

elberg's
ce.

You said this morning that Mr. Middelberg threw dust in the eyes of the Commission. I take that to mean he told an untruth. Can you point out anything in his statement that is an untruth?—I did not make the statement that Mr. Middelberg told an untruth. I said it appeared to me he threw dust in our eyes.

In what portion of his declaration is there anything that appears to be incorrect or untrue?—I have not made a careful study of his evidence; and I do not say he stated any untruths; but, to me, what seemed a very curious thing was his starting off with the tenant and house business. I do not say that there was any untruth. That was a clever way of bringing out his point, but it did not seem to me logical or perfectly fair, and that is what I mean by throwing dust in our eyes. He left out a very important factor in the illustration of the tenant and the house. There are two principals engaged in it—the owners and the tenants, but the tenant was a forced tenant not a free tenant, and one of the so-called principals was only an agent, and we as the poor tenant, can fall back on the Government for redress.

I only made the remark, because, if there were anything that was an untruth in the statement, I wanted to know it.—I do not say it was an untruth at all; I mean it was very cleverly put.

There were some other clever people before the Commission as well as Mr. Middelberg.

Chairman.

I feel myself called upon to thank you for your exhaustive evidence, and specially because you gave yourself the trouble to give the Commission a printed translation which made it very easy for the Commission to follow your evidence; and, as far as can be seen, your statements with regard to the working of the mines, and the figures given by you, are very exact. Your statement has given us a clearer insight into the working of the mines than all the previous statements. As regards the other part of your evidence, about which we had a discussion this afternoon, I feel assured you have given your honest conviction and feeling; and I believe that the interchange of ideas will perhaps lead you to other thoughts, and will also give me thought for reflection and perhaps it may be for the public good after all.—I wish to return my sincere thanks to the Chairman and Members of the Commission for the patient and courteous manner in which my testimony has been received.

r. Leggett's
evidence.

MR. THOMAS H. LEGGETT, Consulting Mining Engineer for S. Neumann & Co. was next called. He said he had been twenty months in the Transvaal prior to that time in America. He proceeded:

railway rates.

In coming before you, it is not my purpose to go over the ground already well covered by men who have been longer in this country, and are therefore more thoroughly acquainted with its condition; but I am in hopes of presenting to your notice one or two matters that have come within my experience, which have a direct bearing on the mining industry of the Rand. The matter of railway freights has been gone over very completely, hence I have little to say about it other than to draw your attention to a particular shipment of mining material recently received from San Francisco, which has, in fact, reached here during the past month, and upon which I have been able to get the different charges from the Pacific coast to Johannesburg. These are set forth in the table marked "Exhibit A," which I hand to you for inspection. The weight of the shipment was 9 tons, and you will note that the per-ton mile rate from San Francisco to New York, which is something over 3,000 miles, was 0.28d.

ocean freight from New York to East London was 0.17d., being somewhat higher than usual on account of the bulky nature of the freight; the Cape Government and Orange Free State charges for haulages of 286 and 328 miles respectively, were identical, namely, 2.27d., or exactly eight times the rate on the American railway for one-fifth of the haul; while the Netherlands Railway charge was 7.45d. per ton per mile, or nearly 27 times the rate in America, and for a haulage of only one-sixtieth the distance! You are doubtless aware that, in this haulage across the Continent of America, there are hundreds of miles of country very similar to that traversed by the railroads of South Africa, while the altitudes to be surmounted exceed 8,000 ft. above sea level; and further, on many of the freight (or goods) trains, the engines have to be doubled in order to surmount the heavy gradients. Even the lack of railway competition in this country can hardly be considered as accounting for this tremendous difference. In short, the Netherlands Railway charges are out of all reason, and can be considered as nothing short of absolute extortion. In reference to this particular shipment, the agent in Johannesburg informs me that one portion of it was delivered at the Johannesburg Goods Station, and the other portion, approximately half, at Elandsfontein. At Johannesburg Station he was charged 1½ per cent. duty, but at Elandsfontein he was forced to pay 7½ per cent. on exactly the same goods. He naturally made a protest to the Elandsfontein agent, who in turn referred it to Pretoria, receiving instructions in reply confirming his charge of 7½ per cent. It would seem as if a very substantial error had been made in this particular, and it emphasises the necessity which exists for the Government taking over the railway, and giving it that thorough and systematic administration which is so urgently needed. With respect to the direct taxation of the mining claims by the Government, at first sight these do not seem excessive. Nevertheless, a comparison with the charges which are made in other republics in America may be worth making. For instance, what does it cost in the United States to obtain title to mining property? The expense of locating, i.e. pegging, the average-sized claim of 600 × 1,500 feet (equal in size to 15.62 Transvaal claims of 400 × 150 Cape feet), together with recorder's fees, is approximately £10. Title in fee simple or freehold can be obtained from the United States Government on payment of £100. To this must be added the cost of surveys, maps, and incidental expenses, increasing the amount by about £50 more. In other words, by a payment of £160 one obtains absolute title to 900,000 square feet of mining ground, which may be worked or allowed to lie fallow for years, at the option of the owner. Let us compare this with the cost of the licences paid by such a property as the Wolhuter, consisting of a mining area of 171 claims. This company paid during 1896 the sum of £519 10s. in licences, which is about its average annual payment. In the United States this amount of ground would be covered—out of course, in actual area, but by virtue of the mining law of the apex—by two 600 foot claims. The cost of acquiring perpetual possession or the freehold of this ground would be £320, or only 61 per cent. of one year's payments on a mining property of equal size in this country. The Spanish-American republics are equally favourable to the development of the mining industry. Their claims are bounded by vertical planes, as is the case on the Rand, and the Government charges are very similar to those which prevail in the United States. I do not know that any comment has ever been made on the score of too heavy charges for mining licences, and I do not make this comparison in any carping spirit, but merely to draw your attention to the policy pursued towards the mining industry by other republics, who accept as an axiom the principle that the success of this industry conduces to their prosperity to a greater degree perhaps than that of any other. The matter of the Pass Law has been thoroughly well ventilated. The question of the cost of

