

Technical and Bibliographic Notes / Notes techniques et bibliographiques

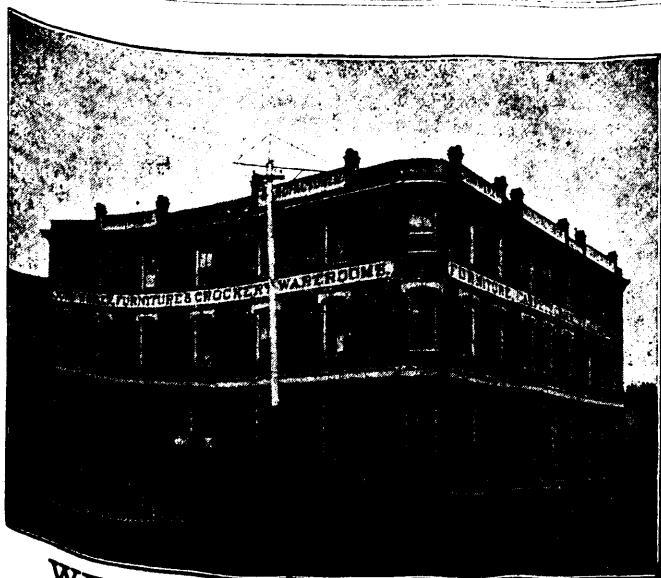
The Institute has attempted to obtain the best original copy available for scanning. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of scanning are checked below.

L'Institut a numérisé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de numérisation sont indiqués ci-dessous.

- | | | | |
|-------------------------------------|---|-------------------------------------|---|
| <input type="checkbox"/> | Coloured covers /
Couverture de couleur | <input type="checkbox"/> | Coloured pages / Pages de couleur |
| <input type="checkbox"/> | Covers damaged /
Couverture endommagée | <input type="checkbox"/> | Pages damaged / Pages endommagées |
| <input type="checkbox"/> | Covers restored and/or laminated /
Couverture restaurée et/ou pelliculée | <input type="checkbox"/> | Pages restored and/or laminated /
Pages restaurées et/ou pelliculées |
| <input type="checkbox"/> | Cover title missing /
Le titre de couverture manque | <input checked="" type="checkbox"/> | Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées |
| <input type="checkbox"/> | Coloured maps /
Cartes géographiques en couleur | <input type="checkbox"/> | Pages detached / Pages détachées |
| <input type="checkbox"/> | Coloured ink (i.e. other than blue or black) /
Encre de couleur (i.e. autre que bleue ou noire) | <input checked="" type="checkbox"/> | Showthrough / Transparence |
| <input type="checkbox"/> | Coloured plates and/or illustrations /
Planches et/ou illustrations en couleur | <input checked="" type="checkbox"/> | Quality of print varies /
Qualité inégale de l'impression |
| <input checked="" type="checkbox"/> | Bound with other material /
Relié avec d'autres documents | <input type="checkbox"/> | Includes supplementary materials /
Comprend du matériel supplémentaire |
| <input type="checkbox"/> | Only edition available /
Seule édition disponible | <input type="checkbox"/> | Blank leaves added during restorations may
appear within the text. Whenever possible, these
have been omitted from scanning / Il se peut que
certaines pages blanches ajoutées lors d'une
restauration apparaissent dans le texte, mais,
lorsque cela était possible, ces pages n'ont pas
été numérisées. |
| <input type="checkbox"/> | Tight binding may cause shadows or distortion
along interior margin / La reliure serrée peut
causer de l'ombre ou de la distorsion le long de la
marge intérieure. | | |
| <input type="checkbox"/> | Additional comments /
Commentaires supplémentaires: | | |

TABLE OF CONTENTS.

	PAGE.		PAGE.
Enquiry Department - - - - -	9	The Starting Point to the Interior - - - - -	33
Publishing Department - - - - -	9	The Golden Eagle Mine - - - - -	33
Purchasing Department - - - - -	9	A Fine Gold Saving Machine - - - - -	34
Mineral Exhibits - - - - -	10	Similkameen River and Creeks - - - - -	35
Mining Papers on File - - - - -	10	Kruger Mountain, Lower Okanagan - - - - -	35
Agents - - - - -	10	Mining Enterprise - - - - -	35
To Our Readers - - - - -	10	What a Canadian Firm is Doing - - - - -	35
Editorial Notes - - - - -	10	Notes - - - - -	36
First Lecture on Metals and Metallurgy - - - - -	12	Boundary Creek Notes - - - - -	36
River Dredging - - - - -	15	Book Notice - - - - -	36
Quesnelle River - - - - -	18	A Flourishing Company - - - - -	36
Lillooet - - - - -	19	On the Stage Road from Ashcroft - - - - -	36
The Great Cariboo Road - - - - -	21	Vernon - - - - -	36
The Cariboo Mines - - - - -	25	Catalogues Received - - - - -	37
The Auriferous Gravels of British Columbia - - - - -	27	Railway and Steamboat News - - - - -	37
Cariboo Creeks - - - - -	28	Mining Centres and How to Reach Them - - - - -	38
First Discovery on Horsefly River - - - - -	30	Gold Commissioners - - - - -	38
The Cariboo Mine - - - - -	30	Province of British Columbia - - - - -	38
The Horsefly Mine - - - - -	30	Assayers in the Province of British Columbia - - - - -	38
Golden Cariboo - - - - -	31		



WEILER BROS.' WAREHOUSES.

(ESTABLISHED 1862.)

WEILER BROS.

VICTORIA, B. C.

**MANUFACTURERS OF FURNITURE,
UPHOLSTERY, ETC.**

**IMPORTERS OF CROCKERY, GLASSWARE, WALL
PAPER, CARPETS, LINOLEUMS, ETC.**

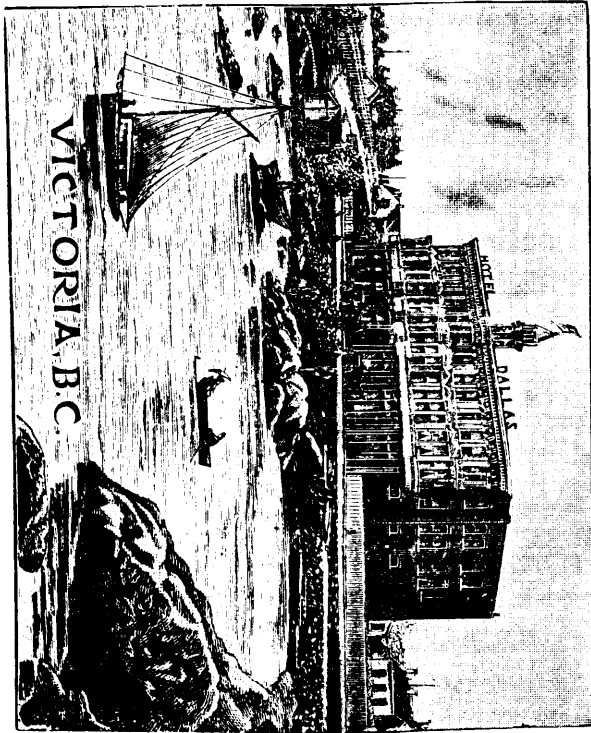
Special attention given to Bank and Office Fittings, and Hotel
and Bar Fixtures. Residences and Hotels
furnished throughout.

All orders, no matter how large, promptly filled, as we
have the **LARGEST STOCK IN THE PROVINCE.**

WRITE US FOR CATALOGUE AND PRICE LIST.

HOTEL DALLAS,

VICTORIA, B. C.



HOME FOR TOURISTS.

Strictly First-class. Rates, \$2.50 to \$5.00 per Day.

W. JENSEN, Proprietor.

Cowper=Coles & Johnson,

Mining Brokers and Agents.

ROSSLAND, B. C.

WM. HAMILTON MERRITT, F.C.S.,

(Associate Royal School of Mines)

Will Report on Mining Properties.

ADDRESS: TORONTO, CANADA (MOREING & NEIL'S CODE.)

CABLE ADDRESS: "BOUNDARY," MARCUS, WASH.

BOUNDARY CREEK

ENGINEERING - AND - ASSAYING - CO.,

GREENWOOD CITY, B. C.

Mines examined and reported on. Assays and analyses of ores.

—THE— MANOR HOUSE

VANCOUVER, B. C.



FIRST CLASS IN EVERY RESPECT.

RATES: \$2.00 Per Day and Upwards.

WILSON & DIXON, COMMISSION MERCHANTS.

REPRESENTING

COPP BROTHERS Co., LTD.,

Manufacturers of Stoves, Agricultural Implements, Wood and Coal Furnaces, Hot Air Registers and English Grates, Mohawk Chief Plows, Queen Cultivators, Drag and Wheel Scrapers, Road Machines, and Rock Crushers

BROWN, & OGGs, & CO.,

Manufacturers of Tanners', Cannerys', and Cornice Makers' Tools and Machines, Dies, Presses, etc.

DOWSWELL BROS. MANUFACTURING CO., Hamilton, Ont.

Manufacturers of Wringers, Washing Machines, Mangles, Churns, Household Novelties, etc.

P. O. B. x 176. Telephone 265.

Write us for Catalogue.

ESTABLISHED DURING THE FIRST GOLD DISCOVERIES IN CALIFORNIA.
INCORPORATED 1895.

JOHN TAYLOR & CO.



63 FIRST ST.,
SAN FRANCISCO, CAL.

IMPORTERS AND MANUFACTURERS OF

ASSAYERS' MATERIALS, MINE AND MILL SUPPLIES, CHEMICALS,
AND CHEMICAL GLASSWARE AND APPARATUS

All articles required for a chemist or assayer and for fitting up a quartz mill. None but the best chemicals, crucibles, and other appliances, such as our long experience assures us to be the best, are kept in stock and all furnished at reasonable prices.
Agents for the Pacific Coast of The Denver Fire Clay Co. and Morgan Crucible Co., Battersea, England.
Borax, Bone Ash, Cyanide Potass., Manganese from our own mine for working sulphurets and gold ores, in ton or car lots, and other articles of Californian production at manufacturers' prices.
Our new illustrated catalogue and assay tables sent free on application.



A HANDY PROSPECTOR'S FURNACE.

The attention of Prospectors and Miners is called to the merits of a new improved apparatus for testing and smelting various kinds of ores and minerals, such as gold, copper, nickel, silver, and lead ores, refractory and compound ores.

This furnace is designed and constructed by and for a prospector, who requires a serviceable furnace, easily transported over a mountainous country by a pack animal; that is complete and ready, and can be set up at any dump of low grade ores, that otherwise will not pay to ship with profit and make a good day's pay out of one to two tons of ore every day.

To judge the price (\$125.00) for such an outfit—of a *Cupola Smelter, knock-down bottom type*, with extension when smelting ores, made of No. 10 steel plates with slag and metal spouts, rotary steel blower, countershaft with geared pulley for blast supply, by either water, steam, or hand power; with three graphite crucibles, three steel ladles, six furnace steel bars and tools, only weighing complete 1285 pounds—when the prospector can determine the value of one ton of the ore in a five-hour heat by the output of the bullion.

With a little ordinary intelligence of the average prospector this five feet by three feet inside diameter little smelter, run on low grade ores, will not only pay for itself every week, but it will convince the skeptic beyond redemption who does not believe with us that the little smelter must come to the ore.

The fact that a great many of these *cupola type* smelters are now being adopted throughout the western mining districts, and all giving entire satisfaction, is sufficient recommendation for the sudden demand as an absolute necessity to every prospector, mine owner, millman, sampling works, or mining company.

Full and complete instructions go with the outfit, which gives mode of treatment of different ores, directions as to setting up and starting smelter, fuel, fluxing material, and general smelting operation.

A small size *Prospector's Furnace* (2 x 4 ft.) of $\frac{1}{2}$ -ton capacity per five-hour heat, costs only \$65 and weighs 650 pounds, same number of tools, with blower, etc., designed for the poor prospector who feels unable to purchase the larger smelter outfit. Refractory gold and silver ores and compound ores assayed and reported on.

FOR FURTHER INFORMATION ADDRESS

NATIONAL ORE AND REDUCTION CO.,

5726 Cheltenham Avenue, St. Louis, Mo.,

—MANUFACTURERS OF—

FURNACES FOR NICKEL, COPPER, GOLD, SILVER, AND LEAD ORES.

Engineers and Contractors for Equipments of Caloric and Chemical Reduction Works.

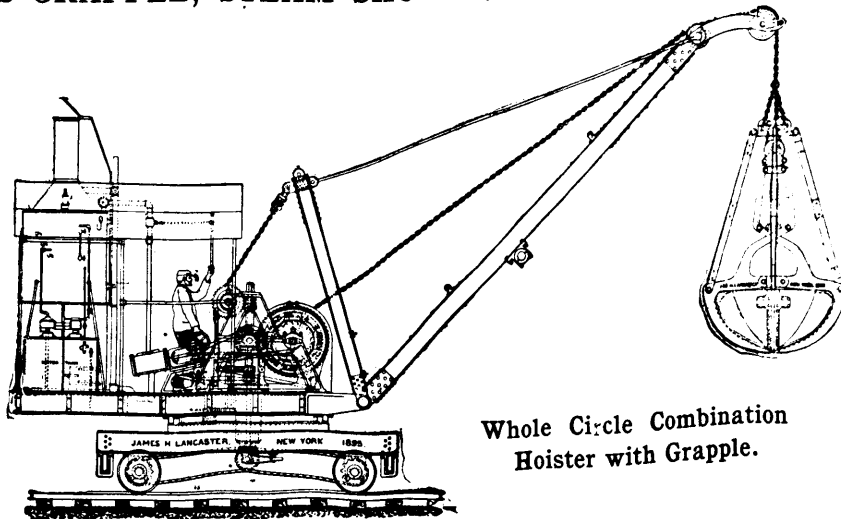
The 'Lancaster' Combination Hoister

WORKS GRAPPLE, STEAM SHOVEL, PILE DRIVER AND CRANE.

Four Machines
in One.

Each Complete
and Superior.

Convertible to
Either in
Thirty Minutes



Whole Circle Combination
Hoister with Grapple.

Large Capacity,
Economical
and Durable.
Indispensable
to Every Con-
tractor and
Miner for Land
and Off-Shore
Work.

PLACER GOLD AMALGAMATORS. Duplex and Alternating Riffles and Amalgamators. Mining Dredges. Washers and Screens. Steam Shovels. Pumps. Clam Shell Buckets. Grapples. Coal and Ore Handling Plants.
ROCK AND ORE BREAKERS. Granulators. Combined Crusher, Screens and Rolls, (superseding Stamp Mills). Suspension Cableways. Sewer Diggers.
Special plants of all kinds, capacities, and powers designed and promptly built.
Catalogues, prices, and testimonials on application.

JAMES H. LANCASTER,

123 LIBERTY STREET, NEW YORK.

P. O. BOX 2366.

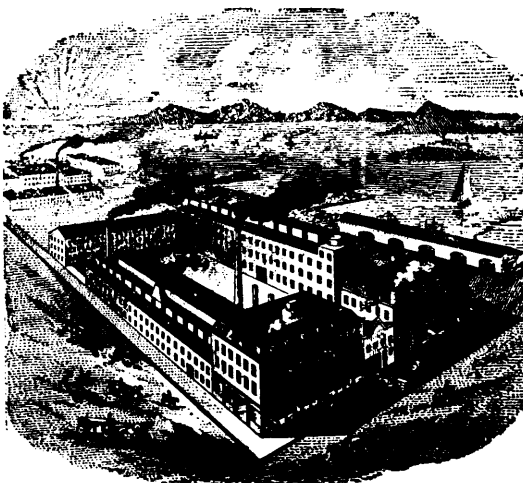
JOSHUA HENDY MACHINE WORKS

Nos. 38 to 44 Fremont St., San Francisco, Cal., U.S.A.

—MANUFACTURERS OF—

HYDRAULIC AND QUARTZ MINING MACHINERY OF EVERY DESCRIPTION.

Hydraulic Gravel .
Elevators,
Hydraulic Giants, .
Water Gates,
Sheet Iron and
Steel Pipe,
Stamp Mills,
Rock Crushers,



Ore Feeders,
Concentrators,
Smelters,
Hoisting and
Dumping Plants,
Saw Mills,
Mine Supplies,
Etc., Etc., Etc., Etc.

SEND FOR CATALOGUE.

BRITISH COLUMBIA BRANCH,

The Giant Powder Co'y, Consolidated,

OF SAN FRANCISCO, CALIFORNIA.

OFFICE:

ROOM 7, ADELPHI BLOCK,

WORKS:

TELEGRAPH BAY,

VICTORIA, B. C.

"VALVE-OLEINE."

675 DEGREES
FIRE TEST.

MASTER MECHANICS, Purchasing Agents, Engineers and Practical Builders of costly Steam Plants and Locomotives, etc., will be pleased to know that a Lubricant is now produced of such extraordinary high fire test as to make it proof against the great heat to which it is subjected, and is therefore a **PERFECT** lubricator where products of lower grade and fire tests pass off at once, leaving the parts subject to wear, or greatly increasing the consumption of oil.

"**VALVE-OLEINE**" is a product in the highest state of filtration, is of the greatest viscosity, is entirely free from all acids and absolutely non-corrosive and without doubt the finest and most thoroughly reliable **CYLINDER LUBRICANT** now on the market, and will naturally lubricate 200 to 300 per cent. more than products of lower tests. It is not only the **BEST** but the most **ECONOMICAL** lubricant. Manufacture and sale controlled exclusively by

THE RELIANCE OIL AND GREASE CO.,

Agents Wanted Everywhere. Write for Full Particulars and our New Catalogue of Large Line of Products. Samples Free.

CLEVELAND, OHIO, U. S. A.

Send two cent stamp for copy "Gems of Art"—Free on application direct from machinery users.

ASHCROFT, B. C.

THE GATEWAY TO THE CARIBOO GOLD FIELDS.

The British Columbia Express Co., Ltd.

THE ONLY STAGE LINE FURNISHING TRANSPORTATION TO

CARIBOO and LILLOOET DISTRICTS

Carrying H. M. Mails and Passengers and Conducting
a General Express Business.

Regular stages leave Ashcroft at 4 a. m. for Cariboo points every Monday and Friday, and for Lillooet points every Monday and Wednesday.

The trip from Ashcroft to Barkerville (two hundred and eighty-five miles) is made in four days, stopping each night to sleep.

This Company is provided with relays of horses along all its routes and therefore possesses special facilities for the rapid conveyance of commercial travellers and private parties.

Round trip tickets issued at greatly reduced rates and all charges reduced to the lowest practicable points.

The stopping places along the routes are comfortable and the tables well supplied at moderate rates.

Preparations are being made for a daily service when required.

A steamboat, which is now being built, will ply on the Fraser River, covering sixty miles of the Cariboo route, which will contribute much to the comfort and pleasure of the trip.

INFORMATION CHEERFULLY FURNISHED—ADDRESS,

B. C. EXPRESS COMPANY, LTD., - - ASHCROFT, B. C.

CARIBOO! GOLD! LILLOOET!

LILLOOET
HORSEFLY
QUESNELLE
BARKERVILLE

We have Single and Double Rigs; Pack and Saddle Horses!

Can send you to any part of Cariboo and also Lillooet!!!!

Special Rates and Rigs to suit parties of four or more!!!!

Write us for particulars—information cheerfully furnished!

Ashcroft Transfer and Feed Stables.

COLLINS & HADDOCK, - - - PROPRIETORS.

TO ALL INTERESTED IN THE FAMOUS

LILLOOET AND CARIBOO GOLD FIELDS!

Parties intending to ship goods to any point in the above mentioned gold fields reached by wagon road or pack trail will find it to their advantage to communicate with : : :

HARVEY, BAILEY, & CO.,

GENERAL : FORWARDING : AGENTS, ASHCROFT, B. C.

We forward over 75 per cent. of all goods destined to any point in the interior. Have ample storage accommodation, warehouses being situated on C. P. R. siding, and every facility for handling all classes of merchandise, including heavy mining machinery.

ASHCROFT, B. C.
THE GATEWAY TO THE CARIBOO GOLD FIELDS.

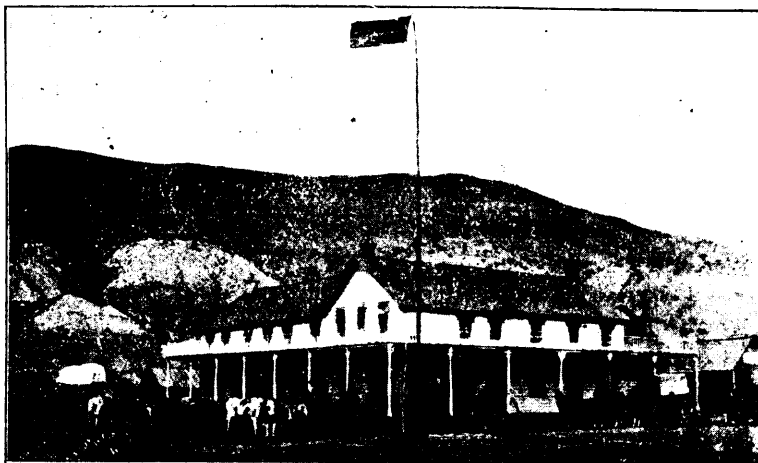
ASHCROFT HOTEL!

DIRECTLY OPPOSITE C. P. R. STATION.

...THE...
LEADING HOTEL
IN ASHCROFT.



BEST BRANDS
OF LIQUORS AND
...CIGARS...



GOOD STABLING
IN CONNECTION
WITH the HOUSE.



OPEN TO ALL
TRAINS AT ANY
TIME of NIGHT.

Travellers going to the Upper Country will find the ASHCROFT HOTEL the most convenient in the town.

W. LYNE, PROPRIETOR.

F. W. FOSTER,

THE
LEADING
MERCHANT,
ASHCROFT
AND
CLINTON.



SPECIAL
FACILITIES
FOR RECEIVING
AND
FORWARDING
GOODS.

Druggist.

MINERS AND
PROSPECTORS

Going into the Cariboo country will find a complete stock of Drugs, Chemicals, Patent Medicines, Drug Sundries, Stationery, etc., at J. A. CLEMENTS', The Ashcroft Druggist. Mail orders receive special and prompt attention.

B. C. MINING JOURNAL.

The only journal devoted to the mining news of Cariboo and Lillooet in the Province.

Published at Ashcroft, B. C., every Saturday.

Terms: \$2.00 per year in advance

DUNLAP, COOKE, & CO.

IMPORTERS OF
HATSAND..... MEN'S GOODS
ALL KINDS OF

Specialties in Underwear, Neckwear,
Shirts, Gloves, etc., etc.

Orders by mail will receive
prompt attention.

VANCOUVER, B. C.

For Mining Supplies *Send your orders or
Write for prices to*
Thos. Dunn & Co., Ltd.

*We have the Largest Stock of this class of Goods on the
Coast—Steel Picks, Shovels, Hammers, Coal, Wire Rope,
Manilla Rope, Blocks, Dynamite, Fuse Caps.*

VANCOUVER.

OPPENHEIMER
BROS.

Wholesale Grocers.

VANCOUVER.

The HICKMAN, TYE HARDWARE CO., Ltd.

32-4 YATES ST., VICTORIA, B. C.

IMPORTERS OF

IRON, STEEL AND HARDWARE.

MINING AND MILLING SUPPLIES A SPECIALTY.

CANADIAN PACIFIC NAVIGATION CO., LD.

TIME TABLE NO. 27

(Taking effect June 21st, 1895.)

VANCOUVER ROUTE.

VICTORIA TO VANCOUVER daily except Monday, at
2 o'clock.

VANCOUVER TO VICTORIA daily except Monday, at
13 o'clock or on arrival C. P. Railway No. 1 Train.

NEW WESTMINSTER ROUTE.

LEAVE VICTORIA—For New Westminster, Ladner's
Landing, and Lulu Island, Sunday at 23 o'clock;
Wednesday and Friday at 7 o'clock. Sunday's
steamer to New Westminster connects with C. P.
R. Train No. 2 going East, Monday.

FOR PLUMPER PASS—Wednesdays and Fridays at
7 o'clock.

FOR MORESBY AND PENDER ISLANDS—Fridays at
7 o'clock.

LEAVE NEW WESTMINSTER—For Victoria, Monday
at 13:15 o'clock. Thursday and Saturday at 7
o'clock.

FOR PLUMPER PASS—Saturday at 7 o'clock.

FOR PENDER AND MORESBY ISLANDS—Thursday at
7 o'clock.

FRASER RIVER ROUTE.

Steamer leaves NEW WESTMINSTER for CHILLI-
wack and way landings every Tuesday, Thursday,
and Saturday at 7 o'clock during river navigation.

NORTHERN ROUTE.

Steamships of this company leave Victoria for
Fort Simpson via Vancouver and intermediate ports
on the First (1st) and Fifteenth of each month. If
sufficient inducements offer will call at points on
the West Coast and Queen Charlotte Islands.

BARCLAY SOUND ROUTE.

Steamer MAUDE leaves Victoria for Alberni and
Sound ports the 10th, 20th, and 30th of each month.
The company reserves the right of changing this
Time Table at any time without notification.

G. A. CARLETON,

JOHN IRVING,

GENERAL AGENT.

MANAGER.

UNION STEAMSHIP CO., B. C., LIMITED.

VANCOUVER.

VANCOUVER TO NANAIMO—SS. CUTCH leaves C.P.
R. Wharf daily (Sundays excepted) at 11:15 p. m.
Cargo at Union SS. Co.'s Wharf at 11 a. m.

