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MINING RECORD

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BRITISH COLUMBIA MINING RECORD

E. JACOBS.....Managing Editor

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EDITORIAL NOTES.

The "Flow Sheet" of the Slocan Star mill that accompanies this month's MINING RECORD will probably prove of much interest to mining men, especially those having to do with ore concentration.

The contributor of the interesting description of the West Fork of Kettle river we publish this month desires to acknowledge his indebtedness to the kind courtesy of Messrs. J. C. Dale, Hugh Wood and Clement Vacher for much of the information given.

Press despatches state that the British Columbia Copper Co. intends increasing its authorized capital from \$2,000,000 to \$4,000,000, and that "the J. J. Hill interests have an option on 40 per cent of the stock of the company." No official information is available at present to confirm or deny these statements, but it is known that the company's general manager last week received a telegram to immediately proceed to New York, and that he at once left Greenwood for that city, where is situated the company's head office.

There is a suggestiveness about the following from Spokane, Washington, that our coast cities might do well to take a note of: "Spokane is fast taking rank as a mining machinery centre. Three years ago the iron industry here was almost nil. Now there are 275 skilled men employed in the foundries and machine shops here. An extensive trade is being built up with southern British Columbia. The Union Iron Works has built five complete smelting furnaces, besides doing a great deal of repair work. It is employing about 125 men, mostly on mine and smelter supplies."

The Nelson *Tribune* lately made this statement: "The only large mine operating in the Similkameen is the highest grade copper mine in British Columbia, and one of the highest grade on the continent. Average values range from \$80 to \$100 a ton." We think the *Tribune* mistaken. The Nickel Plate, near Hedley, is the only mine in the Similkameen that has yet produced ore in quantity, and of this the provincial mineralogist noted, in "Progress of Mining," (Annual Report of the Minister of Mines for 1904) that last year it "mined and treated about 10,000 tons of ore, yielding values of from \$12 to \$15 a ton, chiefly in gold."

Under the present management the affairs of the Le Roi have been placed on a basis that is in strong and favourable contrast to that previously existing. Save for the customary advance against matte in transit, common to most companies operating smelters, the Le Roi Company is out of debt and, as a result of economies and reductions in costs at both mine and smelter, it is earning substantial profits, while the mine is looking well from an ore production point of view. Yet for those who have laboured hard and successfully to bring about this great improvement in the position of the company there is much abuse in the press. Truly this is a strange world, my masters.

The Britannia Smelting Co., Ltd., which has acquired the smelting works established at Crofton, Vancouver Island, in 1902 by the Northwestern Smelting & Refining Co., announces in our advertising columns that on and after July 1, prox., shipments of ore will be received at its works for reduction. Several weeks ago an arrangement was made with the Britannia Copper Syndicate for the smelting at these works of the whole of the output of the Britannia mine, at Howe Sound. It is understood that production will shortly commence at that mine, and that the Crofton smelter will obtain its main supply of ore from it, adding whatever custom ores shall be obtainable.

One who is described as "an esteemed correspondent," writes the *Canadian Mining Review* that at the Le Roi mine "McMillan, it is believed, is 'gutting' ore bodies, and economizing on development, in order to make a showing which will be acceptable to shareholders who are not qualified to fully appreciate the position of affairs." Then the *Nelson Tribune* quotes the *Review* as having openly declared that McMillan has been gutting the mine, etc. Of course, it is too much to ask the *Review* to disclose where its "esteemed correspondent" writes from, but would it not be a singular coincidence if it happened to be from Nelson? It is wrong to make insinuations, but such strategem is not beyond belief.

The appeal of Mr. F. R. Blochberger, of Portland, for samples of British Columbia minerals, for exhibition at the Lewis and Clark Exposition, made through the press, is one that in our opinion should not be responded to. It comes late, and is not likely to result in a creditable exhibition being made. It has been well known for some time past that no mineral exhibit from British Columbia was being prepared, and this Mr. Blochberger might have ascertained weeks ago. It is altogether unlikely a representative exhibit can be got together in the manner proposed, so it would be better to have none at all than one that would probably represent only a few claims and those chiefly for advertising purposes.

In its May number the *Canadian Mining Review* stated, in connection with the recent amalgamation meeting at Winnipeg, that copies of Mr. Brock's re-

port had already been sent out of the country by Mr. McMillan before they could be discussed by the representatives of the various interests, and that this caused a great deal of embarrassment. We hardly think the *Review* knowingly suppressed the fact that such copies were sent only to the Le Roi Mining Co. directors, in response to a cabled request from England for them. Surely all the directors of the Le Roi had a right to see Mr. Brock's report—if not, why not? A half truth can be made to assume a very different complexion to that of a full statement of fact.

Recently the *Engineering and Mining Journal*, New York, in an editorial on "Mining Activity," reviewed the immediate outlook for mining on the North American continent. Its reference to British Columbia was as follows: "In British Columbia there is coincident progress. While the conditions underlying the mining of silver-lead ores remain discouraging, the copper industry is highly prosperous, and with it the winning of gold and silver. In the Boundary district, there is a series of low-grade deposits of such dimensions as to afford the basis for the soundest kind of speculation; indeed it is likely that the Granby Company and its affiliated interests will shortly expand into an undertaking of a magnitude excelled by but few mining and smelting enterprises on this continent."

The attention of managers of British and American companies operating in the Kootenays is called to a small but useful sketch map, Mr. W. H. Jones, printer, of Nelson, prints on his letter heads. Though small, this map gives a good idea of the relative positions of the more important of the towns in the mining sections of East Kootenay, West Kootenay, and the Boundary, and, as well, shows lines of railway and steamer travel. As an advertisement for south-eastern British Columbia it is effective, and its use by outside mining companies, as above suggested, might serve to in some measure enlighten their shareholders as to the geography of the country in which they have more or less interest. If such a desirable end be furthered by this notice we shall not mind having given the printer named an unsolicited advertisement "on the side."

We give in this issue some particulars of the Vancouver Island Mining & Development Co., which lately completed the purchase of a large group of mineral claims situated in the Mt. Sicker district. The capital of this company is moderate; there have not been any promotion profits paid to promoters, all the property having been obtained by the company at actual cost to its organisers; and the company has done considerable development work, with the result that the management has an intelligent idea of the worth of the claims finally acquired. The shareholders, therefore stand on terms of equality, proportionate to their respective holdings, in an enterprise that gives reasonable promise of eventual success, the in-

dications of the occurrence of ore in payable quantities being good, and the management competent and economical.

The resumption of work on the Oyster-Criterion property, near Camborne, under the direction of Mr. A. H. Gracey, who is also manager of the neighbouring Eva mine, is a move in a direction that will tend to give confidence in the *bona fides* of the Great Northern Mines, Ltd., at any rate so far as this mine is concerned. Mr. Gracey is strong on work and weak on tall talk, the latter having been an unfortunate weakness in one or two of those prominently associated earlier with the management of the Great Northern's properties. If there are sufficient values in the Oyster-Criterion ore to make its mining and milling profitable and the mill appliances are efficient, Mr. Gracey may be depended upon to make as high a recovery as is practicable and that too at a low cost. The result of this move may be awaited in confidence that it will be satisfactory.

Dawson intends to entertain the members of the American Institute of Mining Engineers and other participants in their excursion in a manner well suited to so important an occasion. The council has agreed to an appropriation of \$2,500 for this purpose, and the citizens of the metropolis of the Canadian Yukon will subscribe an equal amount. The new Commissioner has, we understand, been authorised to give the visitors a public dinner as the Dominion government's contribution to their entertainment. Among other diversions proposed is one that will probably be a distinct novelty to the party, namely, a baseball game with play to commence at midnight, an arrangement hardly practicable, save in "the land of the midnight sun." The programme will be varied; pleasure will be freely provided for, yet the serious business of impressing the visitors with the golden resources of the Yukon will also be given due prominence.

It may well be doubted whether the cost of ferrying the men to and from Protection island is really the only obstacle to the reopening of the lately-closed coal mines at Nanaimo. It is almost incredible that an unwillingness on the part of the company to incur an additional comparatively small expenditure of \$450 per month is the actual difficulty in the way of an immediate resumption of work in that mine. We are informed that many of the men are fully satisfied the management of the company is insincere, and that if they accept as true certain of the statements made to them from time to time, they will sooner or later find that they have been misled. It appears that there is little confidence felt in the statements of either president or manager of the company, who are suspected of designing to obtain a moral victory over the men, following advantages gained on previous occasions. It seems reasonable to conclude that the real trouble lies deeper than the mere question of whether the men shall pay \$1 per month each for transportation or the company be at this expense.

The report of the address of the chairman of the Kamloops Mines, Ltd., printed elsewhere in this issue, shows the financial position of that company and what the expectations are in regard to the future. We sincerely hope the latter will be realised. The reports from the mine, which is the well-known Iron Mask, situated near Kamloops, indicate that there is an ample supply of ore available, including large bodies at the 200, 500 and 600-ft. levels, respectively. The chairman told the meeting that the London manager and secretary, Mr. John Morrish, had gone very carefully over the ore developments and had reported "that there were \$900,000 worth of high-grade ore on February 11 and sufficient low-grade ore to keep the mill going at the rate of 160 tons per day for three years." A smelting plant is being erected, and it is expected the first unit, with a capacity of 50 tons per day, will be in working order by the end of next month. Apart from this, according to the report of the gold commissioner for the district, included in the Annual Report of the Minister of Mines for 1904, very favourable arrangements have been made with the Trail smelter in regard to freight and treatment. This being so, and the average gross value of the shipping ore being, according to the statement of the same official, from \$30 to \$35 per ton, it would appear that conditions are indeed promising, and that the Kamloops camp should shortly add one more profit-earning mining company to the gradually growing list the province is now able to show.

May we respectfully submit to our many friends in the Boundary the desirability of their representing in the proper direction that it is not quantity of news matter sent out for publication that is likely to benefit their district so much as reliability. In our humble opinion the wide dissemination of allegations made by Brown, Jones or Robinson, estimable men though they may be, regarding such subjects, for instance, as the losses of copper in slags made by local smelters, is not in the best interests of local industries. It will be remembered that such allegations, made against the manager of the Montreal and Boston Co., operating the Boundary Falls smelter, by one utterly incompetent to give a fully qualified opinion on the subject, were last month published far and wide. That they were promptly denied does not, in our opinion, make their publication less reprehensible. They can do no good; they may, and probably do, have an opposite effect. The enthusiasm of the correspondent, who a few months since "discovered" the Boundary and its enormous mineral resources is commendable. His occasional blunders are comparatively harmless, except in such a case as that under notice. Discrimination may well be practised, else usefulness be much impaired by the eventual recognition by the public that grievances of individuals, real or imaginary, are sometimes unwisely permitted to take the place of facts. The outside stockholder usually has but few sources of information; the exercise of much care should, we think, therefore be regarded as an impera-

tive duty by those who supply practically all the district news ordinarily available to him.

The *Nelson Tribune* finds much fault with the provincial government. Among its recent complaints are those regarding the omission to explore the mineral areas "on the route of the G. T. P. in the north of the province," and that "now, owing to the supineness of the British Columbia government, Dr. Ells has been sent to Graham Island, where the finest coal deposits on the coast exist." Neglect is also alleged of the "unlimited areas of magnetite at the Coast." We may mention that before the foregoing was published the provincial mineralogist had already engaged a packer to accompany him into the northern country referred to. Next, we would respectfully suggest that the Report of the Minister of Mines for 1902 be looked up for Dr. Marshall's report on the coal and iron deposits of Graham Island, and as well, for the long illustrated article on "The Iron Ores of the Coast of British Columbia" (also published in pamphlet form by the Mines Department). By the way, the averment that the finest coal deposits on the coast exist on Graham Island, has a strong resemblance to a similar assertion made last year in an article from *Nelson*, published in *New York*, which made an unwarranted reference to the "impending exhaustion" of the coal on Vancouver Island, and similarly "boosted" the coal measures of Queen Charlotte Islands. It will be interesting to compare these unsupported statements with the conclusions of the expert geologists now on the coast when the latter shall make their report to the Geological Survey.

With much gratification we acknowledge the appreciation of the excellent work of the provincial Bureau of Information and the Department of Mines, Dr. H. S. Poole, of Halifax, Nova Scotia, has been good enough to express to us. He has assured us that he was strongly impressed with the facilities placed at the disposal of an entire stranger to obtain information respecting the varied resources of British Columbia, not only by direct application to government departments, but as well by posters and pamphlets found in hotels. Similar facilities, he remarked, are not usually provided in eastern provinces. Here he found in easily accessible form a deal of information that in other provinces could only be gathered by much labour, and even then not in such detail as this province supplies freely. He volunteered the further statement that he "was especially struck with the promptness with which the Bureau of Mines had issued so elaborate a report within so short a time after the close of the year it covered. The thousands of miles to be travelled, the number of pages to be written, the fewness of officials to do the work, and the fact that time was found in addition to reply to very numerous enquiries from explorers, prospectors and others, were, he considered, particularly noteworthy and commendable." Perhaps those who are in the habit of repeating the parrot-like complaint as to the alleged lateness of publication of the report of the Bureau of Mines, will take note of this unsolicited

testimony of one who from experience can more adequately appreciate both the difficulties to be overcome and the good results achieved. It is a simple fact that no report of similar nature and scope is published earlier, neither in Canada, nor, as far as we have been able to ascertain, in the United States or Australia. This notwithstanding, we hope to yet see this record, creditable as it is, passed, by the issue of the report in future years at a still earlier date.

On 30th inst. the resignation of Mr. T. A. Rickard, as editor of *The Engineering and Mining Journal* New York, goes into effect. He will be succeeded in that honourable, yet responsible and arduous position, by Mr. W. R. Ingalls, mining and metallurgical engineer, of New York. When, on January 3rd, 1903, Mr. Rickard's "foreword," on assuming the editorship of that journal, the leading technical mining and engineering publication in the world, was published, it was found to contain the following inaugural pronouncement: "It will be my endeavour to maintain the paper in the forefront of technical journalism by doing as my friend, Richard P. Rothwell, did—publishing reliable information concerning current mining and metallurgical practice, written by men who are alongside the facts." The deep sense of responsibility inseparable from such an occasion did not, as it might easily have done and that without good cause for reproach, distract the new editor's attention from the important part his dead friend had taken among those who "first blazed the trail for civilization and then set it going on whirring wheels." On the contrary, he paused to accord generous recognition of the noteworthy achievements of one who more than a year previously had passed to his rest, and then set himself to do—as well, as he modestly stated his intention, but with due appreciation of past excellency, even better, as we now sincerely believe he has done. In its scientific and technical aspects *The Engineering and Mining Journal* has, we think, made distinct advances under Mr. Rickard's editorship, as too it has been much improved in regard to its general make-up and appearance. That his successor who is also a professional man of known high attainments, may advance to still higher standards, is our unfeigned good wish. We tender Mr. Ingalls hearty greeting in his new position, which we are confident he will fill with advantage to the great engineering and mining industries and credit to himself.

The representations made to the Hon. the Minister of Finance for Canada with the object of inducing the Dominion government to grant the lead bounty on all exported ores of lead, are hardly likely to meet with the response desired by those purporting to be acting in behalf of all constituting The Associated Silver-Lead Mines of British Columbia, Incorporated. It is significant that the largest producers of lead ores are taking no part in this agitation; in fact it is generally known that the St. Eugene, which has been the only mine exporting lead ore since payment of the bounty was commenced, is not seeking a renewal of the concession made last year in favour of such

ores when smelted out of Canada. The movement is weakened, too, by the suspicion that the advancement of the interests of the sampling works at Kaslo is of more concern to some of those taking an active part in it than is the benefit to the lead mining industry as a whole. Whatever the motive, the feeling against facilitating the export of lead ores is general, the fostering of the lead-smelting industry in the province being regarded as the better policy. There is one feature in the concurrent campaign against the local lead smelters that is to be condemned, namely, the persistent misrepresentation regarding the plant and methods of the Hall Mining & Smelting Co's smelter at Nelson. The Hall company has during the past four years expended about \$80,000 on plant maintenance and replacing old plant with the more modern appliances available, and \$80,000 more in new plant. It has in use one important improvement not yet introduced into German works whose smelting practice is quoted as superior to that in vogue at Nelson, and it has lately installed one of the best of modern mechanical roasters. Further, it is arranging for increasing the treatment capacity of its works, which will assist in reducing costs. Yet the mis-statements complained of are reiterated without regard to their falsity. However, lead mine-owners are able to judge for themselves the best course to pursue and they will act accordingly, no matter what agitation or misrepresentation be persisted in.

The visit of members of the American Institute of Mining Engineers to British Columbia and Yukon Territory, announced as to take place during the closing days of the current month and practically the whole of July, should be regarded as an event of more than ordinary importance to the mining interests of the Pacific North-west. To Mr. W. F. Robertson, provincial mineralogist, should be given credit for having been the first to endeavour to induce the institute to make an excursion to this province. Last September the MINING RECORD published a contribution by Mr. W. M. Brewer, who has also been active in a similar direction, in which mention was made of the cause of the failure to come here in 1903. Since then Mr. Brewer has not permitted to pass any opportunity to urge the interest to his fellow members of the institute, and the advantage to British Columbia, that would result were the former to spend a few weeks in this province familiarising themselves on the spot with the extent and condition of its mining and metallurgical resources. Although the institute was organised in 1871 and to-day has a membership numbering between 3,000 and 4,000, yet the general public in British Columbia, as pointed out by Mr. Brewer last September, know but comparatively little with regard to it—its objects and its influence over the mining industry, not only in the United States, but throughout North and South America. The annual excursions made by the members and their friends are considered by mining engineers, metallurgists, geologists and mining operators as being among the most instructive and enjoyable meetings they have opportunities to attend, while it has become recognised

that an excursion of this institute is usually followed by increased activity in the mining industry of the regions visited. It does not require any such consideration to prompt British Columbians to accord a hearty welcome to any representative visitors, yet it is well that attention be called to the fact that many of the visitors will be seeking reliable information on mining matters in the North-west, as well as pleasure, so that a general effort should be made to place at their disposal facts and figures that will serve to inform them correctly regarding the progress and position of the industry in this province and the Yukon.

This will be a record year for Dominion government geological work in British Columbia. Dr. Robert Bell, director of the Geological Survey of Canada, has sent 17 men from his department to work in this province; besides these, five go to Yukon Territory. Dr. R. W. Ells and Dr. H. S. Poole are to examine and report on the coal measures of Graham Island, of the Queen Charlotte group, and Vancouver Island, respectively. Both have arrived at the Pacific coast and Dr. Ells has gone north to the scene of his labours on Graham Island, while Dr. Poole is at Nanaimo, where he has begun his season's work. He will while on Vancouver Island ascertain as far as possible the structure of the working coal fields at Extension, Nanaimo and Cumberland, and its relation to the crystalline rocks that limit it on its western side. The indications of the extension of these fields into the unproved country beyond, in the one direction, and under the waters of the Strait of Georgia in the other, will also be carefully looked into, and an estimate will be made of the possible contents of the fields of coal of economic value—that is, of workable coal. Dr. Poole is a practical geologist and has had many years' experience of similar work in Nova Scotia, where he was also manager of large collieries. Again, as inspector of mines for that province, he gave much attention to subjects of like nature. The coal fields on Vancouver Island are the oldest worked of any on the Pacific Coast seaboard. They were years ago elaborately examined by the Geological Survey, (1) by Mr. James Richardson, as to the coal fields of Nanaimo, Comox, Cowichan and Sooke (see Geological Survey of Canada: Report of Progress for 1876-77, pp. 160 to 192), and (2) by Dr. G. M. Dawson, as to the northern portion of Vancouver Island and adjacent coast. The extensive development of the several collieries that has since taken place, together with the large amount of prospecting done, has doubtless resulted in the accumulation of a mass of data that, if placed at the disposal of Dr. Poole, as it is hoped it will be, would greatly facilitate his work. He has intimated that he will be glad to have the assistance of information thus obtained, and will give due credit for all such assistance. He comes as a compiler or collector of information—not as one who can see through masses of rock—so he seeks it wherever obtainable. While his long experience especially fits him to collect data and arrange ascertained facts in proper order, he naturally has to rely upon the men who in the course of their regular

work have obtained much knowledge of the field. Their hearty co-operation is, therefore, earnestly desired.

The report of the annual general meeting of the Vermilion Forks Mining & Development Co. we publish this month shows that after seven years of patient waiting there seems to be for the shareholders a prospect of release from the hand-to-mouth conditions under which their company has latterly been struggling on. Were it not for the very serious side—serious to British Columbia, as providing seeming reason for the oft-repeated reproach that money put into ventures in this province brings no return—it would be ludicrous to contemplate the position outlined by the chairman of that meeting, notwithstanding that it is claimed the company has spent on its properties about \$11,000 a year for seven years. Here is a summary of the list of the company's properties to which the chairman called the attention of the meeting: Mineral claims (crown-granted and now lying unworked) aggregating 257 acres, coal lands under lease or licence, 2,538 acres and negotiations proceeding for the purchase of the licence of 640 acres more, ground held under hydraulic leases, 240 acres, a ranch of 243 acres; a 62-acre smelter site; water rights, and a townsite with about 300 acres unsold. A big showing, truly, for so comparatively small an expenditure as \$77,000 spread over seven years; but how is it possible for British Columbia to prosper when such a dog-in-the-manger policy can be steadily followed by any organisation over a long period of time. It is pitiful, from a provincial point of view, to think of a company controlling such varied and presumably valuable interests being so weak financially as to have to ask its stockholders to sanction a special issue of stock to provide \$7,500 wherewith to meet existing and accruing liabilities; further, to see what particular stress was placed upon the probable receipt of a few thousands of dollars from the sale of town lots with the resulting possible freedom from further early calls on the stockholders. We call attention to this case, not with the object of in any way reflecting upon the *bona fides* of the Vermilion Forks Co. or its management, who have been among the pioneers of the Similkameen; have long persevered under many difficulties, and have doubtless kept well within their rights in acquiring what they hold, but for the purpose of pointing out the disadvantage at which the province must appear in the eyes of outside capitalists having money available for investment wherever conditions appear to promise a fair return. How can we reasonably expect men with money to turn their attention to this province, when such an exhibition as that above pointed out is made through the medium of English newspapers? Fortunately the Similkameen is not now dependent for its development upon individuals or organisations without funds, for several companies with large financial resources have become actively interested in it, and their success may be expected to soon divert attention from the comparatively poor results achieved by others not so favourably situated.

PROPOSED LE ROI-CENTRE STAR-WAR EAGLE CONSOLIDATION.

THE general similarity of the statements concerning the attitude of Messrs. A. J. McMillan and J. W. Astley on the one side, and the several other gentlemen taking part in the Le Roi-Centre Star-War Eagle consolidation negotiations, on the other, that have been published in two or three provincial newspapers, and in other publications to which writers for those newspapers are known to contribute, have an *ex parte* appearance that does not indicate a desire to deal with the subject strictly on its merits. To our mind the personal element has been thrust altogether too much to the front. If Professor Brock was definitely agreed upon as sole arbiter on the question of valuation, which, however, is not conceded by those not agreeing with him in his valuation of some of the mines examined, the meeting to consider his report was quite unnecessary. If, on the other hand, valuations of representatives of the several companies concerned were intended to be taken into account at the same time, the contentions of those who do not agree with Professor Brock are equally entitled to careful consideration. In negotiations for the equitable apportionment of the respective shares to be allotted the several parties to the proposed consolidation matters of fact only should have attention. It is beside the question altogether to compare the high professional attainments of one man with the suggested limitations of another "who is largely uneducated." The latter was the chosen representative of one of the parties, and sneers at him are unbecoming and entirely uncalled for in discussing the matters at issue, especially as no exception was taken to the non-professional representative of those the high valuations of whose properties were challenged. Among the points to be decided are: Is the valuation of the Snowshoe mine too low, as contended and are the valuations of the Centre Star and War Eagle too high, as also insisted upon. These issues should not be clouded. In commenting upon this matter the *Engineering and Mining Journal* impartially observes "It would be remarkable if one man's valuation of three separate mines suited the owners of each," and it looks for an adjustment of differences of opinion, which is, of course, but an ordinary, business-like view of the situation.

There are, though, so we are informed, still more serious objections offered by Mr. McMillan to the whole scheme of consolidation as proposed. He believes that the total output capacity of the various mines proposed to be included would not be more than sufficient to keep the Le Roi Co's smelter at Northport fully supplied, and this being so, he asks where would there be advantage in including the Trail smelter in the consolidation? And in doing so not only is he well within his rights as the largest shareholder in the Le Roi of those who took part in the negotiations, but is doing his plain duty as resident manager of that company and the guardian of the important interests committed to his charge in his official capacity. He would fail in his duty to the

large body of stockholders were he not to point out to them the great sacrifice the abandonment of their smelter, as may be contemplated, would involve.

Similarly, he should be commended for objecting to the inclusion at a high valuation of the Rossland Power Co.'s concentrator at Trail. The utility of these works should first be fully demonstrated before their acquirement be even thought of. Thus far they have failed entirely to demonstrate their suitability for the purpose for which they were designed, and it is for the Centre Star and War Eagle companies, which control them, to first make them efficient before requiring that they be taken over at anything like cost.

Then there is the proposal to acquire undeveloped coal lands. If Mr. McMillan's objections that these would not bring advantage to the consolidated company, but, on the contrary, their development would tend to the dissipation of its financial resources, be well taken, they should be carefully considered. It is known that the available supply of coal in parts of the Crow's Nest region already having railway transportation facilities is far in excess of the demand, so the advantage of undertaking the development of other coal fields not similarly situated may well be regarded as problematical.

All these matters are subjects for exhaustive enquiry, and serious deliberation, since permanent advantage can only be secured by such procedure. The eventual influence for good or evil such a consolidation as that contemplated would be great, so no mistake should be made. It were far better to continue as at present, than to arrange a consolidation so weighted down by excessive valuations and unproductive enterprises that final disaster might be inevitable. What is required for the rehabilitation of the mining industry of British Columbia in the eyes of British investors is profitable results. These can best be provided for by cautious and deliberate action after mature consideration shall have been given to all reasonable representations, against as well as for separate units of the whole proposed undertaking. More than one highly-prized reputation will be either enhanced or shattered by the success or failure of this consolidation, if resolved upon, so it may be well for those it will affect to weigh carefully the opposition offered to their proposals, and not be altogether carried away by the representations of those having other interests to conserve.

