlogiston theory, it had only lost phlogiston. When lead is heated in a vessel to which the air has access it gains in weight. Said the phlogistonists, we have driven off phlogiston. But we now know that the iron in the process of rusting has merely combined with the oxygen of the air, and under the action of heat the lead also rapidly combines with the oxygen, forming oxide of lead. So that the theory of adding a substance to another substance which will make it lighter has been entirely abandoned.

In all chemical processes it is not only true that the sum of the weights of the products is equal to the sum of the weights of the factors, but it is also true that the weights of the several products stand in a definite relation, this is called the law of definite proportions.

For instance, if we heat 216 parts of pure mercuric oxide, which a chemist knows by the following sign, HgO , the " Hg " standing for mercury and the " O " for oxygen; we will get exactly 200 parts of metallic mercury and sixteen parts of oxygen gas. This a chemist understands by the following equation:



Now, in this experiment, a true chemical combination or interchange has taken place. I wish now to distinguish for you between a chemical compound and a mechanical mixture.

Here we have a mixture of finely divided iron and flowers of sulphur which are at present a mechanical mixture. If we add a little to some bi-sulphide of carbon you will see that the iron is left and the sulphur dissolved. A magnet will attract the iron. If we now make this mixture into a small cone and set fire to it, you will see that it burns; the sulphur is combining with the iron to form sulphide of iron, a new substance, and the properties of the sulphur and iron have disappeared.

With bisulphide of carbon we are not able to dissolve out any sulphur and the mass is not attracted by magnet, but we find that, on treating the mass with diluted sulphuric acid, we get a bad smelling gas which blackens a paper saturated with a solution of lead; this we could not get with the merely mechanically mixed sulphur and iron. The bad smelling gas is sulphuretted hydrogen, which occurs in many mineral springs.

Chemical combination always takes place in certain definite proportions either by weight or measure. Thus we may mix together sulphur and iron in any proportion we choose, but when, on heating, combination takes place, fifty-six grains of iron combine with just thirty-two grains of sulphur, and if there is an excess of one or the other substance, that excess remains uncombined. If there is an excess of sulphur there remains so much free sulphur which we can dissolve out with bi-sulphide of carbon; and if there is an excess of iron there remains so much metallic iron which we can separate with a magnet.

It is this law of the combination in definite proportions which enables us to perform a great many of our chemical analysis, and it is more particularly this point which I hope to touch on in my next lecture.

Byron N. White, manager of the Slocan Star, lately said the Star was shipping 20 tons of ore a day.

Extracts From Mr. Wm. J. Sutton's Report on Alberni District.

In taking a general survey of the country under consideration, before entering into specific details, a glance at the map of Vancouver Island will show the rugged, mountainous nature of its interior. The mountains of Vancouver Island are comprised within what has been called the Vancouver Range, it being the most westerly of the four great ranges or systems of mountains in British Columbia embraced within the Cordillera belt. Commencing at the most easterly, we have first, the Rocky Mountains, then the Gold Range, next the Coast Range, and finally, the Vancouver Range, running more or less parallel in a north-westerly and south-easterly direction.

The Vancouver and Gold Ranges have many features in common in their auriferous schists and altered volcanic rocks. The Gold Range being composed of a number of minor ranges, namely, Cariboo, Selkirk, Purcell, and Columbia Ranges, has thus far produced most of the mineral wealth of the Province of British Columbia. The Vancouver Range is the north-western boundary of the Continent of North America, as there is only a narrow sub-marine plateau extending beyond it, then a quick ascent into the azure depths of the great Pacific.

Comparatively little is yet known regarding the geology of the interior of Vancouver Island, partly owing to its rugged nature and thick undergrowth, also to the limited amount of geological work thus far undertaken. The complications of structure presented can only be satisfactorily worked out by a comprehensive survey of the whole Island, and, therefore, properly comes under the purview of the Geological Survey of Canada; and I would respectfully draw your attention to the needs of the Province in this respect.

The Vancouver Range consists for the most part of an enormous series of eruptive rocks, interbedded with limestone, argillite, quartzite, etc. This great mass of volcanic material and interbedded sedimentary rocks has been grouped together and provisionally called the Vancouver series by Dr. Selwyn. The series amounts to many thousands of feet in thickness, and will most likely be found to cover not only triassic and carboniferous rocks, but even lower in the geological scale. The limestone portion alone attains a thickness of several thousand feet, and Dr. Dawson has suggested limiting the series to the triassic rocks, when they shall have been distinctly separated. The whole region has suffered great disturbance, and it might be termed a region of turmoil and chaos. Volcanic outflows on an enormous scale have occurred at repeated intervals, long periods intervening, during which the interbedded sedimentary rocks accumulated. The amount of volcanic breccia and tuff is also a remarkable feature of the period, a large exposure of which may be seen along the Alberni Road at Cameron Lake. All this great series has undergone extensive metamorphism. The limestones have become highly crystalline and show few fossils. The argillites have become semi-crystalline and more or less chloritic schists. The eruptives, although originally basaltic and trachytic lava flows, have undergone such alterations that we have now diabase, diorite, felsite, etc. A large proportion might be called greenstone, their greenish appearance being due to alteration products such as chlorite, viridite, etc. Some of these extremely altered eruptives might, from a lithological standpoint, be regarded as very low down in the geological scale.

The interior of Vancouver Island lying north of Cowichan Lake and extending through to Alberni, appears

to be the remnant of a high, elevated plateau, the mountain peaks now remaining having an elevation of about 4,000 feet, which is about the average height of most of the principal mountains of the Island, the highest being Victoria Peak, with an elevation of 7,484 feet. Lying uncomformably on the Vancouver Series is quite a large area of cretaceous rocks, forming a sort of fringe along the east coast of Vancouver Island, and embracing the coal areas of Cowichan, Nanaimo, and Comox.

At the head of Alberni Canal there is a basin of sedimentary strata, consisting of sandstones, conglomerates, and shales, which have been referred to as the cretaceous, but from observed lithological differences I am inclined to question whether they belong to the same horizon as the gold-bearing area of the East Coast. A shaft was sunk on the shale near the head of the canal about seventeen years ago, but no distinct coal seam was exposed, although the shales were highly carbonaceous. I came across the outliers of these sandstones and shales in the China Creek Basin, to which I shall have occasion to refer later on. I have also seen similar sandstone and conglomerate on the border of Cowichan Lake.

It is interesting to note in this connection that almost every creek and river on Vancouver Island shows at least one or two colors to the pan. Leech River, in particular, yielded considerable gold to the hardy miners of the early sixties, variously estimated from one to two hundred thousand dollars.

China Creek has been worked for its alluvial gold as far back as 1862, principally by Chinamen, and has yielded about \$40,000 by the most primitive methods, the pan, shovel, rocker, and sluice-box. Considerable gold has also been taken out of Gold River by the Chinese, but nothing definite can be obtained regarding its yield. The black sand along the north shore, especially at Cape Cormorant and Cape Scott, contains considerable fine gold, similar to that found along the coast of Oregon and California.

All the streams which have their sources in the auriferous belt under consideration show strong colors to the pan. I may mention the following:—Cameron, Nanaimo, Nitinat, Cowichan, and Franklin Rivers; China, Shaw, and Granite Creeks. It must not be overlooked that placer gold has been deposited by a natural process of concentration by an extensive erosion of the surrounding country, and is not to be entirely depended upon as a finger index to the extent of the gold yet remaining in the hills.

Starting from the Alberni Settlement, where a number of pioneers are busy clearing land in that fertile valley, China Creek is reached by a good pack trail, which passes over a comparatively level valley, along which a good wagon road could be easily built. The trail strikes China Creek about eight miles from the Alberni Settlement, opposite the Cataract Hydraulic Claim, and then follows the bank of China Creek up to its source, the Golden Eagle Basin.

Along the trail several exposures of syenite can be seen. This syenite extends over a large area, and forms I think, the palæozoic floor upon which the Vancouver series was laid; wherever met with, it was found to underlie all the other formations. It is a typical syenite, showing the hornblende in well defined crystals, but considerably altered; it contains very little mica and a small proportion of quartz, although quartz occurs locally in sufficient abundance to make it a hornblendic granite. Syenite occurs as bedrock along nearly the entire length of Granite Creek, from which it has derived its name through the miners regarding it as granite.

Small outliers of the sandstone previously mentioned

were exposed along the trail, which no doubt originally covered the whole valley, but has since been denuded. There is a large body of this sandstone overlaid with shale, commencing at Mineral Mound Number 12, and extending up to near Mineral Mound Number 15, on China Creek. It is exposed along the beds of Mosquito and McLaughlin Creeks, extending into the foot-hills, and also forms a rim around Mount Patl Patlicant. There is a fine exposure of these strata at a high fall on McLaughlin Creek, there being a perpendicular drop of 150 feet. Here they appear to lie horizontally, but in passing around Mount Patl Patlicant to the west, they form a spiral, and crop out near the top of the mountain on the south side. A good exposure, showing this twist, is on a bluff at the head of Child's Creek. The most remarkable exposure of this sandstone is at its contact with the Vancouver eruptives, well exposed in the bed of China Creek above Mineral Mound Number 15. Here the sandstone dips under eastward at an angle of sixty degrees, which may be explained as a complete overthrow of the strata, or a reverse fault—pre-supposing that the eruptives antedate the sandstone. There is about two feet of flucan, and the sandstone is very much indurated at the contact, the eruptives also being very much altered. The deepest section of these sedimentary strata would amount to about 600 feet of sandstone and 400 feet of shale. No evidence of coal was anywhere seen.

The sandstone near Mineral Mound Number 12, graduates into coarse conglomerate containing large boulders of syenite near its contact therewith.

Mount Patl Patlicant has a capping of eruptive rock, probably phonolite, which rests upon the shale above mentioned.

The gold belt on China Creek lies east of this sandstone, the formation being almost a typical section of the Vancouver series, consisting of diabasic, dioritic, and felspathic rocks, more or less schistose, with interbedded limestone, argillite and quartzite. These eruptive rocks have undergone remarkable alteration, especially in the neighborhood of Mineral Creek, where they become greenish-grey schists, only showing their eruptive origin under the microscope.

On the Alberni claim two veins of gold quartz have been exposed. The lower vein has about two feet of a crystalline quartz containing free gold disseminated through the quartz in fine particles, and in some places plainly visible to the naked eye. The gold is associated with small grains of blende (black jack) in a somewhat peculiar manner, so that the presence of blende is an index to the occurrence of gold. The gold shows signs of crystallization when highly magnified. The vein dips about sixty-five degrees to the east, with a strike of north fifteen degrees east, and conformable with the bedding or foliation of the country rock, and therefore may be classed as a "segregated" vein. The upper exposure of gold-bearing quartz is a narrow vein about a foot in width, cutting across the formation about north-east. The gold occurs in the same manner as in the other vein.

The country rock of the Alberni claim, as already mentioned, is a greenish-gray schist, being an igneous rock highly metamorphosed through hydro-thermal agencies. The same rock formation occurs on the Chicago, Warspite and Victoria claims; also on the claims lying north and south of these claims.

There are two quartz veins exposed on the Chicago claim, one of them lying in a line with the main Alberni ledge, and appears to be a continuation of it. It is the same width and has the same dip and strike.

The Missing Link and Champion claims, lying north of the Alberni, show several quartz outcrops.

veins, eighteen inches in width, were uncovered, showing free gold plainly visible. Very little work has been done, the veins having been only just discovered.

On the Crown Point claim there is a lenticular body of quartz two feet in width, cutting across the formation, exposed for about forty feet.

On the Mountain Rose there is a quartz vein about two feet in width, also running at right angles to the formation, and exposed for about fifty feet, when a slip causing a fault was encountered, beyond which the vein has not been traced. This vein carries considerable chalcopryrite disseminated through the quartz. The country rock is an argillaceous schist or slate, with the line of foliation running due north and south. This schist is well exposed on Brown Creek, running across the Vancouver claim.

Beyond those I have mentioned, very little work has been done on the claims in this section, so that it would be premature to form any definite conclusions regarding the permanency of the auriferous deposits. The majority of the veins are interbedded or "segregated" veins, and have the appearance of being of a somewhat lenticular character, similar to the quartz veins in the Alleghany Mountains, and a large proportion of the gold-bearing veins of California. They are good types of segregated veins, and contain the usual constituents of gold, pyrites, blende, galena and chalcopryrite.

It has been advocated that veins of this description are less persistent than true fissure veins; that they are rich near the surface, and frequently terminate by pinching out in depth and horizontal extension; but recent mining operations have demonstrated that segregated veins may extend to great depths, and be of considerable extent. They often do not differ in any way from true fissure veins, except that they run parallel instead of across the strata.

The schists in the neighbourhood of Mineral Creek have a strike nearly north and south, and I would therefore recommend the prospector to examine carefully the country lying due north and south of this creek. I understand that some good prospects have been discovered since my return, on a creek called the Yellowstone, lying due north from Mineral Creek.

Mineral Creek follows the line of bedding of an interbedded strata of calcareous material, or impure limestone, heavily studded with pyrites, the creek being confined to this bed its entire length, owing to its being softer than the neighboring rock and therefore more easily eroded by the water-course.

In a similar way, a number of other creeks in the neighbourhood were observed following down the interbedded strata of limestone so common to that section.

GOLDEN EAGLE.

Considerable work has been done on the Golden Eagle claim at the head of China Creek, where the trail ends. Two cabins have been built about five chains apart, in what is known as the Golden Eagle basin, which is about 10 acres in extent and completely surrounded by high, precipitous mountains, 4,000 to 5,000 feet in height.

The basin is beautifully situated for a stamp mill or other works which might be needed in working the mines, and there is a plentiful supply of water and timber. The Golden Eagle is about half a mile from the cabin, and is reached by a gradual ascent of about 500 feet up the foot of Mount Saunders, which is covered with heavy debris from the mountain.

The quartz vein upon which the work has been done is exposed along the ridge of a "hog's back," with snowslides on either side. The ridge is covered with timber, which serves as a protection from the heavy

snowslides that would otherwise be a constant menace.

The vein is crystalline quartz with a large percentage of pyrites. There is also interspersed through the quartz some blende, galena, chalcopryrite, and arsenopyrite, making into about 10 per cent. of sulphurets. The vein averages about three and a half feet in width—widening to seven feet and narrowing to a few inches.

The hog's back appears to be an intrusive boss of diorite which has undergone local metamorphism. At a short distance from the vein, the hornblende, of the diorite has undergone alteration to mica. Immediately adjoining the vein the mica diminishes, so that it becomes a leached feldspathic rock which might be classed as a felsite. The vein has a banded structure and has every appearance of being filled by lateral secretion and deposition, and possibly some replacement of the country rock with vein matter.

