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A SHORT REVIEW

OF

MINING OPERATIONS

IN THE

STATE OF SOUTH AUSTRALIA

DURING THE

YEAR 1903.

No^o 1

PUBLISHED, UNDER THE AUTHORITY OF THE

HONORABLE RICHARD BUTLER,

Minister of Mines,

BY

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PREFACE.

A fairly correct outline of the mining operations during 1903 is given in this short review. It has not been possible to amplify or go into details on this occasion; but in future publications, which it is proposed shall be issued half-yearly, all mining items of interest will be fully noted and commented upon. A revised edition of the "Records of Mines" is also in hand, and, generally, it is hoped that full and clear information concerning our mining prospects and workings shall, in addition to the reports and items given to the daily press, be periodically presented in pamphlet form to the public; and the cordial assistance and co-operation of those interested in South Australian mining is requested. Mr. L. C. E. Gee will act as editor.

The figures and estimates given are those of actual production during the year, and will probably differ in some instances from the export returns.

H. Y. L. BROWN,

Government Geologist.

February 26th, 1904.

MINING OPERATIONS DURING THE YEAR 1903.

The total value of South Australian mineral production during the year 1903 may be estimated at **£520,000.**

During the year the following rights and licenses were issued by the Department:—

Miners' rights	1,740
Mineral claims	344
Licences to search for oil, precious stones, mineral phosphates, &c., under the Mining Act Amendment Act	466
Existing gold leases	237, area 4,320 acres
“ mineral leases	418, “ 8,747 “
“ mineral claims	538, “ 18,830 “
“ miscellaneous leases	29, “ 6,486 “

COPPER.

The copper production from Yorke Peninsula mines has been:—

WALLAROO 103,656 tons, yielding 3,242 tons of copper = 3.13 per cent.

MOONTA 61,210 “ “ 1,785 “ “ = 2.92 “

One thousand eight hundred men are employed on these mines.

HAMLEY 4,631 tons crude ore, concentrated to 1,066 tons of 17 per cent.

Seventy-six men employed.

PARAMATTA AND YELTA MINES.

Worked by a French company.—During the year 20,646 tons of ore, of an average assay value of 4 per cent., has been raised at the Paramatta, and at the Yelta the company has erected a 70-ton blast matting furnace and other machinery. The mines have also been connected by railway. Locomotive and rolling-stock have been purchased, and are running satisfactorily.

BURRA.

The present company—the Burra Burra Copper Mining Company, No-liability—has purchased mineral rights from the South Australian Mining Association, and during 1903 a good deal of exploratory work has been done, several new prospecting shafts having been sunk, and levels driven on various portions of the company's property, with encouraging results. Fifty-two tons of 27 per cent. ore were obtained by tributaries working in the open cut.

KAPUNDA MINE.

Some tributers working above water level have raised during the year about £1,600 worth of copper ore.

The proprietors are negotiating for the reworking of the property below the present depth (480ft), and, acting on the advice of the Government Geologist, are stipulating that a working capital of not less than £30,000 shall be provided.

Returns have been received from about eighty copper shows in the North, but data is lacking from many promising and progressive workings. This will be remedied in the future.

The monthly average price of standard copper during 1903 has fluctuated between £53 13s. 8d. and £64 0s. 8d.; the average for the year is £58 3s. 2d., a considerable advance on that of 1902.

It is not intended to enter into details, but it may be mentioned that at the Lynda Mine, near Mount Lyndhurst, and formerly known as the Lorna Doone, energetic work has been in progress, and a satisfactory quantity of ore raised. At Mount Rose, about forty miles N.E. of Leigh Creek, developments have been so encouraging that the erection of a smelter has been undertaken (now completed). The old and well known Blinman Mine has been restarted by the Tasmanian Copper Co., Limited. The Prince Alfred, near Mattawarrangala, has been worked. Negotiations have been entered into for the development of the Mountain of Light, Cutaway, &c., near Leigh Creek, on a large scale. Concentrating plant has been in course of erection at the Mount Fitton South. Good ore has been obtained from the Yudnamutana properties, and generally here and there throughout the North country good percentages are reported from small holders.