KAMLOOPS DISTRICT IN 1904.

(From Report of G. C. Tunstall, Gold Commissioner.)

FROM the report for 1904 of Mr. G. C. Tunstall, gold commissioner for Kamloops district, which includes the Kamloops, Ashcroft, Similkameen and Yale mining divisions, brief excerpts have been made, as under:

The lack of capital in this district still acts as a formidable obstacle to the opening of the mineral locations, which, in many instances, exhibit large bodies of ore. In the Jacko lake section, about 6

miles south of Kamloops, there are deposits of chalcopyrite on the Kimberley, Monte Carlo, Wheel Tamar and other claims, exposed by shafts and open cuts. On other portions of Coal Hill similar results are visible, and claim-owners have firm confidence in their holdings.

The Glen Iron Mining Co.'s property has lain idle for some time. Its output was formerly used for fluxing purposes by the Nelson smelter until a more convenient source of supply was discovered. The Cinnabar mines, north of Kamloops lake, have not been worked recently.

The operations of the Kamloops Coal Development Co. are looked upon with deep interest, as the discovery of a suitable seam would have an important bearing on the mining interests of the district, and would enable the working of low-grade ores which cannot bear the expense of transportation to distant points for treatment. The same remarks apply to the discovery of coal at Enderby, where a large seam of coal is believed to exist, about 5 miles north of that town, at an elevation of about 1,100 ft. above the railway track. This may lead to the resumption of navigation between Enderby and Kamloops. This distance from Enderby to Kamloops is 110 miles, and transportation can be effected by water at a comparatively small cost, but has been discontinued since railway construction.

Kamloops Mining Division.—The Iron Mask group at Coal Hill consists of 7 claims, of which the Iron Mask is the principal location. Development on this property has been systematically prosecuted by Capt. Argall, and the shipping stage was reached last autumn, after the completion of the 100-ton concentrator. Several experiments were made before the results were considered satisfactory, and the changes effected have rendered it thoroughly efficient. Preparations are now being made to enlarge its capacity to 200 tons a day, to accommodate a larger output next season as the different levels show up large bodies of shipping ore. The average gross value of the shipping ore is from \$30 to \$35 per ton, which includes from \$2.40 to \$4 in gold. Transportation to the railway track is effected by a 100-h.p. traction engine, capable of drawing 30 tons. An excellent wagon road, 4 miles long, with comparatively easy grades, was completed last summer and macadamised to meet the requirements of heavy traffic. Favourable arrangements have been made with the Trail smelter in regard to freight and treatment, in consequence of the ore, in common with the mineral deposits of Coal Hill, being of a fluxing character, and, therefore, in demand for smelting purposes. The average number of men employed last summer was 65 although a larger number was occasionally engaged. Every facility is supplied for their comfort in a boarding-house capable of accommodating 100 persons. The ore shipments amounted to 975 tons.

A local company, known as the Kamloops Coal Development Co., started work late last fall, and sank a shaft through sandstone a depth of 380 ft. at a point several hundred yards east of the old Guerin tunnel on the creek running through what was formerly call-

ed the Hudson's Bay Co.'s farm. Several seams, differing in thickness from a few inches to one of over 2 ft., separated by layers of sandstone, were encountered. A drift was run from the bottom of the shaft a certain distance, from which some 6 or 7 tons of first-class coal were obtained. A great improvement was noticed in the distribution and increased number of seams exposed, on those found in the Guerin tunnel. These favourable changes have led to the belief that further east a body will be found that will prove sufficiently valuable to work. The drift looks so promising that the property has been bonded by Mr. Morrish, of London, England, one of the directors of the company which owns the Iron Mask mine, who intends to sink another shaft at a point more than a quarter of a mile east of the present site.

About two months ago much excitement was caused by the discovery of a seam of coal near the summit of a mountain, about 5 miles north of Enderby. The coal is said to be of excellent quality and is stated to be 4 ft. thick, so far as could be observed, but may prove to be of greater extent, as it is partly covered by slides from the mountain. Parties interested, I am told, have applied for the purchase of 3,000 acres of land in the vicinity. A tunnel will be run to ascertain the extent of the deposit. Should expectations be realised a strong company will be formed to operate the mine on a large scale.

Development was continued on several groups of claims in the vicinity of Nicola. Work on Ten-mile creek strengthens the conviction that there will be a prosperous camp in that locality when sufficient capital shall have been obtained to further open up the promising showings there.

Ashcroft Mining Division.—From the report of Mr. J. W. Burr, mining recorder, it is learned that placer mining on the Fraser and Thompson rivers was not carried on as extensively in 1904 as formerly, consequently the quantity of gold mined in this way was not near the total of previous years. The value of the gold taken out during the year was about \$24,000. (Mr. Burr's comments on gold dredging operations are printed on another page.)

In Highland valley, some ledges of copper-gold ore have been discovered, and the year 1905 will see development work carried on there. The mine-owners are very anxious to see the wagon road into the valley completed as early as possible in the spring, so as to enable them to get in machinery and provisions and bring out the ore which is accumulating on the dumps. The ore is distributed all through the mountains on each side of the valley.

Yale Mining Division.—Mr. Wm. Dodd, mining recorder, reported that only Chinese did placer mining in 1904, with but unimportant results. Although material was on the bank ready for building the proposed wing dam, the late winter level of the Fraser river, which is the extreme low water period, was rather higher than usual, and did not permit of the resumption of work on the Saw-mill riffle, above Hill's bar, owned by the local Castle-Revesbeck syndicate, which promised so well during the very brief working sea-

son in the abnormally low water of 1903. The Yale Hydraulic Mining Co. completed its pipe-line of about a mile, and was enabled to hydraulic for about a month.

During the past 12 months the Mount Baker & Yale Mining Co. has completed its 10-stamp mill, and the International Gold Mining Co. its 3-stamp mill, triple-discharge battery. The former company has 8 men employed, and the latter about 20. Both companies are engaged in completing their surface plant, equipment and buildings, and in getting out timbers for their respective saw-mills. The stamps have been in operation for the past 3 months.

(Note.—Owing to the abnormally dry season, which prevented the working of the creeks and benches, the yield of gold has been limited to \$3,000, the smallest yearly return yet made. Individual placer mining on the bars of the Fraser in this division is a thing of the past.)

Similkameen Mining Division.—The mining recorder, Mr. Hugh Hunter, reported that the year 1904 was most favourable for placer mining in this division, but little was done, the Chinese population having dwindled down to a very few old hands. At the mouth of Bear creek 3 Chinamen took out some gold and platinum, and were reported to have obtained one nugget valued at \$120. At different times in past years some valuable nuggets have been found in that vicinity. A few Chinese were mining on Granite creek, but they did not reap the golden harvest they expected.

Not much development work was done on mineral claims; chiefly assessment work. The Boulder Mining Co., Ltd., extended its working tunnel 100 ft. and is now applying for crown grants for all its holdings. On Bear creek Messrs. Chas. F. Law and W. H. Armstrong have done considerable work on the St. George and St. Lawrence claims, and have exposed a vein 5 ft. wide, carrying high-grade gold ore. This vein has been traced through several claims. On Roche river and in Summit camp only assessment work has been done. It is reported that the Sunset and 10 adjoining mineral claims have been bonded, and that 5 per cent of the purchase price has been paid to the owners. On Copper and Kennedy mountains assessment work has been done on the claims not crown-granted. On Granite creek, where a ledge of free-milling ore was found 2 years ago, the owner of the property has done much work stripping the ledge and has started a tunnel.

In Aspen Grove camp assessment work has been done on all but a few of the claims located in previous years, and new locations have been made. Several groups of claims have been crown-granted and others are being developed.

Mr. S. F. Parrish has sent us a copy of the special Southwestern Nevada number of the Salt Lake *Miner's Review*, published at Salt Lake City, Utah, U.S.A. We appreciate this thoughtful courtesy, but regret that we cannot spare space for a summary of the contents of so interesting an illustrated issue.

SLOCAN MINING DIVISION.

(Report by the Provincial Mineralogist.)

LAST month the MINING RECORD published the introductory comment of Mr. W. F. Robertson, provincial mineralogist, to his report on individual mines visited by him last summer. So much general information from the Annual Report of the Minister of Mines for the year 1904 was reprinted in its May number that, as then explained, the MINING RECORD could find room for but few separate accounts or descriptions of mines. The report of the provincial mineralogist is of such exceptional value, though, being the only official and full review the Department of Mines has had published since the issue in January, 1897, of Bulletin No. 3 (which was a report by Mr. Wm. A. Carlyle, then provincial mineralogist, on the Slocan, Nelson and Ainsworth mining districts, and was incorporated with the Annual Report of the Minister of Mines for 1896), that the wider the publicity given to it, the better, hence the prominence here accorded. Conditions have, naturally, so changed during the intervening eight years that the preparation of an official report dealing with the mining situation as it is to-day in the Slocan is opportune, the more so since the revival of mining activity in that district is attracting renewed attention, both in regard to its known richness in silver-lead ores and the big possibilities of its zinc resources.

The provincial mineralogist entered the district from the south, at Silverton, proceeding later to New Denver, Three Forks and Sandon, noting the mineral development successively at these points, in which order it will be found described in the following report:—

SILVERTON AND VICINITY.

Noonday.—The Noonday claim is about 1½ miles south-east of Silverton, on the Hewitt wagon road, and is located on a small creek flowing west into Slocan lake, at an altitude of 2,800 ft. The property is held by Wilson Smith and the Bank of Montréal, and is now idle and has been for a year or so, having last been worked by leasers more intent on extracting ore in sight than in keeping up development.

The rock formation of the vicinity is slate, in which there occurs a crushed zone, having well-defined walls, between which is the crushed country rock and a vein of quartz about 2 ft. thick, which evidently carried, in rather irregular bunches, galena and zinc blende, but in what amount could not be seen, as the property was not being worked. The vein dips at a flat angle, and No. 1 tunnel has been driven on the lead for a total distance of about 250 ft., but with branches, bringing the lineal feet of work here done up to about double that amount. No. 2 tunnel has been driven at 50 ft. lower level, for about the same distance. A fault is apparent which dislocates the vein towards the inner part of both tunnels. Some attempts at concentrating the ore had evidently been made, as a Cornish jig, driven by water-power, was erected in the creek.

L. H. Group.—The L. H. Group, owned by A. R.

Fingland *et al.*, is situated some 4 or 5 miles south-east of Silverton, at an altitude of 5,500 ft. The property was being developed by two men most of the summer, but when visited the owners were temporarily absent, only a Swede, who knew nothing of the property or workings, being found at the cabins, so that only the tunnel mentioned was seen, the upper workings on the bluff not being heard of until later. On the top of the bluff is an exposure of quartz some 15 ft. wide, running about \$8 in gold, and associated with arsenical iron pyrites. At this point there were found a number of nodules of native arsenic, carrying 1,000 oz. of silver to the ton. These occurred in a calcite veinlet.

About 80 ft. vertically below this exposure, a tunnel had been started in the face of the bluff, and was in about 300 ft., with a short cross-cut to the right, while at 60 ft. from the face of the tunnel a cross-cut had been driven to the left for 110 ft., from which cross-cut a drift had been run 70 ft. nearly parallel to the tunnel, and was being pushed ahead. This tunnel starts in an altered shale rock, strikes a porphyry dyke, and follows a slip plane. It cannot be said that there was any vein showing, or any marked line of mineralisation, but the dyke matter contains a small percentage of arsenical iron pyrites and pyrrhotite, with quartz, which shades off into the dyke matter. The percentage of mineral showing is not great, but the manager reports the gold values as sufficiently high to permit of treatment at a profit.

Rocklands.—The Rocklands group consists of the Willard, Rockland and Rustler fraction mineral claims, owned by Messrs. J. P. Graves, Frank Watson and Judge Spinks, and is under the management of Mr. J. W. Hamilton, of Silverton. The group is situated about 3 miles due south-east of Silverton, at an altitude of 4,150 ft., on a small creek, between the forks of which, in a knoll, about 300 ft. of tunnelling has been done, cross-cutting in the schistose country rock, a mineralised zone about 60 ft. wide, carrying copper sulphides with gold values. On the opposite side of the small creek, the mineralised zone appears in a bluff, and is apparently of considerably greater width than the tunnel has as yet proved. Mr. Hamilton reports the zone to run about 1 per cent copper and \$6 in gold. These values are not high, but taken in conjunction with the extent of the mineralised zone, make the property well worth serious investigation. During August of 1904 one man was employed.

The waters leaching out of this zone, and carrying sulphates of copper, had filtered down the creek through an old log-jam, the rotten wood of which had precipitated small nodules and sheets of metallic copper, also forming oxides and carbonates. To this source, and not to the lead, must be attributed the samples of this description which were being so freely exhibited throughout the district, but not by the management.

Hewitt.—The Hewitt group is about 3½ miles south-east of Silverton, and consists of the Hewitt, Rincon fraction, Tranquillity, Crow fraction and Mole mineral claims, the local agent and part owner

of which is Mr. C. T. Cross, of Silverton. The company owning the property is not working it at present, but has leased a portion of the mine to Mr. M. S. Davys, of Nelson, who has kept a small force of about 7 or 8 men employed all summer, and has shipped this year more than 400 tons of ore, running about 150 oz. silver to the ton, 5 per cent lead, and 13 per cent zinc.

The deposit is in a contact between slate and granite, which has been opened for a vertical distance of 830 ft. by four adit tunnels run on the vein and two "blind" levels, Nos. 4 and 5, all connected by raises. No. 1 level is 200 ft. vertically below the outcrop, and is 200 ft. long with about 100 ft. of raises, etc., and has been run to within 75 ft. of the boundary line of the adjoining claim, the Lorna Doone. No. 2 tunnel is 1,090 ft. long with 150 ft. of raises, etc., and is 118 ft. below No. 1. No. 3 is 1,590 ft. long, and 104 ft. below No. 2. No. 6 is 2,250 ft. long, is some 350 ft. below No. 3, and has been run out to the boundary mentioned. From the No. 3 level a cross-cut is driven into the hanging-wall 72 ft., at the end of which a connection is made down to the level of No. 4, where another cross-cut was made and a straight connection made with No. 6 tunnel. The levels Nos. 4 and 5 have only been started, No. 4 having been driven 60 ft. and No. 5, 37 ft. From Nos. 2 and 3 levels, in addition to the contact deposit, there are a couple of north and south ore-shoots which cut into the granite foot-wall, and on these, on the No. 2 level, drifts to the extent of 100 ft. have been driven, and on the No. 3 to the extent of about 405 ft.

These north and south ore-shoots are the portion of the mine which has been leased to Mr. Davys, and from which he has this year stoped out over 400 tons of first-class ore. Up to 1904, including the Davys shipments, there has been taken from the mine of sorted first-class shipping ore, 3,954 tons, and of second-class, now on dump, 3,878 tons; total, 6,932 tons. The sorted ore runs about 150 oz. silver to the ton, 4 to 5 per cent lead, and about 13 per cent zinc. The ore, as mined, will run from 30 to 40 oz. silver, 1.5 to 7 per cent lead, and 6 to 12 per cent zinc.

The ore-shoot on the contact is, at the No. 2 level, about 270 ft. long, or say an average of 150 ft. The ores of the upper levels were richer than those below, this being possibly due to secondary enrichment. In the lower levels comparatively little shipping ore was noted, but there is a large tonnage of second-class ore which would pay well to concentrate.

The mine is well equipped with bunk and mess-houses, and an office and quarters for the foreman. An aerial wire tramway connects the workings with the flat below, where at the lower terminal an ore-shed has been built. From this ore-shed a good wagon road connects with the dock at Silverton, and a zig-zag trail goes up to the mine, but timber and supplies are sent up on the tramway.

Galena Farm.—The Galena Farm, or, as it was formerly called, the Currie group, consisting of five crown-granted claims, the Currie, Grover, Stephenson, Katie, and Peerless, is situated $1\frac{1}{2}$ miles south-

east of Silverton, and is owned by the Galena Mines Co., Ltd., of London. This property has been idle for some time and the workings were filled with water, so that nothing could be seen underground. The mine was formerly considered as having great promise, which the present surface showing would seem to justify, but if one may put any reliance on local reports, the property would seem to be another victim of over capitalisation and "across the sea" management.

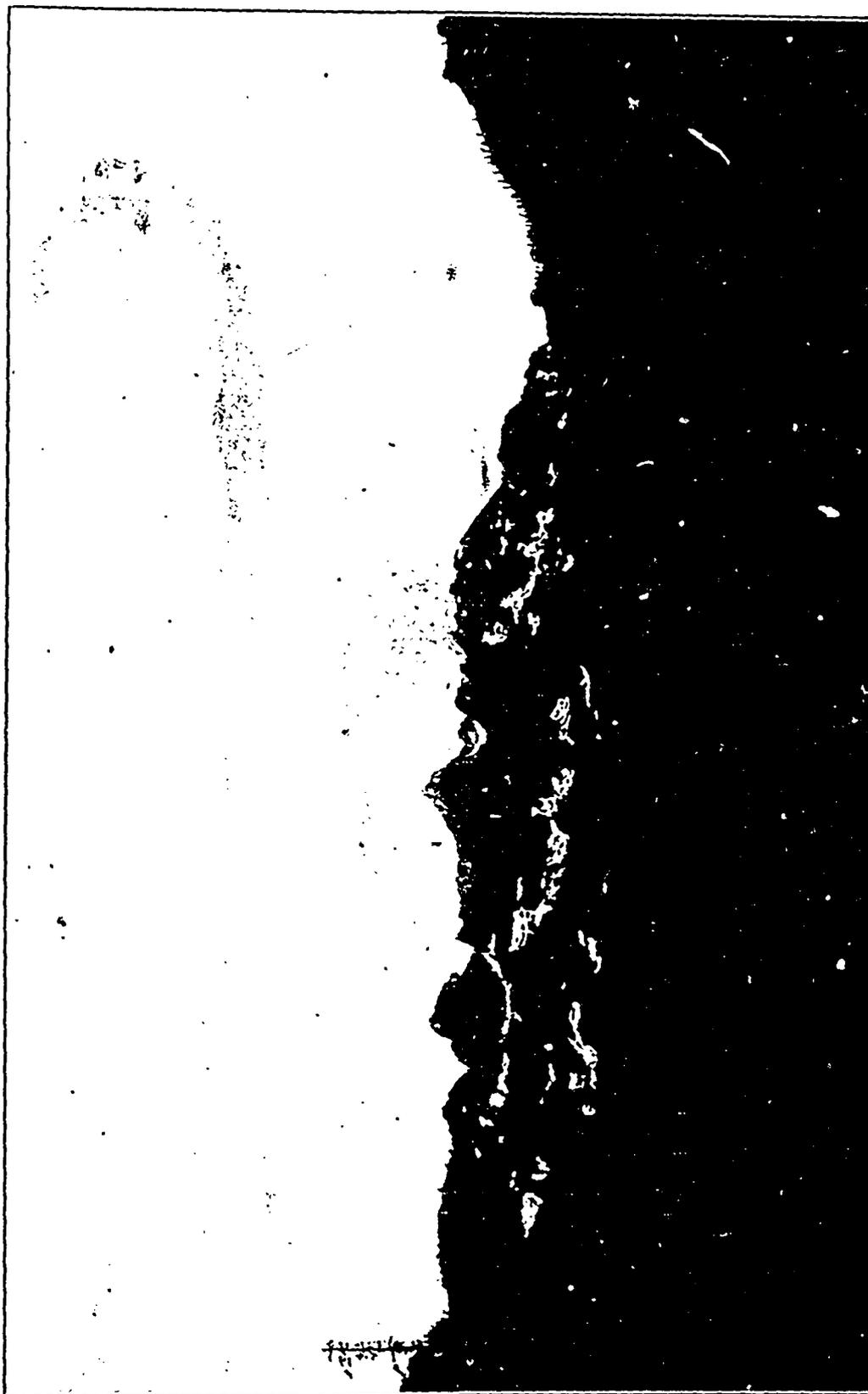
There is showing on the surface, and cutting through a granite formation, a strong quartz vein, 9 ft. wide, which can be distinctly traced in an east and west direction for a long distance, and which contains shoots of ore consisting of argentiferous galena, zinc blende and spathic iron. The lead dips to the north at an angle of about 50 degrees, and it is locally reported that the workings showed, at about 150 ft. down, a vertical east and west fault which cut off the vein, upthrowing it for some distance, as was afterwards shown, when it was subsequently picked up by a cross-cut to the north. The property is essentially a concentrating proposition, and would run from 10 to 12 per cent lead, with about 10 per cent zinc and 15 oz. silver to the ton, making concentrates of about 60 per cent lead and 100 oz. silver. The zinc blende would have to be separated and should, with the improving market for such mineral, prove an additional source of revenue, rather than as formerly, the reverse.

The plant is splendidly and expensively equipped with every appliance. There is a vertical 2-compartment shaft down 220 ft., equipped with hoisting plant, cage, etc., driven by a Pelton wheel under a water head of 300 ft., the water being brought from Gold creek, on which a dam is constructed, by a ditch, and a pipe-line 3,500 ft. long and 30 in. at intake, reducing to 16 in. There is also in place an old steam hoist and boiler, which are still serviceable. A separate Pelton is geared to the half of an 8-drill air compressor, formerly used for two drills and the pumps, of which there are three, a Northey, a Knowles and a Cameron. With the very complete equipment, and the really good showing, the property seems attractive for investigation, and under reasonable management should become a producer. The machinery and plant are kept in good repair by a caretaker who lives at the mine.

Wakefield.—The Wakefield group includes the Wakefield, Cazabazhua, Beaven, Robertson, Jennie Lind, Dalkeith, Kelso and Ben mineral claims, situated on Four-mile creek about 2 or 3 miles north-west of Silverton, at an altitude of 5,000 ft. The lead is a fissured zone from 15 to 20 ft. wide, occurring in black slate, dipping to the south at an angle of about 20 to 25 degrees, with a lime band on the foot-wall from 2 to 8 ft. wide, which carries galena, although the ore is sometimes found also on the hanging-wall side. The property is opened up by a series of tunnels, of which No. 1 is in 700 ft., and above which the ore is pretty well stoped out, though one man was working there getting out ore. No. 2 is in about

1,100 ft. and is largely stóped up to No. 1. Nos. 3, 5 and 6 are each in from 500 to 600 ft. on the vein, but do not appear, as yet, to have struck pay ore.

the manager is Mr. J. T. Lane, who employed this past summer 10 miners, 10 muckers and trammers, with 2 or 3 men on tram-lines, extracting about 40



Typical Mountain Range View in Slocan Mining Division.

The property has been under lease for the past two years to the Anglo-Slocan Syndicate, Ltd., of which

tons of ore a day, which was concentrated in the company's mill at the foot of the hill on Four-mile creek.

The ore concentrated in the ratio of 12 to 15 into 1, producing a lead concentrate running 64 per cent lead and 50 oz. of silver to the ton, and at the same time a zinc concentrate running about 45 per cent zinc and 20 oz. silver. The present company's lease has about expired, so it is perhaps not to be wondered at that the development has been neglected and little ore blocked out ahead.

In the upper levels the ores were higher grade, carrying gray copper, but more zinc blende is coming in with depth. Of the latter mineral there is a large quantity which is not mined more than is necessary, as a market for the zinc has not been obtained, the concentrates being stored at present on the dump, the present price of \$10 a ton for 45 per cent zinc and 20 oz. of silver, offering no inducement to sell. The ore is taken out at No. 2 tunnel, where it is trammed 100 ft. to a bin, from whence it is run in a short tram 400 ft. to a second bin, which in turn discharges into a third bin; it is then loaded into the buckets of the main aerial tramway, which is $1\frac{1}{4}$ miles long, with a fall of 3,000 ft.

The concentrating mill is designed to treat 100 tons of ore a day, but when visited it was only putting through about 40 tons a day. The plant is arranged for the separation of the zinc blende, but no close separation is attempted, as the zinc concentrates carry about 20 to 25 oz. silver, so that it is better economy to allow as much zinc as possible to go into the lead concentrates without reaching the "penalty limit" of 10 per cent zinc. The concentrates are hauled by wagon to Silverton, where they are shipped.

Emily Edith.—The Emily Edith, another of the well-known groups of claims in this district, formerly shipped considerable ore, but for the past two or three years has been shut down, and was found to be in the charge of a caretaker only, who was temporarily absent in Silverton when the property was visited, and, as all the tunnel entrances were locked up, nothing was seen of the underground workings.

The country rock is a hard brown shale, and is cut by a strong north and south fissure vein, carrying argentiferous galena and zinc blende. The mine is developed by a series of adit tunnels run on the lead (to judge from the size of the dumps) for a considerable distance, and of these No. 4 is evidently the main or working tunnel. About 10 tons of galena ore, about 60 per cent lead, were still in the ore-sheds, and there were various piles of zinc blende ore, estimated at about 500 tons of 30 per cent zinc.

The mine is equipped with good buildings, ore-sheds, stables, office and a bunk-house well worthy of being copied by other mines in the province, in which a well-planned attempt was made to give the men reasonable comfort and chances for cleanliness. The bunk-house is a frame building, $2\frac{1}{2}$ stories high, with basement, lathed and plastered inside and clap-boarded outside, and was not an expensive building to construct. In the basement is a heating furnace for the whole building. The first floor contains changing-room, wash-room, sitting-room and writing-room for the men; with a separate entrance, office, draughting-room, and rooms for foreman and clerks.

The top story is one large, well lighted and ventilated room, provided with a single row of double bunks, well-built of planed lumber. This is the "ram pasture," where men are provided with a bunk and mattress without fee beyond the usual charge for board. The second floor is divided up into small rooms, each with a window and door, some fitted up with two beds, and others, larger, with four beds, each bed being provided with a woven-spring mattress, etc. Beds in these rooms could be had at a small additional charge, said to be 75 cents a month for a bed in a four-bed room, and \$1 a month in a two-bed room. These charges, though small, pay splendid interest on the additional cost of construction, and the fact that the rooms were always in demand proved that the men did not grudge the additional charge, which ensured them some privacy and a chance to keep clear of the dirty and undesirable element which, however small in proportion, is often to be found in a mine bunk-house. This bunk-house was planned and built by the then manager, Mr. E. Rammelneyer, and the company, of which Mr. C. E. Hope, of Vancouver, is the agent, has the plans.