NANAIMO TO VANCOUVER—SS. CUTCH leaves daily
(Sunday excepted) at 8 a. m.

NORTHERN SETTLEMENTS.

SS. C. MOX leaves U. SS. Wharf every Monday for
Port Neville at 11 a. m.; Bute Inlet every six weeks,
calling at all way ports. Will proceed to any part
of the Coast when inducement offers.

MOODYVILLE AND NORTH VANCOUVER FERRY.

LEAVE MOODYVILLE—7, 8:30, 11:45 a. m.; 2:30, 5 p. m.

LEAVE VANCOUVER—8, 10:15 a. m.; 1:15, 3:30, 6 p. m.

Late trip Saturday and Sunday.

LEAVE MOODYVILLE—7 p. m. Leave Vancouver,
7:30 p. m.

Steamers and Scows always available for excur-
sions. Towing and Freighting Business. Storage
accommodation at company's wharf.

H. DARLING,

MANAGER.

Telephone 94; P. O. Box 771.

R. E. PALMER, B.A., Sc.

A. M. CAN. SOC. C. E. P. L. S.

CIVIL, HYDRAULIC, AND CONTRACTING ENGINEER.

All classes of structures designed, superintended or
erected. Examinations, reports, and estimates.

Mine development work reported or contracted for.
Mineral claims surveyed in any part of British
Columbia. Agent for owners. Refer-
ences furnished.

OFFICES: ROGER'S BLOCK, HASTINGS ST.,

VANCOUVER.

Theodor Lexow,

195 BROADWAY, NEW YORK,

(WESTERN UNION BUILDING)

IMPORTER OF

CARBONS

—FOR—

DIAMOND DRILLS

And all Mechanical Purposes.

HENRY DEMMERT.

PUMPS FOR ALL DUTIES.

FOR MINING.

STEAM
AND
POWER.

NORTHEY CO., LTD.,
TORONTO, ONT.

Wrought Iron Pipe, Lead Pipe, Sheet Lead, Pig Lead, Ingo Tin,
Cast Iron Soil Pipe, Brass and Iron Valves, Pipe Fittings. - - -

Engineers' and Plumbers' Supplies.

John Boyd & Co.

Metal Brokers, Vancouver, = B. C.

SINKS, BATHS, MARBLE SLABS
PLUMBERS' BRASS GOODS

Injectors, Lubricators, Oil Cups, Steam and Water Gauges, Sheet
Iron, Sanitary Earthenware, Sheet Zinc, Etc., Etc. - - - - -

A. W. MORE & CO.,
MINING BROKERS, REAL ESTATE, INSURANCE, AND FINANCIAL AGENTS.

Special Attention Given to Trail Creek Mining Shares.

70 DOUGLAS STREET, - - VICTORIA, B. C.

The Red Cross Brewery,
VANCOUVER, B. C.
LAGER BEER,
EXTRA PALE.

All orders promptly attended to by our traveller, Nat
Darling, who makes his rounds in the
Interior every sixty days.

H. J. SCOTT, INCORPORATED 1861. W. A. YOUNG,
Agent for British Columbia. Supt. Nanaimo Works

BRITISH COLUMBIA BRANCH
HAMILTON - POWDER - CO.

MANUFACTURERS OF
HIGH EXPLOSIVES, BLASTING, MINING,
AND SPORTING POWDER.

DEALERS IN
ELECTRIC BLASTING APPARATUS, SAFETY
FUSE, DETONATORS, ETC.

Head Office, MONTREAL. Branch Office, VICTORIA. Works, NANAIMO.
Local Offices, VANCOUVER and NELSON.

The Mining Record.

VOL. II.

JUNE, 1896.

No. 6.

BRITISH COLUMBIA MINING RECORD.

Devoted to the Mining Interests of British Columbia.

PUBLISHED MONTHLY BY
ALEXANDER BEGG.

SUBSCRIPTION TERMS:

Canada and the United States, 1 year - - - \$1.00
Great Britain and Foreign, " - - - 1.50

ADVERTISING RATES ON APPLICATION.

OFFICES:

VANCOUVER:

618 HASTINGS STREET (P. O. Box 763).

VICTORIA:

26 Store Street, Henry Croft, representative.

NEW WESTMINSTER:

607 Columbia Street, A. Bell, representative.

EASTERN CANADA—16 Market Street, Montreal, John Parrat, representative.

CALIFORNIA—21 Merchants Exchange, San Francisco, L. P. Fisher, Agent.

LONDON, ENGLAND—Gordon & Gotch, St. Bride Street.

THE RECORD is on file at all our offices and at 253 Broadway, New York.

All communications relating to the business or editorial departments of the British Columbia MINING RECORD to be addressed to

ALEXANDER BEGG,
B. C. MINING RECORD,
P. O. Box 763,
Vancouver, B. C.

VOL. 2.

JUNE, 1896.

No. 6

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

ENQUIRY DEPARTMENT,
B. C. MINING RECORD,
P. O. Box 763, Vancouver, B. C.

PUBLISHING DEPARTMENT.

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:—

	PRICE
Practical Geology, by G. A. J. Cole, F. G. S.	\$ 3 00
Ore, and Stone Mining, by Clement Le Reve Foster, D. Sc., F. R. S.	10 00
Coal Mining, by H. W. Hughes, F. G. S.	6 00
Blasting and the use of Explosives, by O. Guttman, A. M., Inst. C. E.	3 50
Assaying, by J. J. Beringer, F.C.S., F.I.C., and C. Beringer, F.I.C., F.C.S.	3 25
Elements of Metallurgy, by J. Arthur Phillips, M. Inst. C. E., F. C. S., F. G. S., &c.	9 00
The Metallurgy of Gold, by T. Kirk Rose, B. Sc.	6 50
An Introduction to the Study of Metallurgy, by W. C. Roberts-Austen, C. B., F. R. S.	4 00
An Elementary Text-Book of Metallurgy, by A. Humbolt Sexton, F. I. C., M. I. M. and M., F. C. S.	2 50
Tables for the Determination of Minerals, by Persifer Fraser	2 00
A Treatise on Electro-Metallurgy, by Walter G. M. Millan, F.I.C., F.C.S.	3 50
Mine Surveying, by Bennet H. Brough, F. G. S.	2 50
Matte Smelting, by Herbert Lang	2 00
Mining and General Telegraphic Code, by Bedford McNeill, F. G. S.	7 50

Readers of the B. C. MINING RECORD wishing to obtain any work on mining, metallurgy, geology, assaying, etc., may procure the same by addressing

PUBLISHING DEPARTMENT,

B. C. MINING RECORD,

P. O. Box 763, Vancouver, B. C.

PURCHASING DEPARTMENT.

For the accommodation of our readers and others living in the mining districts we have opened a "Purchasing Department" in connection with the B. C. MINING RECORD. In this we will act merely as a medium between buyer and seller—we keep no stock of goods on hand. But it frequently arises that people living in the mining districts require articles which they are unable to obtain near home, and which they do not know where to purchase. If these parties will write to us, we will either inform them where the articles can be had and the price of them or we will place their order with some respectable firm. As we have an intimate knowledge of the trade, not only in the coast cities, but also in Eastern Canada, the United States and England, parties writing us may be assured that if any article they require can be obtained we will get it for them. Where parties know the price of the article they should enclose a post office order for the amount, and we will forward the article. In such cases the express, postage, or freight should be added, as we charge no commission to those ordering through us.

We will be glad to furnish descriptive catalogues, price lists, etc., of machinery and supplies from the best houses in British Columbia, Eastern Canada, United States and England, and thus put mine owners in possession of the most varied and best information to be had in that direction.

Because we make no charge for this work, parties should not hesitate to write to us. Address either of the following offices:

PURCHASING DEPARTMENT,
B. C. MINING RECORD,
618 Hastings Street,
Vancouver, B. C.

PURCHASING DEPARTMENT,
B. C. MINING RECORD,
26 Store Street,
Victoria, B. C.

MINERAL EXHIBITS.

We are placing mineral exhibits in the offices of the B. C. MINING RECORD at Vancouver and Victoria, and invite visitors and othersto 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:—

MINERAL EXHIBIT,
B. C. MINING RECORD,
618 Hastings Street, Vancouver B. C.
Or, 26 Store Street, Victoria, B. C.

MINING PAPERS ON FILE.

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.
The Prospector	Rossland, B. C.
The Ledge	New Denver, B. C.
The Claim	Kaslo, B. C.
B. C. Mining Journal	Ashcroft, B. C.
The Advance	Midway, B. C.
The Miner	Nelson, B. C.
The News	Vernon, B. C.
Rossland Miner	Rossland, B. C.
The Prospector	Fort Steele, B. C.

AGENTS.

The following firms will receive subscriptions for the B. C. MINING RECORD, at \$1.00 per annum, and single copies may be had of them at 10 cents each.

Clarke & Stuart	Vancouver, B. C.
Bailey Bros	" "
Thompson Bros	" "
E. Galloway & Co	" "
Hotel Vancouver News Stand	" "
T. N. Hibben & Co	Victoria, "
R. Jamieson	" "
C. Braund & Co	" "
Pimbury & Co	Nanaimo, "
H. Morey & Co	New Westminster, "
H. H. Lennie & Co	" "
D. Lyal & Co	" "
Bailey Bros	Kamloops, "
W. T. Slavin	" "
Smith Bros	Vernon, "
Gilker & Wells	Revelstoke, "
Kennedy & Porter	" "
Slocan News Co	Three Forks, "
Horrocks & Co	Rossland, "
Zenith & Co	Nakusp, "
Kojeski	Sicamous, "
Cann & Co	Golden, "
G. L. Eastabrooks	New Denver, "
Wm. M. Shaw & Co	Spokane, Wash. "
Shaw-Borden Co	" "
E. A. Thomas & Co	" "
J. W. Graham & Co	" "
Hotel Tacoma	Tacoma, "
McDonald News Stand	" "

To Our Readers.

The July number of The Record will contain, in addition to the regular mining news, a series of biographical sketches of the

MEN OF KOOTENAY

who have been prominent in the work of exploring and developing the district and making it what it is to-day,

THE GREATEST MINING COUNTRY IN AMERICA.

These biographical sketches will be accompanied by
PORTRAITS OF THE MEN—(Half-tone engravings).

There is nothing that appeals to the public mind so much as the experiences of the residents of a town or country. If these experiences are favorable to the country or town it counts for more in public opinion than all the descriptive articles that can be written. For this reason the publisher of The Record will make every effort to have the July number one of the best yet issued.

Mr. Alex. Begg will visit Kootenay during the present month for the purpose of collecting data for

THE MEN OF KOOTENAY NUMBER.

EDITORIAL NOTES.

In our May issue we took the ground that mining machinery should be admitted free of duty and that the present tariff regulations tended to retard the development of our mines.

Some kinds of machinery are not taxed, while others have to pay duty. There should be no such discrimination, as it limits the mine owner in his choice and probably prevents him from buying what would be to his advantage to obtain.

We have been at some trouble and expense in procuring from manufacturers in Canada and the United States their catalogues and price lists in order to impart the information they contain to our mine owners, believing that by so doing we were aiding the development of the mining industry in this Province.

We were somewhat surprised, however, to find that we had to pay a duty of six cents per pound on the catalogues we received by mail from the United States, and as we thought there must be some mistake on the part of the customs authorities, we protested.

But the customs officers were acting within their line of duty, and in accordance with strict instructions from Ottawa. Not content with making mine owners pay duty on mining machinery, the Government endeavored by a tax, to prevent them from obtaining information as to the most improved kinds made and where to obtain them.

This is indeed carrying protection to a very fine point. We paid the duty on the catalogues we received, but in

the case of others who send direct for the catalogues that are dutiable they may never reach their destination should some lynx-eyed customs officer happen to pounce upon them.

—

The whole system is wrong and should be changed in the interest of our mining industry.

—

The tariff as it stands now is not only a hindrance to the development of our mines, but it also acts as an injustice to the Canadian manufacturers. The latter have to pay a very heavy tax on the iron they import, which, we understand, comes in most instances from the United States.

—

The Canadian manufacturer is therefore handicapped and prevented from competing advantageously with his American neighbors. The mine owner, however, has to pay the piper in the end, for it cannot be expected that the manufacturer will throw off the duty on iron in order to give the benefit to the purchaser of machinery.

—

This question of duty on iron and on machinery is one of great importance to the mining industry, and whichever political party is returned to power the abolition of duties on iron and machinery ought to be pressed by those who are interested in seeing a rapid development of our mines.

—

There are indications that all sorts of snares are being laid to entrap the unwary into investing in mining shares. All we can say is that people having money to invest in this way should not only be most careful whom they employ, but they should also investigate fully the character of investments offered them. What is termed "inside information," as advertised is not always to be depended upon.

—

Victoria is still struggling with the problem of keeping two stock exchanges running. It wont work. There is not room for two such institutions in the capital city, and the sooner the business men make up their minds to this fact the better it will be. The first, or original stock exchange has been in operation for a short time. Three or four brokers put in an appearance each day—shares are called but no transactions of any moment take place. The promoters of the exchange, so far, do not put in an appearance, and if it were not for the brokers in question the whole thing would collapse. The second exchange, it is to be hoped, will show more vigor than its rival, but the best thing to be done is to consolidate the two into one.

—

We are desirous of seeing a stock exchange in proper working order in Vancouver and one in Victoria. These

institutions, if properly carried on, will act as a safeguard to investors. Why our mining men do not take more interest in their establishment is to us a matter of surprise and, we think, hardly creditable to them. In the meantime our newspapers are being flooded by broker's advertisements offering mining shares at all sorts of imaginable figures—"inside information" is freely offered to guide the unwary, and before we know where we are mining investments in British Columbia will fall into disrepute.

—

New finds are being made almost daily, and it begins to look as if the whole Province was underlaid with the precious metals. Alberni, about which there was a doubt in the minds of some not long ago, is now proving to be one of the richest camps in British Columbia. Along the coast several valuable discoveries have recently been made, and in Lillooet a wonderfully rich find, as will be seen by the description elsewhere, has been made.

—

There is no doubt about the treasure being here,—what is wanted is capital to gather it in and turn it to account.

—

At Ashcroft extra stages and conveyances are being put to use to carry the large number of passengers going into the upper (or Cariboo) country. Freight teams are kept busy on the road and everything points to a season of unusual activity. The news from the different mines is most satisfactory and it is reasonable to expect that the output of gold will be very large during the present year. Much, of course, has yet to be done in the way of erecting machinery, building of ditches, and laying of flumes, pipes, etc.; but the work in this direction carried out last year will show results this season.

—

That the upper country is wonderfully rich has been demonstrated without a doubt. Although millions of dollars have been taken out of it in years past, the ground has only been skimmed over and the great yields are yet to come. The confidence in its richness of those who know the country is most assuring, and that some great finds will be made in Cariboo in the near future is looked upon as certain.

—

In the Okanagan country capitalists are showing their confidence by investing largely, and there are not a few who look upon mining in that district as one of the most promising propositions in the Province.

—

As for Kootenay, its name has already become world famous, and the constant discoveries of rich veins show that the whole district is one vast camp of mineral wealth.

As we have pointed out on a number of occasions, the introduction of capital is what is needed, and nothing should be done in any way to deter capitalists from investing.

But there is something required on the part of capitalists themselves, especially those hailing from the old country. English capital in the Northwest has not in every instance turned out well for the investors, because of mismanagement on the part of those employed in looking after it. The country was not to blame for this and it may be the same in British Columbia unless care is taken. The first thing the capitalist has to do is to make sure of the man or men he employs to report upon the mines. The next is to engage only thoroughly practical men to look after its development.

The Americans do this, and as a result their investments in the Kootenay have turned out to be profitable. Before they put their money into a venture they know pretty well what they are putting it into, and when they have invested they make sure by employing only practical experienced men that their properties will be worked to the best advantage.

We make these remarks because we know there are men here who pose as experts,—who profess to know more than they really do and who are simply looking out for chances to make a haul out of the first moneyed man who turns up.

There should be an association composed of thorough and practical men and membership should only be granted to those who can give undoubted evidence of their ability and honesty in dealing with mining matters. How many so-called experts are there here who have no real claim to be considered anything of the sort? Let these men get hold of a capitalist and advise him to his loss and the harm they will do to the whole community is incalculable. There are too many in British Columbia looking after "soft snaps" and we warn capitalists against such individuals. A little careful enquiry on their part is all that is necessary. But an association such as we have suggested would be an extra safeguard which we, having the interests of the mining industry at heart, would like to see established. There is nothing of the sort, as we would like to see it, at present in existence.

The people of Rossland have resolved to postpone incorporation, or rather there was so little interest shown in the matter by the property owners of the town, that it was resolved to drop it for the present. This, it appears to us, is a mistake. Incorporation cannot now take place until January, 1898, and long before then the people will probably regret that they did not go in for self-government.

The various departments which we organized in connection with the RECORD are keeping us busy, but we do not grudge the trouble and expense, as our efforts are only aiding in the development of mining in this Province and will ultimately be of benefit to ourselves.

The "enquiry department" brings us letters from all quarters asking for information, and in the "purchasing department," by supplying parties in the mining districts with the catalogues of the best makers on both sides of the line, we consider we are placing most valuable information in the hands of our mine owners. No one need hesitate to write to us, as we will be only too glad to afford any information or assistance in our power to mining men, free of cost.

In this way we make the MINING RECORD helpful.

First Lecture on Metals and Metallurgy.

BY W. PELLEW-HARVEY, F. C. S.

ATOMIC WEIGHTS.

SYMBOL.	NAME.	AT. WEIGHT.	SPEC. GRAV.	FUSING POINT. DEG. F.
Au.	Gold.....	196.7	19.2	2,000
Ag.	Silver.....	107.9	10.5	1,832
Fe.	Iron.....	56.0	7.8	40
Hg.	Mercury.....	200.0	13.6	1,990
Cu.	Copper.....	63.5	8.9	634
Pb.	Lead.....	206.9	11.4	455
Sn.	Tin.....	118.0	7.3	758
Zn.	Zinc.....	65.0	6.9	235
S.	Sulphur.....	32.0	2.0	1,150
Sb.	Antimony.....	122.0	6.7	2,910
Ni.	Nickel.....	58.5	8.9	507
Bi.	Bismuth.....	208.0	9.8	
Cl.	Chlorine.....	35.5		
H.	Hydrogen.....	1.0		
O.	Oxygen.....	16.0		
C.	Carbon.....	12.0		

I am pleased to see so many here to-night. At Westminster last night there was a fair attendance and at Victoria throughout the series there has been a good attendance. The Minister of Mines, I may say, is well pleased with the success of these lectures. I believe it is the intention of the Provincial Government, in recognition of the interest that has been taken, to organize next season a series of classes. It has not yet been made known where these classes will be held, the intention being to take up the subject in such a way as will enable the prospector and mining man to follow out the work that has been outlined in these lectures.

The subject which I have to treat upon is rather an enlargement of that which has been so ably handled by Mr. Carlyle. In introducing myself I would give you to understand that I am unaccustomed to lecturing, and should I make any of the little mistakes expected from a new hand, I hope you bear with me. With this understanding I will try to make the subject as interesting and profitable as is in my power. We know that your object in coming here is to gather information, so I wish to-night to give what information I can in a manner that all may understand it. If there should be anyone here more advanced than his neighbor, he might kindly let his notes pass and assist the other to pick up anything I may have to say. It is no doubt a great secret to

make much from one speech, so I will endeavor to combine my subject to make it clear to all, and will take up the ore treatment from the dump as Mr. Carlyle has left it.

Mr. Carlyle has had long experience in mining matters. He has brought you through the various changes which occur in the different forms of mineral veins met with in mining. Mining, you understand, is but a gamble anyway. I have nothing to do with ore formation, but will speak of the ore itself as it is brought from the mine. The chief and foremost point to be considered by the student of metallurgy is to obtain an understanding of the nature of the ore he wishes to treat. There are various means of acquiring this knowledge. As a rule the prospector makes use of the blow-pipe to test the ore, to show exactly what it contains, and so classify the mineral. Personally I am not entirely in favor of the blow-pipe analysis, especially in this new country where we find not only the oxides, carbonates, sulphides, etc., of many metals but also many metals in combination. The reaction given by the blow-pipe test would give a complex return instead of a decided one. For instance, should you have copper and silver in combination, one color is given you for copper and quite a different reaction for silver taken separately; but together, the two would make such a mixture that it would be impossible to detect with certainty the one from the other unless the operator had great experience. The prospector in going into the field has to consider that the chief obstacle to a complete assaying outfit may be its weight, and that the materials he selects should be as light as possible; still with careful selection he could take along a few test tubes and certain acids that would enable him to get more accurate returns. The principal acids required would be hydrochloric, nitric, and sulphuric, together with ammonia and potash to give the different reactions, and borax and carbonate of soda.

I have here to-night a good many specimens from the Kootenay Country and elsewhere throughout the Province, besides 350 specimens from various parts of world; and in discussing the different ores which will be spoken of, as it will assist you in learning their properties, I wish you to handle the ores themselves while following what I have to say about the practical detection of minerals by assay, coloration, and solution.

I will deal for a minute with the subject of ore sampling, which is an important one. The miner is too apt, when he gets a pile of ore on the dump, to pick for assay the best specimens. In order to make it very clear how the sampling should be carried out so as not to mislead the miner and others, I will handle a little pile of ore I have here, and will show the system of sampling from the dump down to the hand sample. (Here pile of ore is sampled.) We have also a diagram here which shows on a more extended scale the method adopted in the Cornish works where they have rough sampling, in fact all the sampling is carried on in a crude way there at the present time, as it usually is also in this country. Referring to the diagram, the first figure represents a pile of ore as brought from the dump. The rock in this pile is broken to a certain size, perhaps to a quarter inch mesh, before sampling. Having crushed it to the first size you must find how to get the average. The next thing to be done is to strip the pile from the top, thus widening the base, increasing the circumference of the circle, and flattening the ore on top. You then cross-cut it at right angles through the centre into four sections evenly divided. Remove half the pile to form a new pile by taking opposite sections (two opposite original one; form it the shape of a cone; flatten it down; and divide as before. Continue this until the pile is brought down from 1,000 to 100 pounds, or from

100 to 10 pounds. The diagrams will assist you in understanding this, but to make it more clear I will repeat the process. First you will note the pile is made in a conical form. Then it is stripped from the top and brought down till it is of even thickness; quartered through the centre; and opposite sections 1 and 3, or 2 and 4 taken away. This is first broken to a smaller mesh and then the process repeated until the sample is as small as desired.

There are other modes of sampling which are more rapid, more convenient, and, if possible, more accurate. These would be by machinery. In the large smelting works, and in some of the smaller ones in fact, a big parcel of, say, rich sulphides is sampled by taking 1 bag in 10 of the ore sent to be treated. Thus if 100 bags were sent, 10 of them would be picked out and crushed to a very fine pulp. After the machinery has pulverized the ore, it passes, during discharge, through a revolving apparatus having a number of little chutes. As the wheel revolves one way a certain amount of the ore is caught in one tube; as it reverses it is caught in another. It is thus subdivided mechanically until it is brought down to the sample ready for the assay office. When I point out to you the benefits to be derived from accurate sampling you will see that a little expense and a little time thus employed saves a lot of future trouble, and may save the miner a great deal of money. If you send your ore parcel to the smelter after taking only a rough sample it is difficult to tell if they have made a mistake in the returns, but by going to the expense of putting up a sampling mill you can tell if your assay differs from that of the smelting works that they have made a mistake. In this country, or in all countries where mining is in its infancy, the mine owner invariably loses a lot of money by poor sampling. I would impress upon him the advisability of being cautious, and to find out just what copper, lead, silver, gold, etc., his ore contains by accurate sampling, which will enable him to check the smelter in its returns. You all know that certain metals are valued at so much per unit or pound by assay, silver at so much an ounce, and gold at so many dollars to the ton of ore treated. From this must be deducted the smelter charges. The smelter endeavors on receiving various parcels of ores from different parts of the world not to smelt the rich metallic ores by themselves, but to add an ore richer in quartz or lime, or whatever is necessary to get from the ore the greatest amount of gold, silver, or copper at the least cost. We now come to the subject of the detection of the various ores commonly met. Samples are often taken to the assayer to be assayed for silver or for gold when they do not contain it. By a little practice the prospector could easily ascertain for himself whether or not a specimen contained copper, gold, or other metals by a preliminary test. Some specimens containing gold, silver, and copper, like this sample I hold in my hand, would present some difficulty perhaps to the prospector to determine its composition, though he would at once suspect it contained copper, or if not he could treat it roughly for various metals till he found the colorization. It should be pulverized to 80 mesh. To avoid roasting the ore should be dissolved in nitric acid which oxidizes the sulphides.

Before taking this up we will give a test for copper. I have here some Chili bar copper from the Chili mines prepared by electrolysis and which is 96 per cent. pure copper. Chili bar copper is sent to England for treatment. Before shipping the shipper samples it by boring through the bar in different places and then takes an average. If the molten copper is not poured into moulds carefully prepared there will be a difference in the purity of the copper on cooling in different parts of the same bar.

A piece of this or any copper dissolved in nitric acid will on the addition of ammonia to the solution give an intense blue colorization, as you will see by the treatment just gone through with the pure copper.

We will now show the test with the copper sulphide. If you have the copper ore in combination with iron ore, such as that of Trail Creek, the solution will be blue as before, but there will be a residue or precipitate which will be a peroxide of iron. This peroxide of iron is of a brownish color and may be dissolved by adding hydrochloric acid and detected by adding a solution of ferricyanide of potassium.