The large low-grade deposits at Mount Gunson, north-west of Port Augusta, are still unworked, the difficulties of transit and concentration not yet being overcome.

No attention seems to have been paid to the copper deposits on Eyre Peninsula, near Tumby Bay, and in the North-East, beyond small operations at the Queen Bee, Mutooroo, and Trinity Mines, little seems to have been done.

The old mines to the south of Adelaide have been practically unworked, but there is a probability of the old Balhannah Mine being reopened.

MONTHLY AVERAGE PRICE OF STANDARD COPPER, GOOD MERCHANTABLE BARS,
DURING 1903.

	£	s.	d.
January.....	53	13	8
February.....	57	10	7
March.....	64	0	8
April.....	61	19	2
May.....	61	18	5
June.....	57	11	4
July.....	56	16	10
August.....	58	12	3
September.....	56	19	2
October.....	55	15	0
November.....	56	11	2
December.....	56	10	0

Average for the year, £58 3s. 2d.

GOLD.

The most important gold-mining district during the past year has been the North-West, which includes Tarcoola, as out of a total of 4,863ozs. produced from all the batteries working 4,629ozs. have come from this district, the contribution from the Tarcoola Blocks Mine being 4,205ozs., and in addition 246ozs. were obtained from their cyanide plant, making the total output from this mine for the period under review 4,451ozs. At the local Government battery and cyanide plant eleven parcels, totalling 293 tons of stone, were treated, for a return of 424ozs.

The gold from the Wilgena Enterprise Mine, near Eureka Dam, thirty miles E. by S. of Tarcoola, is of the highest grade in the district, being worth nearly £4 per ounce.

Good stone was raised at Glenloth, fifty miles south-east of Tarcoola, and, trial parcels at the Tarcoola Government battery having proved satisfactory, a battery is in course of erection near Glenloth by a private company.

The returns from this district generally cannot but be regarded as satisfactory, except as to the small quantity of stone furnished to the Government battery for treatment; and the confidence frequently expressed regarding the possibilities of Tarcoola and the North-West should, by the aid of systematic and careful prospecting, be amply justified.

In the Hills District—viz., Barossa, Mount Pleasant, Blumberg, Woodside, Echunga, etc.—little gold mining has been done during the past year. Nine parcels of stone were treated at the Government battery and cyanide plant, Mount Torrens, totalling 151 tons 10cwts., with a return of 51ozs. 2dwts. 2grs.

A diamond drill bore has been started by the Government on Crown lands in the hundred of Talunga, near Mount Pleasant, with the object of testing in depth ground held at one time by the Golden Slope and Duke of Cornwall companies, by whom shafts were sunk on auriferous lode formations to depths of 150ft. and 170ft. Drilling was commenced on December 24th.

Near Blumberg working for alluvial is still in progress to a limited extent, and also at Watts' Gully, near Gumeracha.

At Barossa, beyond a little work on the old Lady Alice property and the usual desultory prospecting on the old fields, nothing has been done.

From the Mount Torrens Gold Mine 52 tons of stone gave a return of 22ozs. 14dwts. 13grs.; and from a discovery near Lobethal 14 tons 13cwts. returned 6ozs. 11dwts. 23grs., and 5 tons 14cwts. gave 2ozs. 14dwts. 7grs.

Negotiations have been entered into for the restarting of the Woodside Mines (Bird in Hand, &c.) and also of the Balhannah. Very little has been done on the old Echunga fields, and from Mount Monster, on Blackfellow's Creek, a parcel of 22 tons gave 8ozs. 17dwts. 15grs.

The Grundy Gold Mines Company, working on Mr. Joseph Grundy's property, near Second Valley, has erected a ten-head battery at the mine. Two parcels of stone have so far been treated—one of 128 tons gave $4\frac{1}{2}$ dwts. per ton, and the other of 450 tons $2\frac{1}{2}$ dwts. per ton.