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Native labour

Comparative
working costs
of Californian
and Rand gold
mines.

natives delivered at the mining properties, so to speak, is to my mind a serious item. In one mine that I am acquainted with, not a very large property, having a mill of 40 stamps, the payments on this account during the past year, after deducting the amounts subsequently refunded by the "boys," totalled £2,663. Now, inasmuch as an average of about 390 natives were working at this property during the same period, this comes out at a cost of over £6 16s. per "boy." This cost divided over the tons crushed for the year, gives a charge of 6s. 8d. per ton. At the Wolhuter Gold Mine in 1896 the cost of procuring native labour, after deducting the amounts subsequently refunded by the kaffirs, equals £5,448 10s. This works out at a cost per "boy" of £3 6s. 48d., there being 1,641 "boys" employed on the property. Spreading this charge over the tons crushed for the year, the cost comes to 9s. 5d. per ton. I think you will admit that these charges constitute a very heavy burden upon the mining industry, and trust you will afford us your aid in remedying the matter. What I wish most to draw your attention to, however, is the cost of working in the United States mines, which are similar to those of the Rand, more especially those of California, where the veins are of a width similar to the blanket beds of this district, and the mines are of even greater depth. The data contained in the sheet marked "Exhibit B" will be of interest in this connection. The costs of working such mines as these can, with all fairness, be compared with our own working costs on the Rand inasmuch as the types of the ore deposits are similar, or rather, I should say, that the methods of mining a quartz vein, 3 feet to 4 feet wide, and dipping at 40 degs. to 50 degs., are precisely similar to those employed in working the blanket beds of the Rand. You will note that the poorest mine in this list, with a yield of only 23s. per ton, gave a profit of 13s., when working at a depth of 800 feet to 1,000 feet; and the average grade ore of 27s. to 30s. gives profits of 9s. to 12s. per ton. The main items that enter into the cost of mining operations may be summarised as follows:—(1) motive power; (2) supplies or stores; (3) labour. These must be taken in connection with the character of the ore deposit, in which the hardness of the ground to be broken, the width of the ore body, and the amount of water to be handled are the chief considerations. I have been unable to obtain the itemised working costs of the property mentioned in "Exhibit B," but from my experience of mining in California I am largely familiar with the general features of the mining costs there. In regard to the cost of motive power in this country, the item is considerably in excess of that in California, and this is largely due to the fact that water-powers are numerous in the Sierra Nevadas, and are utilised either directly or by means of electricity. Where these powers do not exist timber is usually plentiful. In this respect I think that the Rand mines will show up more favourably within the next year, inasmuch as I believe that you are becoming convinced of the high cost of our coal, due to excessive freight charges. In the matter of stores the same condition exists, namely, a highly increased cost, due largely to excessive railway rates in the Cape Colony and here. In this connection I would submit a statement showing the costs of the chief mining supplies at the extensive mining camp of Butte City, Montana, for the year 1894, and the costs of similar articles in the Transvaal at the present date. (See "Exhibit C.") Butte is an inland town, situated in the heart of the Rocky Mountains, 1,000 to 1,500 miles from the sea coast, and over 2,000 miles from the source of supplies of drill steel, round iron, piping, etc. From this table you will note that dynamite cost in Johannesburg $3\frac{1}{2}$ times as much as in Butte City, and even with equal percentage of nitro-glycerine, the proportion of cost would be about as three to one. Detonator cost $1\frac{1}{2}$ times as much in Johannesburg as in Butte City; and drill steel is 20 per cent. more expensive here. Common iron costs 44 per cent. more than in Butte City, and Norway iron 60 per cent. more; 3 inch pipe is 68 per cent. more costly in Joh