Copper is one of the most useful of the commercial metals. It is used very extensively for electric wires, tubing for locomotives, for general domestic purposes, etc. It is a metal that is very ductile and is a splendid conductor of electricity.

With silver ores it is sometimes difficult to detect the silver on account of there being so much heavy metallic substances formed by the reaction of the metals present. The only accurate assay used commercially is the fire assay. In my experience in Swansea I found the scorification better than the crucible assay, particularly in treating galena and other rich metallic ores. For this you take 50 grains of the sample and place in the scorifier and add soda and borax. Introduce this into the muffle, which is something like an oven and is made of fire-clay, raise the heat and the sulphide will decompose and the substance melt. This on being poured into a mould will give a little button of metal which may be beaten square and which is a concentrated product containing all the gold and silver in the original 50 grains. This button is then placed in a little basin called a cupel, which is made of bone ash, and replaced in the muffle and subjected to a greater heat. The lead escapes as oxide, etc., leaving the gold and silver in the cupel.

It is necessary to find out from that button the amount of silver contained in the ore. That is a calculation I will not go thoroughly into to-night, but I might state what is done in actual work. The silver and gold in combination is weighed and then the button is dissolved in nitric acid. The gold remains behind as a black powder which takes a gold color when annealed, and the silver is in solution as nitrate of silver. The gold is then weighed and the difference between it and the weight of the original button would be that of the silver.

We will now speak of the methods for detecting metallic silver and rich ores such as brittle silver. I have here some silver foil which we will dissolve in nitric acid, forming nitrate of silver. Then to the solution add hydrochloric acid and immediately we get a white precipitate which is chloride of silver. Lead and mercury will give similar white precipitates, but if the silver be shaken up with ammonia the precipitate will be entirely dissolved, while with lead the precipitate would still remain perfectly white and with mercury would turn black. In Swansea there are large works that treat bars containing silver and gold in combination by means of acids which precipitate the silver from the gold in the same way as shown you here. Remember you cannot part the silver from the gold unless you have about three parts of silver to one of gold and should there be less it would be necessary to increase the amount of silver to free the gold from it. The white precipitate, which is a chloride of silver, may be caught in a filter and remelted, giving at least 98 per cent. of the original silver. The solution, therefore, should not be thrown away as it is of value. If you have no hydrochloric acid, common salt added will provide the chlorine necessary for the reaction.

Samples are brought to the assay office which, apart from the metallic substances, may contain a white look-

ing gangue, which may be called quartz but one may not be sure, perhaps, that it is quartz. Quartz is a common matrix for gold, silver, copper, and other metals. Perhaps you wish to prove whether the gangue in this instance is quartz and to show it is not fluor spar or calcite which resembles quartz in some points. Quartz is harder than fluor spar and that is one ready means of detecting it. If you crush some of it and add sulphuric acid, if fluor spar it will attack the glass, forming a fluoride that would eventually eat the glass away. To test it for calcite place a drop of acid on the sample, if it effervesces it shows the presence of a carbonate, calcite being a carbonate or calcium of lime. The miner should understand these three principal matrices and the means of detecting each.

There are several methods for the detection of gold. Gold is often associated with other metals and minerals. It may be coated with sulphur or some base metal, but behind that coating the gold will be found free from any actual combination. The easiest way for a prospector to determine whether there is gold in an ore is to crush the ore and pan it, and wash off the lighter material leaving the gold behind. If free gold exists in the sample it can then be seen, that is if it exists in fair quantity, in minute quantities, especially if mixed with sulphurets, such as sulphide of copper, or iron or zinc, the test is practically useless. Another test for gold is to dissolve the powdered ore in hydrochloric and nitric acids (or aqua regia), and add a solution of sulphate of iron, or copperas, when a dark brown powder will be precipitated; this, on being filtered and heated will show the gold in minute and separate particles. When protochloride of tin is added to the solution there will be a purple precipitate. These tests are given in some of the prospector's guides. One I would advise you to obtain is "The Prospector's Handbook," by Anderson, costing 3 shillings and 6 pence in England, and, perhaps, \$1.75 here; it is a valuable little work and treats of geology, ores and mining. The assay given by the assayer will not always correspond to the return from the mill, on account of a certain percentage of the coated gold passing over the amalgam plates during the process of milling. In milling with stamp mills the crushed ore is passed over plates on which mercury is placed to collect the gold, if the gold should be coated the mercury does not collect it, thus a big percentage passes over into the tailings and has afterwards to be removed by other means, such as concentration and then chlorination or cyanidation. Concentration is done very simply, something on the same principle as ordinary panning, though in a different way. The Frue Vanner is a very practical machine for removing quartz, etc. The ore is first shed on to the upper end of the revolving belt, water is carefully turned on and the heavier metals are retained near the top while the lighter material is washed away. The sulphides are caught in the corrugations of the belt and are carried down over the V shaped belting; this, in passing through the water is cleaned from the sulphides which have collected in the corrugations, this motion being continuous. Concentrates are treated in various methods, if composed of rich, heavy sulphides, the smelting process would likely be the best treatment if there was a smelter near and the freight was not too costly. If there should not be a smelter in the vicinity it would be necessary to look for something cheaper that could be used on the spot perhaps.

The Americans have become famous for their chlorination plants. This process consists of passing chlorine through the ore and precipitating the gold and silver, which have been thus dissolved, in the form of chlorides. This done, the chlorides are leached and passed into

tanks prepared for the purpose of collecting the valuable chlorides of silver and chlorides of gold, which are then collected and melted. I should add that the sulphides should be roasted before chlorination is attempted. This process is adopted very extensively in the United States, for the reason that most of their ores are sulphides. The cyanide process is also found to be most practicable and cheap.

The cyanide treatment for ores is one I rather hesitate to speak upon, as I am representing the company that owns the rights of this process. At the same time it is so important that it may be of great service to you here. By this method the tailings or non free milling portions of the ore are treated by a solution of cyanide of potassium for the purpose of dissolving the gold or silver. The amount of time required to dissolve the gold from the material will depend entirely on the state in which the metal exists, if it is coarse it will take longer than if fine, which would be the case with any substance sought to be dissolved. Having dissolved the pulp the gold is taken away by leaching, the same as in chlorination. The solution carrying the gold is then passed over a trough in which zinc shavings have been placed, and as the solution flows over the zinc gold or silver is precipitated in a metallic form on to it. With some ores the chlorination process is the more advisable, with others the cyanide is cheaper and more practical.

A prospector may wish to estimate for himself the amount of free gold or the amount of gold in sulphurets without going to the expense of a mill test. He may also wish to find the amount of gold in slimes. To do this pan down the ore as far as you can, getting rid of as much quartz as possible without losing the gold itself. Add mercury to the residue, and rub it up gently for some time with the gold in the pan until it is all amalgamated. The amalgam is then placed in a crucible and the mercury evaporated leaving the gold. In dealing with large quantities of amalgam the retort or crucible is covered, and through the cover is placed a tube which conveys the mercury fumes to a tub of water where they condense into metallic mercury. The gold is then weighed, and by referring to the amount of ore treated in the first place the value of the ore can easily be worked out and the worth of the parcel obtained. To find the amount of gold in the sulphurets is a more difficult task and I do not think it best to go into it here. In these assays there is usually a small mechanical loss, say from 5 to 6 per cent. I might add that in handling the slimes, adding a few crystals of common alum has the effect of throwing down the mud in the solution, which enables you to pour off the water without wasting any of the material. The miner is apt to take the fire assay as the face value of the parcel, but if he gets 92 per cent. of extraction it is doing remarkably well. In some cases by other than the smelting process only 85 to 90 per cent. of the assay value is obtained, and the various charges for smelting and transportation must be written off the value of the products of the ore.

It is important that you should know something about lead and lead ores. Lead is the best metal used for carrying water for drinking purposes, where it is not exposed to the oxidizing action of acids. In ordinary spring water there are several salts which have the effect of eating out lead pipe. Chlorides and carbonates, eventually may wear the pipe away until it becomes porous and allows the air to enter. This condition tends to form poisonous acids. To test for lead, dissolve the substance in nitric acid, and add to the solution some sulphuric acid. This gives a white precipitate which is sulphate of lead.

While we are showing you this test I will mention

something about specific gravity. Concentration is carried on not only by water but by the action of fire, the principle being the same in the one as in the other. In one the concentration is caused by the flow of water arranging the material in layers according to the weight of the substances, and in the other by melting the substances and allowing the heavier metallic portion to sink to the bottom of the crucible and the lighter to come to the top. Thus in smelting sulphates of lead and copper, the lead and copper sink and the other metals, as a slag, rise above them and may easily be drawn off leaving the heavier ones behind. Specific gravity is the number which expresses the ratio of the weight of a cubic inch of a body compared with that of a cubic inch of distilled water at a temperature of 15.5 centigrade. Specific gravity is very important to the assayer and smelter, all his treatments of ores must be guided by it. By referring to the diagram you will see the specific gravity of many of the common metals: Gold, 19.2; mercury, 13.6; lead, 11.4; copper, 8.9; iron, 7.8; etc. If you are panning a substance made up of several of these metals they will arrange themselves in accordance with their weight, or the heavier will remain behind while the lighter are washed away, in the list just given, gold, being the heaviest, would be found nearest the operator, and iron, lightest, would be found furthest away, each arranged according to its specific gravity.

I have treated with the principal metals we come in contact with in this country, there are other important ones I will have to overlook, as the hour is getting late. I wish, however, to speak a few words about cinnabar. We have here a fine specimen of it from Savona's Ferry. Cinnabar is a sulphide of mercury. You will notice how heavy the specimen is, and when scratched shows an intense vermilion color. I believe this is the only cinnabar mine being worked under the British flag, and has attracted more than usual attention, not only here but in England.

An ore often found associated with lead is antimony. It is not easily handled at the smelter in that case. To test for antimony, dissolve the substance in hydrochloric acid, place the solution in a platinum dish and add a small piece of zinc, the zinc causes the antimony to precipitate and form on the zinc. If tin is associated with the antimony it would be deposited in a spongy form which does not adhere to the platinum. This is a very accurate test for both antimony and tin.

If any present would like to remain at the close of the lecture to examine the specimens I would be most happy to show them. We have many of the metals here in the different forms of matrix, quartz, calcite, fluor spar, etc.; the time given to the examination would be of interest and profit to you. One interesting specimen here was found in the Cariboo country. It was mistaken for a great nugget of gold when found, but is really metallic copper, one of the largest pieces I have seen. It contains about 96 per cent. copper with a trace of silver and gold.

River Dredging.

QUESNELLEMOUTH THE CENTRE OF ATTRACTION.

Rich bars and beds in the Quesnelle and Fraser Rivers have attracted the attention of scientific men who, well backed up by capital, will this season make the greatest forward movement in the new field of river dredging. Three machines, two to operate on the Quesnelle and one on the Fraser, have been built and are now practically in operation. The methods, though meant to reach

the same result—to secure gold from submerged gravels are radically different and cover the widest range in extremes of difference, and while each machine has its friends and admirers there is an unanimity of sentiment among practical mining men and “hydraulicers” that each machine, if not covering the entire range of river dredging, will prove admirably adapted to some special field. In each case the promoters are men of much mental ability and have given their plans careful study and they have entered the field to conscientiously conserve the interests of their backers.

The field for river dredging centering at Quesnelle is practically inexhaustible. The great Fraser, from the bend near Fort George in the north to Hope in the south, a distance of nearly 500 miles, has been the scene of active mining for over thirty years, and every bench and bar—every bank of gravel—bears evidence of having been turned over in the quest for the yellow metal. From high up the benches to low water has the gravel been sluiced, rocked, and in some cases, hydrauliced. Quesnelle, Rich Bar, Soda Creek, Big Bar, Lillooet, Lytton, Boston Bar, Yale, Hope—each name has been familiar for thirty odd years as the centre of actual placer mining. On the Quesnelle River the production of gold has probably kept pace in quantity with the output of the Fraser, for the bars have proved to have been richer and the run of gold more confined. No authentic record can be obtained of the output of gold from either the Fraser or Quesnelle Rivers, but much less on the Quesnelle as much of the mining was done by Chinese, who sent the gold outside to other Chinamen and made no proper return of the quantity mined. The most convincing proof of the possible and probable richness of the Quesnelle is the long string of great hydraulic mines which line its banks. These commence far up the North and South Forks and line the river for 65 miles to within four miles of the junction with the Fraser at Quesnelle Mouth. About \$2,000,000 have been expended in developing and equipping the hydraulic mines on the river and they are found in all degrees of perfection, from the mere location to the fully equipped hydraulic plant on the “Cariboo,” which has so far cost the stock-holders over \$400,000. The amount of money spent in the developing of these gigantic hydraulic mines is an evidence of the faith that is within the owners that their gravel banks contain fortunes in gold. The dredging men depend on the wash from these great gravel deposits for the gold they expect to get from the river bed. As one of them expressed it, “the Quesnelle River is one gigantic, ground sluice which has never been cleaned up.” The remark is probably correct and the different machines will be able to demonstrate the richness of the “ground sluice.”

THE FADER DREDGER.

The Fader Dredging Company has a lease of twelve and a half miles on the Quesnelle River, commencing twenty-five miles above the mouth. The machine in operation on the lease is the invention of Mr. F. C. Fader and is being worked under his supervision. The plant as it now stands is worth about \$20,000. It is unique in design, though really of the simplest mechanism. A common 60-horse power boiler and engine is set up on the south bank of the river. A stout, wire cable is run across the river through a pulley on the other side, thence down stream a couple of hundred feet through another pulley, thence back to the engine. The cable is operated by an ordinary winze. Two immense iron buckets are attached to the cable at such distances that one starts from each side at the same time and are simply dragged across the river. Their weight is 1,300 lbs. each and much of their efficiency is

due to their great weight. As they travel back and forth each bucket cuts a furrow in the gravel and travels back and forth in the same groove, constantly working deeper and deeper into the gravel. As the big bucket works its way down the sides cave so that the bucket is usually able to fill itself easily on its trip across the river. When the buckets are brought to shore they are emptied into a common sluice box. Water is raised from the river by a centrifugal pump to wash the gravel and the gold is saved by the ordinary sluicing process.

THE UNDERWOOD DREDGE.

The Underwood Dredge was built during the past winter and the machinery was mostly in place by the 1st of May. The 25th of April the machine was moved under the bridge at Quesnelle and as soon as the machinery was in place it was set to work in the bed of the stream a short distance above the bridge. The machine is quite expensive and completed is worth about \$45,000. The machine is most elaborate and the inventor claims that he has solved the problem of saving gold from the beds of rivers.

The first steam shovel was built in the year 1839 by one Mr. Otis, of Boston, Mass., and was put into successful operation at or near Springfield. In the last twenty-five years other designs involving the same general principles have been introduced, all of them possessing valuable features, but of entirely different form of construction and mechanism. Originally the steam shovel, as its name implies, had a limited field; it was used principally by railroad companies for grading purposes, and is so used by all the roads in the country at the present time. The first material change in its use was to convert the steam shovel into what is commonly known as the dipper dredge for use on rivers, harbors, and canals. Hundreds of them have been so used with success for the past twenty-five years. The merit of the dipper dredge is no longer questioned.

The idea of using a pump for dredging purposes is but a recent conception, and yet a variety of patterns have been introduced with more or less success. The centrifugal pump, however, is the best adaptation yet discovered in this class of dredging devices, in fact there are many conditions where their superior merit above all other dredges has been clearly demonstrated, and many of them are in use in various parts of the States for harbor dredging and making fills. Coarse sand and gravel as well as good sized cobble-stone are readily lifted from deep water and deposited at long distances with the most perfect satisfaction. It was the privilege of the writer to witness the operation of one of them on the Fraser River, in British Columbia, which produced a flow of from 40 to 60 per cent. of gravel, varying in size from that of a garden pea to boulders weighing thirteen pounds.

The hydraulic lift is an old and well known mechanical force, as every fire department in the country attests. This, however, is only one of a thousand forms where water pressure is used. It is largely employed for excavating purposes, driving piles, and placer mining, the only difference being in the manner of securing it. In the case of placer mining it is usually done by natural pressure and is sometimes flumed long distances to secure proper elevation. Where this is not available steam or other power is applied to accomplish the desired purpose, a case in point being where it is employed in driving piles—a tube is inserted in the ground through which a stream of water is forced with such pressure as to clear the way in advance of the descending timber until the desired depth is obtained.

The Underwood gold dredge is a combination of the three foregoing methods, the steam shovel, the centri-

fugal or vacuum pump and the hydraulic lift. These are so adjusted as to have them all take effect at the same time; the plow point at the lower end of the beam to agitate the gravel, the suction to divert the material thus moved into the tubes carrying it to the sluice boxes, and the hydraulic lift to force any heavy substance which may incline to the bottom of the stream into contact with the intake, which flows at a speed pressure equal to four times the specific gravity of gold.

The idea of pumping gold by submarine hydraulic process is quite recent. Vast treasure has been known to exist in our mountain rivers and streams, but it has always been a perplexing question as to how to reach it. In some instances rivers have been turned from their course and mountain streams directed into other channels for the purpose of getting at their concealed treasure, but the pump or dredge alone suggested the thought of

lumbia, in the fall of 1893 and 1894 for the purpose of testing this new method of mining. One was built at Yale, to be operated on Hill's Bar. The results were so satisfactory that the same company are now engaged in the construction of a second plant on a much larger scale, with such improvements as were suggested by the first experiment.

A second one was put to work on Kanaka Bar, a third on Boston Bar and a fourth by a Pittsburg company at or near Lytton, about 150 miles northeast of Vancouver. A fifth is about completed at Lytton, to be operated at Lillooet, on the Fraser, about forty miles above the mouth of the Thompson River.

Being thoroughly familiar with the various methods of the companies referred to, we are able to state from personal observation and experience that they have clearly demonstrated three things, viz:



LILLOOET, B. C.

bringing these auriferous deposits to the surface, where they could be treated as ordinary placer; and although the idea of dredging for gold is not peculiar to this country it has received such attention at the hands of practical men on the rivers of the northwest during the past few years as to develop a class of devices every way adapted to this class of mining.

A great improvement was made by the introduction of the centrifugal pump. It was suggested that inasmuch as they were used for unloading coal from sunken vessels and for hydraulic dredging and dyking purposes, they could also be adapted for lifting gravel and sand or other sedimentary deposits said to contain platinum or gold in paying quantities from our rivers and streams. Accordingly four experimental plants were put into operation on the Fraser River, in the Province of British Co-

First.—The centrifugal pumps now in use will lift their full quota of material to the surface, where the conditions are made favorable for them to get at it.

Second.—The sedimentary deposits of which the bars and beds of these rivers are composed contain gold in paying quantities, many of them being fabulously rich.

Third.—They will and do lift the gold with the sand and gravel to the surface.

The most serious difficulty in this class of mining is the fact that in some portions of these rivers from 50 to 75 per cent. of the formation to be handled consists of boulders, greater or less in size, which must be disposed of to expose pay dirt in sufficient quantities for a profitable industry. They will readily take up the loose gravel on the surface and clean out the pockets between the boulders, while the deeper, and therefore richer,

stratas of the same formation are left untouched, yet with all these difficulties in the way, the system is being operated with profit.

The laws governing the precious metals are as unalterable as gravity. Any attempt to ignore or change them is attended with great expense and is sure to end in failure. This is true of all kinds of mining. It is true that placer is the simplest form of mining. Nature has done all the work. The gold is free, and when once in hand is saved by simple processes. It is frequently found, however, under conditions rendering it exceedingly difficult to obtain. In river dredging its conditions are apparent, the specific gravity of the gold, the character of the formation and the action of the water being the principal elements to contend with.

Assuming that the dredge will agitate the gravel to a depth of 25 feet in sufficient quantity to work the pump to its full capacity, the question arises, will it bring the gold up at the same time? A grain of gold will drop in a column of water eight feet in a second. To counteract this a stream of water flowing in an opposite direction at a rate of nine feet would hold that grain of gold in suspension or move it slowly in an upward direction. The force of the moving current being one-ninth greater than that of the gold, it could not, without disturbing its environments, make its way downward. A No. 8 centrifugal pump, when in operation, has a suction pressure or lifting power of about thirteen and one-half pounds to the square inch, and furnishes an intake of about 36 feet to the second, or four to one in favor of lifting the gold. Add to this the fact that while the pump is in motion from 40 to 60 per cent. of the flow is sand and gravel, or both, sand, gravel and mineral all moving together, and it will be seen how utterly impossible it would be for a grain of gold to escape. Thus it will be seen also that the machine is not pumping gold, but creating a mechanical force which overcomes its specific gravity at least four to one.

Size No. 1 of the Underwood gold dredge is a scow or barge 100 feet long, 24 feet wide and about five and one-half feet hold, propelled by steam. A stern wheel is preferred. In all other respects it is suited to dredging purposes. On the bow of the barge is placed a dredge of regular construction with the Underwood combination attachments, designed especially for hydraulic dredging. This consists of a No. 8 centrifugal pump placed immediately aft of the dredging machinery. To this is attached an eight inch rubber hose made for the purpose, which extends to and is connected with the grated plow or agitator at the lower end of the beam in such a manner as to catch the gravel and precious metal it contains, and which may be disturbed by its motion, directly in the wake or furrow of the device as it moves forward, thus adapting its movements to the natural tendency of the mineral to seek the lowest level when disturbed under water. The agitator is geared to about forty-five tons purchase, and when properly manipulated is capable of penetrating the most rigid gravel formation. It is as readily operated in a bed of gravel 25 feet under water, as the ordinary steam shovel is in a bank of earth.

While the dredge is being operated the pump is always in motion and has a suction pressure, or intake, of about thirteen and one-half pounds to the square inch, or a flow of about thirty-six feet to the second, thereby giving the pump four to one against the specific gravity of gold.

Most gold bearing streams are coated with coarse gravel or boulders of greater or less proportion, and the bars or benches forming the shores are skirted with a rim of the same character, which it is wise to remove; and if the boulders should be of large size it is absolutely necessary to displace them before any attempt is made

to operate the dredge. To clear the ground a large drag or rake is provided, which extends across the bow of the boat, and having arms attached on either side of sufficient length to admit of dropping the same to a sufficient depth to take effect on the material to be removed. When not in use it hangs suspended across the front end of the boat. When used the dredge beam is suspended and the chain block detached from it and hitched on to the rake, which is then dropped down and the steamer backed slowly. This process is repeated until the ground is cleared of the coarser material, when the rake is again suspended and the dredge called into use, and so continued until from natural causes the boulders again interfere with the plow point entering the bank freely, when the same process of clearing the ground is repeated, and so on from time to time until the ground is worked out.

The pump has sufficient force to take up boulders six inches in diameter. For the purpose of avoiding the handling of material unnecessarily the grated portion of the dredge is adjusted so as to admit particles three to four inches in diameter to pass through. This is carried by the force of the stream to a large hopper or funnel shaped reservoir in the boat, where it falls on a system of screens and the coarser material run off into the river; the remainder passes into the sluice box, where it is treated as ordinary placer.

THE YOUNGS DREDGER.

Within a few rods of where the Underwood dredger was constructed at Quesnelle, the Youngs dredger was also built last winter. Like the Underwood machine, the Youngs dredger is a most elaborate affair, and the promoter, Mr. Youngs, is most sanguine as to its merits. The cost will be about \$40,000; the boat is about 100x24. Very powerful engines are designed to drive the boat up the swift current of the Fraser River, on which it is destined to operate, and the same power is designed to operate the powerful centrifugal pumps and bedrock plow with which it is equipped. The bedrock plow is a very powerful and heavy machine which operates on the bottom of the stream and can be dragged across the bottom or used in a perpendicular manner as a chisel. As to the pumping apparatus, it is similar and as powerful as that on the Underwood dredger. The hose is attached to a long arm or sweep and can operate over a space of about 60 feet square without necessitating the moving of the boat. To the arm or sweep is also attached a powerful crane, to be used when boulders interfere with the work of the pump. A simple device, the patent of Mr. Youngs, clears the lower end of the suction pipe should it become clogged. On the 1st day of June Mr. Youngs launched his dredger and she is receiving her machinery as fast as mechanics can place it. Bad roads in Cariboo are partially to blame for the slow arrival of the machinery at its destination. The Youngs Company has about 20 miles of the Fraser River leased, all of which lies in the neighborhood of Quesnellemouth. Other companies have leased most of the beds of the Fraser and Quesnelle Rivers, and some of them will construct dredgers the present year.

Quesnelle River.

Probably the most extensive section given over entirely to hydraulic mining in the British possessions is the Quesnelle River Valley in Cariboo, and it has been repeatedly stated by men noted as scientific mining experts that on Quesnelle River occur the greatest alluvial deposits yet discovered. The deposits so far developed are practically inexhaustible, for it will take an ordinary man's lifetime to pipe off almost any given

lease on the river. The banks of gravel so far worked in and developed are much richer than similar deposits in California, and it is not uncommon to find prospects ranging up to fifty cents a yard; but probably a general average would come nearer fifteen cents per cubic yard, which is a good, healthy average when compared with California three cent gravels.

The water supply for working the great hydraulic mines in Quesnelle River is fairly adequate, that on the south side holding out longer than that on the north. Some of the mines run for three months, some for four, and some for six months; those higher up getting the longest season by reason of being supplied from towering mountains on some of which the snow lies nearly the year round.

Four miles above the mouth of the Quesnelle is the North Star, which consists of three leases of 80 acres each, situated on the south side of the river. A ditch four miles long brings water from a neighboring creek, and 1,000 inches will be used at a pressure of 180 feet fall. Lumber for the flumes, sluice boxes, etc., is on the ground and piping will commence in July.