Four tunnels have been driven in on the ledge. The lowest tunnel, or Number 1, is in 44 feet, with an exposure of seven feet of solid vein matter at the entrance and three and a half feet at the breast. The strike of the vein is south 30 degrees west, and the dip about 70 degrees to the east. The vein below this tunnel appears to widen very rapidly, but could not be followed on account of a snowslide. The next tunnel, or Number 2, is about 100 feet perpendicularly above Number 1 tunnel, and is 65 feet in length. The vein in this tunnel averages nearly three feet, being well mineralized, with well defined walls. The next tunnel, or Number 3, is about 100 feet above Number 2, and is 46 feet in length. In this tunnel the vein pinches to a few inches. Number 4 tunnel is 21 feet in length on a small stringer.

On the upper side of the hog's back there is an exposure of gold-bearing quartz very similar in character to the main ledge, but whether it has any connection I would not venture an opinion without further development.

A large number of claims have been recorded around the Golden Eagle, but no development work of any importance has been done upon them.

KING SOLOMON.

A good deal of work has been done on the King Solomon claim, situated on the divide at the head waters of McQuillan Creek, a branch of the China Creek, but I was unable to fully examine the open cut which had been made on the ledge, on account of its being filled with snow. The ravine where the claim is located, lies between Mount Saunders and Mount McQuillan, at an elevation of nearly 4,000 feet above sea level, so that snow remains in the basin the year round. From what I was able to see, I should judge that the vein is a narrow seam along the side of a dyke. I was informed that it was widening below.

The country rock consists of schists cut through with numerous felsite dykes, which can be plainly seen running up the mountain side. Those igneous injections produce conditions favorable to the concentration of the precious metals; in fact, it has been contended that the presence of gold in veins is always in conjunction with intrusive rocks, that the gold has been carried up with the outflow of these eruptive rocks. Without fully accepting this theory, it is generally believed by mining men that some eruptive action is essential to effect the necessary conditions for the concentration of metals in veins. The occurrence of auriferous deposits in conjunction with dykes is particularly exemplified throughout California, and, apart from any theory in connection therewith, we may naturally expect to find the same conditions here.

It is now well established that the metals occurring in veins in the form of ores, have been deposited by the

chemical solution of their ingredients from the surrounding country rock. The principal difference of opinion, over which there has lately been a warm controversy, is with regard to the stress laid upon lateral secretion, or the ascension of the mineral-bearing solutions from great depths.

A number of claims have also been staked off in juxtaposition to the King Solomon, upon which very little work has been done. The ridge on the east side of the King Solomon basin, of which Hanson Heights is the summit, is very much stained with iron oxide, due to the oxidation of the sulphurets with which the whole region is heavily charged. Hanson Heights is a highly crystallized diorite, it being the same as the summit of Mount Saunders.

On the trail, below the cabin on McQuillan Creek, is a notable out-crop of jasper, or jaspilite, a name given the rock by Dr. Wadsworth. Some of this jaspilite is heavily charged with hematite, and is identical with the jaspilite occurring in the association with the great iron deposits in Northern Michigan. This is the only place I found it *in situ*, although I met with float pieces all over the district. It may only occur as an interbedded layer similar to the quartzites in that locality. Adjoining it on the one side is a large bed of argillaceous schist somewhat ferruginous, and on the other side crystalline rocks.

China Creek for a distance of about twelve miles is taken up under hydraulic leases. Several companies are actively at work prospecting and developing their claims. A dam was under construction at the Cataract claim at the time of my visit, which I understand has since been completed. The company expects to have the water turned on in a few months.

There is a very heavy fall to China Creek, and a number of canons, making it very easy to dam and secure a head of water for hydraulic purposes. The creek at its lowest stage would give about 2,000 inches of water. By careful management, so that the first outlay in bringing the water upon the ground is not too large, there is every reason to believe that the creek will yield a good return to the enterprising miners. Some of the benches show many colors to the pan.

Judging from the small samples I was able to see, the placer gold of China Creek appears to consist of two distinct qualities. The paler gold comes from the vicinity of Mineral Creek, as I did not detect any of it in panning above it. The darker gold is much more worn and smooth and likely comes from well up the creek. In panning along the creek, I noticed quite a number of small pieces of gold with quartz adhering to them, which did not have the appearance of having travelled any distance. There are evidences all along China Creek of the Chinese having skimmed the rim rock. They do not appear to have done any extensive sluicing.

ALBERNI CANAL.

In passing down Alberni Canal from the settlement, carbonaceous shale can be seen exposed along the shore at the old Alberni sawmill site, lying almost horizontally. Following down the shore of the canal, about a mile south, syenite out-crops for a short distance, and is then replaced with a blackish, almost aphanitic, diorite, which constitutes the body of Copper Mountain. This formation extends along the shore down to a short distance below where the Esquimalt & Nanaimo Railway boundary line crosses the canal, where syenite reappears and extends down to Hiwatches or Franklin River.

A good contact of this blackish, fine-grained diorite with the syenite may be seen on China Creek, about midway between Mineral Mounds, numbers 5 and 6,

the syenite dipping under the diorite westward at an angle of about 55 degrees.

There is an old tunnel half-way up Copper Mountain and facing the canal, which was run in 1865, following a cropping of chalcopyrite, which suddenly gave out.

I may mention that numerous veins of chalcopyrite have been found in the diorite of Vancouver Island, but have not proved sufficiently strong to be worked, such as Sansome Narrows, Cedar Hill, Cowichan Bay, Cowichan Lake, etc.

At Hiwatches River there is a good trail starting from the bay below the mouth of the river and following along the foothills, up to the Star of the West claim on Granite Creek, which is a branch of Hiwatches River.

Some placer mining has been done on Granite Creek by the following miners: H. McCoy, W. Poole, H. Hanson, Wm. Lindsay, and G. Carman.

Good pay in coarse gold was obtained along some of the crevices, but the creek being very rapid, and the boulders large, it was found that ground-sluicing would not pay very well. Some of the benches give colors to the pan and may prove to be sufficiently rich to pay hydraulic sluicing.

Some work has been done on the Star of the West claim, located on McCoy Creek, a small tributary of Granite Creek. The vein is quartz with pyrite, and considerable calcite. The vein is about 5 feet in width where it has been exposed, and it may be traced a short distance along the creek, with a strike of N. 50 deg. E. The country rock is syenite on both sides. A ton of rock from the Star of the West, shipped to the Tacoma smelter, gave a return of \$10 in gold.

The Islander claim, adjoining the Star of the West, shows an exposure of basic ore along the bed of McCoy Creek, which is composed of the usual combination of sulphurets.

The Nevada claim also adjoins the Star of the West, being one of those in juxtaposition.

Six miles up Granite Creek from these claims, a number of claims were recorded on a branch called Poole Creek.

The Starlight claim, located on this creek, carries free gold, which can be seen with the magnifying glass, in very fine grains peppered through the rock, in a similar manner as at Mineral Creek, but the associations are different. In the Starlight, the gold is intimately associated with small grains of galena, instead of blende, as at Mineral Creek.

The Starlight can hardly be called a vein, but is rather an ore body charged with gold by percolating waters. An exposure of about 7 feet has been blown out without any well defined walls. The country rock appears to be a diabase that has undergone extensive alteration by the leaching process of chemical solution so prevalent in this district. The ore body consists of quartz, pyrite, galena, calcite, etc. Calcite is a common ingredient of nearly all the veins in this locality, showing that the solutions were highly charged with carbonic acid, the calcium being derived from the feldspars in the rock.

A remarkable feature of this whole region is the prevalence of feldspathic rocks with no free silica.

A large sample from the Starlight assayed \$40 to the ton in gold.

Adjoining the Starlight are the Texas and Emma claims, upon which a small amount of work has been done.

Two claims, called the Tangent and Big Galena, have been taken up at the headwaters of Museum Creek. They show a good exposure of quartz containing chalcopyrite and blende. A sample from the Tangent gave 13 oz. per ton in silver.

Two miles beyond Sweet Water Meadow, on Granite Creek, near the divide, as shown on map, five claims have been recorded on a large intrusive boss of granite upwards of 1,000 feet across. It is a fine-grained granite, with numerous quartz veins, and heavily charged with sulphurets. Although the assays made have been small, still it is a remarkable mineralized mass, and will justify a thorough prospecting. In one spot, I came across some chalcopyrite associated with molybdenite. It is interesting to note the common occurrence of molybdenite throughout British Columbia in association with copper ores; it has been found in numerous places, but only in small quantities.

A good trail could easily be cut from the end of the present trail at the Star of the West Claim up Granite Creek to this divide, and leading over to the Nitinat River, at a small expense. It would be a great convenience to the miners and prospectors in getting in their supplies.

LIMESTONE.

A most remarkable body of limestone outcrops in what I have called Limestone Mountain, at the head of Hiwatches River. There is an abrupt escarpment, almost perpendicular, of not less than 1,600 feet of crystalline limestone, showing well the lines of stratification, and dipping about fifteen degrees to the south. I did not succeed in obtaining any fossils except a few crinoidal stems. A similar mass of the same kind of limestone occurs on the west side of Mount Douglas, showing a good exposure on the east side of Hidden Lake, there being a vertical section of about 500 feet. All these limestones are highly crystalline and more or less dolomitic. They bear a great resemblance to several other large deposits on the island, such as Horn Lake, Kennedy Lake, Nootka Sound, and on Texada Island.

History of Our Mines.

NO 3.—MINING IN VANCOUVER ISLAND.

Gold was first discovered in Vancouver Island in the year 1850, or some time prior to its existence being known on the Mainland. The late Mr. Pemberton in his book "Vancouver Island and British Columbia" says he broke off, almost at random, pieces of gold-bearing rock in various places "within a walk of Victoria." He referred to the year 1852, the same that the Hudson's Bay Company despatched the *Una* to Queen Charlotte Island, where anchoring in Mitchell Harbor a small vein of very rich quartz was exploited. Mr. Pemberton says that the heaviest specimens received from there weighed from 14 to 16 ounces.

Macfie in his book says that the first appearance of gold in Vancouver Island that excited notice was found in 1863 in a district about fourteen miles from Victoria, now known as "Goldstream." Here, he says, the precious metal was extracted from quartz rock there being no placer "diggings." "In a short time," the account goes on, "the auriferous ground was staked out and ten companies were formed to work it, which they did with varied success. The Parmeter Company, in order to test thoroughly the rock they had blasted, sent half a ton to San Francisco to be crushed and assayed. A bar of amalgamated silver and gold was the result, giving an average of \$25.00 to the ton. * * * Other quartz mining companies engaged in the same neighborhood, though invariably finding fair prospects, have not been so successful as the Parmeter; but the chief obstacle to progress, as in relation to other resources, has been the want of adequate capital.

Dr. Brown, who was among the first to explore the

interior of the Island of Vancouver, and who made a somewhat celebrated journey across, sent the news of the discovery of gold in one of the forks of the Sooke River, and his despatch dated July 21, 1864, created a great deal of excitement.

Dr. Brown's letter contained the following: "The discovery which I have to communicate is the finding of gold on the banks of one of the forks of the Sooke River, about twelve miles from the sea, in a straight line, and in a locality never hitherto reached by white men, in all probability never even by natives. I forward an eight of an ounce, or thereabouts, of the coarse scale gold washed out of twelve pans of dirt, in many places twenty feet above the river, and with no tools but a shovel and a pan. The lowest prospect obtained was three cents to the pan; the highest \$1.00 to the pan. The diggings extend for 25 miles and would give employment to more than 4,000 men." Mr. Foley, a member of Dr. Brown's expedition, before a committee of Victoria gentlemen, explained at some length the character of the country and the nature of the deposits. He had prospected till in ascending Leech River he had advanced twenty-two miles from Sooke Harbor. "As he ascended," Macfie says, "the quality of the gold grew coarser, yielding 25 cents to the pan. The prospects became richer and the gold got coarser as he travelled along the north fork of the Leech River." Nuggets as high as \$70.00 in value were found and as high as \$35.00 a day was earned. It was estimated that \$30,000 was taken out of Leech River in little more than a month after the excitement began.

The discoveries referred to drew hundreds if not thousands of people from Victoria to the district. There were to be seen men of all classes, some of whom are well-known citizens of Victoria, with their prospecting pans and outfits. The Hon. D. W. Higgins, the respected Speaker of the House, says that when the first California miners came to Victoria during the excitement of 1858 and later, they expressed it as their opinion that the mountains in the vicinity of Goldstream and Sooke were gold bearing, and some panning out was done to verify this theory, but the results were not of such a character as to induce them to continue.

Referring again to Mr. Pemberton's book we find that in the appendix, describing a trip from Cowichan Harbor to Nitinat, dated November 12th, 1857, the following paragraph appears in his report:

"Gold-bearing rocks are met with in the mountains, sand-stone is frequently found in the beds of rivers, the coast about Nitinat is formed of sandstone, and small seams of coal are occasionally met with in it. In the inlet I noticed one large cliff of bluish, primitive limestone."

On page 160 of the same book we find a chapter headed "Professor James Tennant on the rocks of Vancouver Island." He reports (1852) as follows: "I send the names of the specimens, those marked with the star on the first page. Several of these, Nos. 5, 8, 9, and 13, contain gold. Although I did not find gold in Nos. 6, 10 and 14, I believe the vein from which the specimens were taken contains it."

The note on No. 5 is, "Part of quartz vein with particles of gold disseminated; No. 8, "Part of vein of quartz imperfectly crystallized, contains gold; No. 9, "Clay slate with small crystals of iron pyrites and vein of quartz partly crystallized, the latter containing a small quantity of gold; No. 13, "Clay slate, contains numerous small crystals of iron pyrites and vein of quartz; in the latter the particles of gold were distributed."

It will be seen, therefore, that the prospects of gold and minerals generally were well understood as regards Vancouver Island, and that its possibilities were sug-

gested long before gold in Cariboo was known or thought of. The existence also of copper, iron, and various structural materials were noted in many parts of the Island and contiguous islands, and were referred to at length by the early writers of Vancouver Island.

Coming now to Alberni, the scene of the present mining development on the Island, little was known regarding its resources until quite recently. The existence of gold in China Creek has been known for about 25 years, and the placer deposits were worked at intervals by Chinamen and others, and have been ever since. As is well known these placers have been considered of sufficient value to induce hydraulicing companies to undertake their exploitation on a considerable scale, with what success time alone can tell.

The discovery of quartz ledges so far as known is quite recent, within the last two or three years, and it is interesting to note in this connection that the prospector, whose name is forgotten at the present moment, discovered Mineral Hill by following up one of the creeks. After reaching a certain point he discovered that the mineral indications were fewer, if they did not cease altogether. And so, speculating on the cause for this, he turned up Mineral Creek, which continued to show increasing signs of gold, and thus came upon Mineral Hill, where the largest quartz ledges have been found, and where the Messrs. Dunsmuir are now developing on an extensive scale. The history of the Alberni excitement, so far as it has gone, is so familiar to all that no reference is necessary.

