

FEDERATED MALAY STATES.

REPORT ON THE ADMINISTRATION OF THE MINES DEPARTMENT AND ON THE MINING INDUSTRIES FOR THE YEAR 1920.

PART I.

ADMINISTRATION.

EXPENDITURE.

1. The following table shows the expenditure as estimated and as incurred :

Heading	Estimated	Supplement	Total	Expenditure	Saving
	\$	\$	\$	\$	\$
Federal	52,891	27,105	79,996	64,278	15,718
Perak	133,209	45,633	178,842	168,534	10,308
Selangor	63,862	29,672	83,534	78,138	5,396
Negri Sembilan	18,089	8,469	26,558	22,815	3,743
Pahang	26,368	1,456	27,824	24,088	3,736
Total ...	294,419	112,335	396,754	357,853	38,901

REVENUE.

2. Revenue was collected by the Mines Department as follows :

Federal	\$ 1,149
Perak	35,677
Selangor	25,447
Negri Sembilan	3,162
Pahang	—
Total ...	\$65,435

as against \$62,564 in 1919.

Classification was :

FINES, FORFEITURES AND FEES OF COURT—

Wardens' Courts	\$ 9,060
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FEES OF OFFICE—

Tin-buyers' and Smelters' Licences... ..	30,775
Dangerous Trades Licences	100
Machinery Enactment	24,041
Electricity	849
Non-Ferrous Metal Industry Enactment	300

REIMBURSEMENTS—

Sale of Padlocks	175
Hire of Boring Tools... ..	135

Total ...	\$65,435
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REVENUE FROM ALL SOURCES RELATING TO MINING.

3. The revenue from all sources relating to mining for the years 1918, 1919 and 1920 was:

Heading	1918	1919	1920
	\$	\$	\$
Federal	777	3,615	1,149
Perak	8,694,469	6,342,397	8,174,295
Selangor	4,243,260	3,326,021	3,737,934
Negri Sembilan	268,367	185,231	113,720
Pahang	762,332	631,921	728,369
Total ...	13,969,205	10,489,185	12,755,467

Classification for the years mentioned is as follows:

Heading	1918	1919	1920	Increase + or Decrease — on 1919
	\$	\$	\$	\$
Mines offices	70,223	62,564	65,436	+ 2,872
Premia on leases	412,897	150,116	175,746	+ 25,630
Rent on leases	282,060	276,014	239,184	— 36,830
Exemption from cancellation	3,756	...	64	+ 64
Individual licences	6,170	4,483	3,475	— 1,008
Prospecting licences	9,450	5,125	5,725	+ 600
Export duty on tin	13,142,054	9,944,177	12,203,531	+ 2,259,354
" " gold	70	49	66	+ 17
Commutated royalty on gold	45	77	...	— 77
Royalty on coal	42,186	46,320	61,979	+ 15,659
Ore-buyers and gold-smiths' licences	294	180	261	+ 81
Export duty on copper ... ..	...	80	...	— 80
Total ...	13,969,205	10,489,185	12,755,467	+ 2,266,282

The figures under export duty on tin do not include the war tax which was collected in 1920 but credited to 1919.

The increase in revenue from all sources relating to mining is \$2,266,282, mainly due to the higher tin prices that ruled in the year under review.

WARDENS' COURTS.

4. Two hundred and thirty cases were heard in the Wardens' Courts as against 206 in 1919, there was one appeal to the Supreme Court and the decision of the Warden was upheld. In addition, 113 cases were brought before Magistrates' Courts and of the persons concerned 132 were convicted.

LEGISLATION.

5. An amendment to the Mineral Ores Enactment was passed as Enactment, No. 6 of 1920, in order to remove any ground for a contention that a person licensed under "The Non-Ferrous Metal Industry Enactment, 1918," is at liberty to deal in ores without being licensed under any of the principal Mineral Ores Enactments.

(ii) The Waters Enactment, No. 9 of 1920, came into force on the 1st October and affects the mining industry inasmuch as licences to use water for developing electrical power in connection with mining operations will be issued under it instead of under section 64 of the Mining Enactment.

(iii) An amendment to "The Electricity Enactment, 1913," was passed as Enactment, No. 14 of 1920, in order to facilitate the acquisition of way leaves over alienated land by persons who have obtained a licence to operate an installation.

REBATES.

6. The remission of duty under existing rebates amounted to \$3,900.

GENERAL.