It is recently reported that this property has been taken under lease and bond by Mr. M. S. Davys, of Nelson.

Comstock.—The Comstock was formerly extensively worked by a company, but is now under lease to Messrs. Hunter & Davys, who are operating the property with a force of foreman, 4 miners, 2 ore sorters, and a cook, who also assists with the ore sorting. The property is situated on Fennel creek, a tributary of Four-mile creek, at an altitude of 6,400 ft., and is $13\frac{1}{2}$ miles from Silverton. It includes the following mineral claims: The Comstock, Blue Peter, Isabelle fraction, Kentucky Girl, Ruby fraction, Silver Cup and Silver Chief.

The rock formation of the vicinity is granite, and at the mine appears to be cut by a porphyry dyke. Following the fissure, and seemingly in places replacing the dyke, is a quartz vein from 1 to 5 ft. wide, having a strike N. 30 degrees E., with a dip of 30 degrees S., carrying, in bunches or shoots, up to 24 in. galena and gray copper.

When the property was visited in August last, from $1\frac{1}{4}$ to 1-3 tons of sorted ore were being mined daily, which would assay about 50 per cent lead and 100 oz. silver to the ton. This ore was sacked and hauled by wagon to Silverton, at a cost of \$5 a ton, the team making one round trip in a day.

The mine is developed for a vertical depth of 400 ft., by a series of adit tunnels of the following lengths: No. 1, 40 ft.; No. 2, 200 ft.; No. 3, 360 ft.; No. 4, 540 ft.; No. 5, 720 ft.; No. 6, 280 ft.; No. 7, 160 ft.; No. 8, 360 ft.; No. 9, 140 ft. Stopping had taken place between levels 2 and 3 for a length of 50 ft., and between 5 and 7 for a distance of 360 ft., although not continuously. In No. 9 there is a small streak of rich ore, running as high as 360 oz. silver to the ton.

Towards the foot of the hill and near Four-mile creek, a concentrating plant has been erected, for which the character of the Comstock ore, which is

easily sorted by hand and of which little is second-class, does not seem to offer justification. The mill is complete and well equipped, and was erected in 1897 at a cost of \$23,000. After running a couple of months it was closed down in 1898, since when it has been unused. The ore was hauled to it by teams from the mine, a distance of $1\frac{1}{2}$ miles down a heavy grade, and dumped into the mill storage bins, from which it was trammed to the mill bin. The mill was designed to crush the ore by Blake crushers, from which it was fed by automatic feed rolls on the lower floor, whence it passed to an elevator, and was raised to a 3-screen trommel at the top of the building. The product of the first screen went to the classifier; of the second, to a pair of fine jigs; while material from the third screen, and the oversize, went each to a pair of coarser two-compartment jigs. The products of the classifier went as follows: First product to two-compartment jig; second and third products, each to a three-compartment jig. The overflow from the classifier went to a V-shaped settler, the slimes from which were fed to 2 double-decked Evans revolving tables.

Fisher Maiden.—The Troy Mines, a company of which Mr. C. Twitchell, of Spokane, is secretary, is operating the Fisher Maiden group, as it was formerly called, under the superintendency of Mr. C. D. Long. The property includes the Troy and St. Helena crown-granted mineral claims, and is situated on Four-mile creek, about $1\frac{1}{4}$ miles by trail above the point where the Comstock wagon road leaves Four-mile and turns up Fennel creek. The main and original workings are some 1,000 ft. back from the creek, on a small gulch near Porcupine creek, where 3 tunnels have been driven. The No. 1 has 50 ft. depth at the face; No. 2 is some 75 ft. lower, and has 150 ft. of drifting on the vein, preceded by a cross-cut tunnel 150 ft. long; while No. 3 tunnel is a cross-cut from Porcupine creek valley, 200 ft. long, with a drift on the vein for 350 ft., and is 100 ft. lower than No. 2.

The vein has been traced over a small rise to Four-mile creek, where No. 4 tunnel was driven for 275 ft. on the vein, at a height of 100 ft. above the creek, or at a level 230 ft. lower than was No. 3 tunnel. No. 5 is from about 30 ft. above the level of Four-mile creek, and some 70 ft. below No. 4. This tunnel is being continued on the vein to cut the ore shoot seen in tunnels Nos. 1, 2 and 3, at a depth of 300 ft. lower than No. 3, which it should do in a distance of about 1,000 ft. from the portal.

The vein is a true fissure in syenitic granite, having a N. E. and S. W. strike, with a dip to the N. W. of from 75 to 80 degrees, and appears to accompany, and possibly partially replace, a porphyry dyke, the mineral occurring on either granite wall for from 4 to 12 in. thick in the ore shoots, while the vein proper is from 1 to 4 ft. wide.

The company is at present confining its energies to the Four-mile creek workings, and is operating with 4 miners and a car man, pushing the long No. 5 tunnel ahead as fast as possible, and incidentally taking out a little ore from the ore-shoot between levels 4

and 5. The ore-shoot above No. 1 is reported as stoped out, and while some stoping has been done above Nos. 2 and 3, there is still ore in sight. The ore-shoot on No. 4 is about 110 ft. long and contains a heavy percentage of zinc.

The company shipped, in 1903, some 14 cars of ore, and in 1904, 5 cars or about 100 tons, running 90 oz. silver to the ton, and 4 or 5 per cent. lead. The property is provided with comfortable bunk and mess-houses and office and stables. The mine buildings are sufficient, but are temporary in character, awaiting the completion of the long tunnel.

Alpha.—The Alpha is a group of crown-granted claims situated about 2 miles from Silverton, and some years ago shipped 1,200 tons of ore, chiefly from a large body of galena and lead carbonates found practically on the surface. For a number of years the property has lain idle, originally on account of litigation, the causes of which are said to have been adjusted, and the property is now held by Mr. N. F. McNaught, *et al.*, of Silverton.

The formation is a black slate and limestone, much disturbed and cut by faults. The original discovery was the immense pocket of ore already mentioned, which has been mostly extracted. Leading into this is a vein having a N. E. and S. W. strike, and a dip to the E. of apparently 30 to 40 degrees, accompanied by a light-coloured dyke. The dip has caused some trouble, as apparently the No. 1 tunnel was run under the main vein and missed it, as inclines in ore, from the main showing, later indicated. The showings of ore in the tunnels are not encouraging for this reason, but there is a promising showing in the shallow upper workings, which might be proved and worked by cross-cuts from the present tunnels. The lead here appears to be as wide as 48 in. in places, of iron oxides and lead carbonates carrying good silver values, and locally, a stringer of 20 in. of calcite was noted on the foot-wall, carrying a secondary deposit of ore of good value.

No. 1 tunnel is about 300 ft. long, with upraises, cross-cuts, etc. A secondary tunnel on the same level and started from near the portal of No. 1 was run N. 70 degrees E. for 50 ft., and immediately below this was No. 3 tunnel. About 80 ft. below this is No. 4 tunnel, a cross-cut for 100 ft. through very much contorted country rock, with a drift of 110 ft. on the vein but with no ore showing. No. 5 is still below No. 4, and is on a well-defined lead which did not show ore. It is very much a question whether these last tunnels are on the lead, which, in the upper workings, carries ore.

A gravity 3-rail surface tramway 1,200 ft. long runs from No. 1 tunnel at a slope of about 30 degrees down the hillside, at the bottom of which are bins and an ore-shed, from which a wagon road $2\frac{1}{2}$ miles long leads to Silverton.

VICINITY OF NEW DENVER.

Mollie Hughes.—The Mollie Hughes group is situated on the flank of Goat mountain, about a mile north of the town of New Denver, and on both sides of the Nakusp and Sandon branch of the C. P. railway, at the trestle. The property is owned by Mr.

T. Avison *et al.*, of New Denver, and consists of five crown-granted claims. The country rock is a syenitic granite, cut by a number of parallel and well-defined fissures, running E. and W. or along the flank of the mountain, in which occur quartz veins of greater or less width, carrying, in shoots, ore high in silver.

On the Kincaid vein, just below the railway trestle, there is a quartz ledge, with an E. and W. strike and dip of 70 degrees to the north, which is a clean, well-defined fissure vein in granite, from 4 to 12 in. wide, and on this a tunnel has been driven about 80 ft., in which the vein appeared for about 60 ft., when it pinched down to a seam, but came in again towards the face. From here, about 12 tons of ore were shipped in the early part of 1904, which yielded 140 oz. silver and about \$4 gold to the ton. The vein has been exposed on the surface by various open cuts, etc., for about 1,000 ft., and a cross-cut tunnel has been started to cut the vein at a depth of 70 ft. This has been driven 70 ft., and it is calculated that it will have to go 40 ft. more before striking the ledge.

On the Real Idea No. 2, one of the group, above the railway track, almost a quarter of a mile from, and 600 ft. higher than, Slocan lake, in a large open pit, a quartz vein, here from 7 to 8 ft. wide, is being developed and had been proved on the surface for 400 ft. This is also in granite, with free, well-defined walls, and although no shipment had been made from this opening, about a carload of ore was ready to ship, which, from rough samples, was expected to go about 150 oz. silver and \$40 gold to the ton.

About 75 ft. above the railway track, at the first trestle, another quartz vein has been opened up with a N. and S. strike, on which Mr. W. H. Sandiford, of the Bosun mine, is reported to have sunk a shaft 65 ft., obtaining therefrom a carload of ore, one-fourth of which is said to have assayed 556 oz. silver and \$40 gold to the ton, while the remainder went 100 oz. silver and \$10 gold. The owners have shipped from these workings a carload in bulk, which assayed 72 oz. silver and \$10 gold to the ton. Connecting with the bottom of this shaft is a 100 ft. tunnel, which was supposed to be a cross cut, but which, in fact, follows along a small east and west vein carrying values. From the shaft, at 40 ft. from the surface, levels have been run north and south for short distances. The ore is wheeled from the lower tunnel to a bin beside the railway track, where, when enough for a carload accumulates, it is loaded.

From the Mollie Hughes eastward the face of Goat mountain is scamed with small quartz veins, on a number of which mining in a small way is being carried on. The country rock on this upper part of the mountain is granite, and the veins have a general N. E. and S. W. trend.

Capella.—Of these the best known is the Capella group, comprising five crown-granted mineral claims, owned by Messrs. W. R. Will and N. F. McNaught, from which was taken what was probably the most valuable carload of ore ever shipped from the Kootenays. This carload of ore yielded \$10,100 smelter returns, and assayed 879 oz. silver and \$7.80 gold

to the ton. The property was not personally visited, as Mr. Will reported it as stoped out over the level, and he was only driving a lower cross-cut to the vein, which was not through, and so there was nothing to be seen. He supplied the following general information: On the south face of and near the summit of Goat mountain, at an elevation of 2,500 ft. above Slocan lake, a quartz vein 5 or 6 in. wide cuts the granite in a N. E. and S. W. direction, dipping to the W. at an angle of 35 degrees. There are 4 other parallel veins on this property. The main vein is opened by No. 1 tunnel, which is an 80-ft. cross-cut to the vein, with a drift of 200 ft. on the vein, above which the vein has been stoped to the surface. Below this there is No. 2 tunnel, a cross-cut of 260 ft., with a drift of 120 ft., and upraises therefrom to No. 1.

The ore-shoot is about 100 ft. long, and the values are chiefly on the hanging-wall side. There are several faults throwing down to the N., cut by the tunnel, and a fissured zone in the rock, 6 or 8 ft. wide, cuts the lead without faulting it, near which, in the vein, the best values have been found to occur. The ore-shoot mined has been found to continue to the tunnel level, being still in the bottom, and the lower tunnel is being driven to develop it at a lower level. On another and lower vein, tunnels have been run in 55 ft. and 120 ft., with raises. The shipments made to date from the property amount to 150 to 160 tons of ore, of an average value of \$100 a ton, but no shipments were made in 1904. The drifting at present is being done by contract.

Bosun.—The Bosun mine, situated a short distance from Slocan lake, about half-way between New Denver and Silverton, is owned by the Bosun Mines, Limited, 5, Fenchurch Avenue, London, England, and has for the past year or two remained idle, being now in charge of a local watchman. The property was last under the management of Mr. W. H. Sandiford, who is well known in the district. The property is extensively developed by a series of 5 adit tunnels on the lead, for a vertical depth of 365 ft. and a total length of nearly 1,800 ft. The lowest, or No. 1 tunnel, is 1,000 ft. long, connected by raises with No. 2, 130 ft. above, No. 2 is 800 ft. long, and 80 ft. below No. 3, which is 1,000 ft. long, and 85 ft. below No. 4, No. 4 is 500 ft. long, and 60 ft. below No. 5, which is 300 ft. long, and, at the face, 60 ft. below the surface.

The lead is a large fissured zone filled with crushed material, in which occur, with quartz, lenses of galena and zinc blende. Of the interior of the mine little could be seen, as all the levels are well-timbered and logged, and the "sloughing off" of the clay, from water and air, obscured everything.

Mowich.—The Home Run or Mowich group, owned by Messrs. C. Greenlee, Moran and Kingsbury, is situated on the south slope of Carpenter creek, about 2 miles from New Denver, and a short distance above the old New Denver-Kaslo wagon road. The property includes the Home Run, Mowich, St. Clair, Rosemarie, Grand Stand and Ronald fraction claims, and is in the "slate belt." The main lead is a quartz

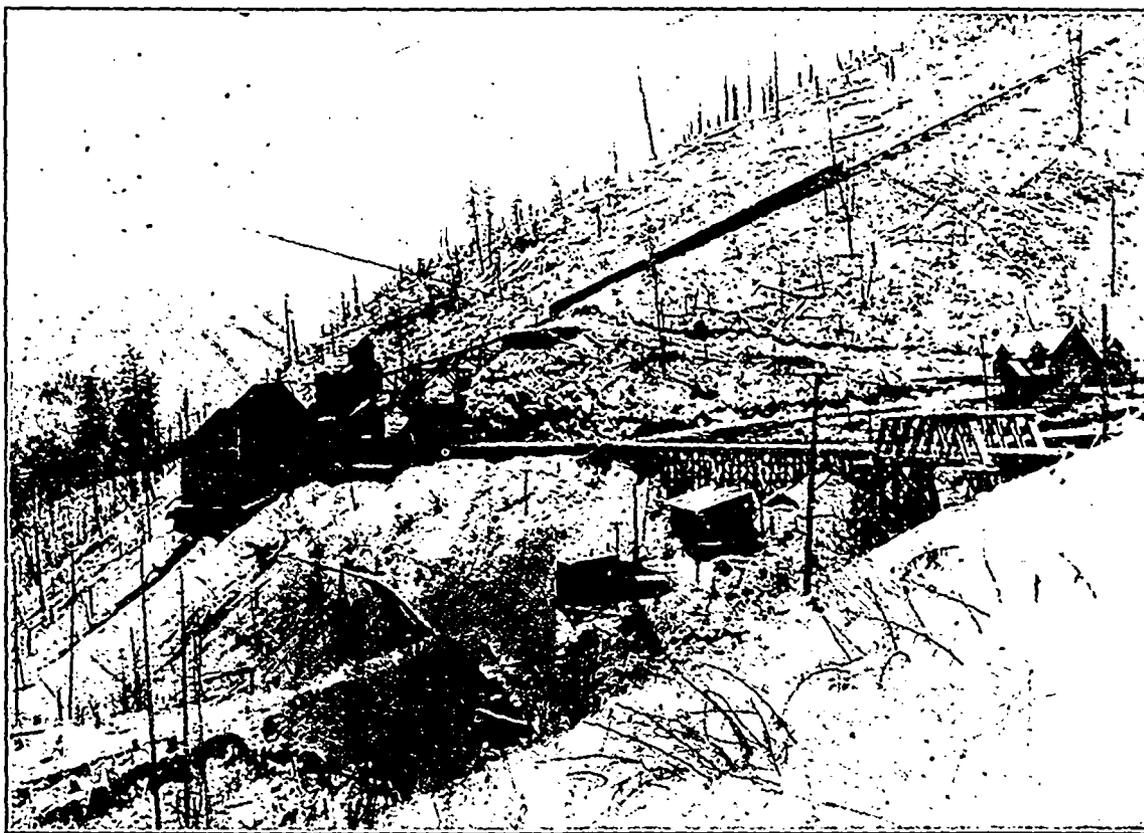
vein, from 3 to 6 ft. wide, cutting the slates, and on this there is a 100-ft. tunnel, with lower down a 500-ft. tunnel, from which some very good ore was taken and some small shipments made.

During the summer of 1904, work was confined to a cross-vein of quartz occurring 800 ft. lower down and running with the formation, between very contorted slates, having a strike about S. 55 degrees E. and a dip to the S. W. of 80 degrees. On this vein No. 1 tunnel was in about 300 ft., at which point there was a raise up 35 ft., while 80 ft. above No. 1, was No. 2, then in 100 ft. The quartz carried, in shoots, gray copper and galena, and one carload shipped ran 11.4 oz. silver and \$2 gold to the ton.

up. This ore is reported to carry 40 per cent zinc and 50 oz. silver to the ton.

VICINITY OF THREE FORKS.

Before the Kaslo and Slocan railway and the Rosebery branch of the Canadian Pacific railway were constructed, the town of Three Forks, situated, as its name implies, at the junction of the three forks of Carpenter creek, was a town of considerable importance, as it was at the junction of the wagon road from New Denver to Kaslo and the branch road from Sandon, over which route, in the early days, many tons of rich galena ore were taken out by pack-train and wagon. This traffic induced the construction of the two railways, but, as is usually the case with such



Silver-Lead Concentrating Mill and Zinc Separating Plant, at Payne Mine, near Sandon. (See page 222.)

Part of a carload was ready in the ore-shed, and it looked probable that about two more carloads would be shipped during the year.

Mountain Chief.—The Mountain Chief almost adjoins the last-mentioned property, and has been idle for some time. It is owned by Messrs. George Hughes (1-3) and McCune, of Spokane (2-3). The property was one of the famous mines of the district, and is represented to have shipped during 1892, 1894 and 1897 \$150,000 worth of ore. There is a strong vein in limestone and slate cutting N. 20 degrees E., and dipping about 45 degrees to the S. W. The ore was galena with zinc blende. On one dump there is a pile of black zinc ore estimated at 50 tons, and at a lower tunnel 100 tons of similar ore is piled

intermediate stations on a wagon road, the advent of a through railway practically killed the town, and today it is deserted, save by a few people having local interests which still keep them there.

There were formerly in the vicinity 3 or 4 mines of importance. These have been passing through a period of inactivity, from which they are only now recovering. In addition, the recent development of a number of small rich "dry ore" properties again gives promise of renewed mining activity in the vicinity, and of a renewed vitality to the old town, which, even now, can boast of two hotels and a store. The town is a station on the Canadian Pacific railway branch, and is the railway headquarters for the upper end of the branch, as the grade from here up to Sandon is

so steep that trains have to be split up and taken on in sections.

Monitor.—The Monitor mine, including the Monitor and Hustler fraction, is owned by the Monitor and Ajax Fraction, Ltd., of 42 and 44, Effingham House, Arundel Street, London, and is under the local management of Mr. Maurice Gintzburger, with Mr. A. R. Fingland as mine superintendent. The mine is idle, pending the installation of machinery at it, and the construction, near Rosebery, of a plant for the separation and recovery of the zinc blende, which occurs with the galena to such an extent as to have been a cause of penalty at the smelter. Its removal from the galena will permit that ore to be treated at a lower figure, while the zinc, if properly prepared for market, will have a distinct value of its own. Formerly the mine shipped extensively, the total shipments amounting to 3,185 tons of ore, which netted \$192,401, of which there was shipped prior to 1901 (when the present company took possession), 688 tons, valued at \$68,869.60, the present company having shipped 2,497 tons, valued at \$123,531. The property is situated on the south slope of the south fork of Carpenter creek, opposite the town of Three Forks.

The country rock is slate, and is cut by a well-defined quartz vein having a general N. 10 degrees E. strike, and a dip to the S. E. of from 60 to 90 degrees, cutting the bedding of the slates nearly at right angles. The vein varies in width, but is as great as 48 in., and carries galena and carbonates, with silver values and a certain amount of gold, also, in parts, a considerable percentage of zinc blende.

The property is developed by 5 adit tunnels, of which the highest, or No. 1, is 450 ft. long, and in its course cuts one fault with a throw of 40 ft., beyond which the vein has been again picked up. No. 2, 78 ft. lower and 650 ft. long, has about 200 ft. of additional exploratory workings off it, and cuts through two faults, the first, near the portal, with a throw of 32 ft. to the right, the second being that noted in No. 1. The work was pushed through both these faults, but was finally stopped at another fault, which dips into the hill with the bedding at an angle of 60 degrees. No. 3 is 50 ft. below No. 2, and meets at the portal a fault with a throw to the right of 20 ft., and also cuts through the 32-ft. fault coming down from the level above. This tunnel likewise is stopped at 850 ft. in, by the same fault which blocks No. 2. No. 4 is 122 ft. below No. 3, and is 1,080 ft. long, and cuts the same two faults as does No. 3, but has not, as yet, been driven out to the main fault. No. 5 is 217 ft. lower than No. 4, and is a cross-cut for 400 ft. with 120 ft. of drifting on the lead, in which is encountered a new fault not previously met with. It is estimated that this level would have to be extended 1,000 ft. before it struck the line of the main fault. There has been good ore in the upper levels, which, although pretty well mined to these levels, is still continuing into the floor, so that the long tunnel is expected to cut these ore shoots with depth. Besides this, No. 5 cuts a new ore-shoot, on which some stoping has been done and an intermediate level started.

Rowse Fraction.—The McAllister group consists of 4 claims, including the Rowse fraction, situated about 6 miles from Three Forks, up the north fork, and is being operated by Messrs. Hunter, Fairbairn, *et al.* The country rock here is a schist on the foot-wall, and an argillite on the hanging-wall, of a well-defined quartz vein with a strike N. E. and S. W. and a dip of 50 degrees to the S. E., or into the hill. The quartz vein, from 3 to 4 ft. wide, was followed down for about 30 ft., when it was completely cut off by a fault. A cross-cut tunnel, started 30 ft. lower down, passed under the line of the upper workings without encountering any vein, but at 150 ft. in, the vein was again picked up and drifted on for 20 ft. The tunnel cuts in its course a second small vein, on which a short drift had been run, but with no great results. A short distance above the vein there is a large porphyry dyke about parallel with it. The vein quartz carries galena, with gray copper and silver sulphides, the ore, as shipped, running over 250 oz. silver to the ton. About 300 ft. to the S. W. of the workings just mentioned, and some 150 ft. higher up the hill, an open cut and tunnel develops a second vein of quartz, which gives much promise, but had been little developed.

Jo-Jo.—The Jo-Jo is situated about a mile to the N. of the last-mentioned claim, and is of about the same character. The property has been worked during the past season by two leasers, who have shipped about 25 tons of ore, running 150 oz. silver. During the summer some samples of ore were met with in the workings, which gave phenomenally high assays.

Messrs. Cory and Foster operated the Cinderella, in the same neighbourhood, under lease, and shipped between 175 and 200 tons of ore during the year. The property is owned in England.

Idaho-Alamo.—The old Alamo and Idaho mines, which formerly were among the largest producers in the Slocan district, have been amalgamated under one company, the Idaho-Alamo Consolidated Mines, Ltd., an English company, of which Mr. P. D. Ahier is superintendent and engineer. The properties are situated on Howson creek, which enters Carpenter creek about a mile below Three Forks. At the head of this creek, near the summit, are two short branch streams ending in semi-circular basins surrounded by steep bluffs, through which the leads cut, and from which point they have been worked. The rock formation of the vicinity is slate, cut by porphyritic dykes, much contorted and bent, and in places faulted, although in the properties under review no important faults were noted.