Alberni.

[BY W. E. NORRIS.]

Although Alberni was prospected for gold as far back as the "sixties," it is only within the past three years that gold has been found in paying quantities, and that work of development commenced upon a large scale. This is all the more extraordinary as, geographically speaking, Alberni is so conveniently situated, being easily reached by water from Victoria, or by road from Nanaimo. From the latter city it is distant only seventy miles and the mail stage runs between the two places twice a week.

By water, from Victoria, it is reached by steamer after a travel of over two hundred miles, as the Alberni Canal, a deep inlet of the sea, runs miles into the heart of Vancouver Island. Naturally the early prospectors were only seekers after hidden wealth in what they would call "paying quantities," that is to say nothing less than ten dollars per day. Not finding this they not only decamped themselves, but persuaded others that it would be a useless waste of time to prospect about Alberni District. It was not until some years after that it was discovered that "John Chinaman," that patient, persevering gold digger, was taking a great deal of fine gold out of what is now known as China Creek, it having received that name owing to it having been worked exclusively by the disciples of Confucius. Further investigations proved that John was very reticent in the matter of gains, but it was found that a few



COMMENCEMENT OF TUNNEL, 7-FOOT LEDGE, GOLDEN EAGLE, ALBERNI.

The existence of black sand on the north end of the island has been known for many years and considerable prospecting has been done at times. However, the returns by the ordinary methods of panning have not been sufficient to induce mining on a large scale, but improved methods may utilize these sands, which are somewhat extensive, to a profitable degree.

The effect of any considerable mining development in the Island—and indications are very favorable that sooner or later it will be a rival to the Kootenays—on the interests of the coast cities, will be extremely marked, and will create an industry by which their commercial futures will be assured.

nuggets of varying values had been taken out and one known to be worth \$75 attracted considerable attention. This was taken from a claim now called the Little Bucker owned by W. B. Garrard.

A resident of Alberni, named Frank McQuillan, had located a lead of fair value, containing quicksilver, and so attracted the attention of prospectors again to the place.

A party left Nanaimo in the summer of 1893 with China Creek as their objective point, with the intention of staking of some claims if found good enough. "dirt" would not have to yield so much as was needed in the sixties, as wages were lower and provisions prop-

asionally so. They found the Chinamen making fair wages "crevicing," but nothing steady. An assay of the surface gravel showed an average of about 35 cents to the cubic yard although in some places it went much higher. The ground being abandoned placer diggings and the Chinamen not having recorded any claims, the prospectors formed themselves into a company and applied for a lease of about two hundred acres along the banks of China Creek about twelve miles from Alberni Village. The lease was granted and named the Constance. Speedily the whole of the Creek above and below them was taken up in leases with the intention of hydraulic plants being installed. The summers of 1894 and 1895 saw the hills about Alberni swarming with prospectors. New creeks were discovered and innumerable ledges staked off, some of the latter of surprising richness. Alberni enjoyed an era of great prosperity, which bids fair to continue. Capital was, at first, very shy of embarking on any enterprise in the new camp, but having overcome the first blush of timidity, little

suming, so much water was found in the shaft that a new one was commenced in a more suitable locality. This time the cement was reached at about sixteen feet and extended for a depth of seven feet, which being penetrated led onto a bed of gravel six feet in depth, then bed-rock. Unfortunately, the bed-rock was pitching at an angle of about 45 degrees and much was not expected of it, but after clearing up the boulders a washing of the dirt between them gave a very satisfactory showing of thin, leafy, oxidized gold, yielding about twenty cents to the pan. Water being very plentiful at the bottom of the shaft it was decided to dig a sump in the bed-rock. It was while preparing to do this that misfortune overtook the workmen, and the shaft, which had not been properly timbered, caved in so badly that the directors, who were satisfied with the showing on the sloping bed-rock, decided to start a new and larger working. This is now being sunk by contract, and a result may be expected shortly.

The Cataract Hydraulic Co, situated below the Con-



MOUNT FLORA, NEAR THE GOLDEN EAGLE.

trouble was encountered in getting men of wealth and influence to help the work along. Experts went up and pronounced some of the ledges very rich and easily worked, owing to its convenient situation, although most of the ore is "rebellious." The hydraulic leases were considered very workable owing to the ease with which water could be obtained and the comparative richness of the gravel.

Having given a brief sketch of the Alberni District gold fields, I will now enumerate the different claims that are working, or have done work other than merely enough to hold their titles. I will deal with the hydraulic claims first and commence with the "Constance," the property of the Nanaimo Alberni Gold Mining Company, Ltd., as being the first to start work on China Creek. This company has put down three prospect shafts, although only striking bed-rock in one. The first shaft went down 28 feet, and gold in more or less paying quantity was discovered all through the different layers. At that depth a hard, blue cement was discovered, which on being panned, showed colors. Work was then abandoned for the winter and upon re-

stance, has a large acreage to work upon and has expended a great deal of capital in building dams. The Company had the misfortune to lose the first dam through an unexpected rush of water before it was quite finished. Nothing daunted, a new dam was started and is now well under way, about forty men being employed upon the works. A sawmill is working upon the claim and supplies lumber to all of the companies that need it. This Company has banks of paying gravel, ranging from 50 to 150 feet in height. The banks average over 30 cents to the cubic yard. Land is being cleared and work progressing favorably. Water is easily obtainable from higher up China Creek and everything will be in order for a clean-up during the summer of 1896.

The Duke of York hydraulic lease is situated about six miles from the village of Alberni and comprises about 240 acres on the banks of China Creek. The benches vary from twenty to one hundred and fifty feet in height and average about 30 cents to the cubic yard. The owners of the Duke of York have evinced their confidence in the property by the amount of work being done and money expended. A flume one and a quarter

miles long (six feet by three), is employed to bring the necessary water taken from China Creek itself, giving a head of 4,000 inches. On this claim, as on all the others, the great drawback is the heavy timber. The company employs about sixteen men, twelve of them being Japs who are doing the clearing. We may expect to hear of a washup in this camp in a month or so. With the prospects before them it will, undoubtedly, be a good one and convince the most sceptical person of the value of the gold mines at the doors of the people of Vancouver Island.

For the rest of the claims I have not much to say, owing to so little work having been done on them. The "Little Bucker," mentioned before, has had a certain amount of development work done upon it and shows up very well, having some rich pockets as well as a good average throughout. The Prince of Wales lease shows 40 cents to the cubic yard of fine gold where prospected, and Pahtl-Pahtlicant, Queen, and other leases have proved that they will some day pay for working when capital is forthcoming.

I have left the quartz ledges until after dealing with the hydraulic leases, owing to the reason that, except on the claim known as the Golden Eagle, very little actual work has been done except in the way of what was actually exacted by the Government. This unfortunate state of affairs was largely owing to the action of the Esquimalt and Nanaimo Railway Company, upon whose land the ledges had been discovered and who claimed the mineral found thereon. This matter was referred to the Supreme Court and a judgment given in favor of the prospectors and holders of the claims. At the time of writing work is being pushed rapidly ahead upon the claims held by the Alberni Consolidated Gold Mining Company, Limited. This Company is the holder of the Golden Eagle and several other very valuable claims. It will be sufficient to say that the Dunsmuir and several other wealthy capitalists of Victoria and Vancouver have taken a large interest in the claims to prove their value. Experts long ago gave very favorable opinions regarding the property, and now a smelter is being erected, roads built and contracts let to run tunnels in the ledges. The ores, though rich in gold, will need capital to develop, being of the order known as "refractory." In this age of science such ores present little difficulty, especially, as in this case, when showing such good results from the hands of the assayer.

A word to the wise in parting. In this camp, as in others, a great many claims have been taken up with a view to sale only on the strength of the richness of the good ones, and by request of those who honestly believe in the wealth of Alberni gold fields I would say, "view and try before you buy." That there are the making of many fortunes in Alberni district no one who knows the state of affairs will doubt. Let British capital forestall American, as our cousins are wide awake to a good thing.

From the Report on the Golden Eagle Quartz Lode, Alberni District.

BY JAMES BRADY, M. E.

The Golden Eagle gold quartz lode is situated at the head of China Creek, in Alberni District, about sixteen miles south-east of the Town of Alberni, and thirteen miles from the mouth of China Creek.

A wagon road has already been made by the Government eight miles out to the hydraulic mines on China Creek, and is being, or is to be, extended to DeBeaux' at Mineral Creek. The distance from DeBeaux' to the Golden Eagle basin is only five miles, and the Government will undoubtedly continue the road to this point

whenever active operations are commenced on the mine. There is now an excellent trail and a road can be easily and cheaply built.

The claim is situated at the south end of the basin and at the base of Mount Saunders, which rises to a height of about 2,000 feet above it, to the south-west.

The general course of the lode is S. S. W., and follows a steep hog's back or ridge on the west side of a small stream which may be called the south branch of China Creek.

Diorite and trappean rocks form the mountains surrounding the mine and Golden Eagle basin, and the lode is in diorite considerably altered near the walls.

The ridge rises at an angle of about 42 degrees and to a height of about 1,000 feet. Four short tunnels have been run in, each about 100 feet above the one below and all in a S. S. W. direction.

The upper tunnel, or No. 4, was started on a rusty seam of felspathic rock and run in 30 feet, ending in a hard diorite, and a drift was run west seventeen feet in the same; another drift, a little back of the face of the tunnel, was run eleven feet east. The last six feet of this drift was a gray and white quartz rock with some feldspar and a little calcite (apparently a lode, but possibly only altered and impregnated country rock) carrying fine iron pyrites, and a very little galena and zinc blende. A general sample across the six feet gave \$1.65 in gold and 91 cents in silver per ton. (Silver at 65c. per oz.)

Tunnel No. 3, 110 feet lower than No. 4, driven 40 feet, shows a lode four feet wide and nearly perpendicular, of quartzose rock similar to the above and giving about the same assay from a general sample. It shows a slaty gouge and a little clay on the walls.

Tunnel No. 2, 80 feet below, is in 60 feet, showing the same almost perpendicular walls, and the same strike, but the lode is not quite so wide as in No. 3. The tunnel is timbered about half way in. The quartz has a much better appearance than that in the tunnels above and is a white and blue banded or ribbon rock, with pyrites, some galena, and a little zinc blende. A general sample across the face assayed \$6.20 in gold and \$1.56 in silver per ton. (Silver at 65c. per oz.)

The lower tunnel (No. 1) 40 feet long, shows a large and well defined lode, seven feet wide at the entrance, holding that width about half way in, or 22 feet, where the tunnel narrows to four feet and the quartz to three feet wide at the end. This contraction of the lode may be caused by a horse in the vein, as the east side of the tunnel does not expose the hanging wall for some distance in from the entrance, and from the superficial examination which I made I thought a part of the vein had been left to the east, and the tunnel carried on to the west of a horse, or on a branch or spur of the main lode. This may not be so, and if not, the lode will widen out again, as veins of this character, particularly in granite and allied rocks, frequently vary considerably in width, both in the line of strike and dip, owing to movements of one or both of the walls after the fissure was formed and before it was filled with the vein matter.

The ore is banded white and blue quartz, carrying coarse and fine iron pyrites and mispickel, with a little galena and zinc blende in places. There is also some altered country rock in the lode, which looks like a coarse felsite and is impregnated with fine sulphurets. A general sample from the east side of the lode gave \$7.85 in gold and 26 cents in silver per ton. One from the roof of the tunnel, or middle of the lode, \$4.55 gold and 58 cents silver; and from the west side say two and a half feet wide, \$12.40 gold and 26 cents silver, making an average of \$8.26 gold and 26 cents silver per ton across seven feet of quartz.

Below this tunnel the lode still widens out and fifteen feet below it is eight feet ten inches across at right angles to the dip. It then becomes covered up and hidden by debris from the mountain.

The diorite forming the wall rock on either side of the lode is considerably altered and impregnated with sulphurets. On the west side it is almost a felsite. There is a distinct gouge, or selvage, of soft, slaty clay between the quartz and the walls.

About 300 feet higher than the upper tunnel and a little east of the line of the tunnels, at the junction or contact of a dark, fine grained trappean rock with the diorite, occurs an outcrop of ore similar to that of the lower tunnel and about seven feet wide. A general sample across the lode assayed \$8.27 in gold and \$1.36 in silver. It is possible that this is the same lode as that on which the lower tunnel was started. It is about 700 feet in horizontal distance from, and 600 feet above, the lower tunnel, and the hill continues to rise 300 or 400 feet higher. The course or direction of this lode, on the surface, would follow the east slope of the hog's back near the gulch of the stream, and would be pretty well covered up for the whole distance with surface soil and boulders.

Golden Eagle Basin, below the mine, is an excellent site for large reduction works. The basin or flat is nearly surrounded by mountains from which several streams flow in and form China Creek. I think the combined streams would afford sufficient water power for a plant of 100 tons (per 24 hours) capacity for half the year, or perhaps nine months out of the year; but this would require further examination to ascertain the quantity of water and head available.

The ore could be conveyed to the mill by a wire-rope tramway one-half or three-fourths of a mile long, and there is sufficient fall to run it by gravitation; or an in-cline tramway can be built on trestles (so as to raise it above the snow in winter) and carried down the middle of the valley. It can be operated by a wire-rope, the full cars hauling up the empties. The grade is very even and I think the line can be built almost straight from the mouth of the lower tunnel to the mill.

The Golden Eagle and Okolona Mines.

These mines are situated in the Alberni District of British Columbia, and in close proximity to the creek known as China Creek and from whence a great deal of alluvial gold is now being produced. Access is made by means of a Government bridle trail running in a south-easterly direction from the Town of Alberni, which is itself situated on the banks of the canal. The twenty-two miles of such trail can be covered easily by pack horse in six hours, thus showing practically that its condition is good. I will not deal any further on this matter, but at once take you from the camp to the mine itself, which is approximately 2,790 feet above sea level.

From the camp to the mine is about one-half mile, the greater part of this distance is covered by a gradual ascent, but to reach the workings, a climb of about 800 feet, at an angle of about 35 deg., is necessary. This is the only difficulty to contend with in reaching the property and one which is associated to a greater or less degree in every mining location in British Columbia. The manner of reaching the mine is no immovable obstacle in the way of your success, as if ore were found to warrant further opening up of the country on the introduction of machinery, no doubt assistance would be obtained from the Government towards making a useful wagon road to it from Alberni, and which means your expenses would be materially reduced.

The main vein, which is a very strong one, standing out almost perpendicularly as it courses in a N. N. E. and S. S. W. direction over Mount Saunders, averages at the surface, from 4 to 6 feet in width, has been opened up in several places by means of tunnels. There are three of these, the operations in the one being carried on at various distances exactly below the other, the variation being easterly, as is the dip of the lode.

AVERAGE OF ASSAYS, ETC.

