tons, the freight to Rossland being about \$48 per ton, including shipping and railway.

The cost of erecting will depend on the amount of blasting, if any, required in connection with the excavating on the site of plant, the amount of concrete to be put in, the price of labor and timber, and will vary at different places. The size of building required would be approximately 33 ft. high by 35 ft. long by 40 ft. wide and should be built on the side of a hill in order that the least amount of foundation work will be required to arrange the plant so that the pulp and oil flow by gravity.

The last item, namely, cost of running plant, includes labor, supervision, loss of oil and royalty.

Three hands per shift should be enough to attend to the 100 ton oil plant, say one man at \$3 and two at \$2.50 each.

Reckoning two shifts of 12 hours a day each

the labour per day treating loo tons of ore	
may be taken at\$16	00
Power, electric	00
Loss of oil and royalty 45	00
Adding, for supervision, repairs and deprecia-	
tion 10	00

Total expenses per day of 24 hours\$76 oo

This on 100 tons equals \$0.76 per ton of ore treated.

Although from the above figures the total expenses in connection with the oil process are only 76c. per ton including everything in that department, it should be noted that in many cases it will be even less, as for instance in the event of water power being available, or an existing company having two or three hundred horse power, or more, at their disposal, it would cost very little for an additional thirty horse power to drive the oil plant.

Further, the charge against loss of oil and royalty isput high to allow for the heavy freight on the oil, viz., about double the price of the oil itself, and probably this may be considerably reduced when dealing with large quantities. The loss of oil may be taken between I to $I\frac{1}{2}$ gallons per ton of ore treated.

Thirdly, the \$10 per day for supervision, etc., is no doubt high, as repairs and depreciation should be very small, and generally the supervision could be shared with that of another department, but the writer considers it better not to minimize costs and to err on the high side, if at all.

The royalty is fixed on the capacity of the plant used and in the case of an oil plant installed to treat the tailings of a concentrating mill of a capacity of 100 tons per day it might be that the method of concentration consisted of sizing and jigging and that the final tailings were only one-quarter the amount of the original ore milled. In this case a 25 ton per day oil plant would be installed and the royalty charged on that tonnage.

In order to form an idea as to what grade ore may be treated successfully by the process, below is given expenses, but the cost of mining is not included as it is impossible to give a fixed figure when it is so variable, according to each district, the nature of the mine, the width of the lode and many other conditions. But it may be safely said that concentration will invariably tend to reduce mining expenses, as the ore will then be mined as it comes, therefore at a cheaper rate, while in the case of direct smelting the poorer ore

either remains in the mine or is dumped on a heap and left to its fate :

Concentrating														1	re	ated	·
	by	(oil						•	1			1			\$	76
Milling																	90

Cost per ton of ore, of producing concen-

trates..... \$1 66

To this would have to be added freight of concencentrates to smelter, which is, in Rossland, about 75c. per ton; also smelting and realization charges, which can be taken at \$6 per ton.

Now if we take a case of a concentration of 10 to 1 the charges on these two items would be 1-10 of the above figures when working out the costs on the ton of ore treated, viz.:

Freight to smelter per ton of ore treated\$ 75 Smelting and realization charges, etc., per ton of

\$6 75

Adding this to the cost of producing concentrates we get the total expenses, mining excluded, (on the assumption of the 10 to 1 concentration) to be \$2.335 per ton of ore treated, so when treating a dump heap and taking a case of 85 per cent. recovery of contents by process any ore over \$2.75 can be treated at a profit.

In taking the smelting and realization charges together it must be remembered that the smelting charge is based on the amount of concentrates to be smelted while there are some of the items in the realization charge, such as interest on mining and concentration, freight on matte to refinery, and one or two other small items which will be just as much when concentrating as when smelting direct, but these will not cut much figure and can be overlooked.

It will be readily seen that the larger the ratio of concentration the more favorable it is for the process, not only on account of freight of concentrates but also as regards the loss of oil, as the concentrates contain in their final state a small percentage of oil.

The question of a mine concentrating a portion of its output to mix with the rest in the crude state in order to make a more nearly self-fluxing product is worth noticing, and it may be quite likely that this will be one of the many cases where the oil process will come in, and in this case it is possible briquetting would not be required. It seems a plausible idea to dump all the ore as it is mined over a series of grizzlies, shipping the coarse to the smelter and treating the fines by the oil process. In this way a preliminary crusher might not be required, the fines going direct to the pulverizer which would be relieved to some extent of its work.

In the case of ores that are not self-fluxing economic concentration should be especially adaptable, as it is only natural to expect that smelting a concentrate would be a less lengthy process than smelting the crude ore and in most cases the amounts of ingredients which have to be added to get a suitable flux will be greatly reduced, hence the smelting charges should be very much less. The loss of copper in the slag should not show anything like so high a percentage when dealing with a concentrated product as when smelting the ore direct.

In conclusion the writer intends that the figures supplied are only meant to convey a good idea to those