burg, and 5 inch pipe is one-third higher in cost. Timber can be obtained in Butte for one-seventh the price demanded here. Mining stulls cost us here three times as much, while lagging poles are thirteen times more expensive. After a haulage of 450 miles from Rocky Springs, Wyoming, to Butte City, coal costs slightly less than it does on the Rand with an average haulage of 28 miles. I have faith that in this also you will apply the proper remedy. The mining conditions are very comparable, as shown by the width of the veins in the list of mines in "Exhibit B," and the depth at which they are being worked. In so far as the hardness of the ground is concerned, the Californian mines as a rule have a considerably softer material to work in. This, however, is largely offset, and in some cases *more* than counterbalanced by the much greater amount of water to be handled, and it is a perfectly fair conclusion therefore, that so far as the natural conditions of the deposits in the two countries are concerned, a comparison of the costs incurred in working them is a fair one. The item of labour comes next, and here I think we shall have some instructive matter for consideration. You will note that the Plumas Eureka and the Sierra Buttes mines, having mills equal in capacity to but 30 and 40 stamps respectively of the Rand type, employ from 230 to 250 white men, or from six to eight men per stamp. This is three or four times the number of white men per stamp employed on the Rand, the difference being offset by the use of kaffir labour. The wages paid to these men in California are 2½ to 3 dollars per day, or roughly from 10s. to 12s. This is a little more than half the average price paid for white labour on the Rand, and considerably less than half where contract work is done, and it must be remembered that contract work prevails here very largely. The salient feature is to be found in the fact that, notwithstanding the employment of white labour at the above rate of wages, mines which would just about pay operating expenses on the Rand are made to yield a large profit in California. We have found that the natural conditions of the ore deposits in the two countries are similar, and the disadvantages that exist about balance one another. The greatest differences in the cost of mining operations in the two countries lie in the cost of motive power, of dynamite, and other stores, and of labour. In the reduction of the first two items we count confidently upon your most necessary assistance. In the matter of labour we know that in California we have largely the same class of miners as are to be found on the Rand to-day, namely, Cornishmen. Why is it, then, that these men are willing in one country to accept half the wages that they require in the other? I think the answer will be found in the simple fact that in America these men go with the idea of settling permanently. They become an integral part of the country. They say to themselves, "This country is good enough for us and our children." Their margin of profit at the above stated wage is almost equivalent to their margin of profit in this country, due chiefly to the difference in the cost of living. But, above all, they realise the fact that they have gone into a country in which they intend to stay and make their home. Here, on the contrary, the aim of nine miners out of ten is to accumulate sufficient money to leave the country, which is not the country of their adoption, as in other republics. And, gentlemen, until it is made so, until the labouring man—who is the backbone and sinew of any industry—becomes an integral part of your country; until he feels that he can settle here and obtain for his family the necessaries and comfort of life, without this feeling of being obliged to save money in order to get away—until this condition of affairs prevails, we cannot hope to reduce this item of cost to a figure comparable to that which obtains in the United States. Mr. Jennings has shown you what has been done with black labour in other countries, and has pointed out in a clear and forcible manner the latent possibilities of the kaffir, and what we may justly expect of him when properly trained. The point which I

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of wish to emphasise is, that in the matter both of white and black labour we are dependent on your active co-operation; in the matter of white labour to so alter the conditions surrounding the white workman that his wage may be reduced without impairing the margin of profit which he now receives, and which all acknowledge to be but a fair recompense to the efficient labourer; in the matter of kaffir labour, to increase the supply so that it shall be adequate for the entire fields, and at the same time to so control it that we may succeed in increasing the kaffirs' efficiency, and extending the scope of his work. I do not know whether you quite realise the great importance of the development of the deep level mines of the Rand, and the bearing which the successful outcome of this work will have on the future prosperity of the country. By deep level mines I do not mean such mines as the Geldenhuis Deep, where the shafts cut the reef under 1,000 feet in depth, but I refer rather to those properties where the reef lies at a depth of 2,000 to 3,000 feet from the surface, which properties require the expenditure of a large amount of capital, and the exercise on the part of the shareholders of a great deal of patience before any return can be expected from the outlay. Roughly speaking, in such deep level properties you have more than double the area of ground of the outcrop companies. It will readily be seen, therefore, that if these deep level reefs can be brought to the productive stage, and made to yield a profit, not only will the original faith of those investing in these fields be verified, but the prosperity of the country will also be greatly enhanced. I here submit a diagram of the deep level shafts now sinking upon these fields, showing the depths at which they are estimated to cut the reefs, and the horizontal distances south from the Main Reef outcrop at which they are located. This diagram shows that within the first 1,000 feet from the outcrop there are 8 shafts = 13%

1,000 to 2,000	"	"	"	"	25 shafts = 40%
2,000 to 3,000	"	"	"	"	12 shafts = 19½%
3,000 to 4,000	"	"	"	"	4 shafts = 6½%
4,000 to 5,000	"	"	"	"	8 shafts = 13%
5,000 to 6,000	"	"	"	"	4 shafts = 6½%
6,000	"	"	"	"	1 shaft = 1½%

