MEMORANDUM

ON

THE IRON INDUSTRY IN TASMANIA.

It is universally acknowledged that the production of iron and steel lies at the root of prosperity in a modern civilised State.

The World's production of pig iron is over 60,000,000 tons per annum, of which the Commonwealth's share does not appear to exceed 40,000 tons, despite important deposits of ore in various States.

Tasmania has raised to date upwards of 60,000 tons of iron ore, of which over 20,000 tons were smelted in the seventies at York Town from Anderson's Creek and near Beaconsfield, and the balance shipped to the mainland and disposed of as a metallurgical flux.

Anderson's Creek:

The ore smelted on the West Arm produced a tough, hard iron, which met with approval in the Victorian Market; but an objectionable element, chrome, began to appear in the product and the increasing proportions of this impurity gradually rendered the metal too hard and brittle, except for the very limited Australian market. This caused operations to be suspended in 1877, and they have not since been resumed. The pig iron contained chrome varying in amount between 2 and 10 per cent. Makers of chrome steel have not yet been able to deal with an ore containing so small an amount of chrome and in such irregular proportions, and yet sufficient to spoil the product for general purposes.

The time however has arrived for experimental work to be taken up on these deposits, so as to establish the probability of obtaining mixtures for the furnace which could suit special markets.

The quantities likely to be available in these Anderson's Creek deposits cannot be estimated with confidence, as very little work has been done on them, but from 2,000.000 to 3,000,000 tons of workable ore probably exist down to creek level.

The deposits have lain idle since 1877; the costliness of experimental work and the

uncertainty of the results having deterred capitalists from embarking in the venture. They are 5 or 6 miles from a river port.

Dial Range:

For 10 years prior to 1908 deposits of haematite ore were worked on the Penguin Creek and sent to New South Wales for flux, Over 40,000 tons were sold for this purpose. These consisted of very clean ore, containing from 66% to 68% metallic ore, only 2 or 3% silica, and practically free from phosphorous. Some difficulties connected with tramway rights to the shipping port, combined with a falling off in the demand, led to cessation of work.

Additional deposits of high quality haematite occur in the Dial Range in the Penguin-Hiana district, but have not been worked . The above are between 3 and 6 miles from the port of Penguin.

Blythe River:

A large outcrop of superior quality haematite exists on the Blythe River, 6 or 7 miles from its mouth, and altogether 12 miles from the port of Burnie.

The quality, ascertained by assay, is such as would be equivalent to about 63% metallic iron - with phosphorous 0.036 to 0.04%.

A precise calculation of quantities of ore existing is impossible, but judging from the outcrop and from a few tunnels which have been put into the ore body, the whole deposit, allowing one half for waste rock, down to creek level may be expected to contain 17,000,000 to 23,000,000 tons of ore, which should yield 10,000,000 to 12,000,000 tons of pig iron.

The property is held by the Blythe River Iron Mines Ltd., but attempts to procure capital for raising ore in Tasmania and for the erection of this smelting works in New South Wales have been fruitless so far, and the deposit is unworked.

Other Deposits:

Other iron ore deposits, which may be utilised in the future, but are situated so that present conditions of freight and working costs preclude profitable exploitation, are in the Balfour district, Silverstream district near Zeehan, and on the Heredith and Savage Rivers.

For the present, the Blythe River, Dial Range and Anderson's Creek deposits are those which will probably be the first utilised for initiating the iron industry in Tasmania. Tasmania thus possesses the raw materials for a large iron and steel industry. the Blythe deposit being estimated as sufficient for the production of half a million tons of pig iron annually for 20 years, or half that quantity for 40 years.

Limestone flux is obtainable close to the deposit on the banks of the Blythe River. For ordinary blast furnaces, coke (of which 18 cwt. per ton of iron would be required) would probably not be available either from the coal seams at Preolenna or the Mersey field owing to their high sulphur contents, and it would have to be imported from the mainland.

But if the electric furnace is used, either coke alone can be employed or coke and charcoal together, and in either case the sulphur content is reduced, as compared with smelting in the ordinary blast furnace. From the accounts published or electric smelting in Norway, it would appear that only one-third the quantity of coke (which is the chief source of sulphur) is used, as against ordinary blast furnace smelting, so that one-third as much sulphur is added; and as for the steel made, it is of better quality than that produced in ordinary steel furnaces.

The bearing of all this on Tasmania, is that if we made the coke here, the coal from Preolenna and the Mersey, although high in sulphur, might be used for the purpose.

Works Site:

If a Commonwealth iron smelting works is established, a plea may be put forward that some place on the sea board of Eastern Australia would be selected, near the coal supplies and convenient for inter-State distribution. But, electric-thermal smelting weighs down the scale in favour of Tasmanian works, and if the Tasmanian Government should decide to erect State works or even if the initiation of the industry be left to private enterprise, the site for works would most likely be on the shore of Bass Straits, where ore supplies from both the Blythe and the Dial Range could converge on furnaces, at a locality suitable for both properties. In much case perhaps even the Anderson's Creek ores could be supplied to

the Works, and have their chromium contents drowned out by admixture with preponderating proportions of pure hematite ores.

Electric Smelting:

With the impending supply of electrical energy derived from the water power to be obtained from the central tableland of Tasmania, the question of smelting the Blythe ores by the electro-thermal process will inevitably have to be considered.

This process is being introduced for ore smelting in Scandinavia and the United States and the future of iron ore reduction generally, it may be anticipated, lies in this direction.