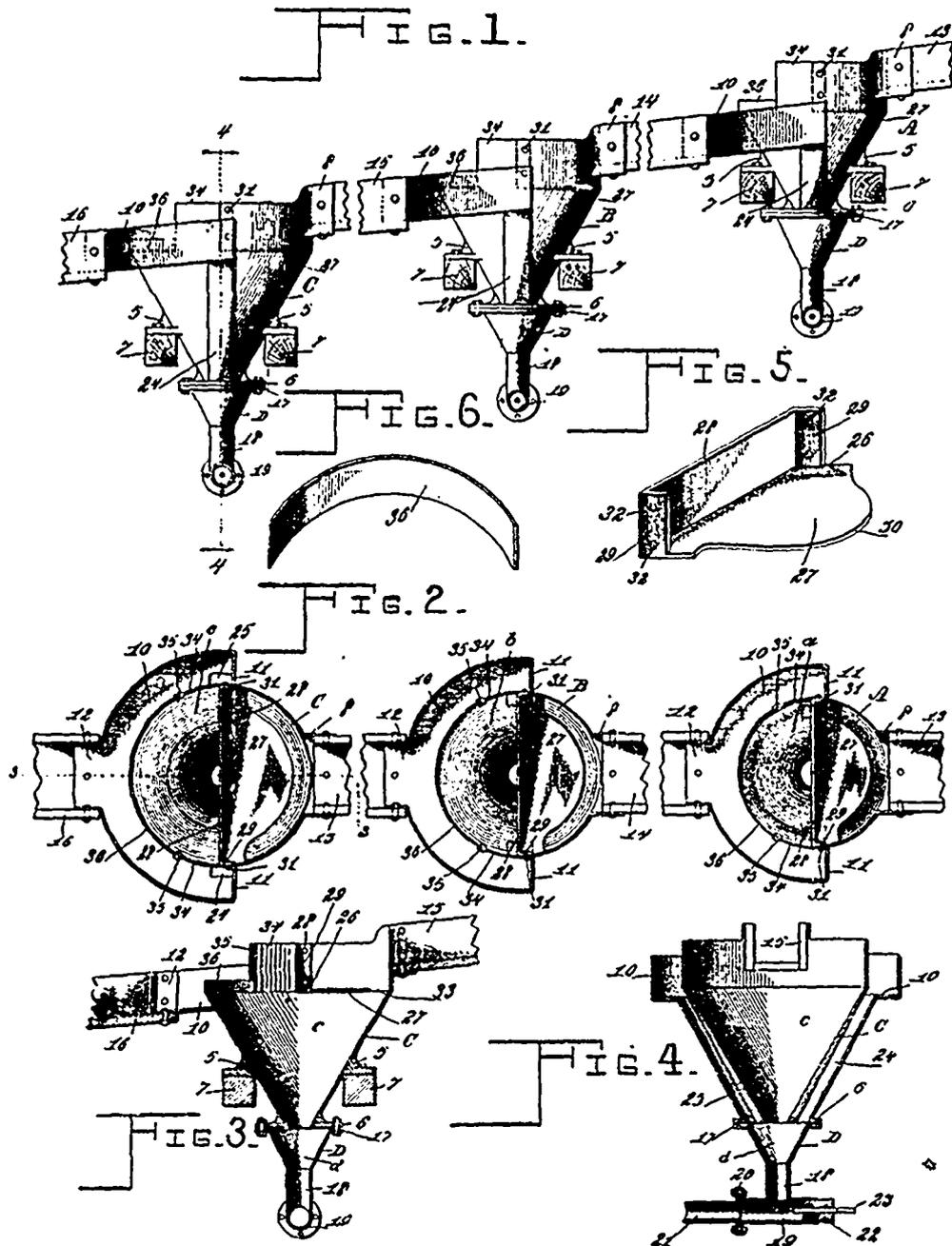
The Alamo vein was formerly worked from the Alamo basin, from which a cross-cut has been driven through into the Idaho basin. The claim has been developed for a vertical depth of 288 ft., by 4 levels driven from 1,000 to 1,200 ft., and systematically laid out with raises, etc. Above these levels the known ore has been pretty well extracted. There was, however, good ore in the floor of the bottom level, and in a winze, so there is reason to believe that it continues downwards. It is reported that a tunnel will be driven this winter to prove this. The vein is from

3 to 8 ft. wide, a fissure in slate, with a dip varying from 45 to 90 degrees. The last shipment was made in 1898, when 400 tons of ore were shipped, running 40 per cent lead and 180 oz. silver to the ton.

A Riblet aerial tramway, 6,000 ft. long, with a rise of 3,000 ft., runs from the mill on the railway up Howson creek to the junction of the Alamo and Idaho

in progress, most was being done on the outcrops. On the surface of the claims in the basin, from 25 to 30 men were employed. The property is opened by a series of adit tunnels, not all of which are connected.

There was exposed on the surface of the lead a large body of ore which was being quarried, while in the basin above the claim a gang of men was employ-



Culver Classifier—Used in Slocan Star Mill.

basins, and can be extended in a straight line to the Alamo workings, if desired. In the meantime a "baby tram," 1,800 ft. long, runs from the upper terminal of the main tram to the Idaho workings, and over this all the Idaho ore is transported.

During last summer, the work was confined to the Idaho basin, and while a little underground work was

ed removing 2 to 3 ft. of the surface soil of the basin, which was found to contain nodules of galena to such an extent as to yield about one ton of 200 oz. silver concentrates for 15 tons of soil. This "outside" work was being pushed to take advantage of the fine weather, which accounted for apparent neglect of "inside" work, which could be performed in bad weather.

The total shipments from the mine are reported as amounting in value to about \$1,000,000, from which the various companies and owners have paid in dividends \$400,000.

There are in this basin two well known veins, the Idaho and the Cumberland, which are parallel for part of their course, but the Idaho branches off abruptly to the south about the middle of the basin. The concentrates from the Cumberland ore run about 65 oz. silver to 55 per cent lead, and from the Idaho 106 oz. silver to 55 per cent lead, while the concentrates from the soil of the basin, mentioned previously, run nearly 200 oz. silver, which has led to the belief that the ore thus found in the soil of the upper basin came originally from the disintegration of the Alamo vein, which outcrops high in the bluff above the Idaho basin.

The Idaho mill is on the Canadian Pacific railway at Alamo, about a mile below Three Forks, and at the lower terminal of the aerial tramway already mentioned. The terminal storage bins have a capacity of 1,000 tons, and the mill 100 tons in 24 hours, but when visited, it was running only on the day shift, putting through about 50 tons a day. From the storage bins the ore passes through a crusher to an ore bin with a capacity of 40 tons crushed ore, from which it is fed by an automatic feeder to rolls, and thence to the first elevator and trommels, etc. The plant consists of crusher, 3 sets rolls, Huntington mill, 2 elevators, 10 jigs, spitzkasten, 4 Wilfleys, and 2 extra Wilfleys to treat tailings from the first four.

The following assays were given by Mr. Ahier:—

	Silver, oz. per ton.	Lead, per cent.	Zinc, per cent.
Lead concentrates	64	56.5	13.2
Zinc concentrates	30	1.2	40
Jig tailings	4.1	.2	....
General tailings	5.7	.4	....
Third screen, No. 7 jig	30.5	1.8	42.1

A saving is claimed for the mill of 95 per cent of the lead contents.

VICINITY OF SANDON.

Slocan Star.—The Slocan Star group of mines has been, and still is, one of the most successful of the district, having paid in actual dividends a large amount. The group includes the following crown-granted claims: Slocan Star, Silversmith, Jennie, Slocan King, Emma, Windsor, Morning Sun, Shogo fraction, Wyoming (in part), Echo fraction, Ophir No. 3, Silver Star fraction and Hidden Treasure. The first five of these are reported as located under the old *Mineral Act*, and, consequently, have "extra-lateral rights," that is, they can follow the lead to the dip across their side lines, while the rights of the remaining claims are bounded by vertical planes through their respective boundary lines.

The property is owned and operated by the Byron N. White Co., of Milwaukee, Wis., of which Mr.

Byron N. White is the president, and Mr. J. W. Dadmun secretary-treasurer, while Mr. Oscar V. White is local manager. The capital of the company is \$500,000, over 95 per cent of which is held by three persons. The company has paid in dividends to date \$525,000, of which the last was \$25,000, paid August 8th, 1904. The total shipments up to July 1st, 1904, were 32,453 tons, of which about one-third was shipped as crude ore, and the remainder as concentrates, and this carried 2,673,248 oz. silver and 18,549 tons lead.

The property is situated on a gently sloping hillside on Sandon creek, about half a mile from its junction with Carpenter creek, at the town of Sandon. The mine is opened up by 5 levels, all entered by cross-cut tunnels. The lead is a regular quartz fissure vein, cutting through and across the bedding of the black slate country rock, and accompanied by a zone of crushed slate country rock, having a normal width of 4 ft., but occasionally widening out to 30 ft. The outcrop of the vein, as it appears on the surface for 3,000 ft., is in shape like the letter "S," the general strike being E. and W., while the dip is variable, averaging about 50 degrees, and is S., or into the hill. The mineral usually occurs on the hanging-wall side of the vein, but occasionally ore is found on both sides. The ore occurs in shoots in the vein, of which there are two main shoots developed by the workings. These are from 100 to 150 ft. wide, and extend from the surface as far down as the workings have gone. The silver values continuing with depth. Nearly parallel with the outcrop is a porphyry dyke or boss, which seems to be associated with the fissure and its mineralisation.

The company is at present engaged in litigation with the owner of the Rabbit's Paw, an adjoining claim, over "extra lateral rights," and as the mode of occurrence of the ore-body, etc., forms a strong determining factor in the suit, it is not considered proper at present to enter more fully into the occurrence of the vein.

The ore is argentiferous galena, carrying a little gray copper, and associated with zinc blende, spathic iron and iron pyrites, with a little manganese. While some ore is shipped as mined, the greater part of the product of the mine is concentrated in the company's mill on the property. The ore being mined at present comes, for the most part, out of No. 3 tunnel, from which it is trammed for about 100 yd. to a temporary ore pocket of 200 tons capacity, and is conveyed thence by a surface gravity tramway a distance of 1,500 ft. to the mill-bins.

The old mine buildings were swept away by a snow-slide in 1903, and have been replaced by temporary structures, pending the completion of a No. 5 tunnel, which is to be driven near the level of the mill-bins, much lower than the present workings, and out of the way of snow-slides.

The mill feed from July 3 to 15, 1904, ran as follows:—

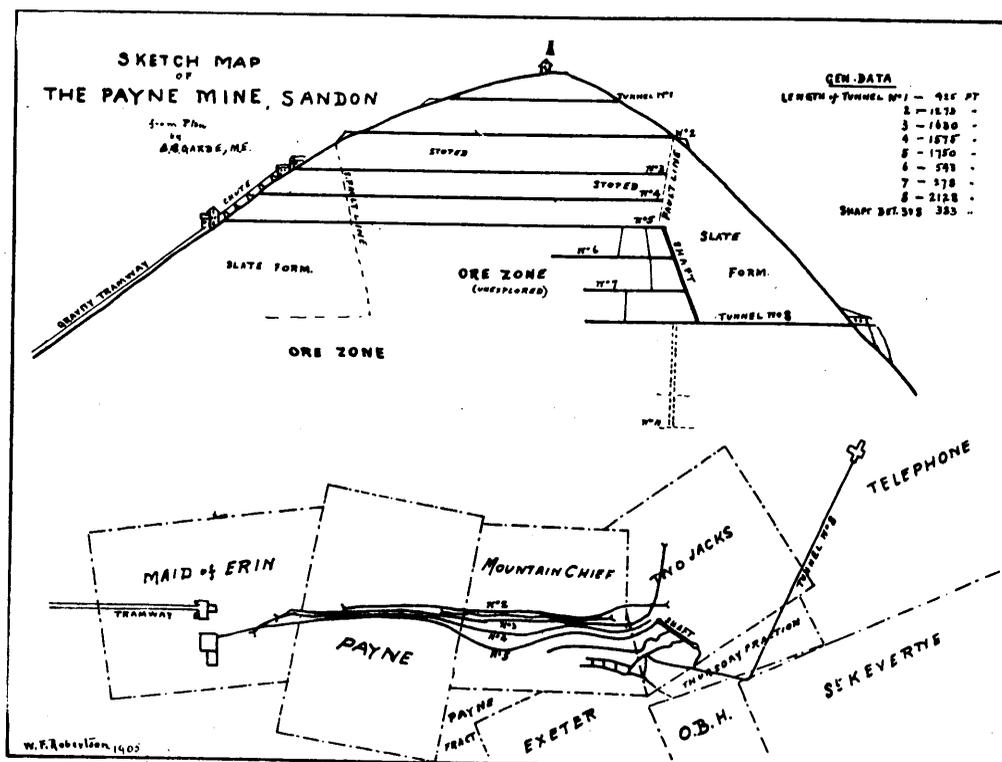
Tons.	Mill Feed.			Tons.	Galena Recovery.		
	Ag. oz.	Pb. p.c.	Zn. p.c.		Ag. oz.	Pb. p.c.	Zn. p.c.
1,553	21	5.1	12	92.3	95.4	61	9.5

Tons.	Zinc Recovery.					
	Ag. oz.	Pb. p.c.	Zn. p.c.	Fe. p.c.	Mang. p.c.	Assay.
334	46.5	2.5	35	15	3	

As will be seen from the above, the zinc forms an important factor in the output of this property, and about 3,000 to 4,000 tons of zinc concentrates were stacked upon the dump, the company having had no

a tableman, and a trammer, with the occasional assistance of a blacksmith and a labourer.

Payne.—The Payne mine is probably the best-known silver-lead mine in British Columbia, and since 1892 has been one of the largest shippers. The ownership of the property changed about 4 years ago, and it has since been held by the Payne Consolidated Mining Co., a Montreal company, of which Lt.-Col. F. C. Henshaw is president, and Mr. C. H. Law is secretary, while the local management was in the hands of Mr. A. C. Garde until the late fall of 1904, when active operations ceased, since when the company's accountant, Mr. Geo. F. Ransom, has been acting manager. The property is situated on the north slope of Carpenter creek, about 2 miles below Sandon, and on the line of the Kaslo & Slocan railway, while



acceptable offer for it from the zinc ore-buyers, who offered an inadequate price for the silver, and objected to the percentage of iron and lead present. It is now reported unofficially that the company intends to erect a plant for the separation of the iron, etc., so enriching the zinc product as to meet market requirements.

The company's concentrating plant is in the charge of Mr. Chas. Culver, who has the reputation of being one of the most expert mill-men in the district, and who has brought the mill up to a high state of efficiency and economy. The Culver classifier, with which the mill is provided, is efficient and contains some novel features. The mill is operated by water power, the water being taken from Sandon creek, and used under a head of 400 ft. The mill force consists of, on each of two shifts, a crusher man, 2 jig men,

from the mill a short wire-rope tramway leads to the Canadian Pacific railway tracks in the bottom of the valley, permitting shipments to be made by either road. The property is well equipped with all essentials as to plant, buildings, etc.

The following statement, prepared by the manager, Mr. Garde, on August 31, 1904, gives a correct idea of the plant and mine:—

"This property was discovered in the fall of 1892, and has been in continuous operation ever since. More than 50,000 tons of silver-lead ore have been shipped, representing a gross value of nearly \$4,000,000. Average value per ton for this period was \$77.30. Average value per ton of concentrates for year 1903 was \$83.32, assaying 124.5 oz. silver and 67.29 per cent lead. Dividends paid since 1897 up to the present date, \$1,438,000. Beside silver-lead, the Payne

has within the past year produced between 3,000 and 4,000 tons of zinc concentrates, averaging about 50 per cent zinc, 14 oz. silver, low in iron, lead and other impurities. Since 1901, the character of the ore in the Payne has changed from a clean galena into a concentrating ore, heavily mixed with spathic iron and zinc. The company has, therefore, during the past three years, completed a concentrating plant capable of handling 200 tons in 24 hr., and more than 125,000 tons of concentrating ore, including stope fillings and dumps, have been treated in this plant. It has also, within the past year, added a zinc separating plant, by which the iron is separated from the zinc by means of magnetic concentration. Both of these plants are in operation. The concentrating plant is located on the K. & S. railway tracks above the C. P. railway, and is conveniently situated for the handling of concentrates over either railway. The entire plant is run by water power, and to help out during the dry season of the year, an auxiliary 150-h.p. compound condensing steam engine is available. There are two pipe lines, one 1,800 ft. and the other 2,600 ft. in length, furnishing power for 4 Pelton water wheels. The capacity of the high-pressure line, under a 750-ft. head, is 300 h.p., while the capacity of the low-pressure line, under a 450-ft. head, is approximately 50 h.p. Three of the water-wheels are used for driving the concentrator proper, while one is coupled to a 100-h.p. generator, supplying power for the mine over a 3-wire pole-line 5,500 ft. long. The electric power at the mine is used partly for driving a 3-drill compressor and partly for running a 50-h.p. hoist, besides furnishing light for the mine and all buildings at lower and upper terminals. The compressor and hoist are geared direct to induction motors, and the current of 2,200 volts is transformed to 220 at the mine. The high current for the hoist motor is carried into the mine by special insulated lead-covered cable.

"List of machinery comprising power plant, exclusive of concentrating machinery:—One 3-rail gravity tramway, extending from the concentrator at the K. & S. railway tracks to tunnel No. 5, a distance of 5,500 ft.—average degree of incline 25 degrees; difference in elevation between upper and lower terminals, 2,300 ft.; capacity of bunkers at upper and lower terminals, 100 tons each; maximum capacity of tram cars, 5 tons; maximum capacity of tram per 24 hours, 500 tons. One high-pressure pipe-line, 2,600 ft. long, 11 in. diameter at the upper end, working under a static head of 750 ft., designed to develop 300 h.p.; one low-pressure pipe line, 1,800 ft. long, 4 in. diameter, working under a static head of 450 ft., capable of developing 50 h.p.; 2 high-pressure 24-in. special Pelton water-wheels, each 160 h.p. capacity; one high-pressure 12-in. special Pelton water-wheel, 30 h.p. capacity; one low-pressure 18-in. standard Pelton water-wheel, 30 h.p. capacity; one 75-kw. three-phase alternating current generator, 2,200 volts, capacity 100 h.p.; one 2½-kw. direct current dynamo used as exciter for above generator; one 7-kw. direct current dynamo used for magnetic separator in zinc mill; two 2-kw. dynamos, driving dust fan in zinc

mill; one 150-h.p. compound condensing steam engine, at present developing 90 h.p.; one 90-h.p. tubular boiler, 54 in. by 12 ft., working under 90 lb. pressure.

"At the mine: A 50-h.p. duplex 3-drill air compressor, geared to a 50-h.p. induction motor; a 30-h.p. electric hoist, geared to a 30-h.p. induction motor; a 15-h.p. duplex electric pump, capacity 100 gal. per minute, geared to a 15-h.p. induction motor; a Knowles sinking pump of 40 gal. per min. capacity, arranged for steam or air; a 25-h.p. sinking hoist, arranged for steam or air; a 12-h.p. gasoline engine (not in use); 2 Ingersoll-Sergeant 3¼-in. air drills; a Mac Machine Co. 2¼-in. 'baby' air drill; a 20-h.p. boiler, used for heating purposes at mine boarding-house.

"In regard to the mine, there are altogether 8 levels, of which the upper 5 have been practically stoped out. Some cross-cutting is at the present time being carried on in No. 3 level, to demonstrate whether any other parallel fissures exist in the Payne ground. No. 5, which is the principal working tunnel and the upper terminal of the tramway, is connected with levels Nos. 6, 7, and 8 by means of a 384-ft. incline shaft. In all of these last-mentioned levels the Payne vein has been encountered and developed for some distance. A considerable quantity of concentrating ore has been taken out of these levels, and the company is engaged in driving them ahead, and is meeting with good prospects of opening still larger ore-shoots in the lower part of the ore-zone. A great deal of work has been done in level No. 8, where a new ore-shoot of considerable value is uncovered for a distance of about 300 ft., showing very strongly, and with all indications of going down. Recently a station has been cut in the east drift of tunnel No. 8, and arrangements are now being completed for the exploration of this ore-body to a depth of 300 ft., after which, if results warrant it, a long tunnel, starting at some point lower down on the Payne mountain, will be driven with the view of tapping the vein and handling all ores from here, thus avoiding hoisting, and also allowing for drainage of the property."

The shutting down of this important property must be considered as a most unfortunate occurrence, and a distinct misfortune to the mining industry of the district, and while the preceding statement of the manager, Mr. Garde, written about a month before the shut down, gives a correct idea of conditions, a few notes from an independent standpoint may help to a fuller understanding of the situation..

The vein cuts from side to side of the hill, while the ore-bearing zone appears to be confined to the central part of the hill, and has a sectional width of about 1,000 ft., with a barren zone on either side, that is, on either flank of the hill. As Mr. Garde says, the five upper levels have been practically stoped out, and the small patches of ore that remain are being taken out by "tributers." Between No. 5 and 6 levels a dyke, locally known as the "white dyke," comes in, having a strike parallel to that of the vein, but, above its junction with the vein, a flatter dip. After meeting the vein, the dyke and vein follow the same dip and

strike, that is, they are together, down to the lowest working level, No. 8, where the dyke cuts into the hanging-wall, while the vein, resuming its old dip, continues in depth into the unexplored portion of the ore-zone.

On levels Nos. 6, 7 and 8, where the dyke is in the vein fissure, the galena is largely replaced by spathic iron, and on these levels the mining has never paid expenses, all profit seeming to have vanished with the appearance of the dyke. On the vein, after the dyke leaves it, there is an exceedingly encouraging showing of ore, on which a winze has been started down, for which a station had been cut, an air hoist installed, and bins constructed. The winze being full of water, this showing was visible only for 15 to 25 ft. from the point where the dyke left the vein, but even with what little could be seen of the ore showing, it was decidedly the most promising ore-shoot seen below No. 5 level, and it is greatly to be regretted that active operations in the way of development should have ceased when the difficulties brought about by the dyke had been surmounted, and just as a fair promise was obtained of the renewal of the conditions prevailing in the upper levels before the advent of the dyke in question.

The mine, as it stands at present, is another instance of the short-sighted policy of gouging out all available ore, and neglecting the proper development, in advance, of further bodies of ore.

Queen Bess.—The Queen Bess group has been one of the important mines of the district, having, under former owners, shipped ore of which the smelter returns show a value of about \$225,000, the ore having had an average value of about \$65 a ton, assaying about 100 oz. silver and 70 per cent lead. The property is situated on the east slope of Howson creek, opposite the Idaho basin, being over the ridge from the Monitor. It was, on January 1, 1904, acquired by the present owners, the Queen-Dominion Mining Co., Ltd., of which Mr. Robert Irving, of Kaslo, is secretary-treasurer, and Mr. George Potter, superintendent in charge of the mine. The property had been opened up extensively by five levels, exploring the contact vein for 1,000 ft., while from No. 5 an inclined shaft connects with No. 10, some 300 ft. lower down. The formation is slate, in which, along a strong fissure, occurs a crushed zone, several feet wide, carrying quartz, with galena, lead carbonates, and oxides of iron, but with very little zinc. The wall on one side of this fissure is unbroken, while on the other side the slate is "blocky" in character, and from the main fissure are several "spurs" of quartz making off at an acute angle. The mineralisation seems to have been greatest where these "spurs" joined the main lead. The former owners had left little or no ore developed, so the attention of the present owners has been taken up in prospecting the property practically anew, and this they are doing steadily and systematically.

Ivanhoe.—The Ivanhoe mine is owned and operated by the Minnesota Silver Co., Ltd., president, Mr. W. H. Yawkey, with Mr. Phillip J. Hickey as local

manager and superintendent. The Ivanhoe and Elgin claims are owned by the company, while 11 adjoining and surrounding claims are held in the names of Messrs. Yawkey and Hickey. The management reports that since the present company acquired the property in 1896, about \$190,000 worth of ore has been mined and shipped, while previous owners are credited with having shipped from 500 to 800 tons of ore richer than the average. The mine is situated on the south slope of Carpenter creek, about opposite the lower end of the town of Sandon, in a small basin among the peaks of the range, and at an elevation of some 3,000 ft. above the creek.

The lead is a fissured zone in slate, having a strike of N. 80 degrees (mag.), and a dip of about 50 degrees into the hill, and contains a quartz vein carrying galena and blende. The outcrop cuts diagonally up the basin and into the bluff at its top, but the mining has been done chiefly in the basin. The mine has been opened up by a series of 8 levels, numbered from 1 to 8, starting from the top, of which Nos. 1, 2, 4 and 8 are connected with cross-cut adit tunnels of the following lengths:—No. 1, 75 ft.; No. 2, 230 ft.; No. 4, 465 ft.; and No. 8, 1,310 ft.

No. 1 level is about 150 ft. below the surface and is 260 ft. long.

No. 2 level is about 90 ft. below No. 1 and is 220 ft. long.

No. 3 level is about 100 ft. below No. 2 and is 800 ft. long.

No. 4 level is about 100 ft. below No. 3 and is 1,500 ft. long.

No. 5 level is about 107 ft. below No. 4 and is 600 ft. long.

Nos. 6 and 7 levels are only started off from the raise, while No. 8 level, which is 320 ft. lower than No. 4, has been driven for 385 ft. to the east and west of the cross-cut tunnel.

The general ore-shoot is, approximately, 360 ft. long in the vein, and extends down to No. 8 level. No stoping or work was going on above No. 2 level, the greater part of the work being done between Nos. 2 and 4, where, also, most of the ore was being produced.

The vein proper follows the crushed zone in the slates, which in places acquires great width, and is filled with crushed slate and clay, between two smooth walls. On No. 3 the ore is found on both sides of the zone, and a level has been driven parallel to the main level, and connected with it by cross-cuts. The ore occurring here all through the zone made irresistible the temptation to extract it, and this was done, with the result that the filling of the fissure was undermined and began to show a tendency to slip down. This has been headed off only by timbering of the most substantial character, placed with great skill and at no little risk.

Another large body of ore occurs in a similar way in No. 8 tunnel, but here the danger had been more fully realised from the first, and an adequate amount and proper system of timbering had been used, so that here little danger exists, and everything seems

to be held securely. This tendency of the zone to slip on the walls is general throughout the mine, and calls for great watchfulness and skill on the part of the mine foreman, besides adding considerably to the cost of mining.

The ore is argentiferous galena associated with zinc blende, but, as compared with the other mines of the district, there is comparatively little spathic iron, the result of which is that the zinc concentrates produced are higher in zinc and lower in iron, and so command a ready market at a fair price. The ore is essentially a concentrating ore, but contains some clean ore, both zinc and galena, and while all the ore goes to the mill and through the Blake crusher, it is then fed on to a Robins picking belt, where as much as possible of the clean galena and blende is picked out by hand and dropped into separate bins.

A Riblet aerial tramway, 8,500 ft. long, and with a fall of 2,300 ft., transports the ore from the mine to the company's mill on Carpenter creek, on the line of the Canadian Pacific railway. The mill was treating from 65 to 70 tons of ore a day of 12 hours, and producing about 7½ tons of galena concentrates, and about 3 tons of zinc concentrates. The lead concentrates are loaded directly from the mill and shipped "in bulk" in box-cars. They assay about 55 to 58 per cent lead, and from 85 to 90 oz. silver to the ton. The zinc concentrates vary in assay from 42 to 50 per cent zinc, depending on the class of machine producing them, but will average about 45 per cent zinc.

The company was employing in August about 62 men at the mine and 4 in the mill.

Chambers Group.—The Chambers group includes the Jay Gould, Eureka, Chambers and Wellington mineral claims, situated on the north slope of Carpenter creek, about 2 miles above the town of Sandon. The property was worked this past year by a local syndicate, and a small quantity of ore was taken out. There is on the property a strongly fissured zone from 5 to 10 ft. wide, cutting through a slate formation in a N.E. and S.W. direction, with a dip of about 80 degrees to the N.W. Following in this fissure up the gulch, a series of tunnels has developed a quartz vein, in which occur shoots of argentiferous galena, which, after being hand-sorted, is shipped by pack-train to Sandon, and gives returns of about 70 per cent lead and 125 oz. silver to the ton.