Up to the time of writing, I have made a great many tests upon various samples received, and my average has given a result of \$32.62 per ton.

Thus.....	No. 1.....	\$105 00
".....	".....	42 28
".....	".....	153 36
".....	".....	5 80
".....	".....	5 00
".....	".....	Trace.
".....	".....	Trace.
".....	".....	12 00
".....	".....	1 47
".....	".....	1 36

10) \$326 27
\$ 32 62
average.

And a 500 lb. sample, all passed 40 mesh screen, gave an assay of \$6.48.

W. PELLEW HARVEY.



FLUME AT ALBERNI.

An Addition to the Town of Alberni.

At a certain state of the tide it is difficult for vessels to approach the landing at Alberni, but this has been remedied by the laying out of a suburb or adjoining townsite and the building of a wharf where the water is 30 feet deep and which is always accessible to vessels of any size. Alberni is beautifully situated and the adjoining townsite rises in a gentle slope from the water's edge. The lots, of which there are 200, being particularly well suited for building purposes. A hotel is now in course of erection near the new wharf and it is expected that the activity in mining will stimulate building operations throughout this rising town.

A road is to be built from the new wharf to the mines and another to connect the old town with the new. Taking it altogether, the laying out of the adjoining townsite by the owners, Messrs. Pemberton & Sons of Victoria, will prove of benefit to Alberni as a whole in making it not only the mining centre of the district, but also a commodious seaport.

The Coal Mines of Vancouver Island.

The following table shows the output of each year from 1874 to 1895, inclusive:—

YEAR.	NO. OF TONS.
1874	81,000
1875	110,000
1876	139,000
1877	154,000
1878	171,000
1879	241,000
1880	268,000
1881	228,000
1882	282,000
1883	213,000
1884	239,070
1885	365,000
1886	326,636
1887	413,360
1888	489,300
1889	579,830
1890	678,140
1891	1,029,097
1892	826,335
1893	978,294
1894	1,012,953
1895	939,654

FROM THE REPORT OF THE INSPECTOR OF MINES.

The collieries in operation during the year 1895 were:—

Nanaimo Colliery of the New Vancouver Coal Mining and Land Company, Limited.

Wellington Colliery, owned by Messrs. R. Dunsmuir & Sons.

Union Colliery, of the Union Colliery Company.

The output of coal for 1895 amounted to 939,654 $\frac{8}{10}$ tons, produced by the several collieries as follows:—

Nanaimo Colliery	338,198 $\frac{8}{10}$ tons
Wellington	336,906 "
Union	264,550 "

Total output for year 1895 939,654 $\frac{8}{10}$ tons.

The exports of coal by the collieries for 1895 are 756,333 $\frac{3}{10}$ tons, as follows:—

Nanaimo Colliery, export	234,321 $\frac{1}{10}$ tons
Wellington	394,878 "
Union	227,134 "

Total coal exported in 1895 756,333 $\frac{3}{10}$ tons.

The returns for the year show a home consumption of coal amounting to 188,349 tons, as against 165,776 $\frac{1}{10}$ tons last year (1894).

The coal exported was shipped at the Port of Nanaimo, Departure Bay, and Union, near Comox, on Vancouver Island, British Columbia. The exports were principally made to San Francisco, San Pedro, and San Diego, in California, U. S. Shipments were also made to Oregon and Washington States, U. S., Alaska, Petropavloski, Hawaiian Island, and to Acapulco in Mexico.

In order to show the standing of British Columbia coal in the California market, the following returns are set forth, for the year ending December 31st, 1895:—

British Columbia	651,295 tons.
Australia	268,960 "
English and Welsh	201,180 "
Scotch	4,098 "
Eastern, Cumberland and Anthracite	26,863 "
Seattle, Franklin and Green River	150,888 "

Carbon Hill and South Prairie	256,267 tons.
Mount Diablo and Coos Bay	84,954 "
Japan, etc	9,015 "

Total for the year 1895 1,653,520 tons.

The total amount of coke imported into California was 28,688 tons, all foreign, mainly from England and Belgium. The owners of the Union Colliery at Comox, B. C., are putting up 100 ovens on a large scale, with a view to supplying this (California) market with coke, as the coal is reputed to be well adapted for coke producing, but it will be several months before they are equipped.

The ovens above referred to are under way, but it will be nearly midsummer before they are filled with coal. In addition to those now in use there will be 100 new ovens, that, when all in working order, will make about 140 tons of coke per day, for which this coal is well adapted to make a first-class article. Thus they will be able to supply fuel for the smelters on the Mainland of this Province. The ovens above referred to are being built near the shipping wharf, and close to them is a large coal washing machine, known by name as the Luhrig Washer. This was only started in January last, but it is expected to cleanse 500 tons of coal in ten hours, with a loss of not more than 3 per cent. of the fine coal (dust). This alone will assure the Union Colliery Company of having an efficient plant, so that nothing may be lost, as the finest particles of coal will make the best coke. This Company has also got near their mine, the Shepherd improved washing machine; this alone can clean about 350 tons of coal per day, but there is quite a loss of fine coal, this fine stuff being just what is wanted to make coke, as they can market the lump coal.

This district never had a better showing of coal than there is now, taking all the working mines and the new find on the south slope of Mount Benson into consideration. In this latter I cannot put an estimate upon the coal, but I think that it is quite safe to say that the coal which will yet be mined from this district by both the Nanaimo Colliery Company and Messrs. R. Dunsmuir & Sons will be many times greater than all the coal that has yet been shipped from British Columbia. Now that we have the coal and plenty of it, of a first-class quality, it is to be hoped that they will have a good market where they can dispose of it at a fairly remunerative price, so that it will pay the companies and the miners who dig it.

In connection with our coal we must not lose sight of our valuable beds of fire-clay. The demand and output of this article for 1895 was three times larger than it was in 1894, and we will expect to see it much increased during the year that we have now entered on, apart from the preparation being made for its manufacture in this district near where it is mined.

NANAIMO COLLIERY.

NO. 1 SHAFT, IN NANAIMO CITY.

This shaft is within the limits of the City of Nanaimo and belongs to the New Vancouver Coal Mining and Land Company, Limited. This has proved to be a valuable property, and, to all appearance, will be for a long time to come.

All the working of this extensive mine is under the waters of Nanaimo Harbour, except a small part, which is under Protection (or Douglas) Island and the Gulf of Georgia. The workings are generally dry, but not dusty, and are quite safe from any influx of water, as there is a thickness of from 450 to 1,000 feet of rock

and debris between the water and the workings of the mine. All the workings are on the pillar and stall system, as well as on the panel principle; the pillars which are left are fully two-thirds of all the coal that was in the mine, this being left to protect the mine, but still remaining in store for mining some future day.

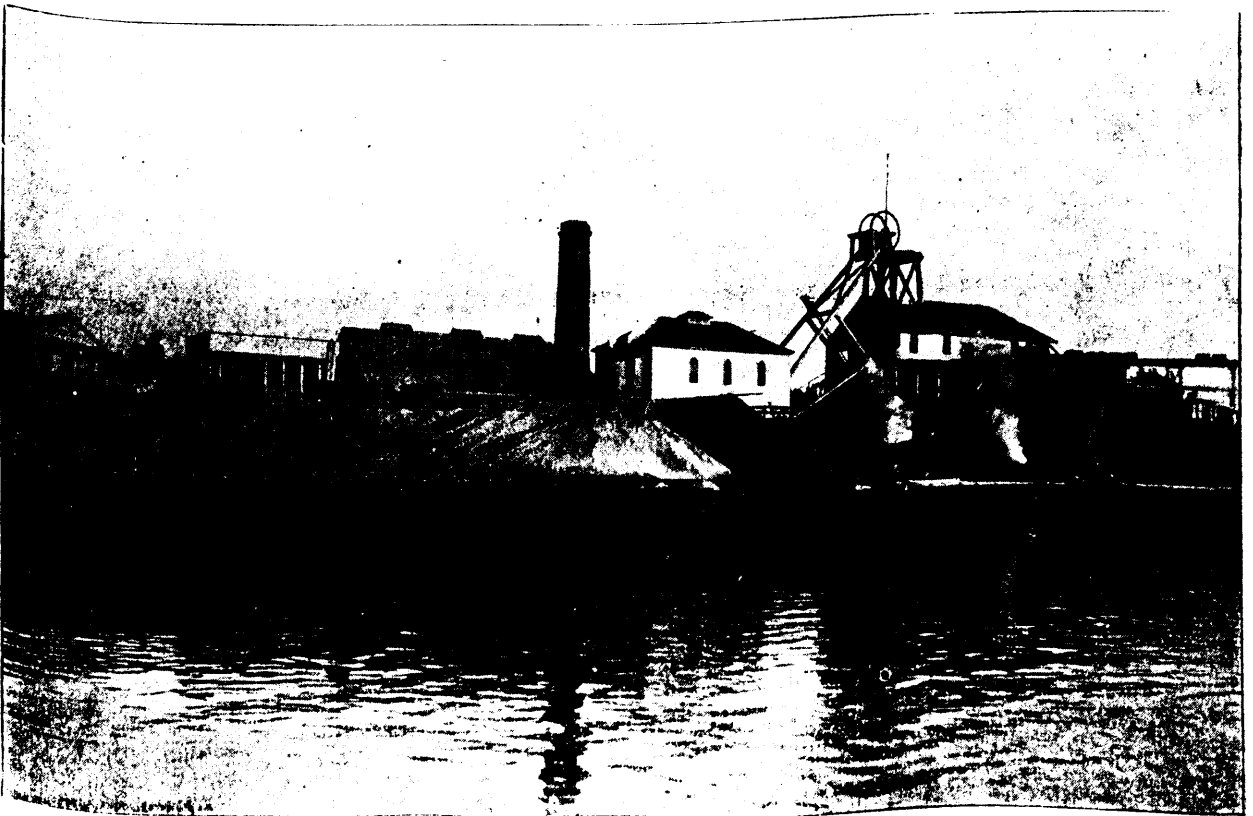
In the levels above mentioned is where the New Vancouver Coal Company has been, and is now, hauling the coal out by electricity. This system of haulage is quite a success with this company in long roads.

PROTECTION ISLAND SHAFT.

This is also the property of the New Vancouver Coal Company, and is situated on the south point of Protection Island.

This mine opens out from the shaft to the north and south sides, with two slopes as the principal opening out and cutting places, together with the north level. The slope on the east side, mentioned in a previous report as

tion, and is now down 1,100 yards, and fully 1,000 feet below the tide-water of the Northumberland Channel, which separates Protection from Gabriola Island. This slope passed through a long stretch of very fine coal, varying in thickness from four to seven feet, and about 900 yards from the top of this slope another very large downthrow to the coal was encountered, which was somewhat discouraging; yet they kept at it, and, after a long, rock tunnel, their perseverance was rewarded by again getting the coal on the low side, five feet thick, and of its usual good quality; and it is to be hoped that this will continue good until they get to Gabriola Island, where this company has large interests. You will have seen that in both the north and south slopes they have recently passed down over a very large fault (or faults), and it is possible that they may be both one and the same disturbance, and, if that should prove the case, they have here a very extensive field of coal awaiting them. There is one level working to the north of this



NO. 1 SHAFT, NEW VANCOUVER COAL CO., ESPLANADE, NANAIMO.

down 800 yards to a fault, has been continued and pushed with all haste through the fault, and is now down 1,500 yards, and 1,500 feet below the surface of the water at the entrance of Nanaimo Harbor, and for quite a long distance they have had good coal, but not quite as thick or hard as might be expected, or as it was on the upper side of the fault, but it will give it quite a different appearance when they work it in stalls. On the upper side of the above fault there is a fine face of stall. In both the north and south sides of the slope the coal is very good and hard, but these places are getting used up towards the No. 3 level of No. 1 shaft, and here they will have to stop for a time again, as in the low side of No. 1 level, leaving a large piece of coal, as well as the pillars, for some future day. All the mining being done here is under the water of Nanaimo Harbor.

From the north level, and about 100 yards from the shaft, here branches off what is called the "diagonal slope," which is being driven in a north-easterly direc-

diagonal slope, and on the east side they have started another side slope, which is down about 400 yards, in good coal all the distance, this lying to the dip of the diagonal. The prospects at present in this pit look well for coal, and we may yet hear of the Manager of the New Vancouver Coal Mining and Land Company, Limited, travelling from Nanaimo to Gabriola Island without the use of a boat.

This company has large bunkers near the wharf at Protection Island, which can hold 1,200 tons, in addition to the bunkers at Nanaimo, which can hold 2,000 tons, so that when a large steamship is expected the bunkers are filled with coal so that they can give it a quick dispatch, there being no difficulty to load a 4,000-ton ship in 30 hours.

NO. 5 SHAFT, SOUTHFIELD.

This mine is also the property of the New Vancouver Coal Company, and is the only mine they now have in

operation in this section of their estate. Here they have been much troubled with faults of one kind and another, and have not got clear of them yet, although they are not quite so formidable as they have been, coal being much harder and of very good quality—in some places twenty feet thick, and in other places quite thin.

NORTHFIELD MINE.

This mine is also part of the Nanaimo Colliery and belongs to the New Vancouver Coal Company, being in the northern part of the large estate. There were a few men working here in the early part of the year prospecting, but, not being successful in finding the coal as thick as they thought would justify them in carrying on the work, they thought it was to their best interests to suspend operations for the present.

WELLINGTON COLLIERY.

No. 1 PIT.

This Colliery belongs to Messrs. R. Dunsmuir & Sons and is near Departure Bay, their shipping point, where they have their extensive wharves for the shipping of the coal, and near the eastern boundary of the Wellington estate.

It is in this mine where they have a strata of fire clay 30 feet thick and of good quality, of which they send out enough to supply any order they may get; but in place of sending away this clay as at present, we yet expect to see it going away in a manufactured state, which can be done near the pit mouth.

No. 3 PIT, WELLINGTON COLLIERY.

This mine, mentioned in a previous report, was idle, excepting the pumping of water and ventilating, but now work has been resumed, taking out some coal and cleaning up and putting it in order, both roads and airways.

No. 4 PIT, WELLINGTON COLLIERY.

This is one of Messrs. R. Dunsmuir & Son's extensive mines, and is the same that has on two different occasions been filled with water, owing to fires in the mine, which blocked up roads, stopped airways, and to all appearances wrecked this valuable property, but everything is again in working order and this property is now one of the most productive mines in this colliery.

No. 5 PIT, WELLINGTON COLLIERY.

This is yet the only mine of Messrs. R. Dunsmuir & Sons where the locomotives of the Esquimalt & Nanaimo Railway Company can go under the shute and get coal for their own use, and here the railway company's cars can also come to the mine and be loaded with coal for the Victoria market.