The last shaft has to go through 3,318 feet of ground before reaching the reef. We have a parallel instance of faith in the value of deep level mines in the case of the Tamarack Copper Mining Company of Michigan, which company sank a shaft 2,300 feet deep before cutting the copper-bearing lode, spending thousands of pounds on that operation, and waiting nearly four years before the mine became a producer. This mine started crushing in 1886, and has been a steady producer ever since. It has to-day five deep level shafts, and their total depths in the early part of 1896 were as follows:—No. 1 shaft, 3,232 feet; No. 2 shaft, 3,535 feet; No. 3 shaft, 4,450 feet; No. 4 shaft, 4,450 feet; No. 5 shaft, 226 feet. This No. 5 shaft will be connected on the 27th level (3,920 vertical) with shaft No. 2. It will intersect the reef at 4,700 vertical and is of five compartments. At present this mine has one stope, working at a depth of 4,500 feet, according to the 1895 issue of the "Mineral Industry, its Statistics, Technology and Trade," to which publication I am indebted for many of my figures. The total dividends paid by this property to the close of 1895 were 4,700,000 dollars or £900,000, with mining ore worth from 20s. to 22s. per ton at a depth of 2,200 to 3,200 feet. The working costs of this property figure at 16s. per ton, showing that even when mining at this depth the average profit in 1895 was 5s. 6d. per ton. I attach statements marked exhibits "E" and "F" showing the costs at this property for the years 1888 to 1894 inclusive, as also those of the Atlantic Mine, which is an outcrop company in the same district, and working during the period mentioned.

depth of 850 to 1,250 feet. This latter property is one of the best managed in the world, as it is making a small profit on an extremely low-grade copper ore. The average value of this ore for the year 1895 was 6s. 3d. per ton, upon which they actually made a profit of 1s. 4½d. This mine is, however, an exceptional instance of remarkable economical management. It has also easier ground to mine in than the Tamarack. I have drawn up a statement, which I here submit ("Exhibit G"), showing the total mining, including surface expenses, of three outcrop mines in this copper district, in order to be able to make a comparison with the costs of the Deep Level Tamarack Mine for the same period of six to seven years. The mining costs of these outcrop mines, namely, the Atlantic, Allouez, and Osceola, including surface expenses, average 5s. 2½d. per ton; the same costs for the Tamarack Deep Level are 9s., showing an increase of 3s. 9½d., which increase may be said to be due to the greater depth of mining. These costs exclude transportation and milling, inasmuch as the method of reduction of copper ore differs from that of gold ores, and further, the reduction costs are not affected by the depth from which the ore is extracted. I have worked out the mining costs (including development work) of 22 Rand companies, which show an average of 17s. 7½d. Mr. Jennings has just submitted to you a statement, including a greater number of companies, 29 in all, in which he shows this cost to be 17s. 7½d., which is nearly double the costs at the Tamarack mine, where they are stoping to-day at a depth of over 3,000 ft. We, of course, have no mines working at such depths here with which we could make comparison with the Tamarack, and the question arises whether such comparison would be a fair one from a mining point of view. To this question I answer, yes; inasmuch as every indication thus far goes to show that upon the Rand the natural conditions will be quite as favourable as they are in the copper districts of Michigan; in other words, that we shall have no disadvantageous increase of temperature for several thousand feet in depth, no undue amount of water, and probably even less timbering to be done than is required in the deep level mines of that district. Hence, the mining conditions admit of comparison, but of course it must be borne in mind that in the Michigan mines they are working on a lode 12 ft. to 15 ft. wide, which width is an important factor in the cheapening of mining costs. If they are to-day extracting in the United States ore that is worth 21s. 6d. per ton, from a depth of over 3,000 ft., and making a profit of 5s. to 6s. upon it, I would ask— is not the same thing feasible here? Given proper conditions, it certainly is feasible; but, under present conditions, we cannot even make an outcrop mine of that value of ore yield a profit. We have a number of deep level mines on the Rand to-day which are unquestionably of much better grade of ore than this, and which will yield a fair margin of profit. I wish, however, to direct your attention to the very large area of medium-grade reef which, if the local conditions are favourable, could be made to yield a profit. Experience gained in the deep mines of the copper district makes it reasonable to expect that, when mining here at similar depths we shall have an increased cost, due to that depth, of approximately 4s. per ton. On the other hand, if in the United States, in a district where the mining conditions are similar, ore can be mined at this depth and placed in the mill for 9s. per ton, is it not reasonable to expect that conditions may be so altered within the next few years in this country as to enable us to do the same work here for 15s. to 16s. per ton, even with our narrower ore bodies? It is true that the Tamarack crushes 392,000 tons per year, but the Simmer and Jack Mine is to-day been equipped with a 280-stamp mill capable of crushing over 400,000 tons annually, and it is certain that in handling medium-grade ores, if we would obtain a profit, we *must* crush in large quantities. If we contrive to mine the deep levels in the near future at the figure stated, we can make a reasonable profit on our medium-grade ores, and, in this event, will make

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productive an immense area of deep level ground, and the life of the industry will be assured for many decades to come. This is the immediate and burning question to-day—how to make our medium-grade outcrop mines payable? But this is inseparably connected with the future of the deep level mines. If we can obtain such reductions in working costs as to render mines yielding 25s. to 30s. per ton profitable investments, we can then look forward confidently to obtaining profits on a similar grade of ore in the deep levels. I appear before this honourable Commission as a citizen of a sister republic, and in so doing am animated by none but the friendliest motives. I feel that I cannot more fittingly conclude my remarks than by reminding you of the memorable words of President Steyn, when, in his address to the Legislature of the Free State on March 11, 1896, he said:—"Here in the Free State, where we have raised the banner of republicanism, where from all quarters strangers are coming to us, is it not a glorious task to incorporate these strangers with us and amalgamate them in one republican people." Gentlemen, I cannot embellish so wise and true a statement. I can only commend it, and the principle that underlies it, to your kind and most earnest consideration. Finally, I beg to express the hope that the evidence which has been submitted here may convince you that the future of this country—not for the next 10 years, but for many times that period—lies in the economical and successful development of the deep level properties of these fields. I believe that a grasp to-day of the conditions that are essential to such development will lead this country to a prosperous, and even brilliant future.