At Tinfoe in Sweden, where electro-metallurgical smelting was adopted a couple of years ago, dividend paying results have been attained, and owing to the excellent quality of the pig iron produced, as much as 16 per ton has been realised for it. Technical advantages are possessed by the electric furnace over the ordinary blast furnace, and either coke or charcoal may be used as the reducing agent.

The latest information available is to the effect that there are now in operation in Sweden over 78 electric furnaces.

Water power and labour may cost less in Scandinavia than in Tasmania, but on the other hand these differences might possibly be compensated by freight and import charges.

Nationalisation of Iron Ore Smelting:

1. The starting of iron ore mines and smelting works generally involves a great outlay. Mr. Darby, the English expert who inspected the Blythe deposit for the owners, estimated an initial expenditure for the works, wharves, steamers, steel plant and mills of £1,000,000. That was 12 years ago. Capitalists have not come forward with the money. The deposit, like deposits in the other States, lies idle and unproductive. That is an argument in favour of the State controlling the industry.

2. Another reason is to be found in the fact that Australia imports large quantities of steel and iron for Government requirements, and if the initiation of the industry is left to private enterprise, subsidised as doubtless it will be by the Government, the latter will eventually be

paying, ironmasters not only the subsidy, but the enhanced prices which that subsidy will help them to earn on Government contracts. That is to say, instead of paying to the British manufacturer his profits, the Government will be paying them to the Australian manufacturer, plus any subsidy.

3. Another consideration is that with the proper technical management, but independent altogether of political control, the State with the necessary capital secured on more advantage - our terms then could be obtained by private owners ought to be able to produce quite as cheaply as or even more so than individual citizens. To secure success, however, the Manager must be of unimpeachable ability and absolutely untrammelled in his control. The management of iron works is a complicated business, requiring the highest technical skill and the greatest care if costly mistakes and losses are to be avoided. Given this, there is no reason why State control should not be as economical and profitable as private control.

4. If the State produces pig iron, then it may be expected Australian purchasers of it for manufacturing purposes may hope to obtain it from the Government at lower prices then it would be procurable from private smelters. This would have the effect of encouraging the manufacturing trade in iron ware. It would give iron workers the raw material at the lowest possible cost.

5. A benefit of distinct public importance accruing from the establishment of State iron works would be the permanent employment of a large number of men.

6. One feature involved in the proposition under review would have to be considered; namely, if any State undertook smelting within its own boundaries whether it could depend upon the other States being customers, or whether the latter would continue to purchase iron and steel from Britain and Foreign countries; because in the latter case the purely local demand would be quite inadequate to keep the smelters at work.

7. It would of course be highly desirable if any State established works adequate forthe requirements of Australia for an Interstate agreement to be entered into, creating a Government monopoly, so as to obviate competition on the part of private ironmasters.

8. I know that it is frequently urged that Government works cannot produce as economically as private ones, and this is ascribed to various causes; inadequate renumeration, absence of the stimulus of personal relations, Government stroke, political influence, unbusiness-like methods in vogue in Government Departments, restrictions of Departmental regulations, unwise selection of officers, and the like. Many of these items are solid reasons and where present would mean ruinous loss. It is well to know beforehand what to guard against. If these drawbacks are excluded, Government enterprise ought to be in a superior posistion.

A good deal of the objections to Government enterprise are probably due to political predilections; there is really no reason any Government ironworks cannot be as successful at least as Government arsenals.

Conclusion:

Tasmania has in the Blythe and Dial Range deposits iron ore resources which can be utilised whenever the industry is initiated.

The quality of the ore is highly suitable for producing the iron and steel required in the Commonwealth.

The quantity available down to water level as far as can be judged from the outcrops is sufficient for requirements in the Commonwealth at the present rate of consumption for say about 20 years more or less; and the period may be greatly extended by mining below river level.

The position of the deposits near the sea-board is favourable for transport of crude ore to smelters elsewhere in the Commonwealth, or for the erection of furnaces on the northern coast of Tasmania.

The notion being taken by the Tasmanian Government in acquiring the enterprise begun by the Hydro Electric Company for the distribution of electric current to different parts of the island, is favourable to the idea of employing the electro-thermal process for smelting the ores, and producing the excellent sulphur-free iron.

There is a possibility of the Anderson's Creek chromiferous deposits being used collaterally for blending with the chrome-free ironstone, but experimental work on this class of ore is needed.

If the State starts the industry it would

require to be safeguarded by an Interstate guarantee that the other States would not compete.

It might be possible for the Commonwealth to take the work in hand and for the States to transfer the land on which the ore deposits exist by perpetual or long leases with the necessary easements and leases for fluxes: or the Commonwealth might subsidies the State manufacture.

If the idea of working the Blythe deposit is entertained, a systematic scheme of prospecting must be devised so as to form a thoroughly reliable estimate of the quantities of workable ore, for it must be remembered that past calculations have been based only on the outcrop and a few exploratory tunnels put into the ore body.

Capital has now been solicited for this enterprise for the last fifteen years without success, and it would appear as if there is nothing to be done but for the Government either to heavily subsidise the venture or to assume control itself.

I take it that the Government would practically confine its operations to the production of steel rails, plates, and sheets, and keep a certain stock of pig iron on hand for supplying to private ironworkers, with whom there would be no interference?

(Signed) W. H. TWELVETREES,

GOVERNMENT GEOLOGIST.

LAUNCESTON,

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