Reco.—The Reco mines include the Ruecau, Texas, New Denver, Ephraim fraction and Clifton mineral claims, situated on the north slope of the valley of Carpenter creek, near the summit of the range, and about 4 miles from Sandon. The property is held by the Reco Mining & Milling Co., Ltd., of Sandon, capital \$1,000,000, of which Mr. John M. Harris is the president and manager of the mine. There are three known veins on the property, all more or less parallel, having a strike about N. 55 degrees E. with a dip to the S.E. of about 70 degrees, and cutting the formation nearly at right angles.

The rock formation of the vicinity is a dark slate, with a strike to the bedding of about N.W. and S.E., while, parallel with the bedding, the slate is cut by

a large number of porphyry dykes varying greatly in size. Immediately below the mine workings, cutting through the Texas and Deadman claims, there is one of these dykes, of great width, reported by the management to be, by actual survey, 1,050 ft. wide, while in the mine workings some 18 dykes have been cross-cut, having widths varying from 2 in. to 24 ft. That the most of these dykes were "in place" long before the vein fissure was formed, is proved by the fact that in the tunnel the vein cuts them all, and further, that the values in the vein seem to be about the same where it cuts through a dyke as in the adjacent slates.

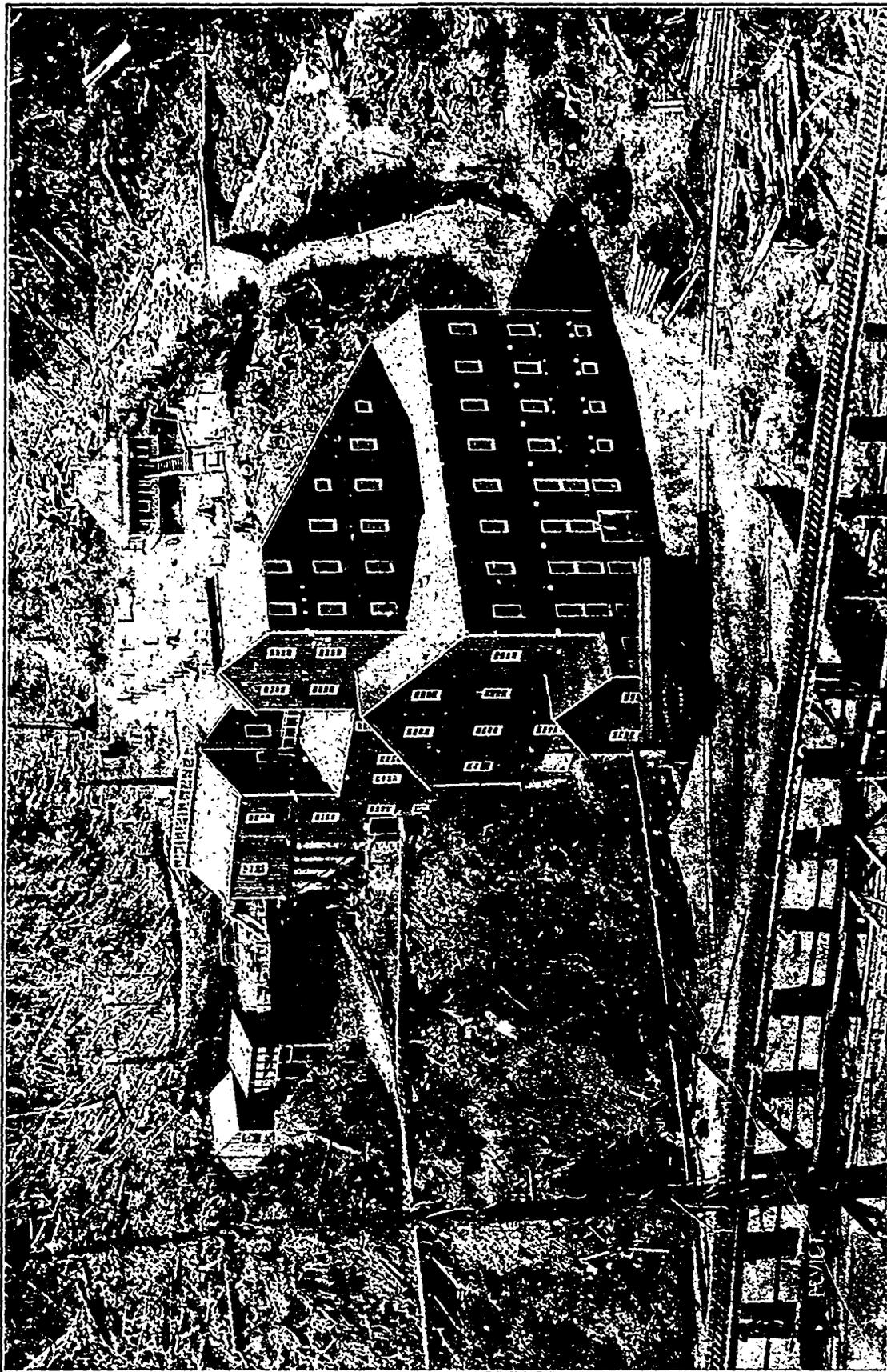
Of the three veins mentioned, the best known is the most easterly, the No. 3, or, as it has been called, the Reco or Goodenough vein, which cuts through the Goodenough into the Reco ground, and which has been developed by a series of cross-cut tunnels run in on Goodenough ground near the dividing line, at the joint expense of the Reco and Goodenough mines, from which cross-cuts the respective companies have run drifts on their own portions of the vein.

The vein in the Reco ground is found between clean, hard walls, from which the ore parts readily, and in width varies from a mere rusty streak up to about 24 in., having an average width of about 6 in. of quartz, etc., of which an average of about 3 in. is solid ore, consisting of silver sulphides, argentite, ruby silver, and some galena, with gray copper and zinc. The ore is easily hand-sorted in the workings, no grade being produced other than shipping ore, which, for the first 5 years that the property was operated, from 1894, averaged, as shipped, 309.6 oz. silver to the ton and 46 per cent lead. Latterly, however, shipments have been somewhat lower in grade, lower freight and treatment rates not calling for such close sorting, and average about 225 oz. silver and 55 per cent lead. Zinc is present in the ore, but in unimportant amount, being about 5 per cent.

The mine is opened up by tunnel No. 2, 900 ft. long; No. 4, a cross-cut of 57 ft. and drift of 1,050 ft.; No. 6, a cross-cut of 270 ft., and a drift 1,025 ft.; No. 7, an intermediate "blind" level, is 640 ft. No. 8 has a cross-cut 350 ft., with a drift of 550 ft. Although some ore still exists above levels Nos. 2 and 4, the vein has been pretty well stoped out as far as the levels have been run, and the greater part of the ore known is between Nos. 7 and 4. As yet comparatively little ore has come out of No. 8 level, but it is possible that the ore-shoot on No. 7 will go down and be found on the extension of No. 8.

It is of more than passing interest to note the values extracted and realised from this small vein. Mr. Harris reports that, as worked up to the present the vein alone has produced on Reco ground about \$700,000 from ore shipped, while from the vein in Goodenough ground another \$100,000 was mined. The original cash outlay for the purchase of the mine and its development was \$2,700, while in 10 years there has been paid in dividends, chiefly from this vein \$287,000.

About 750 ft. to the west of No. 3 vein and high up the hill, is the No. 2 or "big vein," which is prac



Minnesota Silver Co's Concentrating Mill, at Sandon. (See page 224.)

tically parallel with No. 3, and, as far as can be traced, cuts the same dykes. This vein has been opened up by adit tunnels on the vein, of which No. 1 is about 600 ft. long, No. 3 850 ft., and No. 5 275 ft., while between Nos. 3 and 1 an intermediate has been driven for 330 ft. (Note.—The levels on No. 3 vein are designated by the even numbers and those on the "big vein" by the odd numbers.) The stoping done is all above No. 1, except one small stope. No stoping has been done on the intermediate, but in driving this tunnel 60 ft., this past winter, the two contractors sacked about 40 tons of good ore. Above No. 1 tunnel, stoping has been done for a length of 350 ft. and a height of from 40 to 50 ft. The height between No. 1 and No. 3 is about 140 ft., which ground has not yet been stoped. This "big vein" is considerably larger than No. 3 and the ore is lower in grade, but the lead has as yet only been developed, and proportionately little has been shipped, attention having been centred on the higher grade ore in No. 3. Still, shipments from this vein sum up to the not inconsiderable amount of \$90,000.

The mines were worked regularly until 1903, but since that date it has been the practice of the company to mine for four months and develop for four months. The ore is rawhided in winter down a trail to Sandon, from whence it is shipped by rail. The property was not working when visited in August, but arrangements were then being made for the resumption of work by September.

Mountain Con.—The Mountain Con mine is situated in a basin about the head of the south fork of Carpenter creek, at an altitude of about 8,000 to 8,500 ft., and at a distance of 7 or 8 miles from the town of Sandon, from which point it is reached by a wagon road to Cody, and thence by a trail leading up the north side of Carpenter creek along a hillside on which snowslides are so frequent in spring as to render the trail most hazardous at that season of the year. The trail from Cody to the basin below the mine is on a fairly even and light grade, with a good, solid bottom, and a wagon road could be built along its route, but from the basin up to the mine, the last mile, the trail is very steep, and winds around among great masses of granite rolled down from the peaks above, with no earth covering them, and offering a very precarious footing for animals. Should the development of the mine at an time justify it, an aerial tram could be run from the mine to the basin, thus eliminating the last and worst part of the trail. At present the cost of packing ore from the mine to the Kaslo & Slocan railway at Cody is about \$12 a ton, and of conveying supplies from Sandon to the mine \$20 a ton.

Within this past year this property has been so successful that it has caused more interest than almost any other claim in the Slocan. The property has been well known for several years, and was held by three individuals, who on two or three occasions have given a bond on it to various parties, each of whom, after doing some work on it without finding ore, in turn threw up the bond.

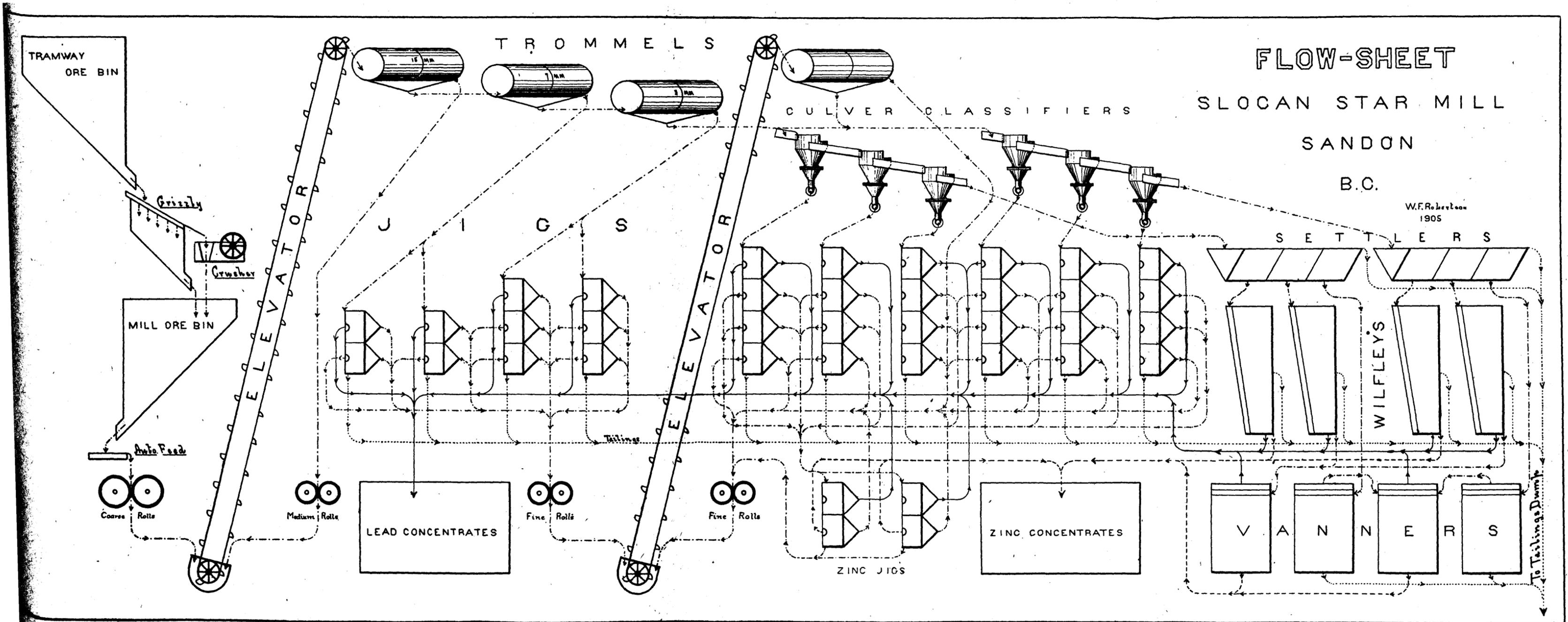
One of the original owners, C. A. McLeod, a miner, despite the many set-backs the property had had, always maintained a strong faith in it, which was not shared by his partners. Mr. McLeod, consequently, took a lease and bond on the property, and operations were begun last year, under a partnership of McLeod and Thompson. The firm was fortunate enough, after comparatively little work, to strike a shoot of very rich ore, from which has been mined and shipped this past summer some 200 tons of ore, of which the average assay, from smelter settlements, was 337 oz. silver to the ton and 27 per cent lead, making the value of the ore \$200 per ton, and the gross value of the shipments a little more than \$40,000. This amount has not only covered the purchase price of the mine, and working expenses, but has left a substantial net profit as well.

The rock formation in the vicinity of the mine is granite, the ore-body occurring in a regular vein of quartz, cutting through an abrupt and bare granite peak. The strike of the vein is N. 40 degrees E., with a dip of 80 degrees to the N.W., and its width is about 18 in. of quartz, with perfectly clear walls of solid granite. Almost exactly parallel to the vein, and about 2 ft. from it, is a slip joint in the granite, which is found to be of great assistance in the working of the vein, since this 2 ft. of granite is easily broken free, and, with the width of the vein, gives sufficient room in the levels and raises, while, in the stopes, only the vein is mined. The fissure is straight and true, giving straight levels with smooth walls, and the only timbering required is in the raises, with a few stulls where stoping has been carried up from the level, enough waste being produced in mining to serve as filling. The conditions for economic mining are ideal, and such as are seldom met with.

The vein quartz is somewhat crushed, and is easily mined, and contains ore consisting of galena, with lead carbonates and iron oxides, carrying average values as already indicated by the shipments, of 337 oz. silver to the ton, but of which shipments one carload assayed 543 oz. silver to the ton. The gold values are neglectable. The ore occurs in a shoot, the width of which has not been determined, and which appears to dip into the hill from the outcropping at an angle of almost 45 degrees.

The previous bonders of the property had driven in tunnels on the vein below the surface outcroppings, but as the shoot of ore dipped into the hill, the tunnels, not having been driven far enough, failed to strike it, which accounts for the bonds being forfeited.

An extension of No. 1 tunnel for from 250 ft. to 300 ft., would come out to daylight on the far side of the peak, where, above the level, on the almost precipitous face of the hill, it is reported there are outcroppings of the vein carrying some exceedingly high-grade ore. The property has much promise and is one of the most interesting of the small high grade properties of the district. It is recently reported that the property has been bonded by Messrs McLeod and Thompson to Mr. M. S. Logan, of Nel



In the course of its comments on the Annual Report of the Minister of Mines for the year 1904 of which several "Flow Sheets," drawn by Mr. W. F. Robertson, Provincial Mineralogist, are illustrations of particular value, the *Sandon Mining Standard* observes: "A special feature of the Report is the excellent description of the different concentration mills around Sandon, accompanied by flow sheet plans. These fill a long-felt want in the district, and are really the first put into such form that they can easily be understood by any practical man, to whom they will save a vast amount of detail in checking up the different points in milling practice at each mine. By studying the feed of the different mills and referring to the flow sheets, he can see the good points suited to the several varieties of ore, and pick out those best suited for his own use. It is to be hoped the publication of these flow sheets will arouse discussion among mill men, as to the good and bad points of the milling practice in the Slocan. Owing to the peculiar nature of certain ores, this practice is not all that could be desired. The sheets can properly be made to serve as an authoritative basis on which to conduct such discussion."

son, and that he has disposed of it to certain Chicago capitalists for \$67,000, subject to an inspection by their engineer in the spring.

Rambler-Cariboo.—The Rambler-Cariboo group includes the Rambler, Caribou, Antelope, Tiger and Best fraction crown-granted mineral claims, situated well up in McGuigan basin, at an altitude of about 6,000 ft. This property has, under various ownerships, been one of the large shippers of the district. It is now held by the Rambler-Cariboo Mines, Ltd., a company with a capital of \$1,250,000 and head office at Kaslo; president, Mr. A. F. McClaine, of Tacoma; general manager, Mr. W. E. Zwicky, of Kaslo.

The rock formation of the district is slate, through which a great boss of granite has been forced up, the whole being much cut by porphyry dykes. A well-defined quartz vein cuts through both the slate and the granite, and across the contact, and has been traced on the surface for a long distance, in a N.E. by N. direction, with a dip to the S. or into the hill.

The mine was originally opened up by 3 cross-cut tunnels, connecting with levels about 100 ft. apart. No. 3 is the main working tunnel, and has a cross-cut 510 ft. long to the vein, and drifts to the extent of more than 1,200 ft. Above this level all the ore, except a few small bunches, was extracted some time ago. The lower workings were flooded, so could not be seen. From No. 3 level a shaft has been sunk 500 ft., with levels Nos. 4, 5, 6, 7, and 8, at intervals of about 100 ft., and here the recent productive mining has been done. From the shaft, drifts have been driven; at No. 4 level north for 63 ft., and south for 350 ft.; at Nos. 5 and 6 levels, north 280 ft., and south 350 ft. (most of which ground has been stoped); at No. 7, north 231 ft., and south 324 ft., of which 250 ft. has been stoped; and at No. 8, north 94 ft., and south 101 ft. From this shaft and levels some very good ore was obtained, and it is reported by the management that the ore-body is strong in the bottom of the shaft and is continuing with depth. The cost of hoisting from this shaft to a higher level, together with the cost of keeping it unwatered, added so much to the cost of mining that the company decided to abandon the workings temporarily and to run a long cross-cut tunnel in to the vein at the 1,400-ft. level, putting up a raise in continuation of the shaft, thus reaching the known ore-body from below. Mr. Zwicky says he feels sure he has "sufficient ore in sight on levels 7 and 8 to liquidate any loan secured to complete the new work."

The portal of the new tunnel is located on Dardanelles creek, about half-way between McGuigan station and the mine, and near the wagon road. The tunnel will be 9½ ft. high by 9 ft. wide (7½ by 7½ ft. in the clear) and about 4,300 ft. long, cutting the vein over 1,400 ft. deep, or 600 ft. deeper than No. 8 tunnel. It will take about two years to complete this tunnel (till July, 1906), and it will cost approximately \$60,000, exclusive of cost of plant. This tunnel was started on July 9, 1904, and by September 1 it had been driven 460 ft., the work being done under contract, and progressing at the rate of about 11 ft. a day, the compressed air being supplied by

the company from its new plant on Dardanelles creek.

In view of the changes being made, very little work is going on in the upper workings, only 6 men being there employed, while in No. 14 tunnel the contractors were running 3 shifts with 12 men.

The company's concentrating mill, located just below No. 3 tunnel outlet, was employed running through the second and third class ore-dumps, which would probably be cleared up in 1904. This old dump is estimated to run about 3 per cent lead and 20 oz. silver to the ton, and the ratio of concentration is about 12 into 1. The concentrates run about 35 per cent lead, 112 oz. silver, 11 per cent zinc and 18.5 per cent iron. The first-class shipping ore runs about 280 oz. in silver, 50 per cent lead and under 10 per cent zinc. The mill is old, and rather out of date, but as the whole plant will shortly be moved to No. 14 tunnel mouth, any great expenditure on it would not be justified. The tailings run about 2½ per cent lead and 10 oz. silver and are being impounded, an estimated amount of some 20,000 tons being so stored.

The air compressor plant has already been moved down the hill to a point below No. 14 tunnel, and is operated by water power, the water being taken out of both McGuigan and Dardanelles creeks, and conveyed from the flume to the plant in a pipe-line 1,600 ft. long, tapering from 12 to 8 in. in diameter. The water is used under a head of 750 ft. to operate a 36-in. Pelton wheel, which is connected by a belt to a 10-drill Rand air compressor.

The company will, for the next 2 years, be engaged entirely in development and construction, for which the previous production of the mine and the showing reported in the No. 8 level would seem to give ample justification.

Antoine.—A little higher up the same basin is the Antoine, of which Mr. George Alexander, of Kaslo, is manager. This property was closed down in November, 1903, and has not since been worked by the company, but a couple of men working on tribute took out this past year about 2 carloads of ore.

The Red Fox, in the same basin, has not been operated by the owners during the past year, but two men have been working on it as tributers.

The Washington has been under development, but has shipped no ore this past year. This property is reported to have in sight, in the mine, a large tonnage of ore high in zinc, which will soon, it is hoped, be extracted and shipped.

The R. E. Lee was under development in a small way, and shipped a car-load of ore.

Sunset.—The Sunset and Trade Dollar, operated by G. W. Hughes, are on the summit of the divide between McGuigan basin and Carpenter creek. The property has been extensively developed, and a large quantity of ore shipped, but during the past year only a small amount of work, chiefly exploratory, has been carried on; the property is reported, however, to have shipped over 300 tons of ore.

Lucky Jim.—The Lucky Jim mine is situated on the slope of the hill south of Bear lake, 600 ft. above the line of the Kaslo & Slocan railway. The prop-

erty has been opened up for many years, and has had an eventful history, as it contained large masses of galena, but also so much zinc blende as to interfere with the sale of the galena without some means of separation. In places the ore is entirely zinc blende nearly free from galena—so much so that the mine has been looked upon as more a zinc than a galena mine.

The country rock formation of the vicinity is slate and limestone in beds, and near these contacts a vein cuts both formations in a general N.E. and S.W. direction, with nearly vertical dip. Where this vein cuts through the slate, it appears to be but a few inches in width, but in the limestone it opens out into large chamber-like deposits, sometimes 30 ft. wide, in which the ore, galena and zinc blende is nearly solid. These chambers seem to be "chimneys," with irregular dimensions and dip. The galena carries about 70 per cent lead and 70 oz. silver, while the zinc blende assays about 50 per cent zinc and 5 oz. silver.

The property has been extensively opened up, but in an irregular manner, by tunnels into the hillside and by great open pits. It was recently purchased by Mr. G. W. Hughes, of Sandon, who is opening it up again in a more scientific way, the mine workings being in charge of Mr. John Wolverton as manager. The workings from No. 2 cross-cut up to the surface, a height of 200 ft., are being properly equipped with tracks, chutes, etc., and will soon be in shape for a regular output. There is certainly a large quantity of ore in sight, but the workings were not in such a condition as to permit of even an approximate estimate as to the tonnage.

On the face of the hill, near the outcrop of the vein, but apparently not connected with it, there is a big open pit, with a face of 30 ft. of pure black zinc blende. Mr. Hughes shipped about 1,000 tons of zinc ore to the Kaslo Sampling Works, where it was weighed and sampled, and bids were asked for on these samples, but as this was done late in the year, results were not obtained by the close of 1904. A number of tons of mixed galena and zinc ore were sent to the Payne mine concentrator for separation. There is a gravity surface tramway from the mine workings down to the railway track, where bunkers are provided. The mine is well equipped with all necessary bunk-houses, etc., and a small air compressor plant.

VANCOUVER ISLAND MINING AND DEVELOPING COMPANY, LTD.

(Specially Contributed.)

THE Vancouver Island Mining and Developing Company, Ltd., has recently completed the purchase of a large number of mineral claims and land, on Mount Sicker, Vancouver Island. This company was formed three years ago with the object of engaging in the development of the mineral resources

of this island. The capital of the company is £50,000, in 50,000 shares of £1 each, about 30,000 of which have been issued and the balance held in reserve, for further working capital as shall be required. The head office of the company is at 45 Leadenhall Street, London, England, and the local office at Duncans. The directors are, Messrs. F. H. Faviell (chairman), William Gardner, John Lancaster and R. W. Wright, and Mr. J. J. Fifield is secretary. The local director and general manager is Mr. Clermont Livingston, of Duncans.

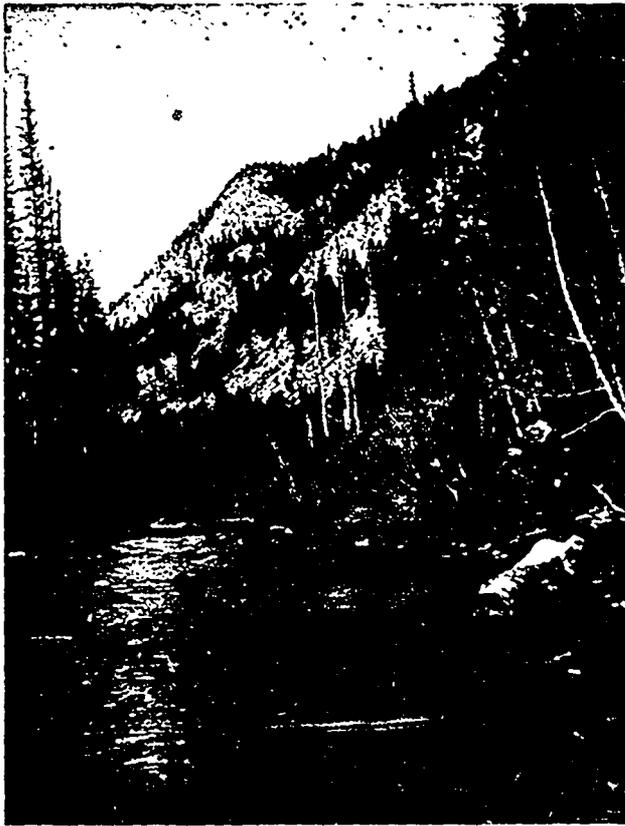
After most careful consideration, the company decided that Mount Sicker offered the best field for extensive exploratory work. The Tyee-Lenora ore body, with its great length of at least 2,700 feet of continuous and practically unbroken ore, is not likely to live alone, and it is a reasonable supposition to believe that persistent mining will disclose similar ore bodies both in extension of and parallel to, the well-known Tyee lode. The company, therefore, purchased a tract of more than 1,400 acres of mineral land, and also bonded 26 mineral claims, nearly all of which were in one solid block. Development work was commenced in January, 1904, and the purchase of the bonded claims has just been completed, which gives the company altogether about 1,800 acres of mineral bearing ground. The major portion of these claims lies to the east of the Tyee mine. The width of this property is about 6,000 ft. (that is to say about the width of four full sized claims), and the length is more than 10,000 ft., the eastern boundary line being only a short distance from the Esquimalt & Nanaimo railway. The strike of the Tyee lode is approximately east and west, so any extension of this lode must be found in this property, the western portion of which adjoins the pumping station of the Tyee, on Cheaminus river, and thence for a considerable distance up Mount Brenton. The geological conditions on the west are identical with those found at the Tyee mine.