EXHIBIT A.

Table showing cost of 9 tons of mining material (bulky) from San Francisco laid down in Johannesburg:—

	Total cost.			Cost per ton.			Percentage of total cost.	Percentage of price in San Francisco.
	£	s.	d.	£	s.	d.		
Price in San Francisco, F.O.B. ...	166	9	5·2	18	9	11·2	44·99	100·00
Freight, San Francisco to New York	31	14	10·3	3	10	6·5	8·58	19·07
Cartage, insurance, fees ...	7	11	10·5	0	16	10·5	2·06	4·56
Freight, New York to East London	58	1	2·0	6	9	0·2	15·69	34·88
Port charges and landing ...	14	18	11·0	1	13	2·5	4·04	8·99
Freight, East London to Johannesburg	66	19	10·0	7	8	10·5	18·11	40·24
Transvaal duty ...	12	18	3·0	1	8	8·3	3·49	7·77
Cartage to mine ...	9	17	6·0	1	1	11·3	2·66	5·93
Exchange ...	1	9	0·0	0	3	2·7	0·38	0·86
Total ...	370	0	10·0	41	2	3·7	100·00	222·77

ANALYSIS OF OCEAN AND R.R. CHARGES.

	Distance Transported. Miles.	Total Charges.			Percentage of total charge.	Rate per ton per mile.
		£	s.	d.		
R.R., San Francisco to New York ...	3,000	31	14	10·3	20·24	0·28
Steamer, New York to East London ...	9,000	58	1	2·0	37·03	0·17
Cape Government Railway ...	286	24	8	8·2	15·57	2·27
Orange Free State R.R. ...	328	28	0	5·3	17·88	2·27
N.Z.A.S.M. ...	52	14	10	8·5	9·28	7·45
Total ...	12,666	156	15	10·3	100·00	

Mr. T. H. Leggett's Evidence.

EXHIBIT E.—ANALYSIS OF EXPENSES, 1888 TO 1894—ATLANTIC MINE.

	1894.	1893.	1892.	1891.	1890.	1889.	1888.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Cost of air drills, etc. (a) ...	8	9	8	9	10	11	8
Cost of fuel for engines ...	7	7	7	6	6	5	5
Other underground expenses ...	51	53	57	67	69	60	58
Other surface expenses ...	10	10	12	12	19	13	12
Total running expenses at mine ...	75	79	84	95	104	88	84
	3/11½d.	3/3½d.	3/6d.	3/11½d.	4/4d.	3/8d.	3/6d.
Transfer to mill and stamping ...	26	28	28	29	31	31	30
Total running expenses ...	102	108	112	125	135	119	114
	4/3d.	4/6d.	4/8d.	5/2½d.	5/7½d.	4/11½d.	4/9d.
Construction ...	45	34	8	11	10	11	8
Total, including construction ...	146	142	115	136	145	133	122
Smelting, freight, and marketing ...	17	18	18	18	20	20	21
Total cost, less construction ...	119	126	130	143	156	139	135
Total expense to market ...	165	160	133	154	166	153	143
	6/10½d.	6/8d.	5/6½d.	6/5d.	6/9d.	6/4½d.	5/11½d.
Thousand tons stamped ...	315	316	301	297	278	279	298
Estimated average depth ...	1250	1200	1150	1000	950	900	850

(a) Pumping also included.

TAMARACK MINE.

	1894.	1893.	1892.	1891.	1890.	1889.	1888.
	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.
Cost of air drills, etc. ...	—	14	18	21	25	21	20
Cost of fuel for engines ...	—	19	24	22	31	33	23
Other underground expenses ...	—	130	134	142	165	151	140
Other surface expenses ...	—	28	26	26	25	30	30
Total running expenses at mine ...	—	191	202	209	246	235	213
		7/11½d.	8/5d.	8/8½d.	10/3d.	9/9½d.	8/10½d.
Transfer to mill and stamping ...	—	46	49	47	59	64	72
Total running expenses ...	246	237	221	256	305-303	300	285
Construction ...	60	45	80	124	05	40	01
Total, including construction ...	306	282	301	380	310	340	286
Smelting, freight, and marketing ...	72	81	77	76	107	107	128
Total cost, less construction ...	318	323	298	332	412	307	413
Total expenses to market ...	378	368	378	456	417	447	414
Thousand tons broken ...	(a)	413	392	330	182	197	163
Thousand tons hoisted ...	—	369	363	301	163	179	152
Thousand tons stamped ...	350	346	339	283	155	169	144
Estimated average depth ...	3100	3000	2900	2800	2700	2600	2500

(a) Estimate not official, affecting all the figures in this column.

The expenses after stamping depend really on the amount of copper rather than on tons of rock. The cost of pumping is included in the cost of running the air drills in the Atlantic mine, but not in the Tamarack. The totals vary two or three cents sometimes, owing to neglected fractions, from the results of direct addition. The expense is per ton stamped in the Atlantic mine, per ton hoisted in the Tamarack.