7. (i) Mr. W. Eyre Kenny, the Senior Warden of Mines, was transferred to the Public Works Department on 23rd April, when Mr. G. D. Lucas, Warden of Mines, Perak, acted as Senior Warden and was confirmed in the appointment on 23rd July. Mr. Lucas went on leave on 18th October when Mr. A. R. Mynott was appointed to act as Senior Warden and continued acting at the end of the year.

(ii) The Senior Warden, one Warden, six Assistant Wardens and two Inspectors of Mines were away on leave during parts of the year.

(iii) Major H. R. Kerr took up duty as Inspector of Mines on 17th December being posted in Selangor, and Mr. J. S. Whitworth reported himself for duty on 22nd December and was stationed in Perak. Major L. A. E. Swinney, Inspector of Mines, Gopeng, resigned on the 31st December.

(iv) Captain G. H. N. Reay was transferred from the Post and Telegraph Department to the Mines Department on 1st November and was appointed an Inspector under the Electricity Enactment.

(v) Messrs. J. H. Inglis, A. M. Hunter and J. H. A. Trowell were appointed Inspectors of Machinery on 6th September, 1st October and 23rd November, respectively.

(vi) Messrs. H. Cropley, W. P. de Basagoiti and D. F. MacIntyre, Inspectors of Machinery, retired on pension during the year.

PART II.

TIN MINING.

EXPORTS.

8. (i) The total export as recorded by the Customs, metallic tin plus 72 per cent. of ore, amounted to 586,905 pikuls as compared with 620,518 pikuls in 1919, showing a decrease of 33,613 pikuls in the year under review. Of the total quantity for the year 1920, 67,884 pikuls were exported as pig tin and 519,021 pikuls as tin in ore, in comparison with 86,299 pikuls and 534,219 pikuls in 1919, respectively, showing a decrease in pig tin of 18,414 pikuls and a decrease of tin in ore of 15,199 pikuls.

(ii) The export as recorded by the Customs from each State, metallic tin plus 72 per cent. of ore and its approximate value, at the average local prices for 1919 and 1920, viz., \$120.68 per pikul and \$150.67 per pikul, respectively, was as follows (as before it should be noted that these average prices are not true volumetric means):

State	1919	1919 Value	1920	1920 Value	Pikuls	Value
					Increase + decrease -	Increase + Decrease -
	Pikuls	\$	Pikuls	\$		\$
Perak	368,078	44,443,659	368,097	55,210,934	+ 19	+10,767,275
Selangor	190,160	22,962,167	162,392	24,626,737	- 27,768	+ 1,664,570
Negri Sembilan	9,135	1,070,078	3,398	552,189	- 5,737	- 517,889
Pahang	53,145	6,408,160	53,018	8,039,320	- 127	+ 1,631,160
Total ...	620,518	74,884,064	586,905	88,429,180	- 33,613	+13,545,116

Reduced to tons (2,240 lbs.) the export for 1919 was 36,935 tons and for 1920 was 34,935 tons showing a drop in the latter year of 2,000 tons.

(iii) The figures in the foregoing table show the actual exports—*ex* Federated Malay States—from each State, the following table is corrected for inter-State trade and shows the export of production in each State for the last three years:

State	1918	1919	1920	1920 on 1919
	Pikuls	Pikuls	Pikuls	Pikuls
Perak	387,750	371,722	371,848	+ 126
Selangor	170,359	178,608	148,715	-29,893
Negri Sembilan	16,246	14,761	11,710	- 3,051
Pahang	53,460	55,427	54,632	- 795
Total ...	627,815	620,518	586,905	-33,613

Perak shows an increase of .034 per cent., Selangor a decrease of 16.73 per cent., Negri Sembilan a decrease of 20.67 per cent., and Pahang a decrease of 1.43 per cent., the decrease on the total production being 5.42 per cent. as compared with 1919.

LOCAL MARKET.

9. (i) At the opening of the year the price of tin was \$167.50 per pikul with the market rising. The rise continued rapidly until at the end of February, the unprecedented high price of \$212 was reached. Thereafter a reaction set in and the price began to decline. With the exception of a slight rally about the middle of the year, the fall in the price continued until at the beginning of December, it stood at \$90 per pikul.

The position at that period became so critical that to save a large number of mines from closing down and the consequent dislocation of labour that would ensue, the Government decided to purchase. From the 14th December, the Government were purchasing at \$110 per pikul which price was raised on the 21st December to \$115 and that was the position at the close of the year.