The development work so far done, consists of a shaft and cross-cuts on the Westholme mineral claim, which shaft is situated 1,700 ft. east of the known occurrence of ore on the Tyee. A series of trenches has been made between the Westholme and Ohio claims. On the latter an open cutting through glacial drift, boulder clay, and into the bed rock, is of the unusual depth of 42 ft. These trenches and open cuts have proved the continuity of the ore-bearing schists for many thousands of feet. The shaft at the Westholme has been sunk to a depth of 510 ft., and cross-cuts have been run from the 150, 250, and 500-ft. levels. Up to date, about 2,000 ft. of cross-cutting has been done. These cross-cuts have proved the existence of copper-bearing material, samples having assayed from 3 to 10 per cent in copper, but no ore body of sufficient size to be of commercial value has as yet been discovered here. The indications are, however, most favourable, and the company has every reason to be confident that the continuous work it is doing will be rewarded by the discovery of valuable deposits of ore similar to that which has made such a financial success of the neighbouring Tyee mine.

WEST FORK OF KETTLE RIVER.

(By Geo. E. Winkler.)

SINCE the palmy days of the Slocan, when rich veins of silver ores made many of their owners wealthy without the aid or intervention of the big capitalist, there has probably been no camp discovered in British Columbia offering inducements for profitable mining to men of moderate means or companies with limited capital, comparable to those presented by several camps on the West Fork of Kettle river.



West Fork of Kettle River.

Unfortunately, five or six years ago, at the time this part of the Boundary district was attracting most attention, it was seriously hampered by lack of roads, so that to visit it a journey of more than 50 miles by road and trail from Midway, the western terminus of the Columbia & Western railway, or 30 miles by trail from Penticton, on Okanagan lake, was necessary. It can readily be imagined, under such circumstances, with what difficulties the shipping of ore and the bringing in of necessary supplies and machinery were attended.

An agitation for the construction of a wagon road, to give access from the district to the Boundary smelters, was started in 1900 and resulted in the secur-

ing of a government appropriation of \$8,000 for the purpose, this sum having been estimated as sufficient for the work. Owing partially to bad management, however, this amount was found to be totally inadequate, for most of the appropriation was spent in the construction of two or three bridges. A long, disheartening struggle for further aid resulted finally in the provision of sufficient money for the completion, about a year and a half ago, of the road, the total cost having been about \$31,000.

The first known discovery of mineral in the West Fork district was made by two prospectors from Kelowna, named Morgan and White, who in the late eighties or early nineties found and located what is now the Arlington claim. After having done three assessments they allowed the claim to lapse and it was re-located in 1895 by Heldstab and Lynch, who later sold it to Count von Bielenberg for \$2,000. The Arlington vein is between 3 and 3½ ft. wide, of white quartz, and carries iron and copper pyrites with a little galena. About 30 tons of ore have been taken out in prospecting the vein, which is said to assay well in gold, copper and silver.

Numbers of other claims have been located in Arlington camp. On one of these—the New Denver, owned by Peter Goodreau—a 50-ft. incline shaft has been sunk on a 42-in. quartz vein carrying fair values in silver and gold. This lead has also been prospected by open cuts, these showing it to be strong and well defined, with a north and south strike.

The second location in the district was the Highland Chief, made in 1895 by three trappers, Farrell, Jordan and Dore, on a quartz vein 12 to 15 ft. wide, averaging \$11 in gold. This property is situated on the east side of Beaver creek, a few miles from where it flows into the West Fork of Kettle river. A cross-cut tunnel has been driven 130 ft. to cut the vein at depth, but has not yet reached the ore. Beautiful specimens of free gold have been taken from the surface showings on this claim.

The first location attracted very little attention. The real awakening of the district may be said to date from the discovery by Jas. C. Dale, in 1896, of the Carmi, on the west side of the river, about six miles north of the mouth of Beaver creek. The Carmi lead is of white quartz, with an average width of about 4 ft. and is strongly mineralized with iron pyrites, the other minerals visible in small quantities being galena, blende and copper pyrites. The highest assay was obtained from a sample of oxidized surface ore which ran \$350.50 in gold and 66 oz. in silver. The massive iron pyrites as a rule gives assay values of from \$45. to \$65 per ton. The general average of the vein will not exceed \$20 in gold and silver, the proportions in which the two metals occur being about 1 oz. of gold to 5 oz. of silver. A few years ago after its discovery the Carmi was purchased for \$30,000 by E. H. Thruston, representing an English company, of which he was one of the principal shareholders. He shipped 885 tons of ore during the winter of 1900-01 to the B. C. Copper Co's smelter, Greenwood, from which the gross returns amounted to about

\$23,000 or \$26 per ton. The cost of shipping and treating the ore which had to be hauled about 50 miles to the railway at Midway, is roughly estimated at \$16 per ton. The greatest depth on the ore is reached by a working shaft, sunk 183 ft. on an incline, from which 50-ft. drifts were run each way at the 100-ft. level and a 100-ft. drift to the east at the 160-ft. level. The lead shows a tendency to widen at depth, and the iron appears to be the most persistent of the minerals found in the outcroppings. From the discovery to the main shaft, a distance of 1,250 ft., the vein has been traced by a series of open cuts, and a 60-ft. shaft following the footwall has been sunk between the two, about 200 ft. east of the main shaft. A tunnel has been driven 85 ft. at the discovery, following the ore, and a 40-ft. shaft has been sunk, from which latter drifts have been made 17 ft. to the east and 35 ft. to the west. With the exception of a short cross-cut to catch the vein where it has faulted slightly, the work is all in ore. The ore shipped was mined from the main working shaft, near which a 60-h.p. horizontal boiler, made by the Jenckes Machine Co., has been installed in the shaft house. A small hoist has been used in raising the ore mined. Two Tremaine stamps were hauled in during 1901, and in the fall of 1904 a mill house was built. A little later five gravity stamps from the old Granite mine, near Camp McKinney, were added. Under the direction of Robert C. Longley, superintendent, the mill has been kept running at intervals during the past winter. The interruptions have been caused by the water in the flume freezing and by breakages of machinery. About \$1,500 worth of gold was saved on the plates and two cars of concentrates were shipped, as a result of the winter's work. The concentrates assayed about \$60 a ton. During March and April of this year a continuous run of 38 12-hr. days was made on a dump of second-class ore thrown to one side at the time the first shipments were made. This was mixed with 100 tons or more of first grade ore taken from near the collar of the shaft, and a considerable quantity of waste, the dump averaging about \$14 to the ton. From this run \$1,500 was saved by the plates and 40 tons of concentrates were obtained and sacked, ready for shipment. The mill treated an average of eight tons of ore a day during the last run.

A short tram carries the ore from the mine to the mill and a 2,500-ft. flume conveys water from Carmi creek, a small tributary of the West Fork. The mill has been making a saving of between 85 and 90 per cent of the values in the ore, the losses varying from 80c. to \$3.50 per ton, according to the class of ore treated. The tailings are being run into a depression in the ground near the mill and may possibly be cyanided at some future time. Ore sheds, a blacksmith shop and an assay office have also been built, but the arrangement and construction of the various buildings give evidence of the fact that the plant has been erected mainly for experimental purposes. Many changes and improvements will doubtless yet be made in them.

Adjoining the Carmi on the west is the Butcher

Boy, owned by Stanhope and Kerr, on which a continuation of the Carmi lead is found. An incline shaft is down 75 ft. on the vein, near the west end of the Butcher Boy ground. Drifts were run 35 ft. to the east and 50 ft. to the west from this shaft. The ore widens in the west drift to more than six ft., but the values are comparatively low, assays showing an average of \$10 a ton. In the east drift, where the lead narrows down to 20 in., the grade is much better, the ore running between \$40 and \$50. Between the Butcher Boy shaft and the Carmi line the vein has been traced by open-cutting. A fault of 60 ft. to the north occurs just after the lead enters the Butcher Boy ground. Two carloads of ore have been shipped from the Butcher Boy to the B. C. Copper Co's smelter, Greenwood. One car ran \$39.50 a ton and the other \$44.10. A further extension of the Carmi vein is also found on the May, which adjoins the Butcher Boy, on the west and is owned by Jas. C. Dale. Work on the May consists of a short tunnel and a number of open cuts.

Two miles west of the Carmi are situated the Rossland and Trail claims, owned by English, Scully and Gannon. A 60-ft. cross-cut tunnel strikes on this ground, at a depth of 40 ft. a 20-in. quartz lead, which carries copper, silver and gold, the principal values being in copper and silver.

Across the river from the Carmi, on the Observatory, also owned by Jas. C. Dale, an 80-ft. tunnel has been driven in an endeavour to trace a small quartz vein carrying iron, galena and chlorides of silver and assaying as high as 300 oz. in silver to the ton. Owing to the broken character of the surface ground the lead has been hard to trace. From surface cuts two tons of ore, running \$59.20 in silver, have been sacked.

Southwest of the Carmi, at the head of Cranberry creek, in a contact between schist and granite, the Aberdeen claim has been located on a small vein which carries iron, galena, zinc and bromide of silver, assays running from \$60 to \$600 a ton in silver. H. McKay and T. King have arranged to run a 175-ft. cross-cut tunnel, to strike the vein at depth, in return for a half interest in the property. The lead is from 10 in. to 2 ft. wide and is difficult to follow because of much faulting near the surface.

There are a number of other claims in the same locality, but no development work of importance has been done on them.

Star camp is the most northerly of the West Fork camps, being located about 15 miles north of the Carmi and 2½ miles west of the river. A number of claims have been staked on a 14-ft. lead of white quartz showing arsenical iron and assaying \$4.20 to \$14 in gold, which is in a free state.

While in course of time and with further development, some of the less-known camps on the West Fork may come into prominent notice, it must be generally admitted that at present Wallace mountain is the banner camp of the district, both in regard to the number and grade of gold and silver-bearing leads. This mountain is near the junction of Beaver creek with the West Fork, on the east side of the

river, and until recently was reached by a three-mile trail from Beaverdell, at which are the only post office in the district, a general store well stocked with prospectors' supplies, two hotels, a blacksmith shop, and a livery stable.

Within the last few weeks the owners of the Sally mine have built a wagon road from their property to the main wagon road at Beaverdell. Like many others of the high-grade mines showing up so well in the Boundary district, the Sally belongs to a local company. This one is known as the Vancouver & Boundary Creek Mining & Development Co., and it was organised some years ago by Robert Wood, the founder of Greenwood and a pioneer in the upper Okanagan valley. Among its principal shareholders are Chris-

low it with the slightest possible loss of time and labour.

The Sally group was located in 1897 by Felton and Stewart, who sold to the present owners. No less than 9 or 10 distinct leads are found on the group, varying in width from 10 or 12 in. up to 4 and 5 ft., and carrying high silver values wherever prospected at depth. The silver occurs in a variety of forms and is associated in the quartz with iron pyrites and blende. Some beautiful specimens of native silver are found, and handsome samples of galena are often met with. Specimens of the ore taken out show tetrahedrite, argentite, ruby and brittle silver, black sulphides of silver and silver chlorides. The width of the ore in the Sally varies from a few inches up to



Carmi Mine, West Fork of Kettle River.

topher Wood, Hugh Wood, Robert Wood, C. Vacher and A. H. Wade. The development of the Sally to its present satisfactory condition is generally credited to Mr. Vacher, the superintendent, who, owing to the disturbances that have occurred since the forming of the veins, has had much trouble in following the ore. The faults vary from a foot or two to 40 and 50 ft., but as depth is attained they become less frequent, and it is hoped will eventually disappear. If the ore faulted but the one way the problem of tracing it would be simplified, but with slips to both north and south it can be understood that the initial stages of development have been attended with great difficulties. By studying the ground carefully, however, and noting the grooves along the slip and the "drag" left by the ore when moving, Mr. Vacher seems able to tell almost the exact location of the vein and to fol-

low it with the slightest possible loss of time and labour. As the veins run up and down hill they have been developed mainly by tunnels. No. 1 vein, which is the only one being mined on the group, has 382 ft. of work done on it. A parallel vein a short distance to the south, known as No. 2, shows larger and richer on the surface than No. 1 and assays from 400 to 940 oz. in silver at various places along its outcrop. When developed this vein should make the Sally rank with the richest silver mines discovered in British Columbia. Work on it so far has been confined to a few open cuts and a short tunnel, but it is the intention of the company to shortly open it up and start shipping ore from it. The greatest depth reached has been on No. 1 vein, the distance between the surface and the floor of the tunnel, which has been driven 234 ft., being 138 ft. The vein shows a steady improvement both in size and quality, a large increase in the native

silver contents being noted in the ore now being mined as compared with that taken from nearer the surface.

The first shipment made from the Sally was in April, 1901, when 16 tons of ore were sent to the Hall Mining & Smelting Co's smelter, at Nelson and returned gross values of \$95 a ton. The second shipment was in February, 1904, when a car containing 42,820 lb. gross, sent to the Canadian Smelting Works, Trail, returned 3,519.10 oz. silver, valued at \$1,876.71. The following month a second car was shipped to Trail. This lot weighed 43,424 lb. and contained 4,778.81 oz. silver and 2,886 lb. lead, together valued at \$2,627.45. This carload netted \$2,318.98 above cost of railway transportation and treatment. In April, 1904, a smaller lot, weighing 32,206 lb. and containing 3,175.51 oz. silver and 840 lb. lead, was shipped, from which the gross amount realised was \$1,698.64.

At that time there was no wagon road between the Sally and Beaverdell, so shipments could be made only during the winter season, the ore being raw-hided down Wallace mountain to Beaverdell and hauled thence in sleighs. As a consequence no further shipments were made till the winter of 1904-05. Last February there was sent to Trail a carload weighing 41,829 lb. and containing 3,994.67 oz. silver and 2,761 lb. lead, and having a gross value of \$2,376.48. The fifth car lot shipment was made in March last, the net weight of the car being 42,575 lb., containing 4,798.20 oz. silver and 3,108 lb. lead, having a gross value of \$2,690.24. This ore averaged 225.40 oz. silver to the ton and 7.30 per cent lead. The railway and treatment charges on this car amounted to \$311.76, leaving \$2,378.48, from which must be deducted the cost of mining and hauling to the railway, these latter amounting to between \$15 and \$20 a ton.

When the mine was visited by the writer there were on hand two cars of first grade ore, sacked and ready to ship as soon as the wagon road to Beaverdell, then under construction, should be completed. The company has saved 175 tons of second-grade ore, running \$30 to the ton, and 400 tons of third-class ore averaging about \$10, which will require either concentration or more suitable smelting facilities than are now available.

The Sally is at an elevation of 4,350 ft. above sea level and is nearly 2,000 ft. above the valley of the West Fork. Substantial log bunk houses, a blacksmith shop, office and ore sheds have been constructed near the entrance to the workings on No. 1 vein.

North-east of the Sally is the Bell claim, owned by Ralph Smailes, *et al*, of Greenwood. The Bell has the distinction of having been the first claim located on Wallace mountain. Three veins of white quartz, from 1 to 3 ft. wide, showing iron pyrites, blende and galena, have been prospected by two shafts, a 70-ft. tunnel and a number of open cuts. Assay values range from \$28 to \$300 in gold and silver.

East of the Bell are the Washington and Idaho claims, belonging to a stock company. These were located on two parallel leads occurring in contact with an eruptive dyke, the strike of which is north and

south. The veins are wider than most of those on Wallace mountain, but the ore is of lower grade than the smaller east and west veins of the camp. Several shafts have been sunk, and considerable open-cutting done on these properties.

South-east of the Sally, on the Napanee, the owner—E. G. Cumming—has exposed a 5-ft. lead of arsenical iron ore assaying \$18 in gold on the surface. Two shafts have been sunk, one to a depth of 70 ft. and the other 30 ft. Like those on the Washington and Idaho this lead has a north and south strike. The vein filling shows more lime than was seen elsewhere associated with values. A number of open cuts have been made in following the vein, which has faulted considerably.

Below the Napanee, on the Black Diamond, belonging to E. P. Kennedy and Jos. Devlin, a 49-ft. shaft has been sunk, following a small vein for 23 ft. Four or five leads have been exposed and some good assays obtained. In the same neighbourhood the Gold Rock, owned by T. Murray, has a 2-ft. vein showing grey copper and galena which assays as high as \$287 to the ton. Down the hill from the Black Diamond is the Standard fraction, owned by W. H. Rambo and W. J. Nelson. The lead on this claim has been prospected with a 94-ft. tunnel and a number of open cuts. The ore shows galena, iron pyrites and native silver.

On the Rambler, adjoining on the west, and belonging to Rambo, Nelson and Finucane, a shaft has been sunk 85 ft., from which a drift has been run 106 ft. to the south to catch the vein where it has faulted. A care of ore was shipped from this property last February, the gross value, mainly in silver, amounting to \$73.35 a ton. This ore was not well sorted, much second grade ore having been included in the shipment. Considerable native silver was observed in the Rambler ore.

On the Bounty, owned by the Stratford Mining Co., a 90-ft. shaft has been sunk and 100 ft. of tunneling done. Half a car of ore was shipped from this claim last March; returns from this were not available.

Adjoining the Sally group is the Duncan, owned by Robert Wood, *et al*. This claim has a number of similar-looking surface showings to those found on the Sally. There is every reason to believe that ore of excellent grade will be exposed here by development.

Three miles above Beaverdell, in what is known as Currie's camp, a number of locations have been made, some of which give considerable promise. The best known of these is the Iron Horse, belonging to J. A. Tuzo, Robert Wood, T. Currie and Ah Ling. On this claim a 5-ft. vein has been traced on the surface for 100 ft. or more. This carries arsenical iron, pyrrhotite and iron pyrites, giving assay returns of from \$100 to \$45 in gold with a few ounces of silver, the value of the ore running close to \$20 a ton. The development work consists of two tunnels, one 70 ft. long and the other 25 ft.

The Comstock^a near by, owned by the same parties, carries galena assaying 50 oz. silver and \$1.40 gold.

The lead varies from a few inches to three ft. in width and has been developed by 150 ft. of tunneling and 70 ft. of sinking. On the Comstock No. 2 a 3-ft. vein of pyrrhotite, assaying \$8 in gold, has been discovered. The Black Diamond, in the same camp, owned by Robert Wood, has a 30-ft. lead, showing iron and galena.

Across Beaver creek, and about a mile and a half up, is the King Solomon, belonging to J. Kelly and S. M. Johnson. On this claim a 25-ft shaft has been sunk and two tunnels—one 70 ft. and the other 50 ft.—have been run on a 6-ft quartz vein well mineralized with iron pyrites.

Seven miles up Beaver creek, on the Big Strike claim, a large body of pyrrhotite has been traced for 150 ft. This assays a few dollars in gold. The St. John claim, in the same locality, has a 10-ft. vein, averaging \$8 or \$9 in gold and copper, that has been prospected by shallow shafts and open cuts. A mile higher up the creek, in Knob Hill camp, on the Rosalie claim, pyrrhotite and arsenical iron are found associated in shoots 18 to 20 in. wide, occurring over a width of 200 ft. and traceable for 1,000 ft. in length. Assays average about \$14 in gold. The Rosalie is owned by the Vancouver & Boundary Creek Mining & Development Co.

The ore-bearing rocks of the West Fork appear to be mainly granites in various stages of alteration, cut by fine-grained eruptive dykes having as a rule a north and south strike. Diorites and magnesian limes were also noticed, the latter occurring generally in blocks. The richest ores are in fissure veins of white quartz with an east and west strike, the leads running north and south being usually larger and lower in grade. In some cases the granite in contact with the rich silver veins is soft and stained with a greenish mineral, probably chlorite.

The experiments in milling and concentrating carried on at the Carmi would indicate that an extension of this method of treatment might result advantageously to a number of West Fort properties. Until some satisfactory means of concentrating is adopted it will be impossible to handle profitably the second and third-grade dumps to advantage. A project is on foot to build a line of railway from Midway to Vernon, and should this enterprise succeed it would give the West Fork camps cheap and ready transportation facilities. Lacking the early construction of a railway through the district, the building of a wagon road to Penticton would be of decided advantage, as it would make the West Fork easier of access. Machinery from the Coast could be taken in more cheaply and agricultural products from the Okanagan could also reach the mines by this route.

Official returns show that total exports from the Dominion of Canada under the heading "The Mine," for ten months ended April 30 were valued at \$24,622,986, as compared with \$27,392,072 for the corresponding period of the fiscal year immediately preceding.

DREDGING FOR GOLD IN BRITISH COLUMBIA.

THE following notes on dredging for gold in British Columbia have been taken from the recently issued Annual Report of the Minister of Mines for the year ended December 31, 1904:

ATLIN MINING DIVISION.

The British America Dredging Co., Ltd., this past season began to operate the dredge which was brought into the camp during the season of 1903. The dredging scheme, as at first formulated by Mr. W. J. Robinson and associates, contemplated working certain leases on what is locally known as the "Poor Farm," that is, certain deposits of loose modern gravel occurring in the present valley of Pine creek, near its mouth, and some two or three miles below the fall on the creek. This gravel, which is said to be eminently suited for dredging, did not carry as high values per yard as a number of other deposits in the camp, which latter, however, may not be as amenable to dredging as the former.

Subsequent to the ordering of the dredge, but before its installation, the company secured the Ophir group of leases on Gold Run—a draw in the Pine creek valley parallel with and on the south side of that creek, and about nine miles from the mouth—and it was decided to place the dredge on this ground, instead of on the "Poor Farm." This decision seemed to be justified by the substantial return of which this ground gave promise, if it could be handled by some appliance such as a dredge, for it had been thoroughly tested by drift workings from shafts 20 to 35 ft. deep, and had been shown to be sufficiently rich to pay wages for even this costly mode of operation.

The general scheme included the establishment of a central power-plant, just below the falls on Pine creek, at which point electric power would be generated, and from there transmitted, at high voltage, to a number of dredges, which it was intended eventually to operate on Pine and Spruce creeks. Up to the present there is but one dredge in operation on Pine creek, and one under construction on Spruce creek.

The central power-plant was built on Pine creek, a few hundred yards below the falls, on a flat near the creek, and on the north side. The plant is compact and simple, is efficient and has been well put together, with no display, the construction being business-like in all particulars. Some little trouble, due to foundations insufficient in such gravelly soil, is reported to have been had at first; but this was subsequently rectified by placing a substantial concrete substructure. When visited, everything was found to be running in first-class order. The power-house is a timber building, covered with corrugated iron, and in this are installed two power units, which can be operated separately or together. Each unit consists of a 24-in. turbine, of a nominal 500-h.p., having a Lombard automatic governor, and directly connected to a Westinghouse 3-phase alternating motor of 180 kw. and 1,100 volts. So far, only one unit has been required, the other being in reserve.

The water for power is taken out of Pine creek above the falls, and conveyed by a ditch along the side-hill to a point opposite the plant, discharging into a pressure box about 187 ft. higher than the turbines. From here it is conducted to the plant by a steel rivetted, slip-joint pipe-line, diminishing from 30 to 24 in. in diameter, and about 1,900 ft. long. The pipe-line connects with a heavy, wrought-iron distributing pipe, equipped with relief valves, and from this water is supplied to the turbines through separate pipes, provided with gates which can be opened or closed as desired.

The plant has been found to operate satisfactorily and has given little trouble. Some difficulty was at first experienced with the automatic governors, as the water for their operation was taken from the main pipe, and contained so much grit and mud as to interfere with the delicate mechanism and adjustment of these machines. Oil was subsequently substituted as the medium for operating the governors, since when the trouble has disappeared and the regulation effected has been satisfactory.

Although little difficulty has been experienced with the plant proper, a deal of trouble has been caused by the filling up of the ditch and flume with sediment from the hydraulic operations further up the creek, and although sand-traps have been in use, they were not enough to catch the fine silt, which finally settled in the ditch, filling it up to such an extent as to require a man a considerable part of the time to shovel it out.

The electric current is "stepped up" at the powerhouse, from a voltage of 1,100 to 22,000 at which voltage it is conducted to the dredge site by a pole-line between five and six miles long, equipped with copper wires. At the dredge there is a transformer house, where the current is again reduced to 1,100, and then again to 400 volts, at which voltage it is used on the dredge, being conducted thereto by an insulated and waterproof cable. The maximum amount of power which can be used by the dredge is about 220 h.p., or less than half what can be generated by one unit of the power plant, and such an amount of power is seldom called for, as the motors are seldom all in use at any one time.