EXHIBIT B.—Sierra Buttes Mine, Sierra County.—Depth of mine, 1,000ft.; average dip, 45degs. Two mills, 50 and 60 stamps respectively, equal in capacity to about a 40-stamp mill on the Rand. Six months crushing, 29,243 tons, yielding 189,196dols.=6·47dols. per ton=£1 7s.; mining, 3·85dols.=16·04s.; milling, 45dols.=1·96s.; total costs, 18s.; profit per ton, 9s. The average yield of the ore for ten years was 7dols. per ton=£1 9s. 2d., yet they disbursed in dividends 1,360,288dols.=£272,000. The number of men employed in mine and mills averages 250.

Plumas Eureka Mine, Plumas County.—Depth of mine over 1,500ft. Dip 57degs.; width of vein, 3½ft. (average); 60-stamp mill=30-stamp mill on the Rand, men employed, 229; in six months crushed, 27,789 tons; yield per ton, 7·27dols.=£1 10s. 3d.; cost mining and milling, 4·32dols.=18s.; profit per ton, 12s. 3d.

Zeile Mine, Jackson, Amador County.—Ore yields 5·50dols.=£1 3s. per ton; costs, 10s. per ton; profit per ton, 13s.; depth, 800 to 1,000ft.; vein, 3 to 4ft. wide; crushing, 120 tons per day, 40 stamps.

Plymouth Consolidated, Amador County.—Vertical depth of mine, 1,500ft.; 120 stamps crush 250 tons per day; yield per ton, 13 dols.=£2 14s. 2d.; costs mining, 3·20dols.=13s. 4d.; milling, 69dols.=2s. 10d.; total costs, 3·89dols.=16s. 2d.; profit per ton, £1 18s. The annual report shows—Gold bullion produced, 1,033,518·29 dols.=£212,658; operating expenses, 331,163·84dols.=£68,141; profit, 702,354·45dols.=£144,517; twelve dividends paid, 600,000·00dols.=£123,456; surplus carried over, 102,354·45 dols.=£21,061. The management and general office expenses are not obtainable for the above mines. They would increase the costs about 2s. per ton.

EXHIBIT C.—TABLE SHOWING PRICES OF SUPPLIES

At Butte, Montana, U.S.A., in 1894, and at Johannesburg, Z.A.R., in 1897.

Material.	Butte, 1894.			Johannesburg, 1897.			Comparat ces of si at Butte tana, and Joh burg, S.
	£	s.	d.	£	s.	d.	
Dynamite per case of 50 lbs.	(a) 1	3	11½	(b) 4 5 0
Detonators per box	0	13	6½	1 0 0
Fuse per coil of 25 feet	0	0	7¼	0 0 4½
Candles (16 oza.) per box of 25 lbs.	0	12	4½	0 10 9
Drill steel per lb.	0	0	4¼	0 0 5½
Iron (common) per lb....	0	0	1½	0 0 2
Iron (Norway) per lb.	0	0	2½	0 0 4
Pipe (3-inch) per foot	0	1	0½	0 1 9
Pipe (5-inch) per foot	0	2	1	0 2 10
Timber per cubic foot	0	0	7½	0 4 1
Skulls per inch of diam., and 1 foot of length	0	0	0 10	0 0 0 10
Logging poles per foot of length	0	0	0 ¼	0 0 3½
Coal per ton, 2,000 lbs.	(c) 0	19	9½	(d) 1 0 0

(a) 40 per cent.

(c) Includes 450 miles of railage.

(b) 70 per cent.

(d) Includes 28 miles of railage average.

(f) ATLANTIC MINE.—An outcrop mine. Average depth, 1,300ft. Width of vein, 12ft. The record of the output for 1895 was: Value of ore, 14·6lbs. copper per long ton, equal to 0·73 p.c., equal to (at 10·52c. per lb.) 1·5352dols. or 6s. 3d. per ton; cost of mining, selecting, and breaking, 0·7525dols. per ton; crushing and concentrating, 2·220dols. per ton; transportation (three miles) and surface charges, 0·0408dols. per ton; freight, smelting, and marketing, 1·881dols. per ton; total costs, 1·2034dols.; profit per ton, 1s. 4½d. = 3318dols.; tons milled, 313,058 tons; product, 4,832,497lbs. refined copper, 508,252dols. = £104,578; average pay of contract miners in this mine for 10 years, 1881-1891, 62·90dols. = £13; average pay of whole force for same period, 51·40dols. = £10 16s.

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TAMARACK MINE.—Deep Level. Width of vein, 12 to 15 feet. Estimated average depth of working, 3,200ft.; one stope at 4,500ft. The record of output for 1895 was: Value of ore, 49·72lbs. per ton, equal to 2·49 per cent., equal to (at 10·52c. per lb.) 5dols. 23c. or £1 1s. 6d. Tons crushed and costs not published since 1894. Basing an estimate on the figures for that year, tons crushed about 300,000. (Note: Production cut down 50,000 tons less than in 1894 by accident to the hoisting engine at No. 1 shaft, and the encountering of poor ground in the territory tributary to No. 2 shaft.) Total operating expense at mine, including transportation and milling, 2dols. 50c., equal to 10s. 4d.; expense to market, including construction, freight, smelting and marketing, 1dol. 36c., equal to 5s. 8d.—total costs per ton, 16s.; profit per ton (approximate), 5s. 6d.