Nine miles from Quesnelle on the south bank is the Occidental Claim owned by Perkins and Bowron. Considerable money has been spent in developing, building of roads, etc. The property consists of two leases of 160 acres each.

On the north side of the river thirteen miles above Quesnelle is the Quesnelle River Hydraulic Mining Company's ground consisting of three leases of 160 acres each. A plant has been in operation on this property for three years but it is too small to do adequate work, as the banks of gravel are immense and inexhaustible. A No. 2 Grant is in use and, a ditch a mile and a quarter long carries the water to the mine.

At Lower Twenty Mile Creek, twenty miles above Quesnelle, is a lease of 160 acres on the north side of the river, which is owned by J. B. McLaren. About \$1,000 has been spent in development and improvements, and the prospects are good.

The Columbia Hydraulic Mine is 30 miles above the mouth and consisted of two leases of 160 acres each, but the property has been added to by the company. Col. M. H. DeLoynes is the manager, and upwards of \$10,000 has been spent in development, improvements, etc. Active work is now progressing and the construction of a ditch is being carried forward. It is not probable that any piping will be done this year.

At Beaver River mouth are two leases of 160 acres each, on which last year about \$5,000 was spent in development and surveying. A ditch almost seven miles long has been projected.

Further up the river and about 30 miles below Quesnelle Forks are the Montreal leases. On this property occurs the most elaborate system of development work yet carried on in Cariboo. Over 3,000 feet of tunnels, drifts, and shafts have been made for the purpose of testing the great gravel deposits on the property. Water for this mine will be taken out of Beedy Creek, a distance of seven miles. It will be carried across Beaver River by an inverted syphon which will be almost one mile long.

At the Cottonwood River is one lease owned by the Cottonwood Hydraulic Mining Co. A ditch one mile long has been constructed, and a small sized plant set up. The mine has been fitted up in first class shape for working and water was turned on about May 10th. Good returns are expected.

Nine miles below Quesnelle on the west side of the Fraser River is the Menominee-Marinet Mine. A force of fifteen men has been employed since snow melt, and a good plant was put in operation about May 15. A ditch one mile and a half long carries water to the mine and a four inch monitor is used. A large strip of ground is being worked which dumps immediately into the Fraser.

Below Quesnelle a company managed by W. C. Fry are sluicing with good results.



QUESNELLE. B. C.

Lillooet.

MINES AND AGRICULTURE.

Lillooet is a place of much interest to the visitor, and the mines are attracting the attention of capitalists, who are investing money in purchasing and exploring. Situated on a high, dry bench on the west bank of the Fraser River near where Cayoosh Creek pours its flood of waters into the former stream, the town of Lillooet occupies a site of surpassing beauty. Native streams are trained through its streets, giving ample and pure water supply, and the beautiful gardens and orchards in the immediate town testify to the prolific nature of the soil, which has only to be watered and cultivated to produce the finest of fruits and vegetables. The citizens are well up to date and hail with pleasure the advent of capital and fresh blood from the outside, which is pushing their mines into prominence.

Lillooet cannot be mentioned without speaking of the surrounding mines, the vast production of gold and the operations of mining men in the vicinity. Years ago, when gold was first discovered on the Fraser River, Lillooet was found to be in the line of the country in which the yellow metal was found. All the benches and bars of the big stream in the vicinity were found to be full of mineral, and coincident with work on other parts of the river, the region round about Lillooet was made the scene of much energy in the matter of gold production. Only the gravels in the immediate vicinity of the Fraser were worked, however, till about 15 or 16 years ago, when Chinamen found gold in Cayoosh Creek. When the first discoveries were made white men paid very little attention to the fact, and in a short time the stream was lined with Mongolians for ten miles from its junction with the Fraser. At one time more than 200 Chinese worked on the stream and the above number were there for years. No reliable information can be obtained as to how much gold was taken from the shallow diggings of Cayoosh Creek, but from the yearly average it is estimated that not less than \$350,000 were produced and some put it as high as \$500,000. The former figure is probably nearest the exact amount. Very few white men ever worked on the creek, and in fact most of the placer mining adjacent to Lillooet has been done by the Chinese. Bridge River was worked for many years, also, and there are some quite extensive works above the Indian reservation. The Indians do a little desultory mining on the reservation along Bridge River. At the time the reservation was set off there were a number of good placer claims on Bridge River. No new ones were allowed to be filed, so that a very promising field is now tied up with no prospect of its being opened. The citizens of Lillooet have wondered why the government would allow such a mining district to be arbitrarily tied up, when it was well known that it was a rich stretch of river for many miles from its mouth up the river. The reservation covers 13 miles of the richest portion.

On Cayoosh Creek only the shallow diggings were worked, and no attempt was ever made by the Chinese to get deeper than water level. For a number of years a company, or rather a series of companies, have been endeavoring to tap an old channel and basin on a claim called the Vancouver Enterprise. A lot of money, probably \$40,000, has been expended in fruitless endeavors, but with indifferent success till taken charge of by the present company, the Lillooet, Fraser River and Cariboo Gold Fields. Numerous managers appeared on the ground, enthusiastic to carry out some newly conceived plan or scheme, only to fail and be superseded by another. They all appeared to think the proposition an easy one, and that the difficulty to be overcome could be encompassed by a few hundreds of dollars. Not till Mr. D. T. Hughes appeared on the scene, did the magnitude of the work become apparent. All previous operations had been commenced on the theory that the deep channel near the falls and under what is called "The Basin," could be easily reached and the gold procured at a nominal expenditure. Not underrating the probable richness of the gold deposit on the claim, he went to work systematically and mechanically to reach it. He drifted into the bench to where he thought the old channel ought to be, and started a shaft at the end of the tunnel which was, at the time the pump was started, 40 feet below the level of Cayoosh Creek below the falls. A new Pelton water wheel and accompanying pump was put in place and started, and the shaft cleared of water in less than 15 minutes. The actual work of sinking the shaft then recommenced, and three shifts of men set to work, each shift going in at 7 a. m., 3 p. m., and 11 p. m., respectively.

"The Basin" is what might aptly be termed a pot hole, but on a gigantic scale. A huge slide appears to have come down from the adjacent towering mountain and constructed, by nature's handiwork, in the most perfect manner, a huge dam over 100 feet high directly across the creek. Cayoosh Creek, even in the fall of the year, is a perfect torrent, and over 20,000 inches of water thunder down through a narrow chasm that can justly be termed a "crack" in the rocks. The thunder and roar of the falling water is terrific, and reverberating in echoes against the surrounding mountains gives the visitor a song in nature's own language, the crash and roar of tumbling waters furnishing to the ear tremendous tones in diapason and base that merge into regular throbs of melody. The rocks which make this waterfall possible have been the medium to stay and collect, for ages past, the gravel and gold that have been washed down from up stream. The richest shallow workings of the creek have been adjacent to, and in "The Basin," and the efforts of the company at that point show that they are fully alive to the probable richness of the ground.

The same company are also doing extensive development on the Bonanza group of quartz claims ten miles up Cayoosh Creek from Lillooet. Considerable development work had previously been done on the Bonanza, but much after the manner work had been done on the Vancouver Enterprise. The rich croppings had been lost almost as soon as the work got under cover, and it took considerable exploring to find it and get started rightly. Several hundred feet of work had been done on different outcroppings but it was as good as thrown away. The work being done is purely development and exploration work. The Bonanza works are situated on a bold point projecting out from a very high mountain and overlook Cayoosh Creek from an altitude 350 feet above the creek level, and the vein runs almost directly up a hog back towards a very high mountain and is lost under a porphyritic formation that caps most of the mountains in the vicinity. It appears that the country rock is well in place and the veins should be permanent. Of the richness of the quartz, we are assured by those interested that the assays are valuable and that the quartz can be worked with profit.

The L. F. R. & C. G. F. Co. have bonds on a number of other properties in the vicinity of Lillooet and in the immediate neighborhood of the town have done over 1,150 feet of exploration work, sinking one shaft through a gravel bank to a depth of 140 feet. One or two bonds have been thrown up, the property being prospected not proving valuable enough to suit their purpose.

Other people follow mining as a business, and beside the operations of the big company a lot of development work goes on all the time. Nearly every man in the town is interested in quartz and placer mines and the past season has seen a large number of quartz claims located. Not much development work has been done on the quartz claims, but some excellent samples of quartz are displayed and we are assured that the mountains west of Lillooet are full of good mineral.

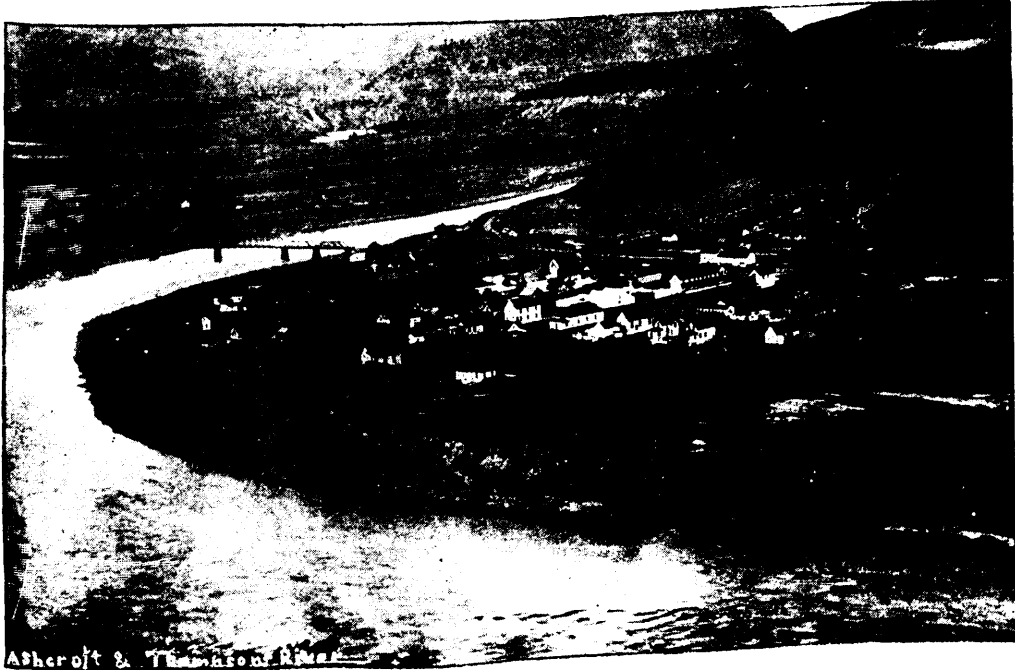
In the commercial world, Lillooet at one time occupied quite a prominent place, and even at the present time the amount of trade and traffic is large. One old saw and grist mill is a substantial and well built structure and does as good work as it ever did, the logs being floated down Cayoosh Creek from Seton Lake. The following old clipping was found tacked on a post in the mill and will be entertaining reading to old timers, who will at once recognize its source:

LILLOOET FLOURING MILL COMPANY.

"The want of a good flouring mill has long been felt in the fine agricultural district of Lillooet. By reason

of this desideratum farmers have had in years past to turn their attention entirely to the cultivation of barley, oats, etc., which they have raised in such abundance that only a small portion could be disposed of, and that at very low returns; large quantities of old stock being still on their hands. Fortunately last year a good deal of wheat was put in and the crop proved very profitable. Last fall a joint stock company was formed for the purpose of erecting a grist mill. The site was chosen on the banks of Cayoosh Creek, so as to have the waters of that stream as a motive power. No time was lost in commencing the works, which were carried out with commendable zeal and energy until completed about three weeks ago. The whole of the works are of a very substantial character and well calculated for carrying out the objects of the projectors; reflecting at the same time great credit on the energy of the place. The mill is driven by two powerful turbine wheels which are sunk some eight feet under ground, in order to prevent a possibility of stoppage by frost. The capital invested by the company amounts to some \$16,000. From the present

movements of the farmers in the district in putting such large quantities of land under wheat crop the company will have reason to congratulate themselves on the success of their undertaking before next fall. It is calculated that there are at present in the hands of farmers around Lillooet something like 400,000 lbs. of wheat which will be ground as soon as opportunity presents. The mill was started the 18th ult. and was steadily grinding at the rate of 700 pounds an hour. The samples are good and will compare favorably with any of the San Francisco mills. We understand the agent of the company, Mr. F. W. Foster, intends sending a consignment shortly to Williams Creek. We hail the undertaking as one of the permanent institutions of the country and heartily wish the projectors every success."—*Cariboo Sentinel*, Barkerville, May 7th, 1866.



ASHCROFT, B. C.

run up Harrison River, also Anderson Lake, portage six miles to Seton Lake, and meet the regular freighters at Lillooet, or at Seton Landing. A steamer still plies on Anderson's Lake, but the bones of the old Seton lie, partially submerged, on the beach at the foot of Seton Lake, near the landing. She was a side-wheeler of some pretensions and was kept very busy in the old days. Her boiler is still in use on a small boat on the coast.

Numerous Indians reside in the Lillooet district and their rancheries are passed occasionally on the road. Some of the Indians are shiftless, but others are ambitious to have plenty to eat, wear and do with. Some of them own good ranches and are well to do. At "The Fountain," about 10 miles from Lillooet, is a village where reside several hundred of them, and at this place is a school where the young receive instruction. The boys have a brass band numbering 25 pieces, 21 horns, 2 drums, cymbals and triangle, and they play very creditably. Like all the coast Indians, these are musically inclined, and every house has its accordion and mouth

harp and they all can sing. At Lillooet and Bridge River are villages, and a few miles below Lillooet is quite a large Indian town.

Lillooet will be of considerable importance with the opening up of quartz mines adjacent to the town. The mineral is in the mountains and the places are not so inaccessible as

many that are now receiving a great deal of attention in the Province. The transportation question is not of the importance at Lillooet that it is at points up the Cariboo road. A team easily goes from Ashcroft to Lillooet and back in four or five days and the stage in summer time makes the trip between points in one day.

The Great Cariboo Road.

MINES, TOWNS AND RANCHES TAPPED.

The Cariboo Road, nearly three hundred miles long, is to Barkerville, Cariboo and the immediate country what the old Santa Fe trail was to the plains and the Rocky Mountain regions, and is the only way of ingress or egress to British Columbia's eldorado. The Cariboo road of to-day is a vastly different affair to the rude trails originally traversed by the "Pioneers," and those who ride over its well graded curves fare very different in the way of comfort and ease than did the zealous gold hunters of '58, who were compelled to literally work their passage to the "Balloon" Country as it was then denominated, from the fact that its altitude was so great

Speaking of agriculture, the district of Lillooet still holds its own as one of the finest farming regions in the Province, and in addition to being an excellent grain country, has added fruit and stock to its possibilities. Many excellent ranches are to be found along the road from Ashcroft to Lillooet and all the benches along the Fraser are turned into productive farms by the residents in that highly favored section. Being on the old Cariboo road the evidences of former activity and enterprise are many. The old road used to

and the difficulty of getting through the timber and brush, over hill and through vale, was such that only that class of men who made the California discoveries great were calculated by reason of their ambition and energy to penetrate the wilds of Cariboo.

New blood is now being inducted into all manner of industries along the Cariboo Road, the mines, the stock-raising, the teaming, in fact, every calling is receiving its share of new force and energy, but we cannot underrate the tremendous struggles which the first comers exerted to get into and explore a region that now can be entered in comparatively a day's travel from the railroad, in a comfortable coach, drawn by the sleekest and well fed horses, under the accompaniments of three square meals a day and creature comforts, *ad finitum* thrown in.

The original Cariboo trailers used the Fraser River largely as a medium of entrance. The first hundred miles up to the great "Box" Canyon was a very easy piece of work to accomplish, and then things changed. The big canoe had to be unloaded, the cargo "portaged" or "packed" around the rapids, and lastly the cumbersome vessel itself had to be taken out of the water and by main strength of human muscle moved to smooth water above. This operation was repeated as often as necessary. The amount of bodily exertion performed was incredible. The start up the river would be made usually in January or February and several months would be taken up in making the tedious passage, but it could usually be accomplished by the time the snow would be fairly off at Quesnellemouth.

Later a route was found which left the Fraser at Harrison, then around the lake of that name, up Lilloet River, winding through the mountain to Anderson Lake, a portage of six miles to Seton Lake, striking the Fraser again at the town of Lilloet. The pack trains could then follow up the river, or go by way of the old Pavilion mountain route, thence by way of Dog Creek, Alkali Lake, Williams Lake, and to Soda Creek. The freighters and miners branched off from Williams Lake to Horsefly and Quesnelle Forks.

Later a good wagon road was constructed from Yale, on the Fraser River, which wound along the Thompson River to Spences Bridge, where a ferry carried freight and passengers across, and still continuing up the northern bank of the Thompson for some miles, passed through Boston Flat and struck the Bonaparte Creek at Cache Creek, thence to Clinton and over the present Cariboo Road northerly. All these old roads still exist and are used at the present time.

The completion of the Canadian Pacific Railway made Ashcroft the starting point for Cariboo, and a lot of work on the Bonaparte bluffs joined the point mentioned with the Cariboo Road, which at the present day is an artery of commerce and traffic of great importance and over which vast amounts of supplies are yearly transported to the Cariboo mines. Several million pounds of merchandise, machinery and general supplies are yearly hauled over the road, and as an instance of the tremendous traffic the statement is incidentally made that in one week during the month of May of the present year, one firm of forwarding agents at Ashcroft loaded upon freight-wagons and started on its northern trip over 180,000 pounds of merchandise. More than twenty-five wagons were required to haul this amount and probably one hundred and thirty horses. This was for one week, and there are two other firms of forwarding agents at the same point, besides the B. C. X. Co., the figures of the three latter concerns not being obtained.

There are more than eighty-five freighting outfits on the road and the whole number of horses and mules constantly in use is over 600. Loads of 5,000, 7,000, and

8,000 lbs. are commonly hauled, but it is not uncommon for some teams to haul upwards of 16,000 pounds, while occasionally loads of more than 20,000 pounds are taken out by a single outfit.

The prices of carrying freights vary a little from year to year, but they are usually as low as is consistent with cost of feed and horse fodder. It can be readily inferred that those who make a business of keeping road houses do a thriving business in providing for the wants of the teamsters and their animals.

Over the road operates the celebrated British Columbia Express Co., or "B. C. X." as it is familiarly designated, of which Stephen Tingley is manager. The Company carries H. M. mails, passengers and express and the regularity and promptness with which the coaches are taken over the road deserves a word of praise and recognition from any source. Stout and well built Concord coaches are the vehicles used and they are kept clean, well repaired and constantly ready for use. The horses are high-mettled, well fed animals, and from four to six of them, as the state of the road requires, are used to draw the coach. Relays are established from 14 to 22 miles, and the coach, passengers, mail and express, are taken to and brought from Barkerville, 285 miles, in 4 days. Specials, in case of emergency, would travel night and day. The company owns several hundred head of horses and sustains a manufacturing and repair shop at the 134 Mile House.

Collins & Haddock, liverymen, do a large business over the road, and they constantly have teams out carrying mining and commercial men to and from up country points. Their huge livery barn at Ashcroft is a veritable horse hotel, and in the neighborhood of 100 horses are usually to be found in the stalls of the building.

Along the road are numerous well kept road houses where good fare, smiling landlords, and well served provender gladden the hearts of travelers at morning, noon and night, and from the railroad at Ashcroft to Stanley in Cariboo can be found the finest of well tilled ranches. Clear up to Quesnellemouth the region is admirably adapted for stock raising, the mines absorbing a large percentage of the beef raised and marketed.

Where the town of Ashcroft now stands was part of a ranch taken up by J. C. Barnes and E. W. Brink in 1872, and in 1880 the first building operations were commenced. The Ashcroft Hotel was built and run by Barnes & Evans until the present proprietor took it over and it is therefore the oldest hotel in the place. Uriah Nelson had the first store. This was the commencement of the town and the advent of the railway soon brought it to its present prominence.

Ashcroft is situated on the Thompson River, at the mouth of the Bonaparte, and on the main line of the Canadian Pacific Railway, 205 miles from Vancouver. As an interior town it has the advantage of being centrally situated, and has enjoyed probably the soundest and steadiest increase of prosperity of any interior town in the Province. And for the size of the place and the number of people in it engaged in business does the largest amount of trade of any place of its size in the Dominion. With the splendid water power at the mouth of the Bonaparte River, its central position and matchless climate, Ashcroft will probably grow into an important business centre and a delightful place of residence. This is the distributing point for Cariboo and Lilloet, and although these districts are not thickly settled they are vast in extent, and when the entire business is centred to one point, as it is to and from Ashcroft, it assumes large proportions. The present active development of the gold mines in these tributary districts has given quite an impetus to business, increasing its volume largely, and the bright prospects for

a successful operation of these mines makes the outlook quite hopeful. A large number of freighters with horse and mule teams are engaged in hauling freight to the several points, while pack trains and ox teams are also brought into service. The mails, passengers and express are carried by a strong, well equipped express and stage company, furnishing an excellent service. This company is ever on the alert to improve or increase the accommodation. In the town there is a good school, churches, hotels, court house, goal, agricultural hall and grounds, town hall, society hall, small water system, etc., and it is proposed to put in an electric lighting plant at an early date.

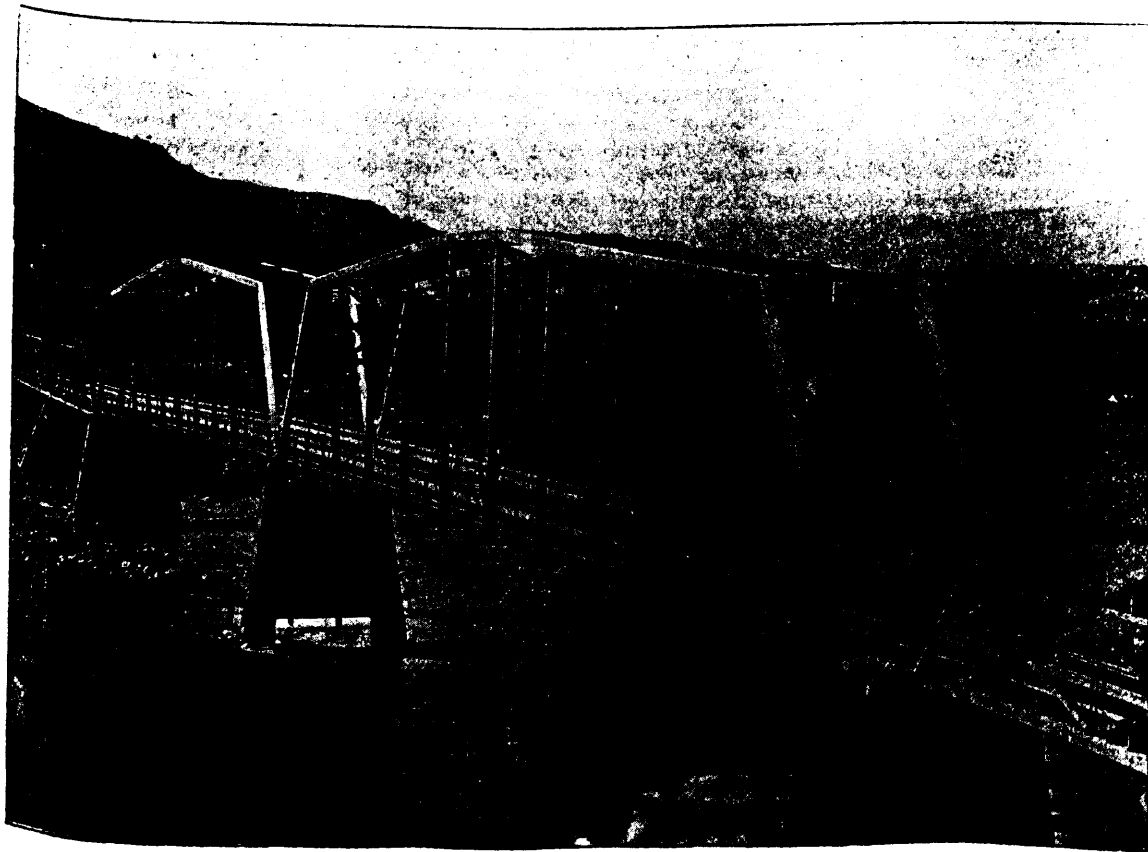
Clinton, the first town north of Ashcroft, is 32 miles from the railway, and has about 200 population. Several stores, hotels, blacksmith and harness shops, schools and churches are found. Thriving trade relations exist between the town people and adjacent farmers and stockmen. A government hospital is to be erected at this

grain for the Cariboo mines. A road branches off from the 59 Mile House to Dog Creek.

Proceeding north from Clinton along the elegant road the traveller passes well kept houses and occasionally good ranches. No better ranching region is found in the Northwest than that adjacent to Lac La Hache.

The 150 Mile House is a distributing point of importance. It is from this point that roads branch off the main Cariboo Road to Quesnelle Forks and Horsefly. A road also branches to Horsefly from the 108 Mile House near Lac La Hache. A store, hotel, stables, and blacksmith shop are at the 150 Mile House and also at the Onward Ranch, three miles to the west. Each of these places does a thriving business with the miners, stockmen, and ranchers.

At Soda Creek are stores, hotels, stables, and blacksmith shop, and besides the road traffic the people do a thriving business with stockmen and ranchers. There is also some mining on the Fraser River in the vicinity.