(ii) The highest price reached was \$46 per pikul above that attained in 1919 and the lowest price touched was \$10 below the similar figure for the previous year, the fluctuation in the year under review was \$122 as compared with \$66 in 1919; the following table gives figures for the last seven years in dollars per pikul:

Heading	1914		1915		1916		1917		1918		1919		1920	
	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.	\$	c.
Highest ...	95	25	86	50	97	50	140	00	182	50	166	00	212	00
Average ...	73	44	78	17	87	53	108	74	150	62	120	68	150	67
Lowest ...	57	00	69	50	77	25	85	00	117	50	100	00	90	00
Fluctuation ...	38	25	17	00	20	25	55	00	65	00	66	00	122	00

The highest price was reached in 1920 on 28th February, the lowest on 2nd December; in 1919 these dates were 31st December and the 18th February; and in 1918 the 3rd August and the 4th January.

(iii) The following figures (\$ per pikul) in connection with the local market, which must be treated as approximations, are of interest:

Year	Ore price	Received by miners	Difference	Duty	Balance
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1914 ...	51 41	42 22	9 19	6 18	3 01
1915 ...	54 72	45 65	9 07	6 77	2 30
1916 ...	61 27	51 35	9 92	7 82	2 10
1917 ...	78 29	61 30	16 99	* 12 56	4 43
1918 ...	108 45	85 32	23 13	* 18 45	4 68
1919 ...	86 89	71 40	15 49	12 00	3 49
1920 ...	108 48	88 00	20 48	15 60	4 88

* Includes war tax.

the figures under "Balance" represent approximately the average deductions made on account of smelting and local costs.

(iv) The following table shows the average London three months quotation in comparison with the average Straits price, in sterling, per ton (2,240 lbs.) for the last seven years:

Year	London			Straits			Difference	Remarks
	£	s.	d.	£	s.	d.		
1914 ...	150	11	0	143	8	10	7 2 2	War declared 4th August
1915 ...	163	19	6	153	4	3	10 15 3	
1916 ...	182	3	5	171	11	2	10 12 3	
1917 ...	237	11	6	213	2	7	24 8 11	
1918 ...	327	12	10	295	4	4	32 8 6	Control April to December
1919 ...	254	14	6	238	9	10	16 4 8	
1920 ...	297	5	11	295	6	3	1 19 8	

LONDON MARKET.

10. (i) The highest three months price reached was £423.10.0 per ton and the lowest £200.0.0 (according to the *Metal Bulletin*), from March onwards a rapid decline in price was experienced, the market eventually collapsing towards the end of the year; the average price for the year being £297.5.11.

(ii) Abnormal and unprecedented conditions on the Tin Market marked the year under review, the main features of which were the extraordinary rise in the price of tin at the beginning of the year culminating in the record price, then a rapid reaction and decline in prices with a slump at the end of the year.

(iii) The extraordinary rapid rise in the price at the beginning of the year was due chiefly to the operations of speculators and the reckless buying was no doubt due to the erroneous deductions that a falling off in production was anticipated with consequent reduction of supplies, that the Central European Powers would be in a position to assimilate amounts approximating their pre-war requirements and that consumption in the United Kingdom and America would increase.

(iv) The slump at the end of the year was due to a variety of causes, chief amongst which was the reduced consumptive demand, the unexpected unloading of stocks of Dutch tin on the London Market, liquidation of large stocks of Chinese tin which had been held up in Chinese ports owing to the high price of silver at the beginning of 1920, the disorganization of the Welsh tinplate industry towards the end of the year, the instability of exchange and the general labour unrest.

(v) The outlook at the end of the year was not encouraging and general conditions were bad, and no improvement in the market could be anticipated whilst the depressing influences mentioned above were in evidence.

PART III.

OTHER MINING.

TUNGSTEN ORES.

11. (i) The total export of tungsten ores of Federated Malay States origin as shown by the Customs Returns was 3,924 pikuls (233.6 tons) as compared with 7,323 pikuls (435.9 tons) in 1919.