No. 5 pit of this colliery is yet the greatest producing mine, the coal being brought to the shaft bottom from the east level, Horn's heading and new diagonal slope by a tail-rope system of haulage, and from the north by a slope, with a steam engine as a motive power. Much of the coal is worked here on the pillar and stall system as well as on the long-wall principle and at the pillars (coal).

There is a large amount of coal in sight here, which will last for a long time. This mine is now connected underground with No. 1 shaft, having a good road to No. 1, as well as a good travelling road to No. 6 pit.

All the pumping from this mine, particularly the slope, is by compressed air and electricity, each of which gives good satisfaction.

NO. 6 PIT, WELLINGTON COLLIERY.

This pit belongs to Messrs. R. Dunsmuir & Sons, and is about 900 yards east of No. 4 shaft, but with not any connection under ground, leaving a barrier about 40 yards thick between the two mines as a safe-guard in case of accident in either place, this strip of coal having already proved very useful, as No. 4 had on two occasions to be filled with water, owing to fires in the mine.

NO. 1 SHAFT, EAST WELLINGTON.

This property is now owned by Messrs. R. Dunsmuir & Sons, and may be considered part of the Wellington Colliery.

The railway has been extended up the valley and is now in connection with the Wellington railway system, the rails being taken out of the old East Wellington track.

ALEXANDRA MINE.

This is also the property of Messrs. R. Dunsmuir & Sons. Work has been resumed here during the past year, after standing for some years, with a slope down 700 yards on an easy grade.

NO. 2 SLOPE, WELLINGTON COLLIERY.

There is nothing yet being done here.

E. & N. WELLINGTON EXTENSION.

It is with pleasure that I have now to report to you this new work and discovery of Messrs. R. Dunsmuir & Sons. This coal was first seen about last midsummer, where a large tree had fallen, tearing up its roots, the same having been standing on a thick bed of coal. This a Mr. Hodgson discovered when travelling in the woods, and this discovery was reported to Mr. Dunsmuir, as it was on the property of the E. & N. Railway Lands. Mr. Dunsmuir lost no time in going to see what was reported to him, and here he saw what appeared might be so valuable to him that he paid Mr. Hodgson handsomely for the information.

This discovery is about seven miles south-west of Nanaimo in Douglas District, and on the south slope of Mount Benson, with an altitude of about 900 feet above sea level, this being the highest point of the cropping out of the coal.

WEST WELLINGTON MINE.

This mine is west of and adjoining the Wellington Colliery of Messrs. R. Dunsmuir & Sons, and is owned by Dennis Jordon, Esq., of San Francisco. There was considerable work done here some years ago by putting a tunnel into the coal, but it was stopped for some reason best known to the owner.

NO. 2 SLOPE, UNION COLLIERY.

This slope is now down about 700 yards from the surface, and quite a long distance of this is in rock, much disturbed with faults, and thin coal, but there has been quite a change for the better, as for a considerable distance the coal has been 4 feet 6 inches thick, very hard and of good quality, overlaid by a strong roof.

NO. 4 SLOPE, UNION COLLIERY.

This slope is the most extensive mine in the Union Colliery, and is the longest hauling slope in the district, being 2,000 yards long from the entrance to the face, in addition to 700 feet outside.

All the appliances and arrangements about this mine are on the most improved system at their disposal for the saving of labor and the handling of coal from this extensive mine.

No. 5 SHAFT, UNION COLLIERY.

This is the new shaft put down by this company, about one and a half miles to the east of the bottom of No. 4 slope. After everything about the surface was put in order, work was commenced in the shaft and continued almost without intermission until it was completed to the depth of 600 feet from the surface.

At this Union Colliery they have been making some first-class coke from fine coal that could not otherwise be sold, and now they are erecting ovens by which they will be able to turn out over 100 tons of coke per day, and this will enable them to work soft coal.

Nanaimo.

[BY W. E. NORRIS.]

The City of Nanaimo is situated on the east coast of Vancouver Island about 70 miles north of Victoria, the capital, and is within daily communication of that city by train (the E. & N. Ry.), and a steamer, the Joan, makes weekly trips between Victoria and Comox, calling at Nanaimo en route.

Vancouver, distant across the Gulf of Georgia 37 miles, is also in daily communication, the steamer Cutch, a fast steel boat, being on the route. Coal mining is the principal industry and the mainstay of the population, which consists of about 6,000 inhabitants.

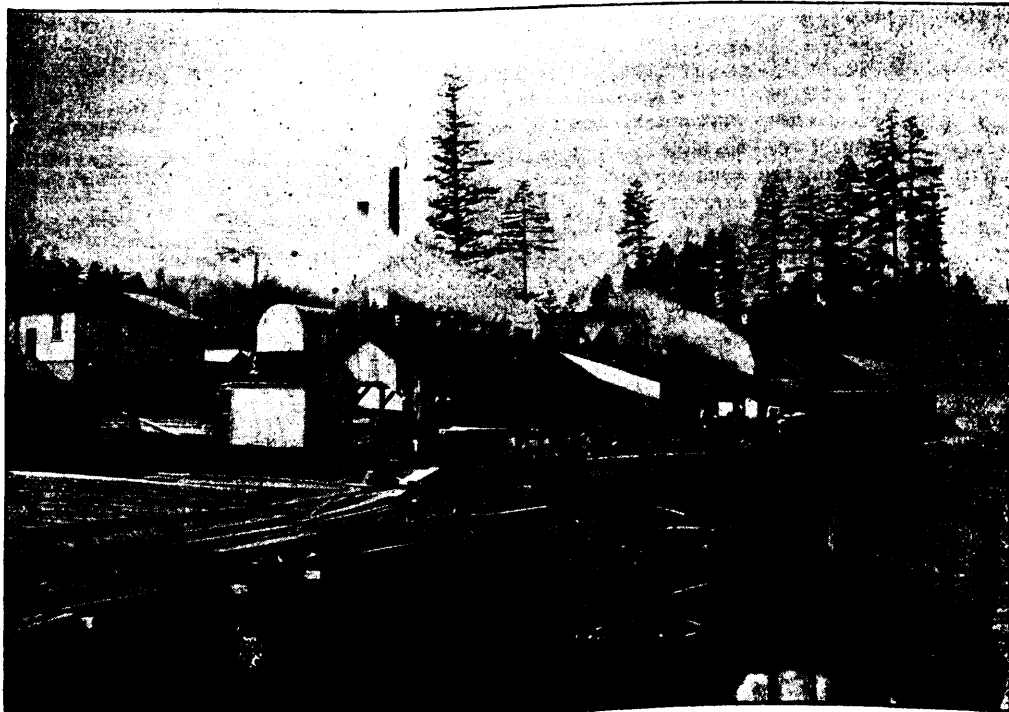
Coal miners who have travelled, and most of them have, say that Nanaimo is the most beautiful coal mining city they have ever seen, and very few could doubt them. Built right down to the water's edge, overlooking a capacious and secure harbor fringed with large islands which effectually screen vessels from heavy sea and weather, and with the magnificent coast range of snow topped mountains in full view across the gulf, and, looking inland, the stately mountains of Vancouver Island clothed with verdure, it would be hard to imagine a more picturesque scene. Coal was first discovered and worked here by the Hudson's Bay Company, who in turn sold out to the present owners, the New Vancouver Coal Mining and Land Company, Limited.

Great credit is due to this company for the energetic manner in which they have pushed the interests of the town ahead, selling lots and land on easy terms of payment to those wishing to enter into business or make a home. The coal is in great demand in all the Pacific towns owing to its standard of excellence. The Esplanade Shaft, locally known as No. 1, has a depth of 630 feet and runs under the harbor a distance of nearly two miles to the bottom of Protection Island Shaft, where another excellent seam of coal has been struck. The

distance underground is covered in a short time by the electric railway which connects the two shafts. A portion of the mine is lighted by electricity and it is one of the best ventilated mines in the world. Visitors to Nanaimo can easily obtain permission to view the underground workings which are models of excellence as regards safety.

The company has cleared a large tract of land in the vicinity of Nanaimo which is used to grow feed for the numerous horses and mules employed about the works. In addition to the mines situated in the city the New Vancouver Coal Company, Limited, owns the Harewood estate and the Northfield and Southfield mines, and also considerable coal lands on Gabriola Island and other points in the Gulf of Georgia.

The City of Nanaimo contains several well built business blocks, and it may be mentioned that the merchants



A. HASLAM'S SAW MILL, NANAIMO.

did not feel the recent hard times in proportion to the other cities of the coast.

Wellington, which lies about five miles north of Nanaimo, is the seat of the coal mines owned by R. Dunsmuir & Sons. This is distinctly a coal mining camp and contains a population of 2,500 souls. The excellence of the Wellington coal is so well known on the coast that it needs no extra commendation. A portion of the place has lately been incorporated and improvements in streets, etc., are taking place. Even to a casual observer Wellington would appear a lively, little place. The coal is shipped from Departure Bay, a point about four miles distant from the mines. Nanaimo is considerably benefitted by the trade of Wellington.

The future of Nanaimo appears assured as it is the centre of the coal and gold mining camps of Vancouver Island and is easily reached by either rail or water. The wealth of coal underlying Nanaimo District appears inexhaustible as the frequent bores have testified. Coal, iron, copper, gold, and other minerals lie at her door only waiting capital to develop some of the latter. Manufactories are especially needed, and with cheap fuel there seems to be no reason why they should not be started at no distant date.

CORRESPONDENCE.

A Coast Smelter.

EDITOR B. C. MINING RECORD:—The large and increasing export of ores to the United States from the Kootenay mines of B. C. has been attracting much attention lately, and as these ores might, with advantage to mine owners and the country, be reduced as cheaply on this as on the other side of the boundary line, the construction of an efficient smelter to accommodate the enormous prospective output of the rich gold, silver, copper and lead ores of the Province is, it is gratifying to note, at last being earnestly discussed. It is to be hoped that the establishment of a refinery will also receive attention, as such an institution would prove an extremely profitable adjunct to the smelter.

For economical working a large and improved smelting plant, situated at sea level, is admitted to be necessary; and this being so, the question is narrowed down to:—What is the best position for a site on the coast line? This question should be thoroughly threshed out, as the success of the smelter largely depends on its being correctly placed.

It seems evident that a position to be favorable must be so chosen as to be contiguous to a feeder railway; and a competing line of railway would be an enormous advantage. It is also clear that proper water facilities would be a necessity and that an ample supply of cheap and suitable fuel, of water and of lime and iron (for fluxes) should be easily accessible.

Without discussing the merits or demerits of the vicinity of Vancouver as a site for the proposed smelter, the object of this communication is to point out that all of the *desiderata* detailed above are at the present moment available at New Westminster. This city is the B. C. terminus of the Great Northern Railway, which line (with its connections by rail and water) taps the Slokan, Kaslo, Nelson and Trafl Creek mining districts. Its freight rates from these points to New Westminster are the same as to Tacoma and Everett—where most of the ores from our mines now go for treatment. Again, New Westminster is one of the termini of the C. P. R., and this railway promises, in the near future to be in a position to bring out the products of many of the Kootenay mines. Situated on the Fraser River, New Westminster has exceptional advantages for water carriage, both from interior eastern points (as far as Hope) and from all western ones. Freight rates from Victoria, Nanaimo and the Islands to New Westminster are the same as to Vancouver. The Everett smelter draws its supply of lime for flux from San Juan Island. From the same place or from Texada Island lime could, as cheaply, be put down at Westminster. Limonite, carrying from 40 to 50 per cent. of iron, is available at Port Kells, on the Fraser River about 12 miles above New Westminster, and, again, at about 12 miles south of the city on the Great Northern Railway. An unlimited supply of fresh water is, of course, always available, as also are building materials of all kinds. Finally, a fine site on rising ground, where a good foundation can be secured at inconsiderable depth, may be selected on either bank of the river, and can be acquired for a trifling sum.

Yours truly,

29th March, 1896.

FESTINALENTE.

[The subject of a coast smelter in British Columbia is an important one, and it is gratifying to note that it is now receiving attention. There is plenty of room for a smelter at New Westminster as well as at Vancouver, and every prospect that both will have all they can do when built.—ED.]

British Columbia's Claims to a Britisher's Attention.

BY J. M. BUXTON.

I think, Mr. Editor, you have given me a hard task; not hard as regards the want of a subject, but as far as regards our most attractive claims. What should I commence with? Our mines, or our shooting, or our fishing. Each of these is 'superlative' but the first and

last even more so. For the Britisher, whether he be English, Canadian, Scotch, Welsh, Australian, or Irish, I cannot conceive a more healthy and interesting and perhaps lucrative way of spending 8 months, say from April to December, than to travel through this Province. True it is that the "kid glove," gentleman might find the trip not only irksome but dangerous. With reference to the latter term, I must however explain that I apply it not to human agency, but to the mishaps which any man might suffer when shooting in the mountains. For this is no country, take hunting Big Horn for instance, where a man can have numberless servants and a good lunch in the middle of the day and a right good dinner at the end of it. We have plenty of "grab," certainly, but it is of the plain order, and eaten or I should rather say devoured, to satisfy an appetite such as only our mountain air can give. Well, suppose the Britisher lands in the Province either at Vancouver or Victoria on the last day of March. He can immediately put up his rod and within a short distance of either city, land his sea trout, mountain trout, Rainbow or Dolly Varden—and in salt water his spring salmon—this, alas, as a rule only to be taken with a minnow or a spoon. As soon as he tires of this sport he can spend the next three or four months prospecting for rock or gravel, from Northern Cariboo to Southern Kootenay, and from the Pacific to the Rockies. I have often debated within myself whether fishing, shooting, hunting or prospecting is the most alluring. A fisherman may be converted, a shooting or hunting man may lose his taste or his nerve for sport, but never have I seen or heard of a prospector giving up his calling. When he once puts his hand to the plough he observes the Scriptural command in its most literal sense, even though in the place of the fortune he seeks, want, disaster or death may be his probable reward. Suppose for instance you are gravel mining, the excitement—outwardly suppressed—as you look at the ever decreasing quantity of black sand in your pan, maybe catching a glimpse here and there of a yellow grain, is far more pleasurable and better fun than planking down your money on a roulette table, or backing horses, or any other such game of chance. Added to this you are in the purest air in the world and in the pink of condition, instead of being in an enervated state in, very often, a vitiated atmosphere. Here you are only relieving Dame Nature of the treasures which she holds out to men of endurance and pluck, instead of winning money from your fellow creatures, who can sometimes ill afford to lose. In rock mining, when you have found your float, there is almost as much interest in hunting for your ledge as in tracking a wounded animal. True it is that sometimes you stumble on your vein quite accidentally; *par exemple*, I remember once, when I had been out after deer, and after having my lunch, I began in an idle manner, to dig a hole in the ground with a stick whilst waiting for my companion. I had not gone down more than three inches before I struck something hard and for want of something better to do I thought I would unearth what I considered to be a stone. I kept up my unearthing business, and shortly found a good ledge. This of course was pure luck or whatever else you like to call it. I could give you details of the mines already in operation, but I will not bore you by furnishing tabulated returns from our different mines, some of which are, or will be, second to none in the world. These facts you can gather from our British Columbia agent in London, Mr. Forbes-Vernon, than whom few men are better acquainted with the different parts of the Province, or our Minister of Mines in Victoria.