BRIDGE AT ASHCROFT--B. C. EXPRESS COACH CROSSING.

point. From Clinton a government mail route branches off and runs via Dog Creek to Alkali Lake, over 80 miles. The route lies partially over the old original road to Cariboo. At Dog Creek are two hotels and stores, a flouring mill and blacksmith shop. The town is in an excellent stock and wheat raising section, and hay and grain are produced at a profit to the ranchers. Across the Fraser River and nearly opposite from Dog Creek is the famous Gang Ranch, owned by the Western Canadian Ranching Co., and managed by J. D. Prentice. Over 50,000 acres of land are under fence, and more than 1,000,000 acres of land are controlled by the company. About 25,000 head of cattle browse this immense range, and the company annually ship large numbers of beef cattle, some of the fat stock finding its way to England last season. At Alkali Lake are stores, a postoffice, and several fine ranches. The farmers are prosperous and raise beef and

Below Soda Creek about one mile is the Soda Creek Canyon through which the waters rush and roar in a similar manner to the big canyon near Yale on the same river. There is geological evidence that the river has cut away the rock and worn a passage at a much lower altitude than formerly, probably dropping more than 250 feet by the process. Appearances suggest that an old channel exists some distance back of the present river to the westward.

Quesnelle is 220 miles from Ashcroft and is reached in three days by stage. The town has about 250 people, three general stores, two hotels and blacksmith shops are immediately in the town, while just out of the village are the saw, shingle and flouring mills of Senator Reed, which do a large business in their respective outputs. At Quesnelle the huge gold dredging machines, of which mention is made in this issue of the MINING RECORD, were built. Another dredger is now in process of con-

struction, and also a steamboat. The latter is to ply on the Fraser River between Soda Creek and Fort George Canyon, and will be of great benefit to all local interests on the river. Quesnelle does business with miners, ranchers and stock men, and is the outfitting point for the Omineca and Peace River regions. Active mining operations have been carried on at Quesnelle and vicinity for many years. This year will witness the opening up of a number of good hydraulic propositions adjacent to the town, while the advent of the dredging machine has created a new era in gold mining, not only for Quesnelle but for the whole Province.

Between Quesnelle and Stanley are several good road houses and ranches. At Beaver Pass is the ranch of John Peebles, one of the original discoverers of the Cariboo. He arrived at Victoria between August, 1858, and January, 1859, and was with one of the first parties to reach Horsefly in April or May of the same year. He pushed on by way of Quesnelle Forks, Keithley Creek and to Antler Creek in the fall of '60, and got to famous Williams Creek with the advance guard who found and made the name of "The Creek" famous throughout the world. He was a shareholder in the Aurora Borealis and Caledonia claims just below the present town of Barkerville and above old Cameron Town. The claims, 100 feet square, yielded over \$500,000 each. [We digress simply as a historical reference to a character that has always been successfully identified with the Cariboo mines.—ED. MINING RECORD.] The road first touches famous Lightning Creek near the Bonanza mine. At Beaver Pass a number of leases have been taken on the abandoned bed of Lightning Creek and development work may prove the ground to be very rich.

At Stanley the traveller is on historic ground and during the sixties over \$10,000,000 were produced from about three miles of Lightning Creek and its immediate tributaries. A young man who was born in the camp remembers seeing 125 pounds of gold washed up for one day's run on the old Victoria claim. The mines were mostly "deep diggings," but some sluicing was always carried on, and at the present day several hydraulic mines are working successfully.

Fourteen miles from Stanley and at the end of the Cariboo Road is Barkerville, on Williams, or "The Creek," four days by stage from the railroad and named from one Barker, who was one of the original parties to discover the creek and locate a claim. The old shaft descending to the gravel which Barker and his associates so profitably worked still opens into the ground near the blacksmith shop and is pointed out to the curious. Dutch William, who discovered gold in the canyon and whose name was given to the creek, got about the poorest claim of the lot, and it is said got no more than \$7,000 from his claim. Others, however, were fabulously rich and the old Cameron claim is said to have paid the share owners upwards of \$1,000,000. "Cariboo" Cameron, whom all old timers will remember, had about \$400,000 of the amount paid to his share—though some people say the amount was about \$260,000—and he carried the "dust" down the Cariboo Road on pack mules, John Brown, the gold commissioner of Cariboo, helping him pack it up. Poor old Cameron! He took the gold to the east, lost it in unwise speculations, came back to Barkerville, died in poverty and now lies buried on the hillside in the cemetery, not a stone's throw from the place where he gained his great wealth. Fabulously rich claims were discovered, worked out and abandoned, shooting across the sky of the mining world like golden meteors, and their importance dying out with the fact that they were worked or drifted out.

The town of Barkerville was once the residence of upwards of 10,000 people and still has a residency of from 600 to 1,000. General stores, hotels, restaurants, blacksmith shops, etc., do business with the miners, and from waning fortunes it is again on the rise to prominence as a mining centre. It is here the Cariboo Gold Fields Concessions Co. will put into operation the largest hydraulic elevator in the world, the pipe and machinery of which company now lie at Ashcroft awaiting transportation, and the old unworked gravel of Williams Creek is expected to turn out again gold equal to the \$20,000,000 it yielded in the sixties.

With the working on the easily reached ground in the Barkerville and Stanley regions the mining interests decayed and the fortunes which were won so easily were either carried outside or were dissipated in vain attempts to reach other supposedly rich ground. The creeks of Cariboo are lined with the wrecks of machinery which was put in place by the old timers in their attempts to open up new mines. Lightning, Peters, Antler, Williams and Grouse Creeks and Willow River, each show the wrecks of these vain attempts by the courageous miners of that day, who were willing to spend their bottom dollar in the endeavor to reach bedrock, and where failure meant poverty to the promoters. It must not be inferred that these failures meant that there was no gold in the ground attempted, but simply that the old time methods and machinery could not cope with the water, which was really the only obstacle a Cariboo miner ever encountered in the old days that he could not overcome. The bedrock shaft and tunnel and the powerful pumps of to-day were not known then. Had they been, Peter's Creek, the Eleven of England, and others on Lightning Creek, the Kurtz & Lane on Willow River, the Ballarat and descending claims on Williams Creek, the Nason on Antler Creek, and numerous others would not still be unworked ground to lure the gold hunter. These attempts were made while the golden stream was coming out of Cariboo creeks at its greatest volume, and while the projectors of the enterprises had the greatest incentive to put forth their efforts. In every case the ground attempted and abandoned then, now lies in its primeval state and still awaits the advent of modern pluck, capital and machinery.

The question of transportation being disposed of by the great Cariboo Road, the importance of which in a measure we have attempted to describe by referring to the immense interests and industries it serves as a public highway, the only question at issue is to plant upon these still valuable properties modern machinery and appliances with which to cope with the water.

A railroad has been projected from some point on the C. P. Railway to Barkerville, but until the building of it is accomplished the Cariboo Road will be the only means of getting into, and out of, the "Balloon" Country. When the railway is finally built, an event which does not now seem to be in the immediate future, the great road will still be a favorite route for prospectors. Many thousands of dollars are yearly spent in repairs, and it is the best wagon road in the world.

We have had several enquiries in regard to field glasses, magnifying glasses, etc., for the use of prospectors and others in the mining districts. Messrs. Clarke & Stuart, of 28 Cordova Street, Vancouver, gave us prices and lists to send to our correspondents. They have a very complete stock from the best makers, and parties requiring anything of this kind should write to them direct. It is an advantage to people in the interior to be able to obtain these articles near at home without the necessary delay of sending a long distance for them.

The Cariboo Mines

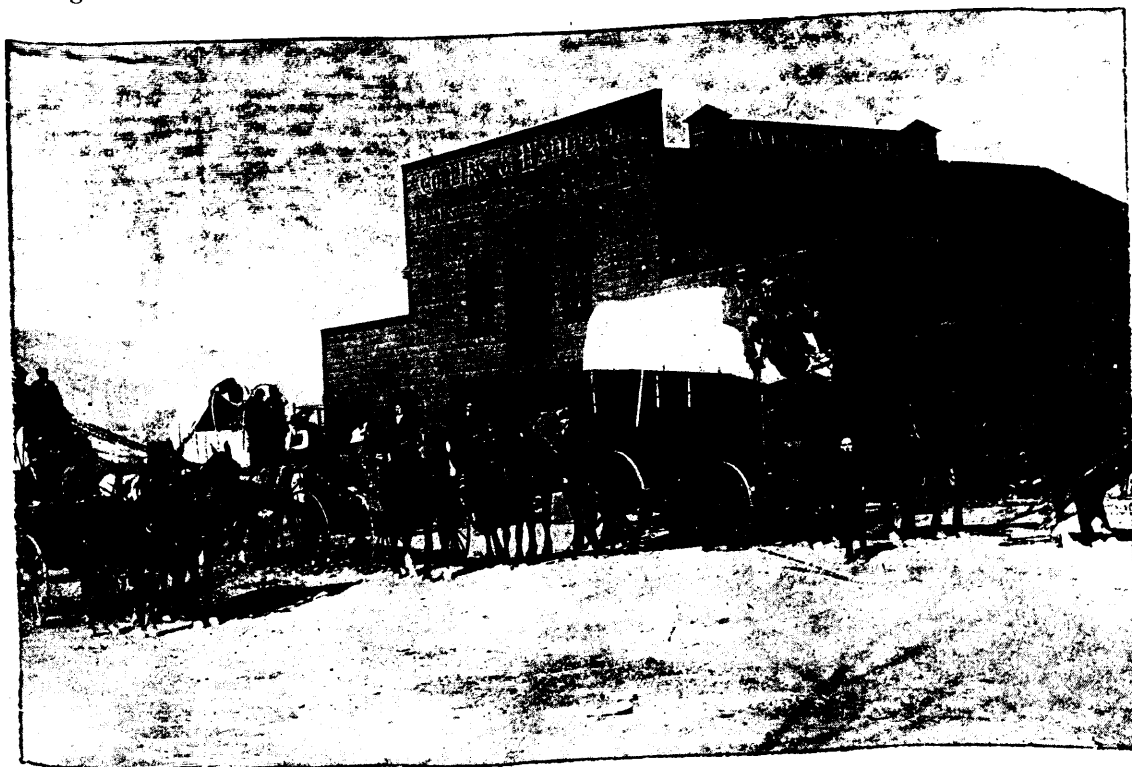
HON. CHARLES F. FISHBACK HAS BEEN UP THERE AND TELLS ABOUT THEM TO INTERESTED LISTENERS IN VARIOUS CITIES.

Mr. Charles F. Fishback, a resident of Seattle, Wash., a lawyer of some distinction and a shrewd investor, recently stated to Seattle parties as follows:

"The Cariboo is not a poor man's country, that is, the poor man cannot become a millionaire in a single day. The conditions are entirely different from the Kootenai Country in this regard, the latter locality containing gold 'in rock in place,' to use the language of the United States revised statutes, while in the Cariboo the gold is found in gravel and is obtained by washing the 'dirt' either in small quantities with a pan or rocker, like the Chinamen do and like the old-time placer diggings of California, or in large quantities with a hydraulic engine, or with a dredger and pump. The miner can make by day's labor perhaps \$2.50 and board, but as that is getting rich too deliberately for our average

man' for \$2.50 a day and board; later, when the water is low, throwing up his job and going off to work for himself, perhaps only a few feet further along the river on identical property on which he was formerly employed. I saw dozens of them on the property of the gentleman with whom I am associated, and when I asked those in charge why they permitted such trespassing, by which the owners lose annually a large amount of their precious treasure, the answer was 'It is the custom to allow them to take away what they can get by the work of their hands. There is gold enough for us all.'

"I found this generous and broad-minded spirit characteristic of the miners of that locality, and here let me say that in our journey to and from, and during our stay in the Cariboo mining district, I found everywhere in British Columbia a superior class of people, honest, generous, sturdy. I cannot say too much of the warm-hearted courtesy with which we were everywhere received on our 200 miles of staging from Ashcroft to Quesnelle Forks. I do not attempt to 'boom' this country. It does not need a boom. That it is rich in gold beyond



FREIGHT WAGONS AND EXPRESS COACH LEAVING ASHCROFT FOR CARIBOO.

American citizen, we find him ordinarily throwing away his pan in disgust, 'damning' the country instead of damming the river, and seeking fresh fields where, by striking a vein or ledge of gold, he may become that most envied of mortals, a bonanza king. Comparatively few white men have remained in the Cariboo. Those who have 'stuck to it,' and have combined good judgment with industry are now the solid men of the district, and as they have learned by experience where all the rich dirt is, either they or their friends control it, and the result is that they only need the assistance of capital to develop their magnificent properties. The money-makers of the country hitherto have been the Chinese. John, or rather Sam (if you call him John he is mortally offended) knows a good thing when he sees it. Year after year, with pan or rocker he is on hand, hundreds of him, patient, delving, untiring, washing away at the rich, auriferous gravel on the banks of the streams; in spring when the water is high working for the 'Melican

the dreams of avarice I firmly believe. I saw evidences of it everywhere. The people who are there know it. But to handle the millions upon millions of cubic yards of earth on the banks and in the beds of their mountain streams, 'Swift flowing to the sea' from whose margins tower great cliffs seamed with precipitous rocks, standing dark and forbidding like grim sentinels over the gold-lined chasms through which dashes each treasure-laden rill or river, to win the immense fortunes that are there means the expenditure of large sums of money in cutting mountain roads, in building ditches, in erecting buildings, in putting in machinery, and in employing men. No single human energy can accomplish this. It means the resources of rich men organized for the carrying out of a great enterprise. Some of these organizations are already on the ground. The great 'Cariboo' Mine, about four miles from the property in which I am interested, is probably the most thoroughly equipped property in the neighborhood, if not in the

district. After an expenditure of about \$300,000 it is now in first rate condition to commence taking out ore. Its great hydraulic engine, furnished with water by its large ditch, almost a canal, seventeen miles in length, is now tearing away great masses of earth which is carried into sluice boxes where the gold is separated and saved. The stock of this company is over 400 per cent. above par and none to be had. To capitalists this fact does not need elaboration. Opportunities equally great for investments equally as satisfactory are numerous throughout the mining district.

"In the first part of our trip over the Canadian Pacific Railroad we were joined by some wealthy English capitalists, who have large interests in the Cariboo and with whom I am associated in our mining property there. Through them we received many courtesies not usual with strangers. Sir McKenzie Bowell, the Canadian premier, was on our train en route homeward from a tour of inspection through the provinces of the Dominion. By invitation we joined his party in a visit to the Indian school at Yale, where the train stopped for some time. All that we saw of British Columbia was sufficient to open our eyes to the grandeur and extent of the magnificent domain owned by Great Britain across our northern frontier. The scenery is grand and beautiful, the soil fertile, and everywhere was the delightfully wooded and evergreen expanse to which the citizens of Washington have become so accustomed that it is a part of their daily life. In our trip of 200 miles by stages we must have seen 100 lakes, not small ponds, but large and beautiful bodies of clear, fresh water, some of them being miles in length, making the soil rich in verdure and furnishing sustenance for great herds of cattle everywhere we went. The soil of the Cariboo, which abounds in gold, is exceedingly fertile in spots, and the Chinese have gardens in the most unexpected places on the bench land among the mountains.

"In the mining camps and especially at Quesnelle Forks, I found the utmost good order and very little, in fact none, of the lawlessness and dissipation which we in the United States are accustomed to associate with mining life. The law there is strictly enforced, and bad characters are not permitted to infest the camps and prey upon the industrious miners. They are soon "spotted" and are simply told to go; and they go. Walking about among the hard-working, honest men from all parts of the world, who have come in to help develop the strange, new country in which I found myself, I could not resist a feeling of admiration for the system of law, order, and discipline in force there, and for the vigorous yet kindly and wholesome manner of its enforcement. The system certainly commends itself to property holders and those seeking a place for investment."

Later in Chicago he stated:

"There will be a mining boom in the Northwest from now on that will lead to the development of some of the greatest properties of the world in Washington and British Columbia. While England has been laying hands on all the valuable gold deposits, let it not be forgotten that Americans are entitled to great credit for opening up magnificent gold properties in the 'Cariboo' and 'Kootenay' Countries of British Columbia.

"The great 'Cariboo' District lies in the heart of British Columbia and consists of a vast area of gold placer deposits, which I believe will more fully repay capital and labor than the famous 'Rand' District of South Africa. I have no hesitation in saying that when American capital once becomes acquainted with the fact that these deposits can be worked with great profit, not for one year or for ten years, but for generations, they will begin to understand the value of a good hydraulic prop-

erty possessing richness of gravel, convenient for operation, and with an abundant water supply.

"The 'Kootenay' Country, as at present explored, is just beyond the American boundary line, and there is no doubt that the names 'Trail Creek' and 'Boundary Creek' will soon become as well known as is Cripple Creek to-day.

"Deep mining is now demonstrated to be practical, and while there is no boom the steady development of lode claims and placers will bring millions of dollars to American investors who are shrewd enough to secure them.

"It would cause great surprise if I should mention the names of some of the capitalists who are investing in and helping to build up our industries. They would number a half dozen of the greatest men of the United States, and an infinite number of men of smaller means who are looking to the state with more and more confidence as the output increases."

And in April he talked to people in Cleveland, Ohio in the following interesting strain:

"The mining industry of Washington is being rapidly developed. Of the two gold mining districts of British Columbia the Cariboo is deserving of careful mention. This district is 250 miles north of the national boundary line, and extends northward into British Columbia. South of the Cariboo is the Kootenay mining district. The Cariboo is enlisting both English and American capital. The gold of this region is in gravel deposits. The gold is washed down in mountain streams which are outlets of beautiful lakes. These streams flow ultimately into the Fraser River. The streams are rich in gold, and their banks, benches, and bars were worked with great profit even by the primitive methods of the past. The introduction of machinery and improved methods of mining show that the output of gold is enormous. From a district fifty miles square \$60,000,000 has been taken out in gold, of which the Government has certain and definite returns, while more than \$125,000,000 is estimated to have been taken out by the Chinese miners, of which no returns have been made to the Government.

"The Chinese are the most indefatigable miners in the world in such a district as the Cariboo, where returns are certain. During the season more than 1,500 Chinamen are found along the banks of the Quesnelle River and the small creeks tributary to it. The Chinese take out great quantities of the precious metal every year. The Cariboo does not offer sufficient attractions to the average American miner, for the reason that the mines are all placers. The matured gold is in the form of dust and small nuggets, distributed through the beds of ancient rivers. Without machinery a single miner can produce gold with pan and rocker to the amount of \$2 and \$2.50 a day. This return is not sufficient to attract men who are anxious to get rich at a single blow of the pick.

"For investment, however, the placer mines are the best in the world. They yield larger returns and more certain dividends for money invested. The Cariboo Mine, which is situated on the south fork of the Quesnelle River, just across from the Fishback Mine, which is on the north fork, produced \$41,800 last year in a run of 26 days; while the Horsefly Mine produced over \$29,000 under less advantageous circumstances. It is believed that these mines will be able to produce \$1,000,000 a year for a number of years.

"The mines have every advantage which goes to make up a placer mining district, which will be of greater importance than the Rand District in South Africa. The gold supply in the Cariboo is inexhaustible, as disclosed by each year's supply being larger

than that of the year preceding. Each year a new 'crop' is brought down by the streams, and distributed along their benches and bars. The gold washings of this famous district extend for hundreds of miles down the Fraser River, away below the gold belt of the Cariboo, and the benches and bars of the Fraser River are supplied with gold which has been washed down by the streams of the Cariboo District which flow into the Fraser.

The Auriferous Gravels of British Columbia.

Perhaps no man in British Columbia has undergone more hardships and toil, and worked harder to bring placer mining in the Province to the front than Mr. J. M. Buxton. No one deserves to be rewarded for his skill and perseverance more than he, and that that reward will come soon to him and to others, the bright prospects for mining in British Columbia would indicate. In the upper country Mr. Buxton is looked upon as an authority on placer mining, and the following extracts from an address delivered by him before the North west Mining Association will be read with interest:

In the gravels of the streams of British Columbia between Vancouver and the Rockies, and between the 49th parallel and Cariboo, is gold to be found. I do not mean to say that it is found in every place in paying quantities, but I do assert, and most of my old friends, the prospectors of gold-bearing gravels, will vouch for the truth of my statement, that in no stream or river can much dirt be washed without getting at least a color. You can start from the mouth of the Fraser and find gold

which is too minute to be detected without a glass, and which may go one cent or one-tenth of a cent per yard, till you get to Cariboo, where the old timers tell me they have often had several hundred dollars to the pan. I am afraid that these shallow diggings, where one could get hundreds of dollars to the pan, are almost worked out, but I venture to assert that the deep channels, which are now being opened up by hydraulic methods, will yield gold in quantities sufficiently large to astonish even the old timers. Until three or four years ago no attempt was made to use the more improved methods favored by the Canadian hydraulic mining companies. Our first venture in this Province on a very large scale was near Lytton, on the Van Winkle Bar. This claim, or combination of claims, I believe to be a good property, but through our want of knowledge and want of water (as to which is the more important of the two I must leave to your judgment) we failed.

To go back to my exploration for hydraulic mining on a large scale: The first place I tested in 1890 was a narrow strip of land between the Tulameen and Similkameen, near the junction of the two rivers. This, I think, was the first exploration work in British Columbia carried out in the way of deep shafts for a large hydraulic enterprise. We found gold in paying quantities, but my English and British Columbia friends were ignorant, at that time, of hydraulic mines except on a small scale, and I knew no Americans who would take the matter in hand. I therefore abandoned the claims, which have since been taken up by various syndicates, the members of which will probably push the matter to a successful issue. After this attempt I prospected by shafts and tunnels the Fraser and Thompson Rivers. The deposits of these two rivers differ in a most marked degree. I must state that in my humble opinion it seems to me that at one time the present Fraser was a succession of lakes and waterfalls, and that the sea once washed the boundaries of what is now known as Yale. In my exploration work on the Fraser I have repeatedly come across water-worn rock at an angle of perhaps ten de-

grees. I have also found in nearly every case that the upper bed-rock, as well as the intermediate bed-rock, is covered with lacustrine deposits, and on the top of this occur the gold-bearing gravels. These facts, connected with others mentioned hereafter, lead me to the opinion that the present Fraser was once a succession of lakes emptying into the sea at the present town of Yale, and that the main river of the Province proceeded west from Quesnellemouth to the Pacific.



150 MILE HOUSE, CARIBOO ROAD.

Leaving the Fraser and proceeding up the Thompson, we find gravel in place from the surface of the bench to bed-rock until Savonas is reached, after which point there is more or less a succession of lakes, and beyond which my prospecting has not been carried. In my opinion a part of the main Thompson, say from Savonas and including the North Fork, ran through Shuswap Lake, Mara Lake, and Okanagan Lake into the Okanagan River. As far as I can find, and as far as my researches go, the streams running into these lakes all wash gold-bearing gravels.

Proceeding up the Fraser from its junction with the Thompson, near which point two dredgers are at present at work, we reach, after passing more gold-bearing bars and benches, Quesnellemouth, at which the Quesnelle River enters the Fraser. I do not think that anyone in British Columbia will deny that there is more gold in this river than in any other river in the Province of the

same length. From the mouth up stream the bed is leased to some Chicago capitalists, who have a dredger nearly completed. I have no doubt but that their apparatus, if efficient, will recover for them greater results than their wildest dreams could have imagined.

Beyond this point we pass hydraulic claims and river leases held by different companies, the shareholders of which hail from many of the different countries of Europe as well as Canada and the States, till we reach by the South Fork the Quesnelle Lake, and by the North Fork the Cariboo Lake. On our way up these streams we find evidence of their cutting again and again at least two old channel systems, one above and one, I think, below the present system. In fact, to tell the honest truth, I have not sufficient knowledge of the country, neither do I think anyone else has, to make an approximate, much less reliable, map of the old channels of this section. This much I can say, that I have travelled a good deal by land and water through this section, and the result is that I am bewildered by the apparent number of old channels which cross and recross each other, all of which carry gold-bearing gravels. It is no unusual thing to find wash quartz gravel nearly two thousand feet above the present river.

At Quesnellemouth we leave the Fraser and proceed almost due east to Cariboo proper, the headquarters of which were, and now are, at Barkerville. For the fabulous sums realized in one day or one week, not from one claim but from dozens, I must refer you to the Government reports, and at the same time I must point out to you that many and many a hundred dollars was carried out of the country without any official notice being directed thereto. While on this subject I may state that it is my firm belief that the Chinese miners take out from the Forks District at the present time over a quarter of a million per annum. This is carried as a general rule to China in dust, or exchanged for American dollars, of which no entry is or can be made. Out of this district and its surroundings I think, according to the Government returns, about sixty millions have been taken.

After the Fraser the Columbia with its tributaries is the next largest stream, and therefore the next on the list of gold producers. Starting from the 49th parallel and proceeding up stream we find gold-bearing benches of more or less richness until we strike the Arrow Lakes. The river above this point does not seem to have been extremely rich, although some of the streams running into it were very productive. At Boat Encampment the river turns, and we proceed up stream in a southerly direction towards its rise, gold being found in its tributaries and in its benches, but not in as large quantities as in the Fraser.

As far as I can gather the Columbia River ran from Boat Encampment through Golden, southwards instead of northwards as at present, and I believe that most of the gold-bearing gravels in this portion of the country are below the present water level. The Kootenay, flowing from the Rockies southwards, nearly joins the Columbia, and is in direct contrast as regards the color of its water to that of the muddy Columbia. The Kootenay and its tributaries have been very rich both before it becomes an American river and after it returns to its native land.