At the Petersburg Government battery and cyanide plant fifteen parcels were treated, totalling 205 tons, for 183ozs. 4dwts. 3grs., the best results being from Homeward Bound (Mannahill), 40 tons 1cwt. for 79ozs. 6dwts. 3grs., and Maynard and Smith (Outalpa Siding), 34 tons 11cwts. for 38ozs. 3dwts. 13grs.

Very little work has been done at the Mount Grainger field, and at Kirkeek's Treasure (Nillinghoo) Mr. J. Heithersay has been engaged in raising good stone and sinking a well for battery purposes.

Prospecting generally for gold has been in progress throughout the North-East and North, but no discoveries of importance were reported.

RETURNS FROM CRUSHING AND CYANIDING PLANTS FOR THE
YEAR ENDING DECEMBER 31st, 1903.

Name.	Ore Treated.			Total Gold Recovered.			Value of Gold.	
	Tons	cwts.	qrs.	Ozs.	dwt.	grs.	£	s. d.
TARCOOLA.								
<i>Government Battery and Cyanide Plant.</i>								
Dr. Rutledge	2	0	0	1	6	16	4	10 0
Wilgena Enterprise.....	117	8	0	90	7	9	358	3 0
Government Mine	44	6	0	155	19	4	518	0 10
Wilgena Associated.....	23	15	0	84	9	8	321	17 2
Curdnatta	47	4	0	43	6	20	154	14 11
T. P. Gourlay	10	0	0	12	14	21	49	12 0
F. Brophy	3	0	0	6	1	12	21	10 0
Tarcoola West	13	0	0	3	6	1	11	14 2
Royal George	13	0	0	3	1	3	11	16 9
Tarcoola Enterprise.....	12	7	0	16	11	14	57	2 11
F. Garwood	7	0	0	7	1	19	24	14 4
	293	0	0	424	6	7	1,533	16 1
Grand total since starting of Government battery to December 31st, 1903	1,138	7	2	1,437	14	8	5,067	19 7

<i>Tarcoola Blocks Company's Battery and Cyanide Plant.</i>								
Battery treatment alone	4,232	0	0	4,205	6	9	14,024	0 0*
Tailings cyanided (1,180 tons)	—	—	—	246	3	22		
	—	—	—	4,451	10	7	14,024	0 0*
Totals for 1903	4,525	0	0	4,875	16	14	15,557	16 1*
Grand total since starting of Tarcoola Blocks Company's battery, May 16th, 1901, to December 31st, 1903 (1,180 tons tailings cyanided)	8,377	0	0	15,673	0	0	47,673	0 0*
	—	—	—	246	0	0		
	—	—	—	15,919	0	0	47,673	0 0*

* Estimated value.

MOUNT TORRENS.

Government Battery and Cyanide Plant.

Government Mine	52	0	0	22	14	13	83	19 0
Oates & Best	10	9	0	1	10	8	4	18 2
Walters & Russack	7	0	0	4	18	19	18	19 2
Besling & Lloyd	7	1	0	1	17	8	5	14 4
I. H. Drew	9	13	0	0	11	22	1	19 7
Mount Monster	22	0	0	8	17	15	31	0 0
G. Clark	23	0	0	1	5	7	4	8 6
Dyer & Olsen	14	13	0	6	11	23	26	0 11
G. J. Sampson	5	14	0	2	14	7	10	7 3
	151	10	0	51	2	2	187	6 11
Grand total since starting of battery by Government to December 31st, 1903	7,603	11	1	4,395	1	15	16,517	10 9