About July you might consider that you were entitled to an "easy all" as far as prospecting goes, and again

turn your attention to fishing for a month or so. I think the pick of the different places at this time of the year is the Thompson at or near Savonas, where mine host, the only one in that locality, is a good fellow, or Ashcroft, or the source of the Columbia, or the Kootenay, up the latter river perhaps being the best fishing ground in the world. Should I tell you a few fishing yarns? Please remember that these are true. This statement I know is always made about fishing stories, but I would not spin one had I no witnesses to vouch for the truth of my tale. Here is one. Fishing once on the Columbia a guardsman, an ex-naval man and myself, only two of us fishing at the same time, in two hours landed a fair amount of fish, but as all our tackle was smashed we returned to camp to refit with the fish we had already caught. After fishing for another three hours we tied our catch to a young tree, and a man taking each end, carried them to camp. How my shoulders ached and how hot the sun was. We had I think a total catch of 248 lbs. of trout and char, the smallest 6 lbs. and the largest 13½. Luckily my ex-naval friend had a large camp of men to whom the fish were a boon. The Kootenay River is probably too well known to need any description, but I can assure you that it is no uncommon thing to hook, and sometimes land, three fish weighing a pound each or over, at the same time. Along this river the C. P. R. have erected fishing huts which are extremely convenient.

When one gets tired of fishing, shooting begins. It is a very easy matter, with the help of the C. P. R., to pop over the Rockies and enjoy in Alberta some exceedingly good prairie-chicken shooting and, except that the heather is not there, you could easily imagine that you were shooting grouse in Scotland. In October you can also have excellent wild fowl, etc., shooting on the coast. One day a friend of mine, who was on the Warspite, and myself bagged 49½ brace of snipe besides odds and ends. Lastly comes the "piece de resistance"—the big game. Deer shooting is simple and monotonous, but Mr. Ephriam and the Big Horn are gentlemen who will not fall to your rifle unless you have plenty of pluck and endurance. At Mr. Ephriam I regret to say I have never even had the chance of firing a shot, but the stately Big Horn I am glad (or should I say sorry?) to state that I have bowled over. I well remember my first Big Horn ram. I was shooting with two other men and when on our way back to camp, just as it was getting dark, our Indian stopped and pointed to a ram some hundred yards below us. As I had already shot a sheep that day the chance was given to one of the others. He put his rifle up, but as he could not see his sights, took it down again. The ram caught sight of us but before he could jump behind the rocks, which were some twelve or fifteen yards away from him, I put a bullet through his spine as he was bounding along—the luckiest rifle shot I think I have ever made. That head now adorns the wall in the hall of the Vancouver Club. The best bag (two guns) which I think has ever been made out here was as follows: Six Big Horn (all picked rams), six goats (curious-looking creatures), five grizzlies, one black bear, three Caribou, and various small game such as deer, etc. This was before the passing of the game act now in force which restricts the number of game to be killed. I think my friend told me that, of the grizzlies mentioned above, the skin of the largest measured eight feet six inches from tip of snout to tip of tail, while green and without being stretched.

When his trip after big game is over the Britisher can go home, and I do not think that he will, even years afterwards, ever regret the eight months he has spent in British Columbia. I may add that not only are true sportsmen welcomed by the greater number of British

Columbians, but that they receive all possible information, given in the most courteous way, by the Government officials in the different parts of the Province. If one wants only fishing and scenery, I must point out to you that both can be enjoyed here as luxuriously here as in England. Although I am always fighting with the C. P. R. over rates, etc., yet I feel I must bear testimony that this company treats the tourist in a most considerate and thoughtful manner, far more so than any other railway on which I have travelled in any other part of the world. But I must reiterate that if a man wants to do a little prospecting and big game shooting, the "kid glove" gentleman is out of place here, and I would advise him to stay at home, but for thousands of men in the Old Country or in her Colonies, full of pluck and muscle, on whom the ordinary life palls, I cannot conceive a more healthy, manly and perhaps profitable way of spending eight months in the year, than by following out the programme I have outlined above.

Victoria Stock Exchange.

On and after Wednesday, April 15, the Victoria Stock Exchange of British Columbia, Limited Liability, will call stocks daily in the board of trade building in that city; such was the decision of the board at their last meeting.

The formation of the exchange took place in September, 1894, since which date many meetings have been held for the preparation of by-laws and the consideration of the modus operandi best suited to meet the requirements of this Province. The company was incorporated October 29th last, with a capital stock of \$2,500 in 25 shares of \$100 each, of which 15 are subscribed to date. The first meeting of the corporation was held on January 31st, when by-laws were adopted, and the following officers, committees and auditors elected:

E. Crow Baker, president; A. C. Flumerfelt, vice-president; F. Elworthy, secretary-treasurer.

Managing committee:—E. Crow Baker, A. C. Flumerfelt, C. A. Holland, Joshua Davies, Gustave Leiser, D. R. Ker and F. Elworthy.

Committee on membership:—R. P. Rithet, Jas. Hutcheson, Thos. B. Hall, A. W. Jones and C. E. Renouf.

Auditors:—C. E. Renouf and A. W. Jones.

The foregoing gentlemen, with Hon. E. G. Prior, Hon. J. H. Turner and Thomas Earle complete the present board.

The objects of the board are to place values on general commercial stocks, and mining stocks will also be listed. It is expected that the board will be of great assistance to holders of stock who do not wish to sell but desire to use it as collateral. The board will also collect and publish statistics and the dissemination of such authentic information in the financial centres of this continent and Great Britain must necessarily become an important factor in inducing capitalists to seek British Columbia as a field for investment. The by-laws of the board, which are based on those adopted by the Toronto Stock Exchange, provide for a very thorough investigation by the managing committee of all companies desiring to be listed.

Examinations in Assaying.

The attention of our readers is called to the change (see advertisement on another page) in the Examinations in Assaying. The holding of the examinations in the fall and at more than one place in the Province is a good move on the part of the Government, as it gives candidates a better opportunity to prepare for, and secure the desired certificates.

Industries in Victoria.

The City of Victoria contains many industries which the space at our command forbids describing in detail. One of the chief of these, however, we cannot overlook—the Albion Iron Works—which, with a capital of over half a million dollars, are able to undertake contracts of almost any magnitude in their particular line. In mining machinery they have already fulfilled very important contracts at the coal mines of Vancouver Island and the quartz mines of the Kootenay. The works cover a whole square, and consist of engine and boiler shops, iron and brass foundries, pattern and machine shops, together with a very complete store foundry where stores of all kinds of the latest patterns and most approved makes are turned out. There is hardly any order in the machinery line which the Albion Iron Works cannot fill, so that mine owners should bear this in mind.

Messrs. Stemler & Earle's is another industry which is well known throughout the Province. Their ground coffees and spices are known everywhere and are not only put up in neat packages, but they are famous for their purity. Dealers throughout the mining districts can obtain not only a pure article, but they can save money by purchasing Stemler & Earle's coffees and spices, and at the same time encourage home industry instead of sending abroad for what they require.

One of the leading manufacturing industries in the Province, as well as one of the oldest established, is the biscuit factory of M. R. Smith & Co. This business was first established in Victoria in the year 1858 as a small bakery by the late M. R. Smith, who soon became well known from the excellence of the quality of his goods. The business now rapidly increased, and soon steam power was added to assist in the manufacture of the goods of the increased trade. Additions were made from time to time until it was finally found necessary to erect premises on a larger and more extensive scale. In the year 1888 a large and commodious factory was erected near the outer wharf, filled with new and improved machinery and all modern appliances. The factory occupies two commodious buildings, three stories in height, the machinery being driven by a 40 horse power engine. The machinery being of the best English and American makes, the finest goods are turned out. The capacity of the factory is no less than 60 barrels of flour per day, and a large number of hands are employed to keep all this going. A saw mill plant has recently been added to the factory and the firm now make their own biscuit boxes, of which a very large number are annually required to meet their increasing trade. The shipping trade extends to all parts of the Province and to the Northwest. In 1886 the firm exhibited their product at the Colonial and Indian Exhibition held in London, England, for which they obtained a medal and diploma. Three silver and one gold medal have since been received by the firm to prove the excellence of their manufactures.

Then there is the immense furniture factory of Weiler Bros., one of the most complete on the coast. The magnificent show rooms of the firm on Fort street testify the very superior furniture of all kinds, from the finest suite to the ordinary kitchen table.

There are oatmeal mills, rice mills, soap factories, vinegar works, saw mills, ship yards, boot and shoe factories, breweries and many other industries in the capital city. Indeed, it has many peculiar advantages for the establishment of industries, and as an industrial centre Victoria is destined to shine in the future rather than as a commercial metropolis.

A Strong Company.

Although considerable mining has been done in Alberni District, it was not until the fall of 1894 that active work outside of the Golden Eagle was commenced. In this year Mineral Creek was staked by prospectors, and amongst other claims which have been recorded the Alberni, Warspite, Chicago & Victoria have become the most prominent, chiefly no doubt from the fact that a large amount of development work has been done on this property. These claims were originally owned by the Mineral Creek Mining Company who, besides having built a splendid trail and good cabins on the property, have done a large amount of prospecting and development work chiefly by sinking on the various ledges on the Alberni claim.

The ore is a light grey color and free milling, gold being easily discernible without the aid of a glass, in fact it has a striking resemblance to the rich ore found in Nova Scotia.

The Company last fall shipped some two tons to the Tacoma smelter from which they received a return of \$145.00 to the ton. These claims have been in litigation for some time as there were several adverse claimants; but matters have now been arranged and the adverse interests have all been united and consolidated under the head of the Consolidated Alberni Gold Mining Co. Ltd., with Jas. Dunsmuir, Esq., of Victoria, President, and Henry Saunders, Esq., of the same place, Secretary. This Company no doubt is one of the strongest Mining Companies ever incorporated in British Columbia, and they purpose developing the property at once on a large scale. It is their intention to put in a stamp mill as soon as the weather will permit, and to work as many men as can be worked to advantage on the different claims.

Assaying.

We will be pleased to place before our readers any particulars in regard to assayers doing business in this Province. It is a most important matter to mine owners to employ only competent and experienced men in assaying, and if we can assist them to secure the services of such we are only too glad to do so. In this issue we call attention to the firm of Robbins & Long, at Rossland, composed of gentlemen who have already enjoyed the confidence of large and influential mining companies. This firm has been doing the assaying for the War Eagle Gold Mining Company ever since they started operations. Previous to that, Mr. Long was, for two years, with the Poorman mine at Burke, Idaho, which has been operated by Mr. Patrick Clark. Mr. Robbins, prior to his connection with the War Eagle Company was for over four years with the Gold Hunter Mining and Smelting Company at Mullan, Idaho, of which Mr. Dennis Ryan, of St. Paul, is president. Messrs. Robbins & Long are therefore gentlemen of experience, and as they have opened an office at Rossland parties wishing to obtain the services of these competent men will know how to reach them.

An Old Reliable Firm.

Messrs. M. Beatty & Sons, of Welland, Ont., is a firm too well known throughout Canada to require an introduction to our readers. They have recently extended their operations to the mining and other districts of this Province. Last month they shipped a set of machinery for a ditching dredge to Mr. D. Benson of Ladner's Landing, to be used in building dykes on the delta of the Fraser River near New Westminster; the hull is built at New Westminster and will be ready for

work in a few weeks. In December they shipped a set of machinery for a combined dipper and suction dredge to the Quesnelle Mining Company, Quesnelle B. C., to be used in dredging the gold bearing sand from the river near that place. It will have a complete set of double cylinder dipper dredge machinery, a special centrifugal dredging pump with direct connected engine mounted on same frame as pump, a stern wheel sixteen feet in diameter with buckets 16 feet long, driven by a double 15x72 cylinder engine. There are two 75 horse power locomotive boilers to supply steam for the three engines, the hull is 24 feet wide and 100 feet long. It has Col. C. H. Underwood's patent gold dredging dipper on it. The Company expect to have the dredge ready for work about the middle of May, and they think it will be the most complete gold dredging outfit that has been made yet. They anticipate it will be very successful.

Notes From Our Correspondent at Nelson, B. C.

A meeting was held at Nelson on the 18th of March for the purpose of taking steps towards organizing an association of those interested in the mining industry. Mr. H. E. Croasdaile was voted to the chair and Mr. J. A. Turner acted as Secretary. It was agreed that the association be called "The British Columbia Mining Association" and the following officers were elected for one month to draft a constitution and by-laws: H. E. Croasdaile, President; A. L. Davenport, Vice-President; John Houston, Secretary-Treasurer. A. H. Kelly, J. A. Turner, and G. O. Buchanan were elected a committee to act in conjunction with the temporary officers. The meeting was adjourned until April 22nd, when the constitution and by-laws will be submitted.

The Hall Mines smelter again "blew in" on the 7th of March. Between that date and the 31st of March 247½ tons of matte have been shipped and about 40 tons more have been produced.

The aerial tramway from the Silver King Mine has been cut in two and is now in successful operation.

John Miles has bonded the Majestic to Henry Symons, of Calgary, for \$30,000, \$2,000 to be paid on May 1st, 1896, \$14,000 on November 1st, 1896, and \$14,000 on May 1st, 1897.

Mr. G. A. Kirk, of Victoria, has bought the Golden Eagle. Mr. E. G. Traversy has sold the Maple Leaf to Mr. T. J. L. F. Poitras for \$500.

A good ledge has been found on the Last Hope near the Royal Canadian.

Railway News.

The Ashcroft *Mining Journal* has this to say about the Canadian Pacific Railway:—

A work train will arrive here about the 25th to begin repairing the track and widening the cut a few miles below Ashcroft. Another train will work east from this point. Altogether, there will be as much work done on this section, it is expected, as was done last season. The C. P. R. is said to have paid its bondholders \$7,000,000 in dividends last year, and undoubtedly has an era of prosperity before it. It is the best transcontinental road on this continent to-day, so far as safety and comfort in traveling are concerned. Another thing often commented on is the uniform courtesy with which travelers are treated by the employees. On no other of the transcontinental roads is such treatment accorded to the travelling public, and the public notice and appreciate such treatment.

It has been practically decided to build a connecting link of railway between the Nakusp and Slocan and the

Columbia and Kootenay during the coming summer, with Roseberry and Slocan Crossing as the terminal points. The construction of this piece of railway will put the C. P. R. in a better position to compete with rival roads by affording an all-rail route from Nakusp to Nelson and Robson; from which point connection can be had with the Trail Creek district by water at all times of the year. It is said that the extension of the Columbia & Kootenay from Robson to Rossland is not a possibility of the immediate future.