Northwards again of both the Fraser and the Columbia are the Cassiar and the Omineca Districts, in which the prospector, who by the way must have plenty of grit in him for this journey, can make good wages by rocking or shovelling into small sluices. I have not been able to personally examine these districts, but from the reports brought in by some of my men I believe the gravel deposits suitable for hydraulic to be much

richer than those in Cariboo. On the other hand, I must point out that the cost of transport is exceedingly high, and the duration of the water season very short. I doubt very little that when roads are built, either by the Government or private individuals, there will be as much capital invested there as in any other part of the Province.

We are as yet only at the commencement of gravel mining by hydraulic methods in British Columbia, and I can assure you that we shall yet turn out millions. In corroboration of this statement, which may seem to be a rather wild one, I cannot do better than quote the words uttered to me by one of the greatest American experts in hydraulic mining, whose name is well known among Californians, viz: Mr. J. B. Hobson, which were as follows: "I have seen more gravel with greater gold tenure in six months in British Columbia than I know to exist in the whole of California."

Cariboo Creeks.

On Lightning Creek about 30 miles from Quesnelle is the Bonanza Mine which has been steadily worked for over twenty years with indifferent results. The owners have great faith in the property and expect to reap a rich reward.

Lovetts Creek is known as an "abandoned" creek, but was at one time the scene of mining operations. A company is now projecting work and is drifting on bedrock.

Peters Creek, which joins Lightning Creek at Beaver Pass, is also an "abandoned" creek, though a company expects to drift there for the the bedrock pay.

A number of leases have been taken on Lightning Creek from Beaver Pass down by one company, and towards Stanley by another. The bedrock is presumed to be rich in each case.

Davis Creek one mile below Stanley has three small hydraulic mines in it, all paying very well. They have been operated about ten years.

Chisholm Creek, which joins Lightning at Stanley, has been extensively worked, but the ground was too deep for old time miners who were drowned out by water. A hydraulic mine will commence operations there this season.

Last Chance Creek opposite Stanley is shallow, and a number of claims being worked pay very well.

Of the rich series of claims on Lightning Creek, the Vancouver, Victoria, and Van Winkle paid the owners about \$2,000,000 profit above working expenses, and it is judged that over \$10,000,000 has been taken out of the creek. Of the claims being worked at present the South Wales is the most prominent and has been exploited by poor men with little capital. Rich ground has been found, and reasonable profit is being made by working the mine. Along Lightning Creek benches which have been worked have proved very rich, Butcher's Flat being a notable instance.

Leaving Stanley, on the road to Barkerville one goes through Devils Canyon alongside of which good pay is still being taken out. Nearly every bench has its hydraulic mine.

On the south side of Slough Creek is famous Nelson Creek which has yielded a million dollars and is still being worked. Three hydraulic mines operated by Chinese men are being worked on adjacent benches.

Nelson Creek on the south and Coulter Creek on the north side nearly meet where the Slough Creek Mining Co. are now sinking a bedrock shaft to reach deep diggings nearly 300 feet below the surface. It is not unreasonable to suppose that the rich stream of gold from each creek will be found on bedrock.

On Willow River the Laird Company are prosecuting a work similar to that at Slough Creek, and the indications are equally good.

Mosquito Creek has two hydraulic claims which are worked yearly at a good profit. Only about 25 days run was made last year but the return on Mosquito Claim was about \$12,000.

Red Gulch, near Mosquito, is also very rich and empties into Willow River near the Laird workings.

Hardscrabble emptying into Willow River further down is now being worked quite extensively. Across the Divide from this is Sugar Creek which runs into Big Valley Creek.

Big Valley Creek has good prospects, and a number of leases in it are now being exploited by a heavy English company.

Pine Creek also empties into Big Valley Creek, and it and Summit Creek have proved to be the richest discoveries made for years adjacent to Barkerville

Jack of Clubs Creek empties into the lake of that name, and has been the "mystery" creek of Cariboo. From the mouth for some miles up it paid handsomely,

but then the pay disappeared.—

Thousands of dollars have been

spent in a vain endeavor to re-

locate the "run" of gold but so far

all efforts have been baffled. That

it is still there is confidently asser-

ted by all who have had any ex-

perience in Cariboo, and the lucky

finder will unearth a fortune.

One of the richest creeks of Cariboo is Lowhee,

also emptying into Jack of Clubs

Lake, and it has the distinction of

producing the largest nugget of

gold ever found in Cariboo. It

was valued at about \$800. Work is still being profitably carried on in

the creek.

Further on towards Barkerville is McArthur Gulch which is being worked. A hydraulic mine is in operation.

The Cariboo Gold Fields Concessions Co. are operating the lower end of Williams Creek from its junction

with Willow River to the town of Barkerville, and the leases extend over a distance of about two miles. Most

of the concessions are on gravel that lay so far down Williams Creek in "the Meadows" that all efforts to

successfully cope with the water failed, and the failure occurred when Williams Creek was producing at its best.

The company proposes to work the ground by the hydraulic elevator plan, and gigantic preparations have been

made to operate the mine. A drain tunnel nearly a mile long has been driven from Willow River up Wil-

liams Creek, designed to carry off surface water, and it will be pushed further as occasion requires. A ditch

several miles long has been constructed to carry water from high mountain streams to the pipe line, and the

water will be delivered into the mine at a pressure of more than 800 feet. The pipe line from the end of the supply ditch to the mine is more than 13,000 feet long, and the enormous power derived from the great pressure is designed to elevate all gravel and debris to a height of from 30 to 75 feet, and to carry it off to convenient dump ground. The pipe for this stupendous enterprise now lies at the Ashcroft freight yards awaiting shipment to Barkerville. It is probably the finest lot of pipe ever put into a hydraulic mine. The joints are fifteen feet in length and will be put together by the collar and lead process. Each piece of pipe weighs over 900 pounds and will cost more than \$100 by the time it is put into the pipe line. Last year the company had over 300,000 feet of lumber cut for its operations and the work for receiving the pipe is well along. It may be incidentally stated that the weight of the pipe is about 675,000 pounds, and about 35 freight cars were required to haul it from the seaboard to Ashcroft. The freight expense to its destination from Ashcroft will be about \$40,000. The pipe was made in Birmingham, England.

The Forest Rose operates across Williams Creek and

below Barkerville. The Rose has a season's work and is understood to clean up from \$10,000 to \$12,000 yearly. The hydraulic work is advancing to the old drift ground and much better results are expected when that is reached.

The Eye Opener is next, nearly opposite Barkerville. This company has struck an old channel of Williams Creek and is working in good pay.

Near the Eye Opener and opposite Barkerville is Conklins Gulch in which have been, and is still, rich diggings.

Just above Barkerville is Stout's Gulch where are two excellent hydraulic claims. This gulch rises opposite Lowhee Creek. Last year several nuggets worth more than \$100 apiece were discovered in this gulch, and one taken from Butt's Claim was worth \$235.

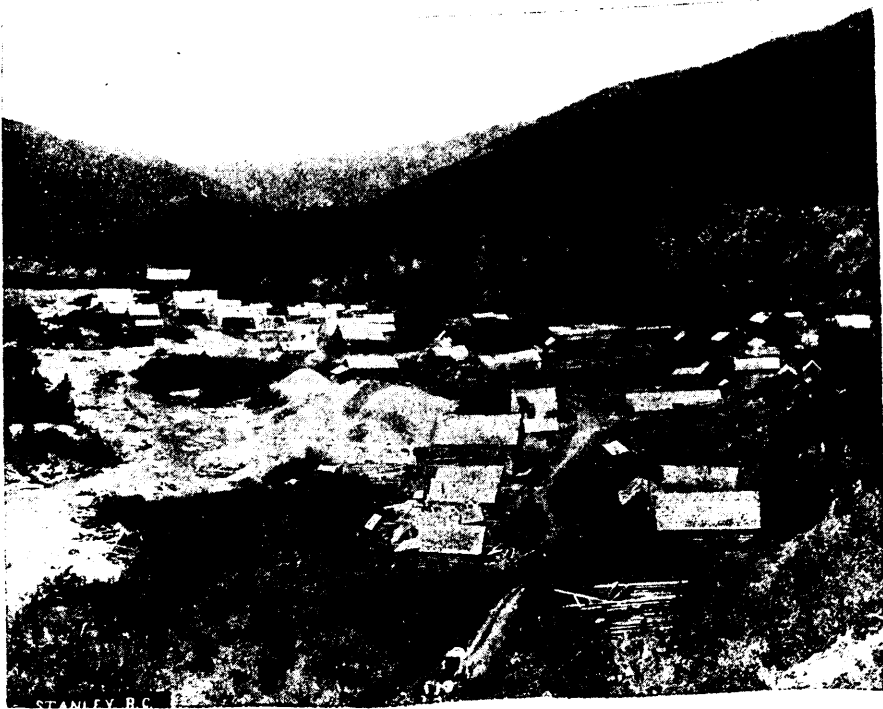
Several claims are still operating on upper Williams Creek.

Grouse Creek, four miles from Barkerville, is still being worked with good results, and is known as one of the richest of Cariboo's creeks. At the mouth of this creek is the Waverly Hydraulic Mine which has been in operation eighteen years, while further up is the Short Bend operated by a local company.

Antler Creek is practically "abandoned," but a syndicate has acquired a number of leases and expects to do some development work this year.

A number of claims are being worked in Cunningham Creek, and good prospects are ahead for it.

On Jack of Clubs creek Mr. Thomas' company have sunk their third shaft. The claim promises good so far.



STANLEY. B. C.

First Discovery on Horsefly River.

In April, 1859, a party consisting of H. O. Bowe and others made a discovery of gold about ten miles above the mouth of the Horsefly River and in the following month another party (amongst whom was Mr. John McLean, now at Quesnelle) also found gold at the same point. While the ground was considered rich the original discoverers passed on to more easily worked claims. At that time the excitement about Keithley Creek commenced. A horn was blown and the people in the vicinity being called together they were told of the riches of Keithley Creek and the result was a big camp.

The Chinese firm of Tong Kee then took up the ground on the Horsefly found by McLean and the others, and it is estimated that they took out over half a million dollars of gold. Tong Kee then sold to Harper and he in turn sold to Ward's company who are now preparing to operate it. There has been some dispute about the property, but this having all been settled the California company is now prepared to go on and work it for all it is worth. The claim runs diagonally across the river and is about a mile and a half long by one mile wide, the bulk of it being on the west side of the river. The ground to be worked is considered to be alluvial gravel partaking of the auriferous nature. The gravel is from fifteen to eighty feet deep and is supposed to be an old gravel bed, the streaks being very rich.

The ground is to be worked by the hydraulic elevator process, the ditch line being about four miles in length and taking water from Mussel Creek. The water is to be delivered at a pressure of 300 feet.

The ditch was dug this spring and the pipe moved on the ground during the winter and spring. Rivetting has been going on since February and it is expected that piping will commence before the end of the season, so that it will be next year before the real work of mining will be begun. The ground is comparatively level and admirably adapted to the hydraulic elevator plan of working. A sawmill and other buildings have been erected at the headquarters, 35 miles east of 150 Mile House and connected by good roads.

Aside from the two great mining companies on the Horsefly there are a number of other claims being worked on a smaller scale, several of which promise good results.

The Cariboo Mine.

The property is situated on the south side of the Quesnelle River, about four miles east of the town of Quesnelle Forks. It comprises eight mining leases, aggregating 426 acres of land which covers the auriferous deposits of an ancient river channel, which is separated for a considerable distance from the modern deep and canyon-like gorge of the south fork of Quesnelle River, and forms the north rim of the ancient river channel which is now found filled to a depth of 400 feet with a heavy deposit of high grade auriferous gravel.

Near the lower end of the property on Dancing Bill Gulch, successful hydraulic mining on a small scale with 5 inch pipes and 1½ inch nozzels, was carried on by Chinese companies for a period of about eighteen years; about one acre of gravel 300 feet deep was excavated without reaching the bed-rock or bottom of the channel.

The water is delivered and utilized through a system of ditches 7 x 13 x 3 feet deep, 17½ miles in length from the mine to the source of supply at Six Mile Creek, the outlet of Polleys and Boot Jack Lake, which have a storage area of about 2,200 acres, and have been converted into storage reservoirs by the construction of sub-

stantial dams eight feet high across their outlets. This supply is augmented by the water of numerous streams on line of main canal, which ensures a supply varying from 2,000 to 3,000 miner's inches throughout the season.

The mine is equipped with a portable hydraulic plant consisting of two lines of 22 in. and one line of 18 in. steel pipe aggregating 4,000 ft. in length, also five No. 8 Giants, having nozzles varying from 5 in. to 9 in. in diameter.

The gold saving appliances consist of 526 ft. of 3 x 5 ft. sluices and 588 ft. of 3 x 6 ft. sluices, paved with improved iron riffles.

The water is delivered at the mine on the floor of the hydraulic excavations with a head of 300 ft.

During the progress of the work of equipment and installation of the heavy plant and opening the working hydraulic pits extending over the seasons of 1894 and 1895, water was used about 48 days in the removal of about 210,000 cubic yards of earth, gravel, and boulders, a large percentage of which was composed of accumulations of tailings and boulders left piled in Dancing Bill Gulch by the Chinese miners, and the product therefrom has been \$65,467. Two working pits are now opened in the upper gravels, the banks of which are about 300 ft. in height.

The floors of these hydraulic excavations lie from 50 to 100 ft. above the bottom of the channel. This lower bench of high grade gravel will be opened and worked as soon as the upper workings are carried forward a sufficient distance to leave the lower workings safe from the danger of caves from the upper workings.

The mines are now on a basis for profitable production, and it is expected that during the ensuing season of 1896, the mine will be run nearly full time and the output very large.

The Horsefly Mine.

During the summer of 1891 Mr. J. B. Hobson, a practical engineer of great experience, with two men went over the ground on the Horsefly River where at the present time active hydraulic operations are being carried on. In the fall of the same year practical steps were taken for the organization of a company which in 1893 was fully incorporated. Mr. Hobson then made a minute examination of the ground ten miles wide by twenty long, drawing maps in which every stream, lake, prominent hill, and gulch of any consequence were shown. On this report the parties interested took up about 1,500 acres about 53 miles north of the 108 Mile House on the Cariboo Road and about six miles south of Quesnelle Lake. There are eleven mining leases in all, and the exact acreage covered by these comprise 1,475 acres of land covering the auriferous gravel deposits of an ancient river a portion of which is similar in character to the famous ancient river deposits in California known as the Blue Lode.

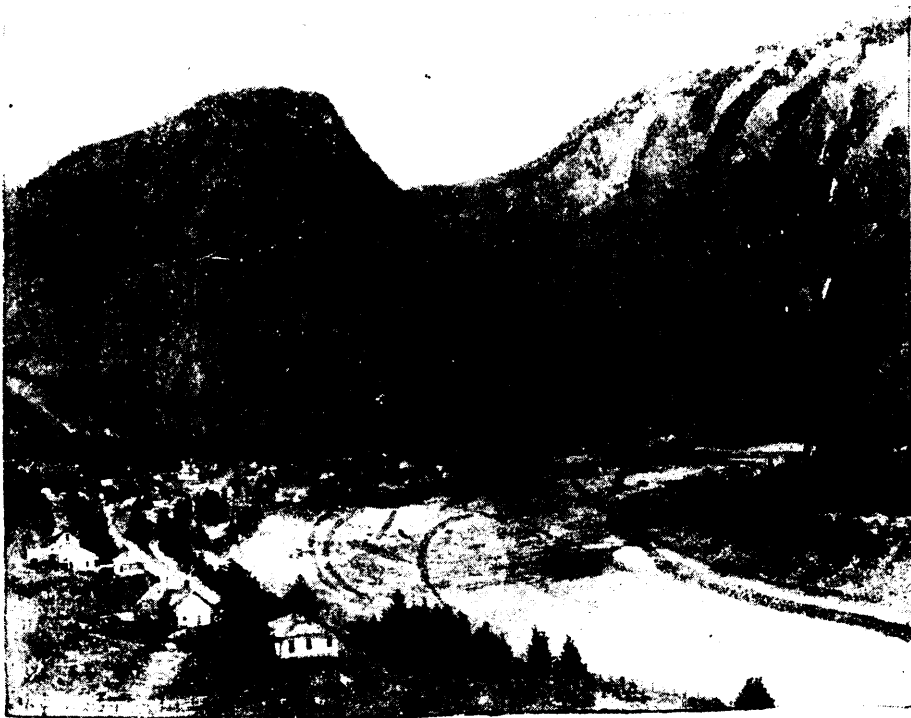
The hydraulic system completed last year under the supervision of Mr. Hobson brings water from Mussel Creek, which is tributary to the Horsefly River, by a ditch and pipe line 12½ miles in length and with a capacity for delivering 1,800 miner's inches of water.

The pipe line is of steel 30 in. in diameter, made in two inverted syphons aggregating 8,300 feet. There are also three sections of flume 3 x 5 feet aggregating 600 feet. Water can be delivered from the main ditch with a head of 168 feet and from the pooling reservoir near the mine with a head of 106 feet, although it has not been found necessary to use it to that extent. The bed-rock constituting the floor of the hydraulic workings is about ninety feet above high water mark of the Horsefly river.

The mines are equipped with a portable hydraulic plant consisting of three lines of 22 in. steel pipes aggregating 3,000 feet, 2,000 feet of 18 in. steel branch pipes, six No. eight 18 in. hydraulic Giants with nozzels ranging from five to eight inches. The gold saving appliances are 800 feet of 3 x 6 ft. sluices paved with improved iron riffles.

Since the completion of the water supply the work of breaking cuts through the rim of deposits, opening up the pits and installing the gold saving and hydraulic plant therein has kept the company's employees actively employed. In the course of these operations a hard body of cemented blue gravel was encountered which gave a great deal of trouble. Blasting had to be resorted to and at last the hard material decreased to a thin stratum and very little trouble is expected from it during the present season. During 1894-5 water was used only 104 days altogether and in that time 450,000 cubic yards of rock cement and gravel were removed and gold to the value of \$59,640 recovered. This averaged thirteen cents per cubic yard of material removed, and the mine being now on a basis for profitable production a large output is expected this season.

At the headquarters of the mine a small village has been built consisting of manager's house and offices, cook and bunk houses, retorting works, assay house, saw and planing mill, blacksmith and carpenter shops, etc., etc. Two acres have been laid out in gardens, and cows, horses, and mules are kept for the use of the employees. The capital of the company operating this mine is \$250,000.00, in shares of \$10 each.



YALE, B. C.

Golden Cariboo.

As the richness of the deep deposits of this section of British Columbia are now attracting the attention of capitalists, not only in Canada and the States, but also in Europe, in the same way that the shallow deposits appealed to the prospectors 30 odd years ago, it would perhaps be as well to give directions as to the route to be followed in reaching this modern Eldorado. Ashcroft is the point where one leaves the C. P. R. system, but for through passengers, whether coming from the East or the West, it is cheaper, I think, to take a ticket to Vancouver and there purchase another for Ashcroft. On arriving at Ashcroft arrangements must be made for transport to the goldfields, either by coach or horse, the former, perhaps, being more suitable for business men who may be pressed for time. After leaving Ashcroft at about 4 a. m. our first stopping place is Hat Creek,

where we change horses and have breakfast. Thence we go to Clinton where we have another meal and another change of horses. Soon after leaving Clinton we ascend about 1,000 feet to a level plateau and finally reach the 62 Mile House, where we have another change of horses but no food. While fresh horses are being put to, it will repay one to visit the canyon which is within a few yards of the stable. This canyon is cut out by some agency (what this agency may be I do not know) to a depth of nearly 1,000 feet through pure lava. The sides being perpendicular, one can trace the different flows which have come from volcanoes, no traces of which now, so far as I know, exist. From the 62 we make our way to the 83, all of the journey being over this lava bed. Here we have supper and a bed, only to be called up again at from three to five in the morning to continue our journey. At about the 90 mile point we begin our descent of about 1,000 feet, from the lava bed to the level of the ordinary country. Our next change is at the 108, owned by my friend Mr. S. Tingley, who is at the same time, I believe, chief owner of the Express Company. Here a road branches off to the far famed Horsefly Country, of which I shall make mention hereafter. From

the 108 we proceed to the 134, and thence to the 150, another point of departure for the Horsefly Country, and also for the Quesnelle Forks district. Leaving the 150 we proceed, with various changes of horses, to Barkerville, some two days journey from the 150.

Harking back to the 108 or 150 Mile House we proceed by either route to the Horsefly Country. On the Horsefly River, perhaps the largest concern operating

there, is the Horsefly Hydraulic Mining Company, Limited, which has ten or twelve locations. This company has enormous capital behind it, derived mainly from the chief officials of the C. P. R. The magnitude of these operations, which have been conducted under the supervision of Mr. J. B. Hobson, can be conceived from the fact that at one blast 40,000 lbs. of powder were fired to disintegrate a certain amount of conglomerate, which was found to exist between the monitors and the pay gravel. From late reports this conglomerate has almost disappeared, and, if such is the case, the company seems in a fair way to make not only a good dividend for the shareholders but almost a fortune for each of them. From the 150, besides the road leading to the Horsefly, is also one leading to the Quesnelle Forks district. Here the largest mine, and at present the most profitable, is that belonging to the Cariboo Hydraulic Mining Company, Limited, which is chiefly owned by the same shareholders as those in the Horsefly. Last

year, the mine being only partially equipped, for the final run they cleaned up \$41,875 for work carried on for 29 days of 24 hours each. This year, after having washed away the debris which fell from the capping and the frozen mass of slide material which always accumulates in hydraulic mines during the winter season, they are now pipping on pay gravel. When this mine is thoroughly opened, which will probably not be before 1899, I think it will turn out a million a year. This long waiting is the worst feature of hydraulic mining, but, on the other hand, no industry is so sure of returning its 10 to 500 per cent. when work on pay gravel commences under conditions by which the full development of the mine may have been reached. Following the South Fork of the Quesnelle, we next arrive at the ground belonging to the Victoria Consolidated Company, which I hope will prove equally as rich as that belonging to the Cariboo Company, whose property it adjoins. Beyond this we have the Quesnelle Forks Mining Syndicate's ground, which is situated at the old junction of the North and South Forks, some short distance from the present junction. On the other side of the South Fork we have the claims of the North Fork Canal and Hydraulic Mining Company (almost directly opposite the ground belonging to the Quesnelle Forks Hydraulic Mining Syndicate) as well as the Rose Gulch and two or three other properties which, I have no doubt, with better appliances than those now in use, and with greater capital for working expenses than the present owners possess, will some day prove exceedingly profitable.

Setting out from Quesnelle Forks and proceeding up the North Fork we reach, first of all, leaving out of consideration bench and bar diggings, Kangaroo Creek. This creek, as far as surface diggings are concerned, has proved very rich, and, in addition to a long tunnel which has been driven to strike the old channel, there is also a shaft which has been sunk some 40 feet below the level of the present river. Just as the miners, all honor to them for their pluck, had penetrated the "blue clay" and struck pay gravel the water came in on them, and, as their resources were limited, active work was for a time discontinued. They, however, have proved an exceedingly interesting geological fact, viz.: that there is an ancient channel far below the present water system. This fact, in addition to the knowledge gained from the Cariboo Company's ground, proves that there are at least two old channel systems, one above and one below the present river. Proceeding up river we strike, first of all, Grey and Company's property. Here an attempt is being made to divert the course of the stream and apparently success will be attained. This river in innumerable places has (unlike the main Quesnelle, the current of which is too swift, as a general rule, for this purpose) been wing dammed, so that I do not see how, provided the river can be diverted, a rich reward will not be reaped by the shareholders. Almost adjoining this property is that belonging to the Fishback Hydraulic Gold Mining Company, Limited, consisting of about 830 acres of what is apparently, or I should say certainly, an old channel of the North Fork. Prospects from the surface of this mine say, for 20 feet down, contain much more gold than the surface of even the far famed Cariboo. What may be the amount realized at the lower levels can only be left to the imagination, suffice it to say that at the outlet many and many a thousand dollars were taken from the gravel in the old days by the rocker. Beyond this property is that belonging to the Consolidated Victoria Hydraulic Mining Company, which company also owns the ground adjoining the famed Cariboo, mention of which I have already made. Proceeding northwards we pass various

streams, all more or less gold bearing, until we reach the Cariboo Lake, into which Keithley Creek, perhaps one of the richest creeks in this district, empties. Returning to the left bank we find the following hydraulic claims situated on or near Black Bear and Spanish Creeks, viz.: the Moore Company, Black Bear Company, Toms and J. Mather. Farther down stream we find a large number of claims held by the North Fork Canal & Hydraulic Mining Company, which are almost opposite to those owned by the Fishback Company. Various claims are also held by small owners until we reach the junction of the North and South rivers at Quesnelle Forks.