The dredge scow is about 90 ft. long, 40 ft. wide and 6½ ft. deep, drawing about 4 ft. of water. The dredge machinery is operated by electricity and is of the Bucyrus type, that is to say, it is a most substantially constructed chain bucket elevator, having on the chain some 96 buckets of 3 cu. ft. capacity each, and, normally, should run at a speed of 18 to 20 buckets per minute. The bucket ladder is a most substantial steel-trussed arm, capable of reaching 20 ft. ahead of the dredge and to a maximum depth of 44 ft., although, in this instance, bedrock is only about 28 to 30 ft. below the level of the water in the pond. The buckets deliver their contents into a revolving screen of heavy boiler-plate, with holes varying from 1 in. at the upper end to 4 in. at the lower end. The oversize boulders from this screen are dumped over the side on to scows and taken away. The screenings pass through into a tail apron-slucice about 120 ft. long, provided with Hungarian riffles. Provision is made for taking the

finer material to gold-saving tables, which, together with about 90 ft. of the sluice, are supported on an independent scow. These tables were found, however, not to be in use, but all the material which passed through the various sized holes of the screen, up to 4-in. holes, after having been once separated, was mixed again and run through the same sluice at the same time, a practice not usually considered the best.

The motors installed and in use on the dredge were as follows: 75-h.p. motor, driving ladder and buckets; 50-h.p. motor, 8-in. cent. pump supplying water for sluice; 30-h.p. motor, 8-in. cent. pump, supplying water for sprays; 20-h.p. motor, driving revolving screen; 20-h.p. motor, driving winches for moving scow; 5-h.p. motor, pumps for general purposes. Also electric light plant.

The whole plant has been most substantially constructed, the workmanship and materials are of the best, and the installation has been all that could be desired. Whether the design is that best suited for the material being handled is open to question, but it must be remembered that the plant was originally designed for the conditions existing at the "Poor Farm."

The ground selected to be dredged underlies a small, almost level, flat, a few feet above the drainage level of Gold Run, where an artificial pond has been made to float the dredge. This last season much time was lost and expense incurred in getting the pond opened out for work, as the tailings had to be dumped on land and removed by horses. This should cease as the pond becomes larger, when they will be dumped behind the dredge. The face of the cut is reported by the manager to have been advanced about 200 ft. The width of the cut was at first 150 ft., but was subsequently reduced to 100 ft. It was estimated that the amount of dirt handled during the season was about 25,000 cu. yd. The superficial deposit is loose gravel, easily moved, underneath which is a deposit of gravel and boulders cemented in a stiff hard clay, and supposed to be a continuation of the "yellow dirt" found lower down the creek, although the colour is not so marked. It is, of course, impossible to inspect directly the deposit being dredged, since it is under muddy water, but its character may be inferred from that of the adjoining drifting propositions. In these the clay, though it weathers on exposure to air, is, when first exposed, tough, if not hard, and tenaciously holds the boulders. This is the gold-bearing stratum, and the gold is chiefly near the bedrock, which is uneven, but not so hard as to be undredgable.

Great difficulty was experienced in working this deposit with the dredge, since even a small boulder set in such clay and projecting, was just a big tooth to "chew up" the dredge buckets, and this it did most effectively, for at the close of the season the lips of all the buckets had been so dented and bent as to render them practically useless for cutting a bank. The lip on every bucket will require to be replaced before next season. These lips were originally of manganese wrought steel, 1 in. thick, and it is the intention of the manager to replace them by lips of 1½ in. steel. The damage to the buckets was practically

the only one sustained by the plant during the season—a creditable showing for the plant, considering the strain to which it was subjected, being often brought to a stand-still by contact with some imbedded boulder. This damage is reported to have been done in the first month's run.

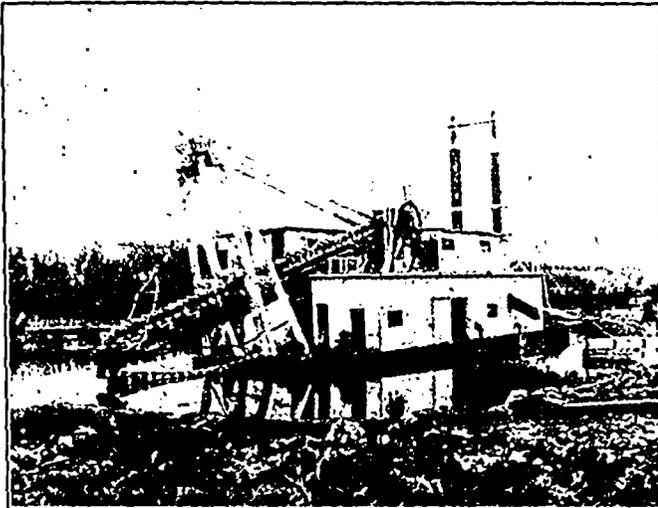
The ground proved to be so tough that towards the end of the season the management adopted the policy of putting a series of holes into the bank with a Keystone drill in advance of the dredge. These were loaded with dynamite and fired electrically, and this did much to loosen up the ground. The full efficiency of this scheme was not demonstrated since, when it was tried, the bucket line was in such a dilapidated condition as to give little criterion of what might be done with the ground so broken up, but it unquestionably was a great assistance, even under the existing conditions.

The gold-saving apparatus, however, left much to

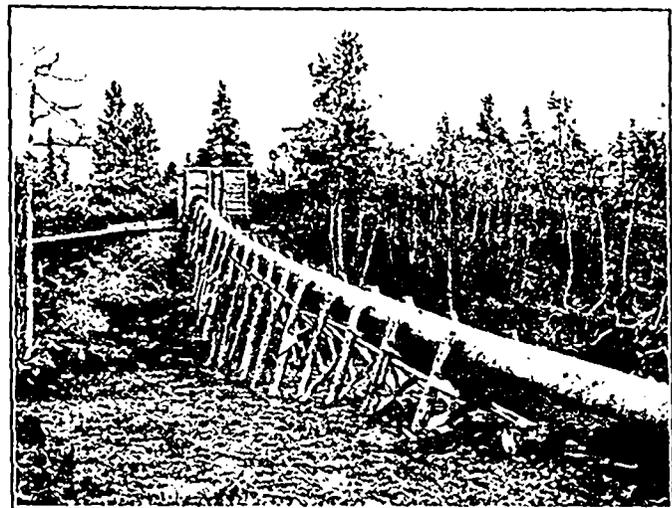
coast, was more than half finished when work was suspended for the season. It is the intention of the company to form a pond to float the dredge by building a dam across the creek valley; and this work has been started. The pole line from the power plant to the dredge site is up, and ready for stringing the wires. It is estimated that it will be at least the end of 1905 before the dredge is in operation.

KAMLOOPS MINING DIVISION.

The dredge on Tranquille creek started to work last June. Operations ceased during a period of two months, owing to the scarcity of water, caused by an unprecedentedly dry season. The gravel worked measured 450 ft. long, 200 ft. wide and 15 ft. deep. Frequent breakages, and time and expense in making repairs, are great obstacles to this branch of mining. The cost of fuel also is great, and the returns are not deemed satisfactory, a condition for which the aurif-



B. A. D. Co's Dredge at Gold Run.



Pressure Box and Pipe Line, Pine Creek.

be desired, in illustration of which the manager reports that in the fall, when dredging out the tailings to form a shallow bottom on which to rest the dredge for the winter, a considerable yardage of this material, which had already been through the gold-saving appliances, was passed over the portion of the sluice, only some 30 ft. in length, on the main dredge scow, and yielded about as much gold as had the original dirt.

On Spruce creek a number of claims have been purchased and consolidated by the British Columbia Dredging Co., a Philadelphia syndicate, allied with the British America Dredging Co. The syndicate has brought in and is installing on these properties a large dredge of the Bucyrus type, much more powerful than is the one on Pine creek, and which, when operated, will be supplied with electrical power from the power plant on Pine creek. About two-thirds of the necessary machinery has arrived at Atlin, and most of this has been taken to the ground by teams. The hull of the scow, the timber for which was brought from the

cross character of the gravel cannot be held responsible.

ASHCROFT MINING DIVISION.

Dredging operations on the Fraser river, above Lytton, have not proved as remunerative as was expected. The Fraser River Gold Dredging Co. built a new dredge, which was completed this spring, and from which great results were expected, but, unfortunately, after work was commenced the machinery could not stand the heavy and constant strain and kept breaking. This involved a great loss of time and money and a very short season.

The old dredge worked till December 1 and took out a lot of gold. It was moved up the river several miles, with the intention of putting it on another of the company's leases, but the water being so low it could not be got over some of the bad places in the river, and work was abandoned until spring. In the meantime, the intention is to take it down to Kamka bar, where the company has a lease which is believed to have a rich pay streak.

LILLOOET MINING DIVISION.

The Iowa-Lillooet Gold Mining Company, Ltd., commenced dredging on its lease on the Fraser river on March 21, and continued running until December 21, with a force of 10 men. Soon after the dredge was put in operation, some of the parts continued breaking, resulting in great loss of time in procuring duplicates from the east. Not a month passed without work being suspended for repairs, sometimes a couple of weeks being lost waiting for renewal parts, so the output of gold, although considerable, was not as large as expected. The dredge, when working, paid very well, proving that the bed of the river contains sufficient gold to pay for dredging, and that it can be saved by the appliances used on this dredge. No doubt, with the experience now gained, the wearing parts of the dredges next built here will be stronger. No other dredging leases have been worked.

COAL MINING IN BRITISH COLUMBIA.

THE following information relative to coal mining in the province has been extracted from the Report of the Minister of Mines for 1904: Tables appearing in the report, showing coal and coke produced, exported, etc., by the province in 1904; number of men employed, daily wages paid, etc., are omitted, space not being available in this month's MINING RECORD for the publication of these. For the same reason the official reports of the government inspectors have had to be left out:

The only coal fields of British Columbia being actually mined for coal are those of Vancouver Island and of the Crow's Nest Pass, and these seem to be more than able to supply the markets at present available, as in neither field have the mines been able to work the year through with a force as great as could have been employed. The gross amount of coal mined in the province during the year 1904, was 1,685,698 tons (2,240 lb.), an increase over the preceding year of 203,785 tons.

The number of men employed at the collieries of the province in 1904 was 4,453, as follows: In supervision and clerical assistance, 140; white miners, 1,614; miners' helpers, labourers, mechanics and other skilled labour, and boys, 1,925; Japanese, 45; Chinese, 729.

In addition to the coal fields actually producing there are a number of others which have been developed to such an extent as to settle definitely the question of their commercial importance.

In the East Kootenay district, large coal fields have been developed on the Elk river, above the junction of Michel creek, and also on one of its eastern tributaries, Fording river.

On the north fork of Michel creek good coal seams have been proved, but little development has taken place this past year.

On the south fork of the same creek there are valuable seams, owned by the Crow's Nest Pass Coal Co., but as this company has at present sufficient openings

already accessible by railway, these newer exposures are dormant.

All the above proved fields can be easily reached by railways, which will doubtless be built as soon as there is a stronger market demand for the fuel.

In the Flathead country there has been some active prospecting going on for both coal and oil, but of the success of these operations there is no official information.

In the vicinity of Kamloops some development of coal seams has taken place, as mentioned in the Report of the Gold Commissioner of that district.

In the vicinity of Nicola the known coal fields have been extensively explored and prospected by two or three companies, and according to analyses given elsewhere, some very good coal has been proved. The building of the long-expected railway through this section will in all probability lead to the opening up of these fields.

The coal fields of the Telkwa river, a branch of the Skeena above Hazelton, and at least near the line that must be adopted by the Grand Trunk Pacific railway, were more thoroughly explored and mapped out by Messrs. McEvoy and Leach, of the geological staff of the Crow's Nest Pass Coal Co. Mr. McEvoy reports extensive seams of semi-anthracite found in a nearly horizontal and undisturbed bed, probably formed from beds of bituminous coal acted upon by the heat produced by a very large volcanic overflow deposit of later date. There seems definite promise that these properties will be opened up in advance of the railway mentioned.

Of the coal areas on the Peace river to the east of the Rockies, but well within the province of British Columbia, there has been little heard this past year, as they are supposed to be upon land "reserved since Confederation, and from which the Dominion Government has a right to make a selection.

VANCOUVER ISLAND COLLIERIES.

The output of the collieries of Vancouver Island for the year 1904 was 1,023,013 tons, gross, of which 784,169 tons were sold as coal, 135,034 tons were used under the producing company's boilers, 22,640 tons were added to the stock piles, and 81,170 tons were used in making coke, producing of this latter commodity 19,571 tons. During the preceding year (1903) the gross output of coal was 860,775 tons, and there was taken from stock some 46,285 tons of coal, so that the consumption of Vancouver Island coal in 1903 was 907,060 tons. The gross output of coal for 1904, therefore, shows an increase over the preceding year of 162,240 tons, an increase of 20 per cent, while the gross consumption of coal shows an increase of 115,955 tons, or 12.7 per cent.

The present output shows a distinct gain, but is not so great as it was two or three years ago, before the invasion of the California market by fuel oil, for California, in 1902, was the market for about three-quarters of the coal output of these collieries, and still absorbs about 53 per cent of the coal sold. The return for the individual mines can not be given without the

permission of the individual owners, and this has been refused by both the producing companies.

The collieries operating during the year were:—

Nanaimo: Western Fuel Co.—No. 1 shaft, Protection Island shaft, Harewood mine, No. 4 Northfield mine, and re-opening operations at the old Fitzwilliam mine, which has been closed since 1881.

Extension: Wellington Colliery Co.—Nos. 1, 2, and 3 mines, all worked from what is known as the No. 1 tunnel.

Cumberland: Wellington Colliery Co.—Nos. 4 and 7 slopes and Nos. 5 and 6 shafts.

CROW'S NEST PASS COLLIERIES.

The Crow's Nest Pass Coal Co. is now operating the following extensive collieries on the western slope of the Rocky mountains in the East Kootenay district, viz.:—

Coal Creek collieries, situated on Coal creek, about five miles from the town of Fernie, on a branch railway to the mines.

Michel collieries, situated on both sides of Michel creek, on the line of the Canadian Pacific railway, being 23 miles in a north-easterly direction from Fernie.

Carbonado collieries, situated on Morrissey creek and connected with the Canadian Pacific railway and the Great Northern railway at Morrissey. The colliery is about 14 miles from Fernie, by rail, in a south-easterly direction.

The total output of the company's collieries for the past year was 662,685 tons. Of this 350,900 tons were used in the manufacture of coke, yielding 218,857 tons, of which 119,004 tons were sold for consumption in Canada, and 97,690 tons were exported to the United States. The coal exported to the United States amounted to 118,188 tons, while 168,980 tons were sold for consumption in Canada.

WATER STERILISER FOR MINING CAMPS.

A SIMPLE but effective method of sterilising water, says the London *Mining Journal*, and one that is suitable for small mining camps, is that designed by Capt. H. Safford, R.M.C. Originally designed for "Standing and Rest Camps" in India, where many are now in use, it consists of two galvanised iron tanks, a boiler, and a cooler, joined by a long iron pipe. After the water has been boiled in one tank it is drawn off into the receiving tank in which it is allowed to cool. The cooling tank is covered with felt or any such material, and a few buckets of water being poured on this aids the rapidity of cooling. The apparatus is easily made at a very small cost, but care must be taken that the cooling tank is impervious to dust, etc., and should be made in one piece, with only a small door at the bottom for cleaning purposes. The connecting pipe must be joined carefully, so that no contamination of the water can possibly take place.

MONTHLY AVERAGE PRICES OF METALS.
(From The Engineering and Mining Journal, New York)

SILVER.

Month.	New York		London	
	1904	1905	1904	1905
January.....	57 055	60 690	26 423	27 930
February.....	57 592	61 023	26 665	28 047
March.....	56 741	58 048	26 164	26 794
April.....	54 202	56 600	24 974	26 108
May.....	55 430	57 832	25 678	26 664
June.....	55 673	.....	25 641	.....
July.....	58 095	.....	26 760	.....
August.....	57 806	.....	26 591	.....
September.....	57 120	.....	26 349	.....
October.....	57 923	.....	26 760	.....
November.....	58 453	.....	26 952	.....
December.....	60 563	.....	27 930	.....
Year.....	57 221	.....	26 399	.....

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

COPPER IN NEW YORK.

Month.	Electrolytic		Lake.	
	1904	1905	1904	1905
January.....	12 410	15 008	12 653	15 128
February.....	12 063	15 011	12 245	15 136
March.....	12 299	15 125	12 551	15 250
April.....	12 923	14 920	13 120	15 045
May.....	12 758	14 627	13 000	14 820
June.....	12 369	.....	12 399	.....
July.....	12 380	.....	12 505	.....
August.....	12 313	.....	12 468	.....
September.....	12 495	.....	12 620	.....
October.....	12 993	.....	13 113	.....
November.....	14 281	.....	14 466	.....
December.....	14 661	.....	14 849	.....
Year.....	12 823	.....	12 990	.....

Prices are in cents per pound. Electrolytic quotations are for cakes ingots and wire bars; cathodes are usually 0.25c lower.

COPPER IN LONDON.

Month.	1904	1905	Month.	1904	1905
January.....	57 500	68 262	July.....	67 256	.....
February.....	56 500	67 963	August.....	66 952	.....
March.....	57 321	68 173	September.....	67 645	.....
April.....	58 247	67 017	October.....	60 012	.....
May.....	57 321	64 875	November.....	65 685	.....
June.....	56 398	.....	December.....	66 384	.....
			Av. year.....	58 857	.....

Prices are in pounds sterling, per long ton of 2,240 lb., standard copper.

TIN IN NEW YORK.

Month	1904	1905	Month.	1904	1905
January.....	28 845	29 325	July.....	26 573	.....
February.....	28 087	29 262	August.....	27 012	.....
March.....	28 317	29 523	September.....	27 780	.....
April.....	28 132	30 523	October.....	28 596	.....
May.....	27 718	30 049	November.....	29 185	.....
June.....	26 325	.....	December.....	29 286	.....
			Av. year.....	27 986	.....

LEAD IN NEW YORK.

Month.	1904	1905	Month.	1904	1905
January.....	4 347	4 552	July.....	4 192	.....
February.....	4 375	4 450	August.....	4 111	.....
March.....	4 475	4 470	September.....	4 200	.....
April.....	4 475	4 500	October.....	4 200	.....
May.....	4 423	4 500	November.....	4 200	.....
June.....	4 496	.....	December.....	4 600	.....
			Av. year.....	4 309	.....

SPELTER.

Month.	New York		St. Louis	
	1904	1905	1904	1905
January.....	4 863	6 190	4 673	6 032
February.....	4 916	6 139	4 717	5 989
March.....	5 057	6 067	4 841	5 917
April.....	5 219	5 817	5 038	5 667
May.....	5 031	5 434	4 853	5 234
June.....	4 760	.....	4 696	.....
July.....	4 873	.....	4 723	.....
August.....	4 866	.....	4 716	.....
September.....	5 046	.....	4 896	.....
October.....	5 181	.....	5 033	.....
November.....	5 513	.....	5 363	.....
December.....	5 872	.....	5 720	.....
Year.....	5 100	.....	4 931	.....

COMPANY MEETINGS AND REPORTS.

KAMLOOPS MINES, LTD.

The Kamloops *Standard* recently published the official minutes of the first ordinary (statutory) general meeting of shareholders in the Kamloops Mines, Ltd., held in London on May 17, ulto. The following has been taken from that account:

The chairman of the company, Mr. G. T. Symons, presided. After the notice convening the meeting had been read by Mr. John Morrish, secretary, the chairman said: The present meeting is for the purpose of complying with Section 12 of the Companies Act, 1900, which provides that a meeting must be called within three months from the date the company was entitled to commence business. The report which has been sent to the shareholders is in accordance with this section, and with your permission I take it as read. As this is the first opportunity we have had of meeting the shareholders since the reconstruction of the company you will doubtless like to hear from the board as to what has been done, and what is the present position of things at the mine. Taking the financial position, you will be pleased to hear that the debenture holders have agreed to accept similar debentures in this company. The liabilities taken over as at February 1 from the old company, including loans, acquired debenture and other interest amounted to about £13,800, excluding debentures, and mine creditors about £3,400. Of the former amount we have paid £8,718. We have remitted £3,272 to the mine for the purpose of paying off the liabilities for plant and machinery, and for current expenses, and we understand that the manager requires about another £1,000, which will carry him on until returns are received from the smelters in respect to concentrates shipped. This amount is being remitted to-day. We have further calls, which will be made in due course, and will realise £11,000, which will enable us to pay off the remaining liabilities, and, unless anything unforeseen occurs, will leave us an ample margin for working capital.

At the mine, the new jigs, of which we have spoken before, have been added to the concentrating plant and the whole of the machinery has been thoroughly overhauled and various additions and improvements made, and the manager, Capt. Argall, now advises that he fully expects to treat 160 tons of ore per day. A cable received from the manager yesterday states that they had commenced then, and from that time he considers the mine is making profits. After very careful consideration your board decided to add a smelting plant, the first unit to have a capacity of 50 tons per day. This was ordered, and is now in course of erection, and the mine manager expects to have it in working order by the end of July. This smelting plant will save us all the rail and smelter charges on the ore it treats, and from Mr. Morrish's calculations and those of Mr. Argall, the saving on this plant alone is expected to be £800 per month. The latest news received by mail from the manager is to the effect that they have opened large additional bodies of ore at the 200-ft. level and the 500-ft. level, and that the 600-ft. level shows up equally well, the manager being of opinion that this level will produce more ore than any two of the upper levels. He further states that he was never more pleased with developments than at present, and I am happy to be able to say that Mr. Morrish, who has gone very carefully over the ore developments, reports that there were \$900,000 worth of high-grade ore on February 11 and sufficient low-grade ore developed to keep the mill going at the rate of 160 tons per day for three years. The total footage at that date was 4,023 ft., as against 3,000 ft. when Mr. Wm. Jones inspected the mine, so that you will see developments are being more than kept up. I do not think there is anything else that we can say to-day beyond that we expect shortly to get regular returns from the mine, particulars of which will be sent to you in due course.

VERMILION FORKS MINING & DEVELOPMENT CO., LTD.

The following report has been taken from the *B. C. Review*, of London, England:

The ordinary general meeting of the shareholders of the

Vermilion Forks Mining & Development Co., Ltd., was held on May 9th, at the office, 7, Great St. Helen's, E.C., Mr. Alex. Crerar presiding.

The secretary (Mr. Edward S. Neave), having read the notice convening the meeting and the auditors' report,

The chairman said: Gentlemen, in the absence of our chairman, Mr. Sheffield Neave, who is in Egypt, it falls to me to present to you the directors' report and the accounts for the year ending October 31, 1904. The accounts need not occupy much of our time. They are a simple statement of modest expenditure confined to absolute necessities. We have expended during the year £1,436, spread over—development work, £284; salaries, both in British Columbia and here, £493; general expenses, £402; government fees and legal expenses, £113; and printing, stationery, cables, and advertising, £144. I should point out that a considerable portion of this amount has not yet been paid. Our manager in British Columbia, Mr. W. J. Waterman, has been content for a long time to take only two-thirds of his salary until the company is in a position to pay arrears, and similarly, Mr. Neave, our secretary, has charged only half his proper remuneration for secretarial work and office expenses. The directors have been paid nothing for four years and Mr. A. Hickling has every year spent months of time and much labour on our behalf in British Columbia, as well as here, for no remuneration at all. It is evident, therefore, on the face of it, that the strictest economy has been observed in every department.

As, by the approach of the railway, we appear to have come to a crisis in our fortunes, it is interesting to point out that over the seven years of our existence we have spent on our properties £15,400, an average of £2,200 a year, which, considering the diversity of our interests and what we have accomplished is certainly moderate. Our auditors have assured me that in their experience of similar companies they know of none to compare with ours in economy of management. What have we to show for our money? Let me go over our properties with you. I take them in the order in which they appear in the excellent report of Mr. Waterman, which we sent to you. First come our mineral claims, of which we have six and a fraction, aggregating 257 acres. They are, Vancouver 44 acres, Home Rule 5½ acres, Jubilee No. 2 42 acres, Iron Mask, 47 acres, La Reine 45 acres, Tempest fraction 1 acre, Princeton 26 acres. We have done on these all the work required by the mining regulations of British Columbia to entitle us to crown grants, and they have accordingly been all crown-granted, so that the claims are indefeasibly ours so long as we pay the annual taxes. It is impossible to say at this stage what the claims are worth to us but we have good reason to believe that some other claims in our neighbourhood on which the showing of ore, mostly copper, is not better than on some of ours, which we have developed more or less, have recently, been bonded for about \$30,000, and a deposit paid; that is \$30,000 per claim. If that is any indication of the value of ours, then we have in these claims something substantial. This is, however, largely speculation, as time and further developments can alone determine the worth of these properties. Next are our coal measures. The most important, because we know most about it, is Lot 1822, an area of 312 acres, and the Townsite coal area, 320 acres. Full details of this important area are given in Mr. Waterman's report, so that I shall not take up time going into them except to say, that we consider this lease, soon to be our property, as one of the most valuable, if not the most valuable, of our assets. Adjoining Lot 1822 is the lease No. 2049, 626 acres, on which, as Mr. Waterman explains, we have proved the existence of coal by drilling, probably an extension of the seams in Lot 1822. Then there is Lot 1328, 640 acres, some distance up the Similkameen river from Princeton. Our explorations here have so far been disappointing, no workable seam of coal having been struck by our drill. We cannot tell what may yet be found, but at present beyond paying an annual tax of £20, we do not propose to give much attention to this licence. We had at one time two licences here, and abandoned them, applying for one new one, which includes, as we believe, the valuable por-

tions of both the former. This was done in order to economise in the matter of taxes. Further still up the river we applied last year for another licence of 640 acres, on which we know there is good coal, and we are in negotiation for the purchase of a licence adjoining it of 640 acres. The importance of these last lies in the fact that they are near a piece of land, fully 62 acres in extent, which we own absolutely, and which we consider to be by far the most suitable site for a smelter, when operations of this kind begin in our district. The spot is close by Copper and Kennedy mountains, on which the great ore bodies are, and when ore reduction begins, it will be most advantageous for us to possess coal bodies near the camp. Our next piece of property is Lot 157, an area of 243 acres, situate about three miles up the Similkameen river from Princeton, which we call The Rancho. The land is all fenced. We have an excellent dwelling-house on it besides other buildings. Some of the land is already under cultivation, and much more is available. As population grows in Princeton, there will, no doubt, be a ready market for the produce of this farm. Then we have two hydraulic leases, together 240 acres, which we tested to some extent a number of years ago and proved that there is gold to be won if sufficient water-power be provided. We have maintained our rights here, paying the annual tax of £20. We have also considerable water rights in the Bromley and Stevenson creeks, kept up by paying about 25s. a year. It is possible that we may find here at least a partial source of water supply for the town. Lastly, but by no means of least importance, there is the town of Princeton. We have already sold in lots about 21 acres, at an average of fully £200 an acre, and we have about 300 acres left, but you must not run away with the idea that we shall get £200 an acre for this. Naturally the best sites have been chosen by the first purchasers, although I should point out that the company has retained many specially chosen sites to be disposed of by and by when population grows and values increase. This is bound to follow on the advent of the railway, and we cannot tell what demand there may be for our town property or where prices may go to. As some indication, however, of the trend of events, I may say that Mr Waterman, who is on the spot, and knows best what is judicious, has told us in a letter received yesterday, that he has raised the price of lots as from May 1, by, we understand, 50 per cent.