Up on Smelter Hill, away back, just where the plat of town of Trail ends, the C. P. R. Company is surveying a townsite. Just when the property will be placed on the market is not known, but it is being surveyed by J. Hirsch, who came to Trail not long ago for that purpose. It is supposed that as the C. P. R. proposes to build to Trail this year, and will make Trail its terminus for some time to come, the new townsite, or addition to Trail, will be used for terminal grounds, and the sale of lots made on that proposition.

Changes in the staff of the Kaslo & Slocan Railway have been important during the week. Charles Flolliott has retired from the management and will return at once to St. Paul. W. H. McGraw has also severed his connection with the Company and will return east. Both positions, thus vacated, will be filled by N. D. Miller, for a time chief engineer of construction, who has been recalled to take the place of general manager. W. J. Adams, who has been acting as master mechanic, has also resigned.

The engines and cars for the Rossland & Trail tramway are all on the road. No. 1 engine and some cars were at Arrowhead recently while there were about a dozen cars at Revelstoke. Another engine and one car were on the scow at the mouth of the Kootenay River, to be towed to Trail by the Str. Illecillewaet, and the Nakusp brought down a car and loaded it on a flat car at Robson the other day. The cars are about six feet wide and twelve feet long, and will carry about ten tons of ore. The initials on the cars and engine are C. R. & K. R. R.

The Columbia River is now open for steamboat traffic as far as Revelstoke, but it is stated that the large boats of the C. & K. Navigation Company will make Arrowhead their northern terminus during the coming summer, thus utilizing the thirty miles of Railway from Revelstoke to the head of Arrow Lake. This arrangement will cause serious loss to Revelstoke hotel-keepers.

The Columbia and Western Railway Company, which is now applying for a charter from the Provincial Government, announce the following route selected:

	MILES.
Trail to Rossland	12.5
Rossland to Big Sheep Creek, Christina Lake summit	23.0
Big Sheep, Christina summit, to foot of Christina Lake	27.0
Christina Lake to Grand Forks	13.0
Grand Forks to summit of Pass Creek	21.0
Summit of Pass Creek to Midway	16.0
Midway to Icanap Pass	32.0
Icanap Pass to Penticton	43.0

Total distance from Trail to Penticton..... 187.5

The incorporators are F. A. Heinze of Butte, A. P. Heinze of New York, F. E. Ward and Chester Glass of Rossland.

As will be seen the road will be all in British Columbia. Most of the grading is already completed between Rossland and Trail. Properly handled this road will be a great factor to the best interests of this section of the country.

Happenings at the Mines.

CARIBOO.

H. R. Bellamy has finished up his work on the Horseshoe Bend, Thompson River, claim with very satisfactory results, a portion of the ground running as high as \$1.50 per yard, and his company will immediately arrange for building a dredge to work there. Mr. Bellamy's company has a twenty year lease of the Horseshoe Bend.

Already quite a large number of men have gone up into the Cariboo, heading in most cases for the Horsefly or Forks Country. The demand is not, we fear, going to equal the supply at least not for some weeks to come, as the camps in the vicinity of Barkerville will not be active until near the first of May. Quite a number of the men who went up lately have employment promised them at the Horsefly.

Messrs. Young and Lee of Pittsburg, Penn., passed through Ashcroft lately on their way to Quesnelle, where Mr. Young is building his dredger for work on the Fraser River. About 60,000 pounds of machinery direct from Pittsburg is now on the way. The freight on the carload is nearly \$1,000 and with Canadian duty makes a valuable consignment. Mr. Young is a practical man and knows as much about river dredging as any man in the Province. If Mr. Young's judgment is good, dredging will be a prominent factor in gold mining in British Columbia from now on.

On the Breckenridge claim near Quesnelle Forks several shafts have been sunk to a depth of 50 or more feet. They are now drifting and are taking out some gold. They are well pleased with the outlook.

The outlook for the various propositions in the Quesnelle section is good. The Montreal Company, the Beaver Mouth, the French Company, the Columbian, the Fishback Hydraulic, and various other large propositions are making preparations to go on with work on a large scale, and dozens of propositions will be put in shape for capitalists to take hold of for the next season. Quesnelle Forks has a great future.

Fifty as fine looking men as you often find, headed by Mr. Deasey the foreman of the Cariboo Mine, left for the Forks recently. They all hail from California, are thorough hydraulic miners, and are a class of men who are a desirable addition to any mining country.

There is a rumor that the Quesnelle Lake Dam Company is making hopeful progress in the formation of the company, which is speedily to undertake the erection of a dam to pen back the waters of that lake, and so lay open for mining the whole of the South Fork river bed, which, from diving and other tests, is known to be immensely rich, probably the richest in gold of anything in the Province, in fact the divers regard it as literally paved with gold in places.

EAST KOOTENAY.

Mr. Wm. McNeish again visited his copper mine lately and gives very encouraging accounts of the same. He brought with him some remarkably fine specimens of copper ore, some blue copper glance which contains 64 per cent. metallic copper. This ore exists in large quantities and it promises to exceed even the owner's expectations. He is making arrangements to have some of it shipped to a smelter.

Mr. Young, manager of the Invicta Gold Mines, Ltd., and Mr. Mitchell, purser of the same, passed through Golden the other day, on the way to the company's gold mine on Wild Horse. They are going to commence active hydraulic operations as soon as the spring opens

up. This is the property that formerly belonged to Mr. Griffin, who was in the Old Country last winter.

LARDEAU CREEK.

J. Knowles, who has a placer claim at the mouth of Lardeau Creek, Trout Lake, struck it rich one day last week. He was working in shallow water, and, turning over a boulder, was agreeably surprised to observe several good-sized nuggets. He worked out the hole and secured over \$100 in coarse gold that day for his labor. J. Knowles got over \$600 out of his claim last winter. J. Atkinson and his partner, who have the adjoining claims are reported to be doing well.

LILLOOET.

John Sweeney, foreman; Pete Levesque and J. McCreary, of the Consolation Mine on French Creek, Big Bend, are down from the mine on a holiday. They express themselves as well satisfied with their property. The output for the past four months amounted to \$4,000 with four men working. Nuggets worth from \$5 to \$20 are comparatively common, but Sweeney brought down two the like of which are not picked up every day; one goes just an even \$50 while the other weighs a few cents over \$43.

NELSON.

The Silver King Mine, four and a half miles south of Nelson, is easily British Columbia's greatest precious metal mine, judging from its output. Last week the shipments of matte from the smelter at Nelson aggregated 213,565 pounds, of the value of \$26,045 according to the entries made at the customs house. During the week the ore smelted yielded a ton of silver.

Byron N. White, manager of the Slocan Star Mine, Nelson, passed through Nelson lately on his way to Spokane. He said the Star was shipping 20 tons of ore a day.

Within a radius of twenty miles of Nelson are half a hundred well-defined ledges carrying free-milling gold ore. For some reason few of these ledges are worked. The Poorman, on Eagle Creek, six miles southwest of Nelson, is the best known, and it has been worked off and on for six years. The work done this winter goes to prove that it is a mine. The winze started at the foot of the incline tunnel has been sunk 80 feet, and a drift started on the vein, which at that depth—about 180 feet from the surface—is three feet wide. But it is not the fact that the vein is as well defined at that depth as at the surface that gives confidence to the owners; it is that the ore is found to be free milling and not sulphureted. Some of the first ore ever taken from the mine is now being hoisted from the lowest drift.

SLOCAN.

The owners of the Reco mine, in Slocan district, recently divided \$30,000 amongst themselves as profits from ore shipped. The owners are Messrs. Harris, Kelly and the two Whartons.

In one week 401,200 lbs. of ore were exported from Kaslo last month. The value was \$21,389. The total amount exported from Kaslo to the American smelters since January 1st, is 6,694,117 lbs., valued at \$340,366.

The Two Friends, a claim about nine miles from Slocan City, between Springer and Lemon Creeks, owned by N. C. Murphy and P. M. Schonberg, is truly a great mine. The owners have taken out between 50 and 60 tons of ore during the last month, and the following are assays which they claim to have obtained: Dry ore, 1,374, 576, 271, and 238 ounces of silver per ton of ore. The galena ore runs from 68 to 79 per cent. lead. An

other assay of 19,731½ ounces of silver per ton was obtained on a sample of cupriferous argentite which was deemed comparatively useless until shown to a local assayer.

The Slocan Star concentrator will begin operations early in May. There are 30,000 tons of concentrating ore on the Star dump, and it will be run through the mill during the next six months, provided the two per cent. tax has its head cut off.

After tunnelling 300 feet the ledge has been struck on the Surprise, and proves the ledge to be two feet of solid ore which runs 200 ounces per ton.

A large amount of ore has been taken out of the North Star during the past winter. It is estimated that there are 2,500 tons at the company's landing on the Kootenay River ready for shipment, some 800 tons at McGinty, and nearly 3,000 tons on the dump. Recently another strike of the rich wire silver was made in another drift separate from where the former discovery was made. There is a strip in the roof of the drift some fifteen feet in length covered with lead crystals and wire silver. Parties who have seen them say it is a beautiful sight, the crystals hanging from the roof and sparkling with the wire silver. There is no doubt that the North Star is one of the largest silver lead properties on the continent.

We have been informed that it is the intention of the owners of the Gold Hill property, to develop the mine during the spring. The property is a low grade proposition with a mountain of quartz in sight.

SOUTHERN KOOTENAY.

A discovery of much importance has been made on the Josie ground. A vein coming directly from the Le Roi has been uncovered just north of the wagon road leading from the Josie dump. The outcrop of the vein has been traced about 700 feet on the Josie ground and at one point has been stripped for thirty feet, the average width being from eight to ten feet. Clean ore has been exposed in some places and this is of shipping quality.

Superintendent Stephenson, of the Nest Egg, reports that the new shaft on the south vein, about 300 feet south of the old No. 1 shaft on the north vein, shows in the bottom at a depth of 29 feet, nearly three feet of clean ore, which averages \$25 in gold and 2 per cent. in copper. The Nest Egg not only promises to make a mine, but what is of still more importance, the contest on the title is in a fair way to be settled.

Under the direction of Mr. Ballinger, superintendent of the Montana Ore Purchasing Company's smelter at Butte, the silica bottom was placed in No. 1 furnace of Trail's smelter, and also in No. 2 and in the big furnace. Nos. 1 and 2 smelters and the blast furnace were blown in. When the charge in furnace No. 1 was drawn the test was satisfactory in every respect. The company is at work on Nos. 3 and 4 furnaces, and they will be completed in about six weeks. Mr. Ballinger will remain in Trail for some time and see that everything is running all right before he leaves. There will be no more trouble with the Trail furnaces, and the fires now started will not be allowed to grow cold for a long time to come.

Superintendent Clark in an interview said: "In the War Eagle we have been running on the big ore chute for the past sixty days, and it has been getting a little wider as we progressed. When we first struck it the ore body was about two feet wide, and kept on slowly widening until this morning it is 12 feet between walls. The distance driven on the chute is now about 150 feet.

The value of the ore is perhaps a little better than that obtained from No. 1 tunnel, both in gold and copper. We have shipped 12,000 tons of ore from No. 1 tunnel that have averaged \$42.50 in gold, 5 per cent. copper and 3½ oz. in silver."

The drift from the No. 2 tunnel of the Cliff is approaching the big ore chute exposed by the upper shaft. The face of the drift now shows 14 inches of the highest grade ore yet encountered in the mine. Several average samples taken from this showing ran from 35 to 40, including both gold and copper.

Just as we go to press we learn that the north cross-cut from the main tunnel of the Centre Star has tapped a new ledge at a distance of 200 feet. The ore is quartz carrying copper and iron, both very fine grained. There is no doubt it will prove to be a shipping ore when assayed. The width of the ore body cannot yet be determined as they have just broken into it.

Ore has been struck in the lower tunnel of the St. Eugene, which is of the same character as that in the tunnel above. There are between 2,000 and 3,000 tons on the dump. The lead in the first drift is seven feet in width.

Important Notice.

Arrangements are now being made by the management of THE RECORD for a system of regular correspondence from all the principal points in the Mining Districts of the Province. Reliable correspondents are being chosen and it is hoped that this new feature will be in full working order in the next issue of THE RECORD.

Our London (England) Agents.

Messrs. Gordon & Gotch, St. Bride Street, London, England, will hereafter act as the Agents of the British Columbia MINING RECORD in Great Britain, and are authorized to receive subscriptions and advertisements for this Journal.

The Output of the Mines in British Columbia for 1895.

The output in the various districts is estimated as follows:

Cariboo	\$ 309,900
Cassiar	22,575
Lillooet	40,663
East Kootenay, placer gold	17,575
" " silver, lead, etc.	255,500
West Kootenay, free and placer gold	25,500
West Kootenay, gold, silver, lead, copper, etc.	2,175,000
Yale, placer gold	48,408
Osoyoos, " "	12,400
Total output	\$2,907,221

Gold Commissioners.

- For the Province.—W. S. Gore.
- Alberni.—Thos. Fletcher, Alberni.
- Cariboo.—John Bowren, Richfield.
- Cassiar District.—James Porter, Laketon, Cassiar.
- Lillooet District.—Frederick Soues, Clinton.
- East Kootenay District.—J. F. Armstrong, Donald.
- West Kootenay District.—N. Fitzstubbis, Nelson.
- West Kootenay District.—J. D. Graham, Revelstoke.
- Yale District.—Chas. Lambly, Osoyoos; G. C. Tunstall, Kamloops.

Assayers in the Province of British Columbia.

- Public Assayer, H. Carmichael, Victoria.
- W. Pellew Harvey, Vancouver.
- Robbins & Long, Rossland.

Province of British Columbia.

Minister of Mines.—Hon. Col. James Baker.
 Provincial Mineralogist.—W. A. Carlyle.
 Public Assayer.—H. Carmichael.

MINING CENTRES IN BRITISH COLUMBIA

—AND—

HOW TO REACH THEM.

ALBERNI.

Alberni.—Steamboat communication with Victoria and by stage with Nanaimo.

Basclay Sound.—Forty miles from Alberni; communication by steamer with Victoria.

CARIBOO.

Barkerville.—Two hundred and eighty-five miles from Ashcroft; stage from Ashcroft. See stage lines.

Bonaparte.—Twenty miles from Ashcroft; stage from Ashcroft.

Big Bar.—Stage from Ashcroft.

Clinton.—Thirty-two miles from Ashcroft station; stage from Ashcroft.

Fort George.—Nearest post office, Quesnelle, where stage to and from Ashcroft changes.

Horsefly.—Nearest post office, 150-Mile House; stage from Ashcroft; change at 150-Mile House.

Lac La Hache.—One hundred miles from Ashcroft; stage from Ashcroft and Barkerville.