RETURNS FROM CRUSHING AND CYANIDING PLANTS, &c.—*continued.*

Name.	Ore Treated.			Total Gold Recovered.			Value of Gold.		
	Tons	cwts.	qrs.	Ozs.	dwt.	grs.	£	s.	d.
PETERSBURG.									
<i>Government Battery and Cyanide Plant.</i>									
T. O'Bryan	19	17	0	5	18	6	21	1	1
R. F. Atkin	11	2	0	6	19	8	23	13	11
Homeward Bound (T. Bruce).....	40	1	0	79	6	4	306	5	4
R. Hooper.....	9	17	0	6	7	1	20	19	0
A. E. Threadgold	33	0	0	12	14	18	49	18	1
Waterhouse & Thiede.....	10	6	0	2	18	7	10	7	7
Mavnard & Smith	34	11	0	38	3	13	121	15	6
J. Watkins	4	3	0	2	9	15	8	15	1
H. B. Lawn	3	18	0	1	2	6	3	19	7
J. Gottlieb	5	11	3	14	5	6	57	1	4
J. Stott.....	10	12	0	0	11	16	1	15	3
E. Johnson	3	14	0	1	8	4	5	1	4
F. J. Spence	5	1	0	5	11	2	17	3	0
F. Meyer	4	15	0	4	4	13	16	6	0
	205	0	3	183	4	3	667	15	2
Grand total since starting of battery to December 31st, 1903	2,981	8	2	2,236	11	1	8,071	2	10

TOTAL BATTERY AND CYANIDE RETURNS FOR 1903.

Mount Torrens (Government battery)	151	10	0	51	2	2	187	6	11
Petersburg (Government battery)	205	0	3	183	4	3	667	15	2
Tarcoola (Government battery)	293	0	0	424	6	7	1,533	16	1
Tarcoola Blocks battery alone; also 1,180 tons of tailings cyanided for 246ozs. 3dwt. 22grs.	4,232	0	0	4,205	6	9	14,024	0	0
	4,881	10	3	4,863	18	21	16,412	18	2

THE MACDONNELL RANGES, NORTHERN TERRITORY.

The Macdonnell Ranges, although within the boundaries of the Northern Territory and coming under the operation of the Northern Territory Mining Act, yet geographically belong to South Australia proper. All business is done from Adelaide, and as a matter of convenience the administration of the Mining Act south of the 19th parallel of latitude is conducted by the Hon. Minister Controlling the Northern Territory, with the help of a resident warden at Arltunga.

The White Range, at Arltunga, has produced satisfactory returns during the year, and although the sanguine expectations raised regarding the Winnecke portion of the district have not so far been realised, yet some of the battery results of parcels from this place are very satisfactory; about 800ozs. of alluvial gold were found there during the year, and deep and systematic testing of the reef country remains to be done.

The returns from the Government battery and cyanide plant, Arltunga, for the year 1903 are given in full herewith and will be found interesting. W is marked after parcels coming from Winnecke and locality.

ARLTUNGA, MACDONNELL RANGES, NORTHERN TERRITORY OF SOUTH AUSTRALIA.

Government Battery and Cyanide Plant.