From the Forks down stream the first mine of any importance, although many acres of the bench lands have been staked out, is that belonging to the Maud Hydraulic Mining Company, Limited. As I am president and managing director of this company, I cannot say anything against it or for it. So much, however, I will say, that we have eight locations amounting in all, I think, to about 800 acres with a water right of 9,000 inches, which latter can, by construction of several dams, be brought on to the company's property without building even a single mile of ditch. From rim-rock to rim-rock of this channel the distance is about 4,000 feet: this measurement being taken at a point about 300 feet below the surface. My opinion is that the old channel on which the Cariboo Company's ground is situated was joined by another old channel (which ran parallel to the present North Fork) at some point at a short distance east of the Maud property. From my knowledge gained from the formation of the country, as well as from tests of the fineness and character of the gold from this property compared with those from the old channels to the eastward I am led to believe that this company owns the main ancient channel. This property can at the same time be both hydrauliced and drifted. Proceeding down stream we pass the locations of the More Head Creek Syndicate, on which not much development work has yet been done. Further on we come to the grounds of the 20 Mile Creek Syndicate, on which development work has been carried on for one or two years. I might mention that from this point to the Forks 20 miles of the river have been leased by capitalists who intend to place dredgers at work during the present season. If they can make a tithe of what one man made last season they will make gold almost as cheap as silver. This man waded into the river until the water was near the top of his gum boots and took gravel from the bottom, which he carried ashore and washed, in four days cleaning up six ounces. This property, as well as the Fishback, is now being transferred to a large syndicate which is on the eve of expending large sums of money in equipping their mines. The whole of this river has been taken up for dredging purposes and at present two plants are in operation, viz.: the Fader bucket dredge and the ordinary dredge under the able direction of Colonel Underwood. Various rumors have been afloat as to the amount of gold taken out but the amounts named seem too high to be true. Below the 20 Mile Creek is the ground owned by the Montreal & B. C. Prospecting & Mining Co., which probably has a larger area of mining property than any other company in B. C. From what I can gather, systematic development work has been carried on and the result of tests of the gravel have been extremely satisfactory. At the mouth of the Beaver River is the property belonging to the Beavermouth Hydraulic Mining Company, Limited, which I believe has lately been sold to an English syndicate. From what I hear the deposit seems to be the same as that in the ground of the Montreal Company. Beyond this again we find the French Company exploring

ing and developing property similar to other bench claims on this river. The last property before we reach Quesnelle mouth is the McLaren property, on which work has been progressing for some little time.

As I am afraid that this paper has gone beyond the space which you may feel inclined to spare in your journal, I must defer my description of Upper Cariboo until your next number. I hope, however, that I have given you sufficient data to arouse the interests of would-be investors, so that they may feel inclined to personally examine the deep deposits of a district which all British Columbians will agree with me in naming "Golden" Cariboo.

J. M. BUXTON.

The Starting Point to the Interior.

It may be interesting to those who have never travelled over the Cariboo Road and to others who may wish to ship goods into the interior to learn the following particulars:

Ashcroft is, it may be said, the jumping-off place on the C. P. R. for travellers bound for Cariboo. Immediately opposite the station is the Ashcroft Hotel, a roomy house with comfortably furnished rooms and other conveniences, where the night is spent before taking the stage; or if the travellers wish to spend a day or two at the "Gateway City," as it is called, the Ashcroft Hotel is a good house to stay at. A few doors away is the office of the B. C. Express Co., from which the stages start Mondays, Wednesdays, and Fridays; or, if a party of five or more persons wish a special stage, it will be furnished to them at regular rates. The B. C. Express Co. are famous for the excellence of their conveyances: The horses are the best that can be procured, and the drivers are careful and thoroughly experienced men. The stopping places along the road are most comfortable, so that the traveller experiences no hardships, but a good deal of pleasure, on the trip.

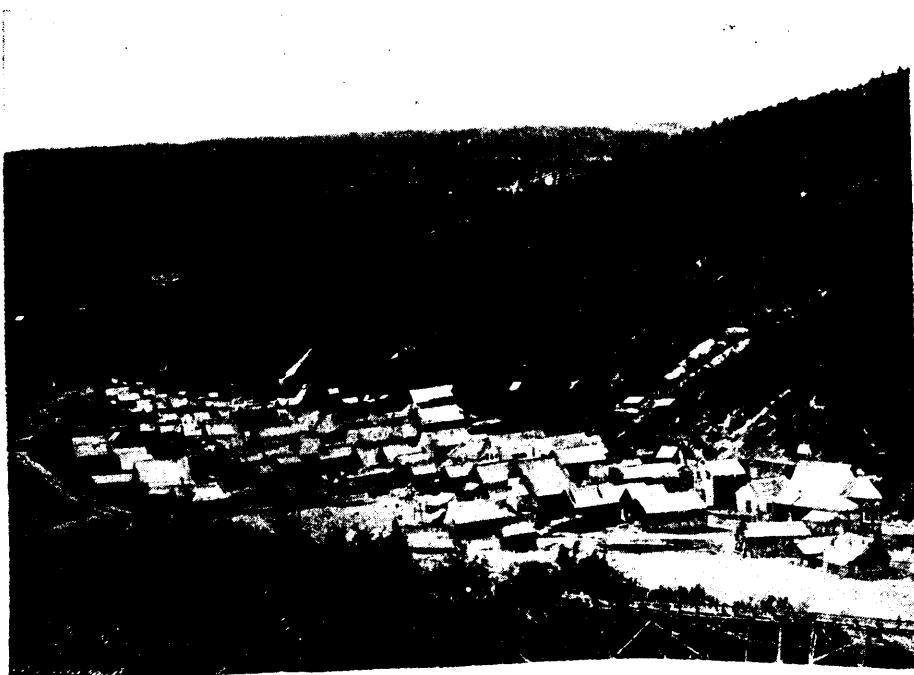
A short distance down the street, and on the opposite side from the Express Co. are the commodious stables of Collins & Haddock, where a large stock of neat buggies, etc., are always on hand for those who wish to take a spin around the country. In connection with this it may be well to mention, for the benefit of those who have time, and who love a delightful drive, that the road from Ashcroft to Lillooet presents to the eye some of the most magnificent bits of scenery to be found in British Columbia. For about fifteen miles approaching Lillooet the road skirts the river, and with a comfortable rig behind a pair of good horses a most enjoyable trip can be had. If a party desire to take time to thoroughly enjoy the road to the interior, they can obtain a most comfortable conveyance from Collins & Haddock, and travel into Cariboo at their own sweet leisure. There is thus every convenience afforded to travellers going into Cariboo.

Near the Ashcroft Hotel there is a well equipped drug-gist establishment kept by Mr. Clements, so that parties going into the country need not cumber themselves with anything in that line coming from the east or west.

And now we come to a most important item of information to those who are interested in mining development. From Ashcroft all goods and machinery have to be hauled by team over the road, and a few doors from the hotel are the offices of Harvey, Bailey, & Co., who undertake to forward anything, from a needle to the largest piece of machinery, to any point in the Interior. Their facilities are exceptionally perfect for this work, and while at Ashcroft we saw a pile of steel piping consigned to their care, for a large hydraulic company, the inland freight of which alone will amount to over \$40,000. This piping was manufactured by Thos. Piggott & Co., Ltd., of Birmingham, England, and is of the very finest quality made.

Mr. F. W. Foster, who carries on two immense mercantile establishments, one at Ashcroft and the other at Clinton, also does a very large amount of freighting, so that parties having machinery or goods to go into the Interior have every facility at Ashcroft for forwarding them.

Parties going to Cariboo should stop at Mr. Foster's establishment at Clinton, where they will be able to form a good idea of the immense trade being done, and at the same time obtain articles necessary on the journey or in the work of prospecting or mining.



BARKERVILLE, B. C.

The Golden Eagle Mine.

An auriferous ledge, from eight to ten feet in thickness, of free milling gold quartz, has just been discovered on Cayuse Creek, ten miles above Lillooet, which assays all the way up to \$1,320 in gold per ton. This mine is owned by a syndicate represented by McKinnon, DeBeck & Co., Vancouver, some of the members of which, with pardonable enthusiasm, predict that it will prove a bonanza of startling dimensions. Although prospectors have, for years, hunted for this ledge, judging of its near vicinity by the float found in the neighborhood, and also by the richness of the creek, which has yielded in the past ten or fifteen years one million dollars, yet the ledge could never be found.

Last month a half-breed named Joe Copeland, while hunting mountain sheep, found the croppings of the ledge on the face of a bluff, in a place almost inaccessi-

ble, and brought a few samples of the rock away with him. He showed his samples to Arthur Noel, a miner from Montana, who had been hunting for the ledge for a year and a half. Taking Noel into partnership, the two went back and worked on the ledge to show it up, hammering out enough gold, by crude methods, to pay for their supplies. The present owners of the mine had some difficulty in buying it for \$25,000—\$50,000 being the price asked by the lucky discoverers. It is the intention to organize a limited liability company, and immediately go to work developing the mine. By bringing water from a point three quarters of a mile up the creek, 100 feet of head can be obtained, and of ample volume to drive a 20 stamp mill, though it is probable that a mill of 10 stamps will be used at the start. The mine is situated ten miles from Lillooet, as already stated, and Lillooet is within 46 miles of Lytton on the C. P. R. To get in machinery and supplies it will only be necessary to make a trail for a distance of about four miles.

This mine will be of direct benefit to Vancouver, as all the supplies will be drawn from there, and if it is one tenth as rich as present indications would suggest, it will be a large contributor to the wealth of the Province. It may be added that the vein is so clearly defined, and of such a uniform thickness, that there can be very little doubt of its permanence, and owing to its favorable position, some 1,800 feet from the creek, it could be profitably worked at \$5 per ton. It is under contemplation to put in a dynamo and use the electric drill.

A Fine Gold Saving Machine.

A BRITISH COLUMBIAN'S INVENTION.

The working model of a fine gold saving machine has been constructed at the Albion Iron Works at Victoria, which may solve the puzzling problem of saving at a small cost the gold contained in black sand, the fine gold, sometimes invisible to the naked eye, which is constantly being lost in hydraulic propositions, and with some modification as an amalgamator and concentrator in stamp mills, increasing the capacity of a stamp mill four-fold—saving the free gold in the ore and throwing out the sulphurets contained in the tailings for further treatment freed from the lighter matrix. This machine, considering its capabilities, is very simple in construction. It can be made in any size from a hand machine for the prospector, with a weight of about 150 pounds, with the capacity for treating about ten to twelve tons per day, to that for hydraulic mining, weighing nearly a ton and a half, and which can draw the principal part of the gold from two thousand tons of the escaping tailings daily. These machines will be constructed in such a manner that they can be taken to pieces for transportation. A short description may be interesting to some of our readers.

The amalgamating portion of the machine consists of an outer cylinder, copper lined and having a depression beneath to contain a large quantity of mercury. Inside this cylinder revolves an inner cylinder made of many folds of corrugated copper running spirally to the centre, at one end of which is a discharge opening into an outer chamber in which are revolving a number of beaters; the sides of this chamber are also of corrugated copper. Between the folds of corrugated copper in the inner cylinder are placed vibrating plates of corrugated copper, and between these again are current diverters or vanes moving in opposite directions to each other, in such a way that they distribute the current or stream of tailings passing through the machine alternately on each side of the folds. As the folds in the entire inner cylinder are

amalgamated on both sides, it will at once be perceived that the amalgamating powers of this machine are very great; while the corrugations in the machine not only prevent scouring but make the machine practically a revolving sluice box, having amalgamated copper riffles. Means are provided for quickly opening the machine, and it takes but a few minutes to extract or clean any or all of the plates. From the second chamber, where the beating or agitating paddles are placed, the tailings pass into the discharge, which, by easily arranged parts, throws out two separate grades of tailings, heavy and light. The heavy grade can be thrown out by proper attention to its gravity so as to contain but little of the waste, and can be saved for further treatment if found desirable. If the machine is designed to save the fine gold in the escaping tailings from hydraulic mines, a separate part, consisting of a grating, generally known as a "grizzly," but of improved design, is provided, having the bars extending around the sides and bottom, and leading to an under current placed below the bars. Means are taken to regulate the size of the tailings passing through the bars into the under current.

This "grizzly" with the under current is generally placed in the line of sluice boxes at the discharge end, and conducts the sifted tailings, passing through it, into the hopper of the amalgamator already described, the boulders and coarser gravel being carried over the bars to the dump. The gold saved in this way is simply that which has refused to be retained in the riffles or under currents in the flume, and represents simply a saving of gold which would otherwise be lost. The capacity of one of these larger machines is between 300 and 400 tons of siftings per day, which would represent the finer tailings in from 1,500 to 2,000 tons of the tailings passing down in the flume. All the exposed and wearing parts of the corrugations in these larger machines are steel bound, preventing any wear on the copper itself.

A large size machine has over one thousand square feet of amalgamating surface, and carries on these plates and in the pockets about 500 pounds of mercury. One or more machines can be attached to the flume. The small power required to run the machine can easily be obtained from the head of water at the mine, from which point it can be transferred to the machine in the most convenient form.

Where large quantities of black sand are to be treated a machine about two-thirds the size of that intended for hydraulic mining will be made. The amalgamating portion of this machine is similar to that of the larger one. There will be attached to it, however, a set of steel rollers having interlocking teeth, and beneath these rollers is a cylinder with spirally arranged indentations on its surface. This roller rests in a bed having sharp but shallow indentations arranged horizontally across its surface. The black sand falling from the hopper above passes between the teeth of the revolving rollers, where it is made of an even size, and is carried down between revolving rollers and its bed (called the "pulverizer"), and falls into the amalgamator, ground into an impalpable powder. The cleaving affinity between the gold and the black sand having by this process been destroyed, no trouble will be experienced in saving the gold, however fine. The capacity of this machine will be from 60 to 75 tons per day, and very low grade sand can be profitably worked, as the running expense will be very light. For free milling ore and ore containing a percentage of free gold and some sulphurets, the machine will be of the size and description of that described for the treatment of black sand, save that extra care will be taken in the position of the pulverizing roller, so that any degree of fineness can be obtained. Some ores require coarser grinding than others. The

pulverizing roller will be found very useful where rusty gold is present, releasing it from its coating of oxide, and so permitting free amalgamation. When the sulphates are to be saved for future treatment, the lower tailings discharge can be so regulated by shortening or extending the position of the upper discharge that the effect of gravity on the tailings discharged automatically from the lower discharge will be such that very clean concentrates can be produced, the lighter portion passing away through the upper discharge. The amalgamator, as described above, if run in connection with an ordinary stamp mill, or with any rock crusher which is capable of reducing the rock sufficiently fine to permit of easy crushing in the grinders attached to the amalgamator, crushed rock the size of an ordinary bean or a large pea is preferable. Where a stamp mill is used, a very coarse mesh, say six to eight to an inch, would give good results and enable a ten stamp mill to do the work of forty stamps under ordinary conditions.

A handy, little machine will be made on the principles of this amalgamator, but somewhat simplified and with a weight of but 150 pounds. This will be worked by hand and will handle from ten to twelve tons of sand or gravel per day. It is designed for prospectors' use and will be very portable and a close saver.

Similkameen River and Creeks.

While giving due prominence to the fact that gigantic hydraulic operation are now in progress in the Cariboo and Yale Districts, which have received great attention from the press, there are several plants in operation and in course of construction in places that have been almost overlooked because they are out of the general trend of travel and observation.

On Tranquille Creek, near Kamloops, is a hydraulic plant which last year did some work and this year has resumed operations, while another company has gone on to the ground in the same creek and is busily engaged in erecting a plant of good capacity. The gold in the creek is of excellent quality and coarse, having much the appearance of that found at Barkerville and Stanley.

Near Princeton are two or three plants in operation and in course of construction, which are to work the gravels in that vicinity. One of them, the Similkameen Gold Mining and Platinum Company, has a hydraulic plant that will compare favorably with many much talked of concerns in Cariboo and other parts of Yale District.

On Granite Creek, a tributary of the Similkameen River, extensive placer deposits were found and worked thirty years ago. The gold was coarse and of excellent quality.

The Similkameen River has been extensively worked for many years and has been a gold bearing stream clear down to its mouth at Oroville in the state of Washington.

Kruger Mountain, Lower Okanagan.

Situated in the southern portion of Yale District, some ten miles below Fairview, is Kruger Mountain, which has lately come into prominence as a rich quartz-bearing region. During the past fall and spring hundreds of locations have been made, and thousands of dollars spent in development work. The ores in appearance and quality are nearly akin to those of the Fairview Region, and the classification by scientists and assayers is nearly the same. So recently have the discoveries been made that not a great deal of development has been done, but enough to show the valuable character of the quartz has been accomplished, and a number of mills are to be erected to work the ores. The mountain is divided by

the boundary line, and a part of it lies in the State of Washington. Similkameen River flows past its southern base.

Just across the river is Palmer Mountain, about fourteen miles long, and as the press of Seattle and Spokane have always so handsomely noted the mining interests of this Province, it is with pleasure that a word is said of the prominent section covered by Palmer Mountain and the Chapacas. At Golden on Palmer Mountain is the Spokane Group of quartz mines, 25 in number, owned by J. B. McLaren of New Westminster and his associates. A substantial, ten-stamp quartz mill is in operation, and development work and ore crushing are steadily progressing. The ore is of fair assay value and the quantity in sight is immense. The Triune mill, one mile west of Golden, is also at work crushing ore.

Palmer Mountain has probably the richest surface showing of any section in the state. It was on the Rainbow Claim that a piece of quartz of about twenty pounds weight produced over \$2,300 in gold, being nearly solid. Work on the south end of Palmer Mountain near Loomiston has been in a state of suspension for a couple of years, but a big scheme is being projected to run a tunnel 4,000 feet to tap the Gold Finch Group of 17 claims. The plan is practicable and feasible, and will cross-cut more than a dozen lodes of value. The capital has been subscribed.

On Mt. Chapaca a Wisconsin syndicate has been developing the Rush Mine for some years and will this season erect a mill.

On Little Chapaca is the Wyandotte Group which is a paying and valuable property. The cyanide process will be used from now on to save the mineral.

Mining Enterprise.

A LARGE CONTRACT FOR AIR COMPRESSING MACHINERY.

The Le Roi Mining & Smelting Co. have just closed a contract with the Canadian Rand Drill Co. of Montreal for the largest and most extensive air compressor plant ever built in the Dominion of Canada.

The specifications call for one cross compound condensing Corliss air compressor of about 450 indicated horse-power. The machine is to be fitted with the latest type of mechanical air valves, which effect a considerable percentage of economy. When in position the machinery will be used for hoisting and pumping and to operate about 40 drills at the elevation of the Le Roi Mines, which is about 3,000 feet above sea level.

The machine is to be built in the new works of the contractors at Sherbrooke. When it arrives at the property it will be put on the Black Bear, which is west of the present shaft house on the Le Roi. The plant will weigh 137,000 pounds.

What a Canadian Firm is Doing.

Messrs. M. Beatty & Sons, of Welland, are doing a good deal of work in building dredgers for the Fraser and Thompson Rivers. They have just completed the Underwood dredger and now they have just closed the contract for a gold dredging plant consisting of a dipper dredge, scows, sluice boxes, grizzlies, etc., to be used on the Fraser River at Boston Bar, by a company of capitalists in Welland, most of whom are practical manufacturers and dredging contractors. They expect to have it in operation by September, if not delayed by high water too late, and think it will be the most complete and successful plant yet put in operation in B. C. for taking gold from the river bottoms.

Notes.

We call the attention of our readers to the advertisement of John Taylor & Co., San Francisco, Cal., one of the largest houses in their line in the United States. San Francisco is a handy market for supplying parties in British Columbia with assayers' materials and as John Taylor & Co. carry a very large and complete stock of all articles in that line we would recommend our readers to communicate with them. They also carry a full stock of mine and mill supplies, and miners, mine owners, and assayers will find it to their advantage to communicate with this reliable firm.

We would call attention to the advertisement of James H. Lancaster, of New York, in this issue. This firm is one of the foremost in the United States and mine owners should not fail to send either to us or direct to Mr. Lancaster for descriptions of the various machines manufactured by him. It will well repay them to do so.

One of the most useful arrangements for prospectors is the handy furnace manufactured by the National Ore & Reduction Co. It is not only handy but exceedingly cheap, and no prospector, who can afford the small price asked for these furnaces, should be without one. It is one of the best things offered in the market to miners with limited means.

The California wire rope structures are now famous in British Columbia, and the success, which has attended them wherever erected, is a guarantee that our mining men will continue to use what they have tested and found to be good.

Not long ago we had the pleasure of going through the work shops of the Northey Co. at Toronto, and were surprised at the number and variety of pumps being manufactured. These pumps, so far as we can learn, have always given satisfaction. We have a supply of descriptive catalogues of the Northey Co., and will be pleased to forward copies to those wishing to enquire into their merits.

Boundary Creek Notes.

[FROM OUR CORRESPONDENT.]

Owing to the continued bad weather very little of importance has been going on in this district. Prospectors have been out without being able to locate anything of value owing to the snow, which, even in the valleys, has continued to fall intermittently during the past month, and is still lying several feet deep on the higher hills. Quite a number of small deals have taken place, and absurd prices, asked in many cases for totally undeveloped and unproved claims, are being obtained. The only transfer of importance is the sale of the Skylark Mine to an American Syndicate, the Skylark being one of the best developed claims in this district.

Mr. George Turner has continued operations with a diamond drill on the Gold Drop, Greenwood Camp, and has proved up the mine satisfactorily to a depth of about one hundred feet.

Miners are coming in from all directions to the Boundary Creek District, though chiefly at present from the American side, and there seems every probability that this summer will show a great activity and development of the vast bodies of ore in and around Boundary Creek.

Book Notice.

We have received a copy of the Merchant's Agency Red Book, which in handy form is a useful directory of the whole Province. The announcement is made that it will be issued semi-annually, which will make it a

thoroughly up-to-date work which no mercantile or manufacturing house can afford to be without. An enlargement of the work is promised, the main features of which are: a complete guide to each city, town, village, settlement, mining camp, railway station, express, telegraph and post office, P. O. savings bank, money order office, etc., as well as the distance of each place from some well known point or distributing centre.

It contains a complete list of trade and professional concerns and enterprises engaged in business at the different points, with kind of business, names of partners in a firm, full christian names, etc.

It is one of the handiest and most useful works yet issued in the Province, and is published at The Merchant's Agency at Victoria, B. C.

A Flourishing Company.

Shares in the Dominion Developing and Mining Company are commending themselves to Eastern buyers and the stock is being rapidly taken up. The company have secured an interest in the recent wonderful find of gold in Lillooet and now are part owners of the rich Golden Eagle Group. Besides this the company are carefully watching every opportunity to secure valuable properties, and as the management is conducted on an economical and thoroughly business basis, the outlook for investors in this stock is most promising.

On the Stage Road From Ashcroft.

DISTANCES FROM ASHCROFT.

Places	Miles	Places	Miles
Cache Creek	6	122-Mile House	107
C. McDonald's	12	127-Mile House	112
Hat Creek	14	134-Mile House	119
20-Mile House	20	139-Mile House	124
22-Mile House	22	141-Mile House	126
CLINTON	32	144-Mile House	129
59-Mile House	44	150-MILE HOUSE	135
61-Mile House	46	Soda Creek	165
70-Mile House	55	Alexandria	185
83-Mile House	68	Moffat's	198
87-Mile House	72	Australian Ranch	200
100-Mile House	83	Bohanon's	220
105-Mile House	90	Quesnelle	241
108-Mile House	93	Cottonwood	265
111-Mile House	96	Beaver Pass	270
115-Mile House	100	Stanley	280
117-Mile House	102	Barkerville	but

Places below, the roads branch from 150-Mile House, but distances are from Ashcroft.

Places	Miles
Big Lake	159
Beaver Lake	167
Quesnelle Forks	191

Vernon.

This is the chief town in what may be described as British Columbia's store-house—Okanagan—Spallumcheen. It is incorporated, and its assessed value is some \$500,000. It is on the Shuswap & Okanagan Railway, about four miles from Okanagan Lake, which gives it exceptional communication with all the rich farming, fruit-growing, and mining fields of Lower Yale. It is a great resort for tourists, big game abounding near at hand. It is the supply point also for the adjacent mining camps at Hewitt's, Swan Lake, and Cherry Creek. It has good stores, Bank of Montreal branch, Wulfsohn & Bewicke's private bank, daily mail, fire brigade, and a live, well edited newspaper. Church of England, Presbyterian, Methodist—all have churches; in fact every comfort can be had at Vernon.

CATALOGUES RECEIVED.

Which will be sent free to any subscriber of the RECORD on application to the Editor.

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.
 Northey Manufacturing Co., Ltd., Pumping Machinery.
 Girard Water-wheel Co., Water-wheels.
 M. C. Bullock Manufacturing Co., Diamond Drills, &c.
 H. W. Caldwell & Son Co., Elevating Machinery, &c.
 Edward P. Allis Company, Mining and Milling Machinery.
 J. J. Norman Company, Gas and Gasoline Engines.
 Sullivan Machinery Co., Diamond Prospecting Drills.
 Electrical Engineering Co., Dynamos and Motors, &c.
 Canada Paint Co., Paints, &c.
 William Hoskins & Co., Hydro-Carbon Blow-pipes, &c.
 Gutta Percha and Rubber Manuf'g Co., Rubber Goods.
 The Dominion Wire Rope Co., Wire Rope.
 Dodge Wood Split Pulley Co., Pulleys.
 Selby Smelting and Lead Co., Refiners of Bullion, &c.
 The Goulds Manufacturing Co., Hydraulic Machinery.
 Marvin Electric Drill Co., Electric Drills, &c.
 Western Plating and Manuf'g Co., Amalgam Plates, &c.
 D'Este & Seeley Co., Engineering Specialties.
 Robert Aitchison Perforated Metal Co., Perforated Metals.
 Jos. Dixon Crucible Co., Graphite Lubricators, Crucibles.
 The Connersville Blower Co., Blowers, &c.
 Henry R. Worthington, Hydraulic Machinery, &c.
 The Jeffrey Manufacturing Co., Chain Belting, Mining Locomotives, &c.
 The Philadelphia Engineering Works, Ltd., Engines, Air Pumps, &c.
 James Leffel & Co., Water-wheels, &c.
 Wm. Jessop & Sons, Special Steel.
 James McBeth & Co., Electric Blasting Apparatus.
 R. D. Wood & Co., Special Gas Machinery.
 The Risdon Iron Works, Mining Machinery, &c.
 The National Ore and Reduction Co., Prospector's Furnaces.
 A. Wickoff & Son., Steam Pipe Casing.
 Eimer & Amend, Assayer's Appliances.
 The Card Electric Motor and Dynamo Co., Electric Power.
 The Norwalk Iron Works Co., Compressors, &c.
 The Taylor Iron & Steel Co., Manganese Steel.
 Wm. Ainsworth, Assayer's Outfits.
 The Roessler & Hasslacher Chemical Co., Chemicals.
 The Ludlow-Saylor Wire Co., Screens, Nails, Fencing, &c.
 The Stilwell-Bierce & Smith-Vaile Co., Water Heating and Purifying Machinery, Boilers, &c.
 The A. Leshen & Sons Rope Co., Special Fattened Strand Power Rope.
 The Lafin & Rand Powder Co., Finest Modern Sporting Powders, Loaded Shells, &c.
 The Canadian Rand Drill Co., Drills, Compressors, Special Oils, &c.
 Wm. Ainsworth, Fine Balances and Assayers' Appliances.
 Fried. Krupp, Iron and Steel Works, Mining Machinery, &c.