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(g) Comparison of costs of outcrop and deep level mines in the Michigan copper district. Table showing mining and surface expenses per ton milled, over a period of six to seven years. Does not include transportation and milling.—Width of ore body, 12 to 15ft. Outcrop mines.—Atlantic: depth, 850ft. to 1,300ft., 3s. 8d.; Allouez, depth over 1,000ft., 5s. 10d.; Osceola, depth over 1,000ft., 6s. 2d. The average cost per ton was 5s. 2½d. Deep Level.—Tamarack, 2,500ft. to 3,100ft., 9s.; increased cost of mining due chiefly to depth, 3s. 9½d. The Tamarack crushes 392,000 tons of 2,000lbs. per annum. The Atlantic crushes 371,000 tons of 2,000lbs. per annum. The Allouez crushes 115,000 tons of 2,000lbs. per annum. The Osceola crushes 229,000 tons of 2,000lbs. per annum.

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Mr. Smit.

In quoting your railway rates from this Republic, did you only quote rates between Johannesburg and Vereeniging, or the whole of the Republic?—They are only from Vereeniging to Johannesburg.

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Do you know the tariff charged between Vereeniging and Johannesburg is higher, *pro rata*, than the money charged by the same company on other lines?—No.

In making a comparison, you say that workmen have to be paid higher here on account of the cost of living here; but does not the same apply to those working in the manufacture of dynamite and on the railways?—But, in the matter of dynamite, is not a large quantity brought into the country—that is, there is not much labour employed on it.

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There is a very great staff of white men.—Is not that a misapplication of energy? Why not put that labour in the countries where the materials and labour are cheaper.

You will, of course, make allowances that dynamite made in this country will cost more money made here than the cost price of that imported?—Unquestionably. Therefore I object to its being made here.

You have had a lot to do with mines in California?—Yes.

You say that circumstances are very much easier there than here?—I say so in the matter of motive power.

Working
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ifornia.

Mining pays better there because the motive power and the labour are cheaper?—
Yes.

This being so, why didn't you go back to California when you found that mining was so much cheaper than here?—Most engineers come out here under an engagement entered into before leaving.

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^{ion} In which way do you propose to make workmen an integral part of the Republic, and offer them sufficient inducement to stay here?—I feel that is a question that is better answered by a statesman of the country. I feel it has a vital bearing upon the economic working of our deposits here. Deep levels are a matter for the future, and I am trying to bring forward to your attention the immediate necessity of making workmen an integral part of the Republic, and that to work the deep levels economically we must unite the bone and sinew in the interests of the country.

When did you frame your statement?—The latter part of last week.

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^{ence} Did you, more or less, co-operate with Mr. Jennings?—No; my statement is entirely independent of his.

Still you refer to Mr. Jennings' declaration in a couple of instances?—Yes.

You must have known last week what Mr. Jennings would say?—Mr. Jennings read me a large portion of his statement yesterday afternoon.

And you have consulted him about your declaration?—No.

Mr. de Beer.

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^{pply.} You have stated that it cost one of the mines £6 7s. to deliver a "boy" on to the mines. How do you arrive at that?—By dividing the total cost expended in procuring "boys" by the average number working.

How do you arrive at the total cost?—By the totals paid, less the amount refunded.

But in what way is the money spent?—I do not know that.

How do you arrive at your figures?—I take them from the secretaries' statements at the company's office.

The amount you quoted differs very largely from that by other managers. The highest figure quoted up to the present is £2 to deliver "boys."—These are the secretaries' statements taken from the annual report showing the amount charged to that account. I think you will find these figures agree with those given by Mr. Goldmann.

^{work.} It is new to me that most of the work, as you have stated, is done under contract?—"Largely prevails here," is the expression I used.

You think that miners earn much more working by contract than by shift?—Many miners earn more, and I think Mr. Catlin's statement is in support of that.

That is the bonus system?—I mean the contract system in its broad sense.

I understand by contract work you mean piece-work?—Literally it does mean piece-work, but I used the term in its broad sense.

^{ages.} But is it not very difficult under these circumstances to give a correct average of wages earned by white miners?—Not necessarily. In any one mine you may have a given number of contractors, and their pay must show on the pay rolls. In the same way you may take the number of men on day pay; then it is very easy to make an average on the total of men you employ.

But you still don't give the Commission a fair idea of the wages actually earned when you say that a man in receipt of a salary of £18 a month may earn £50 or £60 under the bonus system?—Well, I think these figures have been gone into with great detail by Mr. Sydney Jennings and Mr. Hennen Jennings, and if I remember rightly they gave the average at about £24.

Unfortunately they were not questioned on contract work.—Contract work does not greatly exceed that average pay, in my experience. You will never, in any part of the world, get a miner or any other class of workman to work by contract for the same money exactly as he will work by day. A contractor expects to put in some of his own time. If he works overtime, that is his own personal investment in the work he has in hand, and he expects to come out above the day-pay man, because he feels he has devoted more time to his work.