Name.	Ore Treated.			Total Gold Recovered.			Value of Gold.		
	Tons	cwts.	qrs.	Ozs.	dwt.	grs.	£	s.	d.
White Range West.....	55	4	0	68	9	22	261	15	2
White Range Extended.....	133	1	2	201	18	0	775	7	5
White Range Consols.....	6	8	0	5	5	21	18	17	11
White Range East.....	47	19	5	55	15	20	202	10	8
Great Western.....	147	4	0	139	7	21	566	0	11
White Range South.....	14	19	0	14	15	1	52	17	6
Wheat Fortune.....	74	14	0	55	16	19	213	15	6
Holly Oak.....	23	16	0	21	6	3	80	6	3
Claraville Mine.....	103	2	1	81	12	18	233	0	0
Melba (W).....	23	5	0	36	2	16	138	12	0
Black Eagle (W).....	11	8	0	29	4	13	117	15	9
“.....	23	0	0	58	7	11	239	14	7
Round Hill.....	33	17	1	21	15	22	86	5	4
Excelsior.....	97	18	0	207	0	20	804	5	9
Beehive North.....	11	10	0	9	4	16	37	3	4
White Range Mine (Luce's).....	379	19	0	462	6	14	1,756	5	10
Redemption.....	10	10	2	9	17	13	33	3	11
Beehive South.....	4	5	0	3	9	7	13	10	6
White Range North.....	14	12	0	18	11	8	68	16	5
Sunrise.....	12	0	0	8	15	6	31	15	5
Star Creek.....	20	10	0	13	5	5	53	3	11
Midnight.....	4	0	0	3	10	16	13	6	0
Duffer.....	7	5	0	6	2	0	22	12	11
Monarch.....	4	5	0	3	12	18	14	0	8
Black Prince (W).....	8	10	0	3	14	7	14	7	3
Reward (W).....	87	0	0	134	18	3	537	12	9
Junction (W).....	109	11	0	86	2	8	352	1	10
Coorong (W).....	50	18	0	48	9	11	194	2	10
Coronation (W).....	41	5	0	15	1	6	48	2	9
Big Gun (W).....	9	5	0	6	0	21	23	4	10
Golden Eagle (W).....	9	14	0	12	11	6	44	19	1
Oversight.....	18	16	0	18	11	5	61	1	4
Standard.....	8	0	0	2	15	3	10	3	11
British Enterprise.....	17	5	0	5	10	6	20	3	9
Reefers' Arltunga.....	13	2	6	7	12	5	30	5	0
Killarney (W).....	23	5	0	21	12	10	86	4	10
Georgina Gap (W).....	7	15	0	3	8	22	13	15	6
Hindmarsh, White Range.....	8	5	0	7	14	14	29	11	3
Round Hill.....	7	17	0	4	5	10	17	2	9
Rattler.....	18	0	0	3	10	23	12	7	9
Brown Hill.....	12	0	0	7	6	14	28	10	6
Macdonnell Ranges.....	100	8	0	29	17	18	94	17	10
Happy Chance.....	8	0	0	2	13	18	10	8	11
Joker.....	13	10	0	7	17	15	30	15	10
Royal Standard.....	12	9	0	15	2	12	60	8	9
All Alone.....	7	8	0	1	15	13	5	3	11
Hopeful.....	4	0	0	0	7	15	1	10	2
Winifred.....	8	19	0	1	9	0	5	2	11
Never Despair.....	4	9	0	5	4	0	15	0	3
Union.....	3	12	0	2	3	12	8	4	8
	1,877	16	3	2,019	13	2	7,562	9	11
Grand total since starting of battery to December 31st, 1903.....	5,539	3	1	6,265	9	6	23,318	1	0

PHOSPHATE.

In a country like South Australia, where the agricultural interests are of paramount importance, the discovery of large local deposits of phosphate rock, rich enough to be readily and economically converted into artificial manures, is a matter of the utmost importance to the State, not only in regard to the benefits conferred by it on our own agricultural districts, but also from the prospect of an export business to the adjoining States, which it affords.

During the year two fresh discoveries of workable deposits have been opened up, one in the hundred of Bright, eighteen miles S.S.E. of Kooringa railway station, and the other in the hundred of Belvidere, four miles S.E. of Kapunda railway station. Other discoveries, the extent of which are not yet determined, have been made in the Ashbourne district, south of Adelaide, and near Ardrossan, on Yorke Peninsula.

For 1903, from the deposits worked by the Clinton Phosphate Company, near Clinton, Yorke Peninsula, the original find of phosphate in South Australia, 1,052 tons of phosphate rock, containing from 62 per cent. to 65 per cent. of tricalcic phosphate, have been sold.

From the Fairview Phosphate Mine, hundred of Bright, second discovery, 100 tons of rock, containing 55 per cent. tricalcic, have been sold. Here a large amount of opening up and road-making work has been done, and a company named the Adelaide Artificial Manures Company formed. The old smelting works at Dry Creek have been acquired, and will be utilised for the preparation of super-phosphate. North of and adjoining the Fairview Company's Reward lease another deposit has been found, and named the "Lily Dora." Ten tons from this place, averaging 62 per cent. of tricalcic, have been forwarded to the Chemical Works. A further discovery has been made to the north again of this.

From the Kapunda find, hundred of Belvidere, third discovery, about 400 tons were sent away, carrying from 50 per cent. to 78 per cent. of tricalcic. The prospects here, also, are highly encouraging.