Lillooet.—Weekly stage from Clinton, where connection made with stage for Ashcroft.

Lightning Creek.—Between Quesnelle and Barkerville, by stage.

One Hundred Mile House.—Stage from Ashcroft.

One Hundred and Fifty Mile House.—Stage from Ashcroft.

Quesnelle.—Two hundred and twenty-five miles from Ashcroft; stage from Ashcroft.

Quesnelle Forks.—Stage and pack trail from Ashcroft.

Soda Creek.—Stage from Ashcroft.

Slough Creek.—From Barkerville, twelve miles.

Tatla Lake.—Stage from Ashcroft, changing at Soda Creek.

Willow River.—Stage to Barkerville or Stanley, thence rail.

Williams Creek.—From Barkerville, seven miles.

CASSIAR.

Dease Creek.—

McDame Creek.—

COAL CENTRES.

Crow's Nest Pass.—

Nanaimo.—From Victoria, all rail, 73 miles. Steamer from Vancouver.

Union.—

Wellington.—From Victoria, all rail, 83 miles. Steamer and rail from Vancouver.

EAST KOOTENAY.

Cranbrook.—Nearest railway station, Golden. Communication by steamer from Golden to Windermere, thence by stage.

Fairmont Springs.—Nearest railway station, Golden. Steamer to Windermere, thence by stage.

Fort Steele.—Steamer and road from Golden. Steamer from Jennings, Montana, G.N.R.R.

Galbraith Ferry.—Steamer from Golden. Stage in winter.

Galena.—Nearest railway station, Golden; thence by steamer. Stage in winter.

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FOR MINERS AND PROSPECTORS

AT LOWEST POSSIBLE FIGURES.

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 VICTORIA AND ALBERNI

Golden.—On the main line C.P.R., 475 miles from Vancouver.
Moyie River.—From Fort Steele. 25 miles.
McMurdo District.—Steamer and trail from Golden, 35 miles.
Perry Creek.—Steamer from Golden to Fort Steele, thence by road.
St. Mary's.—From Fort Steele, 20 miles, trail.
Thunder Hill.—One hundred and fifteen miles from Golden. Steamer in summer, stage in winter.
Windermere.—Steamer from Golden. Stage in winter.
Wild Horse Creek.—From Fort Steele, two miles trail to Kootenay river.

WEST KOOTENAY.

Ainsworth.—Twenty-eight miles from Nelson and twelve from Kaslo. Steamer communication.
Albert Canyon.—A station on the C. P. R., 400 miles from Vancouver.
Big Bend District.—Fifty miles from Revelstoke by trail and boat.
Cariboo Creek.—Steamer from Nakusp, ten miles.
Fort Shephard.—Nearest post office, Trail Creek; communication by rail and steamer from Revelstoke.
Illecillewaet.—On the main line C. P. R., 407 miles from Vancouver.
Kaslo City.—Thirty-five miles from Nelson; communication by steamer.
Lardeau City.—Forty miles from Revelstoke; communication by steamer.
Lardo-Duncan.—Steamer from Kaslo to head of lake, thence river trail 40 miles.
Nakusp.—North-west terminus of Nakusp & Slocan Railway, 50 miles from Revelstoke. Steamer communication from Revelstoke tri-weekly.
Nelson.—Thirty miles from Robson; is the eastern terminus of the Columbia & Kootenay Railway, and also on the Spokane & Northern Railroad. Steamer from Revelstoke.
New Denver.—Steamer from Revelstoke and rail from Nakusp; all rail from Kaslo. Distant from Revelstoke, 78 miles, from Kaslo, 28 miles.
Pilot Bay.—Eighteen miles from Kaslo, thence by steamer.
Revelstoke.—On main line C.P.R., 379 miles from Vancouver.
Rossland.—Seven miles from Trail Creek by road or stage.
Sproat's Landing.—One hundred and sixty miles from Revelstoke, and one and a half miles from Robson.
Springer Creek and South Stocan Camps.—From New Denver by steamer, twenty miles.
Sandon and Cody Creek.—All rail from Kaslo, 29 miles. Steamer and rail from Revelstoke via Nakusp and Three Forks. Distant from Three Forks, four and a half miles.
St. Mary's Country.—Steamer from Kaslo or Nelson to Davie Townsite, thence trail.
Three Forks.—Steamer from Revelstoke to Nakusp, thence rail; from Kaslo, all rail. Distant from Revelstoke, 82 miles; from Kaslo, 24 miles.
Trail.—Rail from Spokane to Northport, thence steamer. All steamer from Revelstoke, or steamer and rail via Nelson. Distant from Spokane, miles; from Revelstoke, 150 miles; from Nelson, 50 miles.
Trout Lake City.—Steamer and stage from Revelstoke.

LILLOOET.

Bridge River, Cayoosh Creek, Fraser River.

VALE.

Boundary Creek.—Nearest railway station on the S. and O. R., Okanagan Landing, thence by steamer to Pentiction and on by stage to Midway.
Fairview Camp.—Communication by boat from Okanagan Landing to Pentiction, thence by stage.
Kettle River.—Steamer from Okanagan Landing to Pentiction, thence by stage.
Midway.—Rail from Sicamous to Okanagan Landing, steamer Pentiction and on by stage.
Okanagan Mission.—Rail from Sicamous to Vernon, thence by stage, or by steamer from Okanagan Landing to Kelowna, thence by livery.
Osoyoos.—Rail to Okanagan Landing, steamer to Pentiction, and thence by stage.
Rock Creek.—Rail to Okanagan Landing, steamer to Pentiction, and thence by stage.
Yale.—Nicola Lake Stage from Spence Bridge and Kamloops, 50 miles.
 Any of these points may be reached by rail from Spokane to Marcus, and thence by stage, twice a week.
 Mail stage leaves Pentiction for Midway every Thursday morning.

CATALOGUES RECEIVED.

A supply of handsome catalogues, price lists, and other information has been received by the Purchasing Department of the RECORD from the following firms, and copies will be mailed free to any of our subscribers who may desire to obtain information as to the latest and best mining machinery, etc., etc.

The following catalogues have been received up to this time: Joshua Hendry Machine Works, Mining Machinery of all kinds.

- The Giant Powder Company, Explosives.
- Shelton & Co., Vancouver B. C., Furniture.
- Merrall's Hydraulic Quartz Mills.
- The Pelton Water Wheel.
- Goodyear Rubber Co., Rubber Goods.
- Union Iron Works, Machinery.
- The McGlew Ore Concentrator Co., Concentrators.
- The Babcock & Wilson Co., Water Tube Steam Boilers.
- The Goubert Manufacturing Co., Water Heaters, &c.
- Gates Iron Works, Rock and Ore Breakers, &c.
- Fraser & Chalmers, General Milling Machinery.
- The Metallic Roofing Co., Steel Shingles.
- H. W. Petrie, Machinist and dealer in Machinery.
- James H. Lancaster, Dredging and other Mining Machinery.

— THE —
COLUMBIA & KOOTENAY STEAM NAVIGATION CO.
 LIMITED.

TIME TABLE No. 9.

In effect March 15th, 1896.

REVELSTOKE ROUTE, STEAMER "NAKUSP."

Leaves Arrowhead for Nakusp and Robson on Sundays, Tuesdays and Thursdays at 8 p. m.
 Leaves Robson for Nakusp, Arrowhead, and C. P. R. points east and west on Mondays, Wednesdays, and Fridays at 4 p. m.
 Connection is made at Robson with C. & K. Railway for Nelson and all points on Kootenay Lake and with Steamer Lytton for Trail and Northport.

TRAIL CREEK-ROBSON ROUTE, STEAMER "LYTTON."

Leaves Trail for Robson on Mondays, Wednesdays and Fridays at 8 a. m.
 Leaves Robson for Trail on Mondays, Wednesdays and Fridays at 1 p. m.
 Close connection at Robson with steamer Nakusp for Nakusp and Revelstoke and with C. & K. Railway for Nelson and Kootenay Lake points.

NORTHPORT-TRAIL CREEK ROUTE, STEAMER "LYTTON."

Leaves Trail for Northport on Tuesdays, Thursdays, and Saturdays at 7 a. m.
 Leaves Northport for Trail on Tuesdays, Thursdays, and Saturdays at 1 p. m.
 Connects at Northport with Spokane Falls & Northern Railway for Spokane.

NELSON-KASLO ROUTE, STEAMER "NELSON."

Leaves NELSON FOR KASLO:— Sundays at 4 p. m. Tuesdays at 5:30 p. m. Wednesdays at 5:30 p. m. Thursdays at 5:30 p. m. Fridays at 5:30 p. m. Saturdays at 5:30 p. m.	Leaves NELSON FOR KASLO:— Sundays at 8 a. m. Mondays at 3 a. m. Wednesdays at 3 a. m. Thursdays at 8 a. m. Fridays at 3 a. m. Saturdays at 8 a. m.
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The steamer leaving Nelson connects on Tuesdays, Thursdays and Saturdays with Nelson & Fort Sheppard train, at Five-mile point, and with C. & K. Railway on Wednesdays and Saturdays for Kaslo and Lake points.

The steamer leaving Kaslo connects on Mondays, Wednesdays and Fridays at Five-mile point with Nelson & Fort Sheppard train for Spokane, and at Nelson with C. & K. Railway for points north and south.

The right is reserved to change this schedule at any time without notice. For tickets, rates, etc., apply at Company's office, Nelson.

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Synopsis of British Columbia Mining Laws.

HOW TO LOCATE MINERAL CLAIMS.

Every person over eighteen years of age, and every joint stock company shall be entitled to all the privileges of a free miner, on taking out a free miners' certificate, the cost of which is \$5 a year.

Any Gold Commissioner or any Mining Recorder can issue free miners' certificates.

A free miner can locate and hold mineral and placer claims, under the mining laws in force at the time, during the continuance of his certificate, but no longer.

A mineral claim must not exceed 1,500 feet long by 1,500 feet wide, and must be marked by two legal posts, numbered one and two, placed as nearly as possible on the line of the lode or vein, and not more than 1,500 feet apart.

The line from one to two is the location line, and the claim may extend any number of feet to the right and to the left of said location line, provided the total distance on either side does not exceed 1,500 feet.

A legal post marked "Discovery Post" must be placed on the lode where it was discovered.

On No. 1 post must be written :

1. "Initial Post."
2. The name of the claim.
3. The name of locator.
4. Date of location.
5. Approximate bearing of No. 2 post.
6. Length and breadth of claim.
7. Number of feet to the right and number of feet to the left of location line.

On No. 2 post :

1. Name of claim.
2. Name of locator.
3. Date of location.

The line from one to two must be distinctly marked by blazing trees, cutting underbrush, or planting posts.

RECORDING MINING CLAIMS.

All records must be made at the Mining Recorder's office of the mining division in which the claim is situated.

An affidavit that mineral has been found in place on the claim must be made by the applicant, or someone in his behalf cognizant of the facts, and filed with the Recorder.

A mineral claim must be recorded within fifteen days after location, if within ten miles of the office of the Mining Recorder. One additional day is allowed for every additional ten miles.

The locator must furnish the Mining Recorder with the following particulars, in addition to the affidavit above mentioned, at the time the claim is recorded, paying a fee of \$2.50 for recording claim, and 25 cents for filing affidavit :

RECORDING MINING CLAIM.

1. Name of claim.
2. Name of locator.
3. Number of locator's Free Miners' Certificate.
4. Where the claim is situated.
5. Direction or bearing of location line.
6. Length and breadth of claim.
7. Number of feet to the right and number of feet to the left of location line.
8. Date of location.

ANNUAL WORK.

To hold a mineral claim, work to the value of one hundred dollars must be done on the claim each year from date of record.

An affidavit made by the holder, or his agent, giving a detailed statement of the work done must be filed with the Gold Commissioner or Mining Recorder, and a certificate of work obtained from the Gold Commissioner or Mining Recorder, and recorded (fee \$2.50) before the expiration of each year from the date of record.

The holder of adjoining mineral claims may, subject to filing a notice of his intention with the Gold Commissioner or Mining Recorder, perform on any one or more of such claims all the work required to entitle him to a certificate of work for each claim.

Any labor or money expended in constructing a tunnel to develop a vein or lode, will be deemed to have been expended on such vein or lode.

In lieu of the above annual work, the holder of a mineral claim may pay to the Mining Recorder the sum of one hundred dollars, get a receipt and record the same, each year from date of record.

(Placer mining laws, and laws in reference to hydraulic gold claims will be given in a future issue.)

CERTIFICATE OF IMPROVEMENTS FOR CROWN GRANT.

To obtain a certificate of improvements to a mineral claim the holder must have done work on his claim to the value of \$500; had the claim surveyed and marked out by a provincial land surveyor, whose field notes and plan must be immediately forwarded to the Lands and Works Department; posted notice on claim and in Mining Recorder's office for sixty days; filed copy of surveyor's field notes and plan with Mining Recorder; inserted copy of notice in *British Columbia Gazette* and in some newspaper published in the province and circulated in the district, for sixty days after posting notice on claim; and filed with Mining Recorder affidavit of himself, or his agent, in the required form and to the effect that the above conditions have been complied with.

CROWN GRANTS.

Applications for Crown grants must be made to Gold Commissioner within three months from date of certificate of improvements.

The holder of a certificate of improvements, on making application for Crown grant, must enclose certificate of improvements and the Crown grant fee of \$5.00.

A Crown grant issued since the session of 1893 conveys only the surface of the claim, for the purpose of winning and getting from and out of the claim, the minerals contained therein including all operations connected therewith, or with the business of mining.

TABLE OF FEES FOR REFERENCE.

For every free miners' certificate (for each year).....	\$5 00
For every substituted certificate.....	1 00
For recording any claim.....	2 50
For recording every certificate of work.....	2 50
For recording any "lay over" or every other record required to be in the "Record Book".....	2 50
For recording every abandonment, including the memorandum to be written on the record.....	2 50
For any other record made in the "Record of Abandonments".....	2 50
For recording every affidavit, where the same does not exceed three folios of one hundred words.....	2 50
For every folio over three, thirty cents per folio.	
The above rate shall be charged for all records made in the "Records of Affidavits."	
For all records made in the "Record of Conveyances," where the same does not exceed three folios.....	2 50
For every folio over three, a further charge of thirty cents per folio.	
For all copies or extracts from any record in any of the above-named books, where such copy or extracts shall not exceed three folios per copy.....	2 50
Where such copies or extracts exceed three folios, thirty cents per folio for every folio over three..	
For filing any document.....	5 00
For a Crown grant.....	5 00

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Sheet Iron and Steel Pipe, ★ ★ ★ ★ ★		Hoisting and Pumping Plants, ★ ★ ★ ★ ★
Stamp Mills, ★ ★ ★ ★ ★		Saw Mills, ★ ★ ★
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