Cont: tin

Are there no miners' licences in America—that is, have the mine workmen to pay any tax to the Government—say 7 dollars per month?—They only pay their taxes as citizens.

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Are you certain there is no such licence as the one I refer to?—Absolutely certain.

Chairman.

You have already stated, with many other witnesses, the wages paid and the cost of living in California, compared with the wages and the cost of living here. I want to know whether the rate of wages paid here is higher than the rate paid in America, compared with the cost of living?—I think so.

Comp rate and c ing i State Rand

How do you reconcile that with your statement, if you say that most miners come here to make money, whereas in America they stay?—From the fact that the majority have not their wives and families with them here. If you refer to the married men who settle here with their families, then I would say the cost of living here is excessive.

Here they must make more, for they have the cost of coming out and the expenses, the sending money home to their wives, and yet they save money here?—Yes, unmarried men.

Still, as long as he works here he must send money home to his family, and also he must have money to go home again.—I think that makes the point very clear, that men do not and cannot settle here.

What would be the comparison of the population of the goldfields here and the goldfields of California?—The goldfields of California are much more scattered. You have camps there of from 1,000 to 3,000 people spread over a length of hundreds of miles of mining ground.

Compa populat Rand at fornian fields.

And in these camps is there any other occupation besides gold mining?—On the western slopes of the Sierra Nevada, immediately below the mining camps, there is a fertile district.

When was the gold first discovered in California?—In 1849.

Discovery in Calif

When did the United States come into existence?—As the United States, in 1776.

Do you know how long this Republic has been in existence?—In the neighbourhood of 50 years.

And the goldfields here?—To put it roughly, about 11 years.

When was the first railway built in the United States?—I do not know exactly; I think at the beginning of this century, 1820 to 1830.

First railw United S

I am very pleased to learn about all the other countries, and to take example from them. Other witnesses have given comparisons between other countries and this. I think everyone will agree that, unless you can change the whole economical position of the Republic in one day, it is impossible to make a just comparison between mining here and what it is in the old countries. The development and progress of the country marches with the times, and you may be convinced that the Commission will do everything in their power for the industry. I am sorry that all who have given evidence have only given the position of affairs, and how you desire them to be, without giving

Commissio tends wei wards m industry.

a way out, still, I am in hopes that some of the other witnesses will point a proper way out.—I do not wish to take up the position of a mentor. In alluding to other countries, I only point out what has been accomplished, though it is with the hope that we may accomplish the same thing here, and I realise fully it will be a question of great difficulty, and I think a great deal depends on starting rightly. I fully believe that the Mining Commission is ready to aid us in every way possible, and I believe that the ways out of the difficulties are matters for serious consideration and thorough discussion. The only thing a witness can do is to make suggestions, and such suggestions are only the opinions of one man, whereas if you had an advisory Board, as has been suggested, to work in conjunction with the representatives of the industry, a way out will be clearly found.

Mr. Schmitz-Dumont.

When you talk of deep levels you do not mean to comprise mines like the Bonanza, which strikes the reef under 1,000 feet?—Exactly.

What you call a deep level is a mine 2,000 or 3,000 feet deep?—These are the mines to which I wish to draw the attention of the Commission.

Have you not seen in the papers that the Bonanza and Geldenhuis Deep are always mentioned as models or examples of deep level mines?—An engineer pays very little attention, as a rule, to the ordinary everyday expressions. He comes to his own conclusions.

I see it in all the papers. It is always the Geldenhuis Deep and the Bonanza as examples of deep level mines?—Let me explain the distinction I wanted to draw. It is that some of the outcrop mines are to-day working at very nearly the same vertical depth from the surface as these mines. When you are a few hundred feet more or less under the maximum of, say, 1,000 feet, it affects the working cost much less. Look at the working costs of the Geldenhuis Deep, and you will find they are working about the same cost as the outcrop mines, which goes to show that at that point the depth is not a vital factor. But when you get to 2,000 or 3,000 feet then the depth does become a vital factor, and that is the point I wish to draw your attention to for consideration.

You don't wish to judge the future deep levels by the Geldenhuis and the Bonanza?—Certainly not.

If the papers say the future of the deep levels depends on the future of the Geldenhuis and Bonanza, you think they are wrong. You don't agree with that opinion?—Everyone has a right to his own opinion. I don't say they have not a marked influence. In deep level mining we go step by step as the industry progresses. When a man finds he can work at 1,000 feet and make a profit, as they are doing at the Geldenhuis Deep, then he thinks he will try 2,000 feet. That is an index, and the Geldenhuis Deep is more of an index because it is a medium grade ore, whereas the Bonanza is a very rich grade.

Don't you think the Robinson and the Ferreira Deep, or any of those, would be a far better index than the Geldenhuis of the future?—Of the future of what?

Of the future indications of deep levels—of the cost of working deep levels in the future.—Of the mines I am alluding to; yes.

You said at the Tamarack Deep Level mine a ton of quartz cost 9s. to mine. The mining and surface-work.

Comparative working costs of outcrop and deep level mine.

And for the outcrop of the Tamarack mine it only costs 5s. 6d.?—What I said was that the average cost per ton of three outcrop mines was 5s. 2½d.