SILVER-LEAD.

Returns show that about 730 tons of silver-lead ore have been forwarded for treatment, the bulk, carrying about 40 per cent. lead, with silver and other minerals, coming from the Beltana Blocks Mine, in the Ediacara district, west of Beltana, and worked by a Melbourne proprietary.

COBALT.

COOKE'S COBALT PROPRIETARY

(Formerly South Australian Cobalt and Nickel Company).

Mr. J. H. Cooke has taken over this find from the original company.

A ton of dressed ore gave, on bulk assay at Port Pirie, 14 per cent. of cobalt. Ore is now being raised and dressed, and a parcel of 10 tons is to be forwarded to Germany as a trial shipment.

RUTILE.

The rutile mine on section No. 8, hundred of Talunga, is being worked by Mr. W. H. Mead, who has obtained during the year about 1 ton of rutile from the property.

The price quoted locally for the mineral is 6d. per pound.

COAL.

LEIGH CREEK MINE.

Nothing has been done here beyond keeping the mine clear of water and the machinery in order.

A suggestion has been made that from this coal "producer-gas" for smelting purposes could be generated. It is stated that in America, from 8cwts. of similar coal,

sufficient gas is derived to smelt 1 ton of ore; and in this connection the following paragraph from the Government Geologist's report of 1891 will be of interest:—

“A high percentage of carbonaceous and bituminous matter has been noticed in the shale of No. 2 bore for a considerable depth, some of the core containing as much as 30 and 40 per cent. An analysis by Mr. Cosmo Newbery, C.M.G., shows that free petroleum also is present in it. This points to the fact of the shale having absorbed petroleum from some source or other, and indicates the probability of petroleum being met with in larger quantities down below. Whether it will pay to extract from the shale, oil, tar, and other products developed by heat during the process of distillation is a question which will have to be settled by future experiment under the conditions of cheap fuel and an economical process.”

The Government Assayer (Mr. G. Goyder, jun.) reported, October 30th, 1890, “that the shale from 965ft., when distilled, gave 3,000ft. of unpurified gas per ton, a little tarry matter and water, and a trace of petroleum.”

No. 2 bore proves these beds of shale to extend from the surface to 1,900ft.

SALT.

Despite the drawback of a wet season excellent progress has been made in the development of the salt industry, the production for 1903 reaching about 40,000 tons. This came from Yorke Peninsula; the Kangaroo Island deposits were flooded, and therefore could not be worked.

GRAPHITE.

New finds of rock containing graphite were made near Clève, west of Franklin Harbor, and also in the hundred of Sleaford, near Port Lincoln. These require further prospecting.

IRONSTONE AND LIMESTONE FLUX.

The ironstone used for flux at the Broken Hill Proprietary Company's works at Port Pirie is procured from the company's leases at the Iron Knob, forty miles west of Port Augusta. The quantities raised for this purpose so far are—

1901	9,101 tons.
1902	84,932 “
1903	52,900 “

During the latter year 24,890 tons of limestone flux also were used, obtained principally from Wardang Island, Port Lincoln, and other coastal deposits.

TOURMALINE.

A discovery of tourmaline has been made in the hundred of Dudley, on the eastern end of Kangaroo Island. The stones are remarkable for their size and beauty, and after passing through the lapidary's hands form very handsome gems. The prevailing color is green in various shades, although some of the crystals have centres of a delicate pink color. Sales made show that the stones have commercial value in the rough, and the discovery bids fair to be of importance.

MISCELLANEOUS.

Shipments of gypsum and whiting have been made from the southern portion of Yorke Peninsula, the most extensive deposits being at Marion Bay, and worked by Mr. Hasell, of Melbourne.

Deposits are also being tested south of Port Augusta.

Kaolin of a nature fine enough to be classed as china clay has been found, and is being worked, near Adelaide.

The various manganese mines have practically stopped working, owing to the dullness of the market.

Bulk samples of zinciferous ore from Billy Springs, near Mount Fitton, have been forwarded to Germany for testing, and satisfactory results returned.