Railway and Steamboat News.

The Kaslo and Slocan railway is building a spur track to the Iron Hand Mine, owned by the Hall Mines, Limited, of Nelson, for the greater convenience of shipping ore from that property.

C. E. Perry, the Canadian Pacific engineer, is of opinion that the Canadian Pacific Railway Company contemplate building the connecting link between the Columbia & Kootenay and Nakusp & Slocan branch lines this summer.

Very little ore has come over the Kaslo & Slocan Railway during the past week, but the passenger traffic continues satisfactory. The Slocan Star shipped 120,000 pounds to Great Falls, Montana, and the Lucky Boy

has sent 32,000 pounds to the same point, while 35,000 have gone from the Antoine to Everett, Washington.

The telegraph line of the Red Mountain Railroad will be constructed into Rossland at once. Austin Corbin, general manager of the Spokane & Northern and Red Mountain Railroads, says he will have it in operation inside of 10 days.

Work on the Columbia River & Kootenay Railway is progressing as favorably as could be expected, the rain for the past week having retarded the tracklaying. Three miles of the line has been accepted by the superintendent and four or five miles more are ready to be turned over. The completion of the bridge on which they are now at work, near the Deadwood Mine, will be the last heavy bridge work before Rossland is reached, and with no bad luck the track will be into Rossland in a few days.

Travel is on the increase on the S. & O. branch, and a number of immigrants from the Northwest have recently reached this city with reports of more home-seekers on the road.

The Rossland *Miner* predicts that the Canadian Pacific will reconsider its plan of coming into Rossland over Mr. Heinze's narrow gauge. The narrow gauge is all right so far as it goes, but the *Miner* believes it will hardly answer the needs of the Canadian Pacific so far as Rossland is concerned.

Superintendent Gutelius of the tramway company stated recently that the road will soon be ready to handle freight and passengers between Rossland and Trail. That a train will leave Rossland and Trail each morning and return in the evening connecting with the daily boat between Trail and Northport. The fare one way has been fixed at \$1. No round trip rates have yet been made. Neither have the freight rates been fixed. A temporary depot will be built in Rossland.

The C. & K. Navigation Co.'s new freight steamer Trail has been launched at Nakusp. She is 162 feet long, with 30 feet beam, and is capable of carrying 250 tons. This will enable the company to handle all the freight which will be required, and put an end to the blocks which formerly hampered merchants and importers.

Capt. Troup states that he expects to arrange for a daily boat to Northport as soon as the steamer City of Trail is completed. At present the Lytton makes daily trips to Northport, but so long as there is so much business there is no certainty as to the trips being made with any regularity. The new time card will be widely advertised and will direct all travel through Trail, instead of the long and muddy ride from Northport to Rossland by stage.

There have been reserved for the purposes of the Columbia & Western Railway land grant the following tracts of land in Kootenay and Yale districts: "Commencing at the north-east corner of township Eight A (8A), Kootenay district, which is also the northeast corner of block 12, granted to the Nelson & Fort Sheppard Railway Company by Crown grant dated 8th March, 1895; thence due north 22 miles; thence due west 28 miles; thence due south 6 miles; thence due east 10 miles; thence due south 16 miles; thence due east 18 miles, more or less, to the place of beginning; also that portion of land described as commencing at the said northeast corner of block 12; thence due east 16 miles; thence due south to the international boundary; thence west along said boundary 16 miles; thence north to the place of beginning."

MINING CENTRES IN BRITISH COLUMBIA

—AND—

HOW TO REACH THEM.

ALBERNI.

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

Barclay 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.—Six 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.

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

Lac La Hache.—One hundred miles from Ashcroft on stage line from Ashcroft to Barkerville.

Lillooet.—Weekly stage from Ashcroft.

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

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 road from Ashcroft.

Soda Creek.—Stage from Ashcroft.

Stanley.—Stage from Ashcroft.

Slough Creek.—Stage from Ashcroft.

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

Willow River.—Stage from Ashcroft.

Williams Creek.—At Barkerville.

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.

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 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 Shepherd.—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 & Slovan 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 Slovan Camps.—From New Denver by steamer, twenty miles.

Standon 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 Darric 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, 100 miles; from Revelstoke, 150 miles; from Nelson, 50 miles.

Trout Lake City.—Steamer and stage from Revelstoke.

LILLOOET.

Bridge River, Cayoosh Creek, Fraser River.

YALE.

Boundary Creek.—Nearest railway station on the S. and O. R., Okanagan Landing, thence by steamer to Penticton and on by stage to Midway.

Fairview Camp.—Communication by boat from Okanagan Landing to Penticton, thence by stage.

Kettle River.—Steamer from Okanagan Landing to Penticton, thence by stage.

Midway.—Rail from Sicamous to Okanagan Landing, steamer Penticton 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 Penticton, and thence by stage.

Rock Creek.—Rail to Okanagan Landing, steamer to Penticton, 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 Penticton for Midway every Thursday morning.

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. Fitzstubbbs, Nelson.

West Kootenay District.—J. D. Graham, Revelstoke.

Yale District.—Chas. Lambly, Osoyoos; G. C. Tunstall,

Kamloops.

Province of British Columbia.

Minister of Mines.—Hon. Col. James Baker.

Provincial Mineralogist.—W. A. Carlyle.

Public Assayer.—H. Carmichael.

Assayers in the Province of British Columbia.

Public Assayer, H. Carmichael, Victoria.

W. Pellew Harvey, Vancouver.

Robbins & Long, Rossland.

.... SEND FOR

SHELTON & CO'S

ILLUSTRATED CATALOGUE OF

FURNITURE.

The largest and most complete stock on the Mainland of FURNITURE,
CARPETS, LINOLEUMS, BABY CARRIAGES, Etc.

Warerooms. 507, 509, 511, and 513, Hastings Street, - - VANCOUVER, B. C.

THE DOMINION DEVELOPING AND MINING COMPANY

(LIMITED LIABILITY)

AUTHORIZED CAPITAL, \$500,000.

HEAD OFFICE: 411 CORDOVA ST., VANCOUVER., B.C.

This Company has been formed to acquire by gift, purchase, pre-emption, exchange, or other any lawful means, gold or other mineral claims, or prospects, or interests in same, and any water rights, lands, or property, either real or personal, that it may be found necessary to acquire for operating them. Parties having mining properties for sale should communicate with the Secretary.....

OFFICERS

JONATHAN MILLER, ESQ., President.
JOHN HENDRY, ESQ., Vice-President.

CONSULTING ENGINEER

W. PELLEW HARVEY, ESQ., Vancouver
F. C. S., M. N. Eng., Inst., M. M. E.

BANKERS

BANK OF BRITISH NORTH AMERICA
Vancouver, B. C.

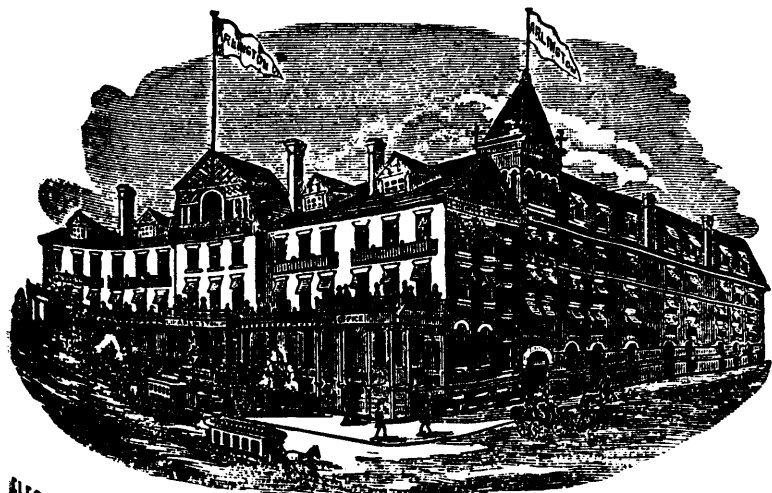
SOLICITORS

MESSRS. MCPHILLIPS & WILLIAMS.

OFFICES AND SECRETARY

J. J. BANFIELD,
411 CORDOVA STREET, VANCOUVER, B. C.

Owing to this Company having recently made several purchases of valuable mining properties, the Directors have authorized a further issue of ten thousand shares of stock. Forms of application for shares and all necessary information may be obtained upon application to the Secretary.



THE ARLINGTON HOTEL,

KING ST., WEST,

TORONTO, ONT.,

Now under the management of W. G. HAVILL, is a large, new, and very attractive Hotel of quiet elegance in all its appointments, with a cuisine and service of superior excellence.....

RATES. \$2.00 TO \$3.00 PER DAY.

SPECIAL RATES BY THE MONTH.

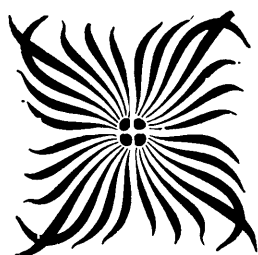
ELECTRIC CARS PASS EVERY FIVE MINUTES. PORTERS AT ALL TRAINS AND STEAMERS.

FRIED. KRUPP GRUSONWERK,

MACDEBURG-BUCKAU (GERMANY).

Engineering Works, Iron and Steel Foundry

MINING AND MILLING MACHINERY.



Gruson Rock and Ore Crushers of specially strong construction.

Roller Mills, Stamp Batteries.

Chrome Steel Shoes and Dies.

Ball Mills, with a continuous feed and discharge improved system for reducing ores to any degree of fineness.

MORE THAN 1,000 AT WORK.

Amalgamating Apparatus, - - -
 Hydraulic Classifiers, - - -
 Jig Machines, - - -
 Harz and Bilharz Patterns, - - -
 Round Buddles, - - -
 Improved Rotary Tables, - - -
 Improved Percussion Tables, - - -
 Salsburg Tables, - - -
 Sweeping Tables, - - -
 Amalgam Cleaners, - - -
 Amalgam-Distilling and Gold Smelting Furnaces, etc. - - -

CYANIDE PLANTS. COMPLETE CONCENTRATION PLANTS

TWELVE AWARDS AT THE COLUMBIAN EXPOSITION.

"THE VICTOR,"



The Greatest Gold Saving Machine in the world.

Will positively save every color of Free Gold, whether, coarse, flour or flake.

The only Machine in the world that will save FLOURED QUICKSILVER.

This Machine is now running successfully in California.

WEIGHT, 300 Pounds.
 CAPACITY, 25 Tons per Day.

A FULL SIZE MACHINE can be seen in practical operation at the FACTORY, No. 150 WATER STREET, VANCOUVER, B. C.

VANCOUVER PRIVATE ACADEMY,
 ESTABLISHED 1893.

COLUMBIA COMMERCIAL COLLEGE,
 ESTABLISHED 1894.

COLUMBIA CONSERVATORY OF MUSIC,
 ESTABLISHED 1895.

LYSTER & CO., Proprietors.

College Block, Hastings St., Vancouver, B. C.

ACADEMY CURRICULUM:—A general education. Students prepared for teacher's certificates, High School, Civil Service and other examinations. Rates (in advance) \$5.00 per month.

COLLEGE CURRICULUM:—Shorthand, Typewriting, Telegraphy, Book-Keeping, Languages, Penmanship, etc. This is the best equipped Business Training School in British Columbia. Send for Circular. Rates (in advance) \$10.00 per month.

CONSERVATORY CURRICULUM:—A higher musical education. Piano, Organ and Vocal Music a specialty. Teachers procured for all wind and string instruments. Beginners taught daily. Rates (in advance) \$5 to \$10 per month.

For the purpose of increasing an interest in Natural Science and to procure a representative museum of the Flora, Fauna and Minerals of the Pacific Coast, the proprietors of the above named institutions make the following liberal offer to collectors in British Columbia. Certificates will be transferable and will be good for six months after September 1st, 1900. Candidates are free to select more than one course of instruction if desired. Each collection may represent more than one kingdom, animal, vegetable or mineral.

Per Collection of	125 mounted specimens,	Tuition Certificate,	Value	\$5.00
"	"	"	"	10.00
"	"	"	"	25.00
"	"	"	"	50.00

CONDITIONS:—Plants, flowers, ferns, mosses, etc., to be perfectly dried, mounted preferred. Zoological specimens to be carefully preserved, ready for putting in place. Minerals (not necessarily metals only) to be of convenient size for cabinet. In each and every case, the exact locality from which the specimen was gathered must be given, and each specimen will be representative one of the kind. Two specimens of the same kind will be counted if rare; and the right is reserved in each case to increase the above offer in case the collection is more than ordinarily well selected, and to return collections which cannot be used. Collections will be accepted or refused as a whole and will not be culled without special consent. All charges must be prepaid to Vancouver. This offer will be withdrawn after September 1st, unless otherwise stated.

HALLIDIE ROPEWAY.

FOR THE TRANSPORTATION OF ORE, FUEL, AND OTHER MATERIAL

over rugged and mountainous regions the HALLIDIE ROPEWAY stands pre-eminent as to simplicity, efficiency, and economy.

In the removing of large quantities of rock, sand, gravel, earth, etc., to construct levees, dams, or embankments, in excavating canals, canals or cuts, in transporting sugar cane, etc., more efficient work can be done at less cost by this system than by any other.

Twenty-five years' experience. Hundreds of lines constructed 500 to 25,000 feet long. Address,

CALIFORNIA WIRE WORKS,

OFFICE: 8 AND 10 PINE STREET. SAN FRANCISCO, CAL. WORKS: 332 BAY STREET.

CATALOGUES ON APPLICATION

ENGRAVINGS!

... PORTRAITS! BUILDINGS! SCENERY!

Fac-similes of Signatures, Letters, and Engravings of All Kinds for Book and Newspaper Printing. Map Engravings from Tracings. Also Reproductions from Photographs, Brush Drawings, and Prints. Fine Book and Catalogue Illustrations. Good Work at Low Prices!!!!!!

SPIKE BROS. COMPANY, TACOMA, WASH.

FIELD GLASSES! MAGNIFYING GLASSES! COMPASSES!

Lemaire's Superior Quality, Extra Power Field Glasses: \$12.50, \$15.00, \$20.00, and \$25.00
Magnifying Glasses: 50c., 75c., \$1.00, \$1.25, and \$3.00—can be carried easily in pocket
Pocket Compasses from 25c. to \$3.75

Surveyors' and Engineers' Supplies.

DRAWING PAPERS, ...
TRACING PAPER AND CLOTH,
BLUE PRINT PAPER, ...
MATHEMATICAL Instruments

MINING BOOKS
TELEGRAPHIC CODES!

CLARKE & STUART,

WHOLESALE AND RETAIL

BOOKSELLERS, STATIONERS, PRINTERS
and GENERAL NEWS AGENTS.

28 CORDOVA ST., VANCOUVER, B. C.

WRITE FOR PRICES.

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:—	Leaves	KASLO FOR NELSON:—
	Sundays at 4 p. m.		Sundays at 8 a. m.
	Tuesdays at 5:30 p. m.		Mondays at 3 a. m.
	Wednesdays at 5:30 p. m.		Wednesdays at 3 a. m.
	Thursdays at 5:30 p. m.		Thursdays at 8 a. m.
	Fridays at 5:30 p. m.		Fridays at 3 a. m.
	Saturdays at 5:30 p. m.		Saturdays at 8 a. m.

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.

T. ALLAN,
SECRETARY.

J. W. TROUP,
MANAGER.

J. A. MACFARLANE,

(Fellow of The Chemical Society. London, since 1880.)

MINES EXAMINED AND REPORTED ON. ASSAYS MADE WITH SCRUPULOUS PERSONAL CARE:

623 HASTINGS STREET, VANCOUVER, B. C.

99777

BUSINESS MEN have endorsed the **NATIONAL CASH REGISTER** as the best system of handling cash and credit sales. It has saved them money and will do the same for you.

A. H. WALBRIDGE,

SOLE AGENT FOR B. C.,

VANCOUVER, B. C.

P. S.—Will be in the Kootenay country with full stock of Registers during June.

HARRISON HOT SPRINGS SANITARIUM,

HARRISON HOT SPRINGS, B. C.

Stages meet all trains; fare 75c. each way. Saddle and driving horses. Good roads.

ST. ALICE HOTEL.

First-class. Terms: \$2.00 to \$3.00 per day; \$12.50 to \$17.50 per week. To our guests we charge only 25 cents each for baths.

BATH HOTEL.

Open all the year round. Connected directly with the Hot Springs. For invalids and those wishing cheap accommodation from \$7.00 per week. Baths, 25 cents each.

These two Hotels being under the management of the owners of the Hot Springs afford every facility at the lowest rates to those wishing to avail themselves of the baths or enjoy the benefits of a visit to this beautiful spot.

Send Stamp for Petrie's Large Descriptive List of

**NEW AND SECOND HAND MACHINERY, ENGINES AND BOILERS, PUMPS,
CANNING MACHINERY, SAW AND SHINGLE MACHINERY, WATER
WHEELS, MINING MACHINERY, ETC., ETC.
MENTION WANTS.**

H. W. PETRIE, TORONTO, ONTARIO.**W. Pellew Harvey, F.C.S.**

(Mem. Fed. Inst. M. and M. E.)

ASSAYER and MINING ENGINEER

Appliances for testing parcels
up to 200 lbs.

PENDER ST., VANCOUVER, B. C.

THE
Commercial Printing Co.

(LIMITED)

PRINTERS and BINDERS.

Dupont Block, New Westminster.

P. O. BOX 353.

THE
CASSELL GOLD EXTRACTING CO., LTD.
OF GLASGOW.

THE MACARTHUR-FORREST PROCESS (CYANIDE).

Send samples for experimental purposes and full treatment report. Full particulars on applying to the Canadian agent of the Company.

W. PELLEW HARVEY, F.C.S., VANCOUVER, B. C.

MARCUS WOLFE,
Insurance, Loans, Real Estate.

JOHNSTON BLOCK, - NANAIMO, B. C.

P. O. DRAWER 17.

WM. K. LEIGHTON,
FINANCIAL AND MINING BROKER

P. O. DRAWER 33,

NANAIMO, - B. C.

THE MERCHANTS' AGENCY RED BOOK,
A - GAZETTEER - AND - TRADE - DIRECTORY - OF - BRITISH - COLUMBIA
(ISSUED SEMI-ANNUALLY.)

THE ONLY DIRECTORY OF BRITISH COLUMBIA IN TWO YEARS.

A Handy Gazetteer of Every Point in British Columbia. A Complete Directory of all Trades and Professions in Business. Commercial and Mining Enterprises carefully enumerated.

Advertising Space Reserved for Representative Firms.
Also issued (to subscribers only) with Capital and Credit Ratings of the Trades.

Address: The MERCHANTS' AGENCY of British Columbia, Victoria and Vancouver, B. C.

GROCERY SUPPLIES

FOR MINERS AND PROSPECTORS
AT LOWEST POSSIBLE FIGURES.

E. J. SAUNDERS & CO.,
VICTORIA AND ALBERNI.

E. G. PRIOR & CO.
(LIMITED LIABILITY)
IMPORTERS OF
Iron, Hardware, Agricultural
Machinery, and Vehicles
...of All Kinds...
SOLE AGENT FOR THE
PLANET, JR., FARM AND GARDEN
...IMPLEMENTS...
WAREHOUSES AT VICTORIA AND KAMLOOPS
Write for Special Catalogue and Prices.

PIONEER
STEAM COFFEE AND SPICE MILLS,
STEMLER & EARLE.
ESTABLISHED 1875.
MANUFACTURERS OF
COFFEE,
SPICES,
COCOA,
CREAM TARTAR,
MUSTARD, AND
BAKING POWDER.
Pembroke St., between Government and Douglas Sts.
VICTORIA, B. C.

MacKINNON, DeBECK & CO.,
* * *
Land, * *
Mineral,
and * * *
Timber, *
Brokers,
611 Hastings Street,
VANCOUVER, B. C.
TELEGRAPHIC ADDRESS:
"CORTES," VANCOUVER.

R. P. RITHET & CO.,
Wharf St., Victoria.
Wholesale
Merchants
SHIPPING AND INSURANCE
... AGENTS ...

LANGLEY & CO.,
Wholesale
Druggists
—ESTABLISHED 1858.—
VICTORIA, B. C.,
AND VANCOUVER, B. C.

[ESTABLISHED 1890.]
B. C. FRUIT, CANNING & COFFEE CO., LTD.
VANCOUVER,
Manufacturers of and Wholesale Dealers in
Jams, Jellies, Marmalades, Spices, Flavoring
Extracts, Coffees, Sauces, Ketchups,
Vinegar, Pickles, etc., etc.
Coffee Roasting and Grinding Mills of the
latest improvement and patented.
All Goods bearing the Company's Trade
Mark, the Sun, and marked Pure,
are guaranteed in every way.

Proprietors of Victoria Wharf, Outer Harbor,
and Columbia Flouring Mill, Enderby.
AGENTS FOR
Victoria Lumber and Manufacturing Company,
Cheminus, V. I.
Victoria Canning Co. of British Columbia.
Fraser River, Skeena River, and River's Inlet Can-
neries.
Skeena River Packing Co., Skeena River.
Lowe Inlet Packing Co., Lowe Inlet.
Pacific Coast Steamship Co., San Francisco.
Puget Sound Tugboat Co., Port Townsend.
Queen Insurance Co. of America—Fire.
English and American Marine Insurance Cos.
LLOYD'S AGENCY. HAWAIIAN CONSULATE.
VICTORIA.

M. R. SMITH & CO.,
ESTABLISHED 1858.
BISCUIT
MANUFACTURERS.
Gold Medal awarded at Royal
Agricultural Exhibition, 1895.
VICTORIA.

P. O. BOX 47.
McMILLAN & HAMILTON,
VANCOUVER AND NAKUSP.
WHOLESALE
GROCERIES
Domestic and Tropical Fruits and
Produce.
WRITE FOR PRICE LIST.

P. O. BOX 126.

OPPOSITE DIARIES

BEAUMONT BOGGS

FIRE INSURANCE. LIFE INSURANCE.
 NOTARY PUBLIC FOR BRITISH COLUMBIA. COMMISSIONER FOR NOVA SCOTIA.
 Secretary "North Saanich Coal Company, Limited."

MINING BROKER, FINANCIAL AGENT,
 VICTORIA.
 CORRESPONDENCE SOLICITED.

MINING PROPERTIES IN ALL PARTS OF THE PROVINCE FOR SALE

PARTIES HAVING
 MINING PROPERTIES
 FOR SALE IN
 Cariboo, Lillooet, Similkameen,
 Kootenay, Big Bend,
 and other districts of the
 Province should communicate
 with this office.

C. S. DOUGLAS & CO.,
 Mining, Financial and Real Estate Brokers,
 139 CORDOVA STREET, - VANCOUVER, B. C.

MINING SHARES BOUGHT
 AND SOLD.
 Good Real Estate Investments
 in Vancouver,
 Kaslo, Nelson, Rossland,
 Ashcroft.

Cable Address: "Stanford," Vancouver.

CORRESPONDENCE - WITH - PROSPECTORS - PARTICULARLY - INVITED

ASSAY AND MINING SUPPLIES

We are manufacturers and direct importers and carry a large stock of Balances, Furnaces, Fire Clay, Goods, Glassware, Platinum, Acids, Chemicals, and all other assayers' and miners' requirements. Write for prices to

MACFARLANE & CO., VANCOUVER, B. C.

GEO. D. SCOTT, FINANCIAL AND MINING BROKER

MANAGER OF THE VANCOUVER MINING BUREAU, WHERE A FULL LIST OF
 ALL RELIABLE COMPANIES' STOCKS ARE ON SALE.

Mining properties for sale in every district, many of which have excellent showings and are partly developed. Can give working bond on good properties for their development, parties retaining an interest in lieu of cash; or obtain properties for companies, vendors taking stock in payment. Special attention given to developed properties, with shipping ore. All on reasonable terms. Correspondence solicited.

305 CORDOVA STREET, - - VANCOUVER, B. C.

WULFFSOHN & BEWICKE, LTD., BANKERS, MINING BROKERS, FINANCIAL, REAL ESTATE, AND INSURANCE AGENT

VANCOUVER, B. C.; Dock House, Billiter St., LONDON, E. C.; VERNON, B. C.

Representing Lancashire Fire Insurance Co. of Manchester; Hamburg-American Packet Co.; Mercantile Development Co., Ltd., London; Anglo Western Pioneer Synd., Ltd.

MINING PROPOSITIONS FINANCED

CABLE ADDRESS: "WULFFSOHN," VANCOUVER, CANADA