This is our property, gentlemen, and, as mining men say, it is a very fair showing, the value of which it is impossible to estimate and might be hard to exaggerate; but intrinsically valuable as not only our property, but far more besides, in the region of the Similkameen is, the value has until now been absolutely dormant, since we have had no transportation facilities by which the country's products could be conveyed to market. Happily we have the prospect, amounting we trust to certainty, that all will soon be changed. Copies of two cablegrams which we received from our manager have been sent to you; one received on April 19, "Railway certain," the second April 22, "Construction will commence immediately; will probably arrive about the beginning of next year." These messages were received so recently that we have not yet had time to get confirmation by letter of the second one, so that we are not now in a position to tell you precisely how and where the line is to run, but we do know that its construction is being undertaken by the Great Northern Co., at the head of which is Mr. J. J. Hill. The intention, as far as we can gather, is to continue from Midway through the Similkameen valley to Princeton, and eventually on to the coast via Abbotsford. By rapid construction it is expected that Midway will be linked to Princeton, a distance of about 120 miles, within a year from now. We have every reason to believe that construction is now actually under weigh. We do know, at any rate, that the actual survey to locate the route for the rails was begun at Princeton nearly four weeks ago, and it is very important for us to know that the survey started on the bench immediately above our present coal pit on our land. I may say here that we have heard, on what appears to be fairly reliable authority, that simultaneously with the

construction of the Great Northern line, the Canadian Pacific will commence building to us from their main line at Spence's Bridge. It may be, therefore, that within the next twelve months we shall have two great railway corporations tapping at the doors of the Similkameen for its traffic. We seem, therefore, to be within reasonable grasp of the prosperity we have patiently waited for for seven years. Before we can touch it, however, there is a good deal to be done, and some money to be spent. We must provide for the year that is before us, and to do so we require £1,500. First of all we must pay off a bank advance to the extent of £420; but the most essential payment is for the purchase outright of our principal coal licence, No. 1,822, to which I have already referred. We have the option of purchasing these 312 acres for £312, being £1 an acre, but that right will expire on the 28th of this month. Unless we exercise it the price to us after that date will be exactly double, or £624. There is no question about the wisdom of at once making the purchase. Those two items are referred to in the short report we issued to the shareholders. The balance of the £1,500—viz., fully £700, will suffice to pay for management in British Columbia and taxes there, as well as office expenses here, with a little over for some necessary work in the town—such as grading of lots and streets, and so forth, in preparation for the influx of population, miners, and agriculturists, which we hope to see. Even larger questions than these will be forced on our attention by and by. I refer to the proper method of dealing with our coal property, whether by working it ourselves, by leasing it on either a rental or royalty basis, by selling it outright, or it may be by forming a subsidiary company to work it. Similar with our mineral claims, our town, our water supply, our rancho, and our smelter site. I mention these things only to show you that we are, as far as we are able, anticipating events. You may rest assured that we shall come to no decision on such vital matters without the fullest consideration of what is best for the company, or without taking the best available advice.

Now as regards the sum of £1,500 which we require. As explained in the report, we wish to raise it by issuing 1,000 "A" shares at £1 10s. each. They carry the benefit of six times the dividend of ordinary shares. Every shareholder will be offered the proportion to which he is entitled by his present holding of shares in the company. These are, of course, generous terms, but as all the shareholders have the chance of taking their proportion, no one is injured. Our shares have a greater prospective value than ever before, and I would strongly advise all to apply for their full quota. We have already had intimation from several shareholders that they wish to have more than proportion. We feel sure that whatever shares you do not take we can easily place.

Mr. Hickling: I may say that the chairman has gone so fully into every subject connected with our properties, that he leaves me very little to add. There are, however, one or two things I should like to draw your attention to. In the first place you will see from this map an indication of our belief as to which way the railway is going. The Great Northern have, up to the present, built to Midway, and they have also a line which runs down to Republic in Washington State. Some reports state they intend making their connection from Republic up to Princeton, but whichever way the line goes it will make little difference in distance. The point to which they are going, or to which their surveys have been made, is Oroville, where they will be working in the States. They will then come to a place called Night Hawk, on the boundary. They did all this survey work last year, and this spring they have started two survey parties, one from Hedley, down the river, and the other from Hedley up to Princeton. The surveyors have already been in Princeton. It is perfectly certain they will follow the Similkameen river to Princeton. The Canadian Pacific will work from Spence's Bridge through Nicola; and they are going to build to Nicola this year. The only additional remark I have to make is in regard to a letter which I received from Mr. Waterman last night, and in which he mentions matters of interest. He says, "As far as the railway situation is concerned, all doubt is passed. I cabled to Mr. Neave

yesterday, saying construction would start at once, and that the railway is expected to reach here in 12 months." That is a confirmatory report by letter of the cablegram which we previously received. Then there is a long letter in which he makes different suggestions regarding the working of the properties, and he finishes with this little paragraph: "I was busy all day yesterday showing people lots, and expect to realise about \$850, but two deals are still hanging fire; I shall not know until about 10 days if these are sales. This will make about \$1,000 for this week." That only shows that activity has commenced quickly. Formerly it took us about six months to dispose of \$1,000 worth of lots, whereas he has already been able to sell \$1,000 worth in a week. This shows that there is already a movement and he is evidently so impressed by the demand, that he has carried out the instructions received from the company, that when the railway came he was to raise the price of the lots 50 per cent.

The report and statement of accounts were adopted; the retiring director, Mr. Sheffield Neave, was re-elected; the auditors, Messrs. E. Pidduck & Co., were re-appointed; and the proceedings then terminated.

ALBERTA COAL COMPANY.

The annual general meeting of the Alberta Coal Co. was held at Nelson last month. Among those present were Messrs. E. P. McNeil and J. Nelson of Fort McLeod; J. Schirmer, of Spokane; D. McArthur, W. Blakemore, J. O'Shea, H. Irvine, M. Logan and W. A. Jowett, of Nelson.

Mr. W. Blakemore, M.E., was voted to the chair. The minutes of the last annual meeting were read, and Mr. Jowett, who had just returned from Spokane, reported that the negotiations between the company and Mr. Andrew Laidlaw, of Spokane, whereby the Imperial Coal & Coke Co., of Montreal, were to develop the property, had fallen through. The necessary payments to protect the title with the government had been made. In consequence of the inability of the president, Mr. A. O. Applequist, to attend, the annual statement and balance sheet were not forthcoming.

The following were elected directors for the ensuing year: Messrs C. W. Busk, J. A. Turner, W. A. Jowett, J. Schirmer and A. O. Applequist. Mr. Byron Sharp was appointed auditor.

On motion of Mr. McNeil, the meeting was adjourned for a month, and the directors were instructed to obtain a full statement of the company's affairs and submit it to the adjourned meeting.

BEATRICE MINES, LTD.

The annual general meeting of the Beatrice Mines, Ltd., was held at the head office of the company at Revelstoke, on May 9. The only business transacted was the election of directors and adoption of the financial statement and balance sheet, which showed the company in excellent financial standing. The following directors were elected for the ensuing year: Mr. G. S. McCarter, president; Mr. J. A. Stone, vice-president; Mr. F. Fulmer, manager; Mrs. M. Anderson, and Mr. C. Holten. Mr. H. Y. Anderson was re-appointed secretary-treasurer. It was stated that the company was shipping from Camborne to the smelter 130 tons of ore taken out last winter.

COMPANY CABLES AND NOTES.

CABLES.

Cariboo Consolidated.—The following cablegram has been received from the manager: The water in the shaft stands at just below the top of old workings, at an elevation of 637 ft. Have recommenced driving east cross-cut; everything looks most favourable; we are now pumping 900,000 gal. of water per 24 hr."

Le Roi.—April: Shipped from the mine to Northport during the past month 9,671 tons of ore, containing 4,000 oz. of gold, 4,100 oz. of silver, 206,600 lb. of copper. Estimated profit on this ore, after deducting cost of mining, smelting, realisation and depreciation, \$21,000. Expenditure on development work during the month, \$5,500. Development of the mine continues to be satisfactory.

Le Roi No. 2.—April: Shipped to Greenwood, 142 tons. Net receipts from Greenwood \$19,888, being preliminary payment for 634 tons shipped, \$6,315 being deferred payment on 1,885 tons previously shipped. Shipped to Trail, 404 tons. Net receipts from Trail \$8,364, being payment for 83 tons concentrates shipped. Total receipts from both smelters, \$34,567."

Slough Creek Gravel Gold.—Manager cabled on May 5: There is splendid gravel in working No. 5, but too much water to save much gold. I expect to have the gravel in the face of working No. 4 soon.

Tyee.—April: Smelter ran 16 days and smelted: Tyee ore, 3,224 tons; custom ores, 187 tons; total 3,511 tons. Matte produced 316 tons. Gross value of contents (copper, silver and gold), after deducting costs of refining and purchase of custom ores, \$47,106. (Office note—The general manager reports that the partial cave, to which attention was called in the circular dated March 10, last, has been cleared and opened, and ore is now being won from the stopes which were temporarily closed, but under the conditions created by the partial cave the output of the mine will remain for the present at about 2,000 tons per month, to which it was restricted).

Tyee.—May: Smelter ran eight days and smelted 1,501 tons Tyee ore, giving a return, after deduction of freight and refining charges, of \$23,070. Short run owing to installation of new machinery.

Ymir.—April: 35 stamps ran 27 days and crushed 2,100 tons of ore, producing 480 oz. bullion; estimated realisable value (gross) of product \$5,250; 145 tons of concentrates shipped, estimated value \$3,250; cyanide plant treated 1,700 tons of tailings, producing bullion having estimated gross value of \$1,150; sundry revenue, \$100; total \$9,750. Working expenses, \$10,640. Loss, \$890.

NOTES.

Notice has been gazetted of the survey of a tract of land in West Kootenay district for which the Metropolitan Gold & Silver Co. has made application to purchase.

Announcement has been made of a proposal to make shares in the Spitzee Gold Mines, Ltd., Rosslund, assessable to the extent of a total of \$100,000. The company has been opening up a promising mine, but its available capital is insufficient to provide for the more extensive development and larger equipment required for production on a more profitable scale than in the past. Excellent results have been obtained from development to date, but enlarged operations are necessary to place the mine upon a substantial financial basis.

The Great Western Mines, Ltd., has gone into voluntary liquidation and appointed Mr. Erland G. Hadow, of Ferguson, accountant, its liquidator, for the purpose of such winding up. Creditors and others having claims against the company are required to send particulars to Messrs. Harvey, McCarter & Pinkham, solicitors for said liquidator, Revelstoke.

Reports from Bullion, Quesnel Forks, are to the effect that heavy rains last month raised the water in the Consolidated Cariboo Hydraulic Co.'s reservoirs, and that previous to this rainfall the manager, Mr. J. B. Hobson, had commenced hydraulicing. The gravel pits were found in good condition after the winter shut-down. Work on the 1,200-ft. sluice tunnel has been resumed.

EXAMINATION OF ASSAYERS.

The Minister of Mines has given notice in the *British Columbia Gazette* that certificates of efficiency have been issued to the following, on the recommendation of the Board of Examiners, in accordance with the *Bureau of Mines Act Amendment Act, 1899*: Messrs. Philip Ewing Hart, Ulrich L. Parsenow, Wm. Gordon Stephen, and Sydney Herbert Wimberley, all of Victoria; Messrs. W. P. D. Pemberton, Oswald Norman Scott, and Charles W. Workman, all of Rosslund, and Mr. T. Fraser Sutherland, of Greenwood.

PERSONAL.

Mr. A. W. Warwick has resigned the editorship of the *Mining Reporter*, Denver Colorado.

Mr. A. J. McMillan, general manager of the Le Roi Mining Co., Rosslund, is on the coast for a few days.

Mr. T. T. McVittie, C.E. and P.L.S., of Fort Steele, has been resident in South-east Kootenay for 23 years.

Mr. Henry Berryman, of Port Essington, has been gazetted a deputy mining recorder for the Skeena mining division.

Mr. E. G. Warren, manager of the Greenwood Electric Co., is absent from the Boundary on a business trip to Montreal.

Mr. Rufus Buck has returned to Dawson, Yukon Territory, to put in a water system for the Klondike mining district.

Mr. A. D. Wheeler, late superintendent of the B. C. Standard Co.'s Hunter V. mine, near Ymir, is now operating the Krao mine, Ainsworth.

Mr. Norman Carmichael, manager of the Highland mine, Ainsworth, has returned from a business visit to England, whence he went last February.

Mr. Neil McL. Curran, manager of the North Star mine, Kimberley, East Kootenay, has returned to the mine from a business visit to Montreal, Que.

Mr. Louis Pratt, manager of the Last Chance mine, near Sandon, last month paid a visit to a mining property on Monashee mountain, going in via Vernon.

Mr. Alex. Sharp, consulting mining engineer for Messrs. P. Burns & Co., lately examined the coal measures near Enderby, upper Okanagan, for his principals.

Mr. W. M. Brown, of Revelstoke, president and manager of the Revelstoke & McCullough Creek Hydraulic Mining Co., spent a week of last month at the company's property, McCullough creek, Big Bend.

Mr. J. E. McAllister, superintendent of the British Columbia Copper Co.'s smelting works at Greenwood, has returned after an absence of several weeks, spent at New York and other United States cities.

Mr. J. M. Harris, manager of the Reco mine, near Sandon, Slocan, was in Victoria last month. Mr. Oscar White, superintendent of the Slocan Star mine, was another Sandon visitor to the capital about the same time.

Mr. S. F. Parrish last month returned to Salt Lake City, Utah, from a trip to Tonopah, Nevada, and the country northwards from that busy mining camp. Since then he has been in Idaho on professional business.

Mr. F. W. Guernsey, C. E., has completed a preliminary survey of a route for the electric transmission line the West Kootenay Power & Light Co. proposes extending from its present terminal at Rosslund to the Boundary.

The many friends of Col. E. S. Topping, original owner of the Le Roi, Rosslund, and "Father of Trail," but now of Bulkley Valley, Skeena district, will note with pleasure that he has been gazetted a justice of the peace for British Columbia.

Mr. F. M. Tweedie, manager of the Princess Royal Gold Mine, Surf Inlet, Princess Royal Island, came down from the mine on the 13th inst. He is en route to New Brunswick, where is situated the head office of his company.

Mr. W. Yolen Williams, late superintendent of the Granby Co.'s big mines at Phoenix, Boundary district, has returned from a visit to Wales and Continental Europe, and has since been to the Similkameen, where he has interests in mining properties.

Mr. G. H. Grant is proceeding to Quatsino Sound, West Coast of Vancouver Island, to direct development work on the June group, which his father, Capt. Grant, of Victoria, and Mr. Lippy, of Seattle, Wash., have arranged to work under a bond.

Mr. H. T. Pemberton, of Boundary Falls, general manager of the Montreal & Boston Consolidated Mining & Smelting Co., is stated to have gone to New York to there discuss with the directors plans for the future operation of the mines and smelter of the company.

Mr. Rudolf Liden, who since he left Prince of Wales Island in May, 1904, has been travelling much through Wash-

ington and Oregon, was in Milwaukee, Wisconsin early this month, on his way to either Arizona or Old Mexico, on Allis-Chalmers Company's business.

Mr. C. A. E. Shaw, C.E., who a few weeks ago was seriously injured in a runaway accident at Voigt's camp, Similkameen, is now at his home in Greenwood. He hopes to shortly be able to resume the survey field-work he had in hand at the time he was disabled.

Mr. E. August Bradley, of Revelstoke, manager for the Buffalo Mining Co., and the American Mining Co., last month visited Buffalo, N.Y., to confer with the directors of the former relative to the installation of machinery on the company's mining property at French creek, Big Bend.

Mr. H. W. Treat is once again in British Columbia, having come from New York for the purpose of looking into the position at the Van Anda mine, Texada island, the bond on which was relinquished at the end of last year by the English company that had for some time been operating it.

Mr. Clyde M. Eye, formerly superintendent of the Rosslund Power Co.'s concentrating mill, near Trail, left San Francisco last month for Manila, to erect and operate in the neighbourhood of that port a cyanide plant the Joshua Hendy Machine Works is supplying to Mr. A. M. Clarke, of Manila.

Mr. Pellew-Harvey, for years a principal in the Vancouver firm of chemists and assayers that did business under his name, and Mr. E. Nelson Fell, who several years ago was manager of the Athabasca mine, Nelson, are reported by London newspapers to now be acting managers for the Spassky Copper Co., Akmolinsk, Siberia.

Dr. Ells has been quoted by the *Vancouver World* as authority for the statement that Dr. Robert Bell, acting director of the Geological Survey of Canada, will visit British Columbia next month. He is expected to reach Vancouver about the time the American Institute of Mining Engineers excursion party is scheduled to arrive there on its return from Dawson.

Mr. L. M. Rice, of Seattle, Washington, is mentioned as contractor's engineer on the Spence's Bridge-Nicola railway the Canadian Pacific Railway Co. is about to build. Mr. Rice was C.P.R. construction engineer on the Columbia & Western railway when that line was built into the Boundary district, and there obtained a reputation for doing substantial and thorough work.

Mr. James Johnstone, president of the B. C. Standard Mining Co., and at one time manager of the Crow's Nest Pass Coal Co.'s collieries, South-east Kootenay, now a well-known resident in the neighbourhood of Nelson, West Kootenay, has returned from a visit to Scotland. He was accompanied by his father, Rev. James Johnstone, M.A., of Belhelvie, Aberdeenshire.

MACHINERY NOTES.

A 7-drill compressor is being obtained for the Providence mine, near Greenwood.

The British Columbia Copper Co., Ltd., Greenwood, recently added to the machine drill equipment of its mines in the Boundary district 6 type E-24 Ingersoll-Sergeant rock drills.

The Canadian General Electric Co. will supply the electrical apparatus and equipment, including the car motors, in connection with the electrification of the Lulu Island railway between Vancouver and Steveston, a distance of 17 miles, for which the British Columbia Electric Railway Co. has authorised the expenditure of \$120,000.

To keep pace with the requirements of its rapidly-increasing business, the Hamilton Cataract Power, Light & Traction Co. is making extensive additions to its power plant at De Cew Falls. Orders specifying prompt delivery have been placed with the Canadian Westinghouse Co., Ltd., for the following apparatus: Two 6,400-kw. 3-phase, 2,400-volt, 8,000 alternation, 287 r.p.m., 2-bearing generators with motor-driven exciters and switch board apparatus; and four 3,200-kw. oil-insulated water-cooled raising transformers.

CERTIFICATES OF INCORPORATION.

- Britanna Smelting Co., Ltd.*, with a capital of \$625,000, divided into 25,000 shares of \$25 each.
- Western Pacific Clay & Investment Co., Ltd.*, with a capital of \$500,000, divided into 5,000 shares of \$100 each.
- British Columbia Construction & Distribution Co., Ltd.*, with a capital of \$25,000, divided into 25,000 shares of \$1 each.
- Salmon River Placer Mining Co., Ltd.*, with a capital of \$40,000, divided into 400 shares of \$100 each.
- Boundary Iron Works, Ltd.*, with a capital of \$25,000, divided into 50 shares of \$500 each.
- Lacled Mining Co., Ltd.*, with a capital of \$150,000 divided into 1,500,000 shares of ten cents each.
- Pollock Mines Co., Ltd.*, with a capital of \$1,000,000, divided into 1,000,000 shares of \$1 each.

REGISTRATION OF EXTRA-PROVINCIAL COMPANIES.

- Southeast Kootenay Coal & Petroleum Co., Ltd.*—Head office in Spokane, Washington, U.S.A. Capital \$250,000, divided into 1,000,000 shares of 25 cents each. Head office in British Columbia, at Rossland, West Kootenay. Attorney (not empowered to issue and transfer stock) George W. Kerr, clerk, Rossland.
- Lorne Creek Hydraulic Mining Co.*—Head office at Bellingham, Whatcom county, Washington, U.S.A. Capital \$10,000, divided into 1,000,000 shares of one cent each. Head office in British Columbia, at Vancouver. Attorney, William Ernest Burns, barrister-at-law, Vancouver.

APPLICATIONS FOR CERTIFICATES OF IMPROVEMENT.

Mineral Claim.	Mining Division.	Applicant.
Helene fractional	Ainsworth	D. P. Hatch.
Mammoth	Fort Steele	Jas. Angus, Jas. A. Harvey, J. T. Laidlaw and Wm. Tarrant.
Britton	Grand Forks	Ella Clarke.
North Seattle fractional	do do	do do
Boston	Greenwood	Vancouver & Boundary
Houston		Creek Developing & Mining Co., Ltd
Kingston		
Kingston fractional		
Keystone	do	Samuel J. Jensen.
Lillie James	do	Chas. H. Tye.
Surlingham fractional	do	Wm. Farney, Jas. B. Macaulay, Jas. Marshall, Geo. W. Rumberger and Alex. Strachan.
Glencairn	Kamloops	John Goddard.
Greater New York	Lardeau and	T. Flack, L. Guere
Lone Star fractional	Trout Lake	and G. Martin.
Telephone		
Woodchuck	Lillooet	E. J. Taylor and L. G. Burns.
Wood-Duck		
Edna fractional	Nelson	John Smith
Kitten fractional		
Tip Top	New Westminster	John J. McPhee.
Diamond Dot	Similkameen	H. H. Thomas.
Sailor Jack	do	J. B. Woods.
Blade	Slocan	John H. Wolverton
Marie fractional	do	Jake Kelson
Empire	Trail Creek	John Anderson, Samuel McKee and Francis A. Williamson.
Revenue		
Minnehaha		
Portland		
Umatilla fractional	do do	F. R. Blochberger.
Victoria		
Walter fractional		
Rambler	Trout Lake	J. A. M. Aikins.

TRADE NOTES AND CATALOGUES.

The Jeffrey Mfg. Co., of Columbus, Ohio, U.S.A., have issued an illustrated folder giving information relative to their Swing Hammer Crushers and Pulverisers, Coal and Roll Crushers. Crusher Catalogue No. 30, and Pulveriser Catalogue No. 30, giving further data, may be had free on application. Another folder similarly deals with this company's portable outfits for excavating, elevating, conveying and screening.

The *N. L. C. Central Station Bulletin*, published by the Nernst Lamp Co., Pittsburg, Pa., the district sales office of which in Canada is with the Canadian Westinghouse Co., Ltd., Hamilton, Ontario, is an illustrated publication treating chiefly on the Nernst lamp. The June number contains an article entitled "A few remarks concerning the use of the Nernst Lamp in the Middle West," and other matters of a similar character.

An illustrated pamphlet the Locomotive & Machine Co. of Montreal, Ltd., has had printed describes the Atlantic Steam Shovel. Four of these machines of the new Robinson Wire-Rope type, designed by Mr. A. W. Robinson, mechanical engineer, Montreal, have lately been sold to the Canadian Pacific Railway Co. and one to the Canada Copper Co., the last for digging heavy ore.

Three illustrated circulars of the Westinghouse Electric Manufacturing Co., Pittsburg, Pa., received lately, are as follows: No. 1102, Westinghouse Direct Current Multiple Arc Lamp for 110 and 220 Volts; No. 1104, Westinghouse Portable Instruments; No. 1113, Belted Type Rotating Field Alternators.

The Canadian Westinghouse Co.'s Circular No. 1109, on the Single-Phase Railway System, and Circular No. 1110, on Westinghouse Catenary Line Construction, give data on these subjects, respectively. The letter press is supplemented by blocks, diagrams and tables.

The Westinghouse Machine Company has recently announced substantial extensions in its sales organisation. These extensions are the result of the rapidly increasing business, making necessary the more thorough covering of southern and western territories. In addition to the original New York, Boston, Pittsburg and Chicago offices, new branches have been established at Cincinnati, Denver, San Francisco, Charlotte, N.C., and Atlanta, Ga. With these added facilities the extensive mining territory of the West and cotton industries of the South may receive more active attentions. The steam turbine and gas engine business of the company has increased rapidly during the last few years, and the prevailing activity in this branch of power development augurs well for the future. The company has representative offices in the following cities: New York, Boston, Pittsburg, Chicago, Cincinnati, Denver, Charlotte, N.C., Atlanta, Ga., Philadelphia and San Francisco.

W. F. Stanley & Co., Ltd., manufacturers of surveying instruments, of 4 and 5 Great Turnstile, Holborn, London, England, have published an illustrated pamphlet describing their new Dabbar-Scott Auxiliary Top and Side Telescope, as follows:

This form of auxiliary telescope, by its peculiar yet very simple construction, embraces all the advantages and eliminates all the disadvantages of all other types. The particular feature is its interchangeability with top or side positions and the means provided to ensure perfect adjustment with the minimum of trouble, thus forming a mining transit which will perform with exactness all the complex functions in mine surveying and requiring no correction for eccentricity. The auxiliary telescope is provided with a centre that may be screwed to the threaded extension of either the transverse axis or the vertical pillars of the main telescope. In either position it is clamped firmly and ranged quickly into alignment with the main telescope by two opposing screws. The diaphragm of the auxiliary telescope has one web only, so placed that it is vertical when on top and horizontal when at the side. The observation of steep horizontal angles is made only with the auxiliary on top, and of precipitous vertical angles with the auxiliary on the side. A counter-balance is