(ii) The export of wolfram of Federated Malay States origin as tabulated from Customs Returns was as follows for the past three years in pikuls :

State	1918	1919	1920
	Pikuls	Pikuls	Pikuls
Perak	334	107	...
Selangor	3,700	3,367	1,905
Negri Sembilan	63	12	...
Pahang ... ..	...	...	...
Total ...	4,097	3,486	1,905

(iii) The export of scheelite of Federated Malay States origin as shown by Customs Returns was as follows for the last three years :

State	1918	1919	1920
	Pikuls	Pikuls	Pikuls
Perak ... ..	...	6	...
Selangor	1,874	3,831	2,019
Negri Sembilan ... ..	...	...	...
Pahang ... ..	...	...	...
Total ...	1,874	3,837	2,019

(iv) The production of tungsten ores in each State, after correcting export figures for inter-State trade, was, as nearly as can be ascertained, as follows :

State	1918	1919	1920
	Pikuls	Pikuls	Pikuls
Perak	2,515	4,074	3,650
Selangor	3,004	2,186	1,641
Negri Sembilan	435	1,063	1,054
Pahang	17	...	...
Total ...	5,971	7,323	6,345

The year under review shows a decrease of 3,399 pikuls (202.32 tons); 2,421 pikuls of tungsten ore remain in the country awaiting shipment. Export duty on tungsten ores was not charged.

(v) Tungsten bearing ore from other countries, sent to the Federated Malay States for treatment, resulted in a re-export of 916 pikuls of clean ore as compared with 1,667 pikuls in 1919.

GOLD.

12. (i) The quantity of gold placed upon the market was as follows for the years noted, in ounces:

State	1918	1919	1920
	Ozs.	Ozs.	Ozs.
Perak	1,237	1,091	1,338
Negri Sembilan	38	33	9
Pahang	17,034	15,278	11,476
Total ...	18,309	16,402	12,823

for the year under review the Raub Mine produced 12,023 ounces.

(ii) The approximate value of the 1920 production based on market rates was about \$422,522 (£51,627) as compared with \$626,600 (£73,100) in 1919.

COAL.

13. (i) The output from the Malayan Collieries, Limited (Selangor), for the last four years was as follows:

1917	155,279 tons
1918	168,740 ..
1919	191,293 ..
1920	247,917 ..

an increase of 56,624 tons on the preceding year, making a total of 876,599 tons since production commenced.

(ii) The output for the year under review was distributed as follows:

Federated Malay States Railways	96,407 tons
Mines	115,041 ..
Other Federated Malay States Consumers	9,626 ..
Exported	26,843 ..
Total ...	247,917 ..

(iii) The power of the plant employed was 1,937 horse-power and the labour force averaged 2,100 men.

(iv) In the north mine, main seam, no advance had been made in the main incline up to June, and by the end of the year it had been driven a total length of 1,705 feet; in the south mine the main incline was advanced to 2,037 feet.

(v) In addition to Nos. 1 and 2 great seam open-casts No. 4 was opened up and brought to the producing stage. On the main seam, in addition to No. 5 open-cast, No. 6 is producing.

(vi) The total amount of arching completed at the end of the year was 2,533 feet.

(vii) Three-quarters of a mile of sidings were built during the year, making a total length of surface railway track of three and three-quarter miles.

(viii) Hydraulic sand stowage was successfully carried out during the year.

(ix) The electric coal cutter started work in January, two 120 horse-power electrically driven turbine pumps have been installed for carrying off the water from the sand stowage scheme and a main boiler stack and induced draft fan have arrived and will soon be erected.

QUARRIES.

14. The tonnage of stone quarried by the Public Works Department, mainly for use on roads, was as follows:

State	1918	1919	1920
	Tons	Tons	Tons
Perak	125,924	114,574	105,976
Selangor	141,276	143,633	158,294
Negri Sembilan	71,792	83,478	38,119
Pahang	34,322	37,079	40,167
Total ...	373,314	378,764	342,556

as in former years stone was also quarried for railway purposes and for cement manufacture.

CEMENT MANUFACTURE.

15. The Batu Caves Cement Works (Selangor) operations were as follows, in tons, for the last three years:

Year	Limestone	Cement manufactured
1918	7,656	5,384
1919	6,786	4,395
1920	7,372	5,451

all of which for the year under review was used locally and shows an increase of production of 1,056 tons as compared with 1919.

PART IV.

LABOUR, MACHINERY AND TIN MINING LANDS.

LABOUR.

16. (i) The labour force employed on mining at the end of year under review (inclusive of individual licences but exclusive of holders of dulang passes) was 89,557, all of whom, with the exception of 610 on gold and 3,000 on coal, were employed on tin and tungsten mining; these figures do not include labour employed on extraction and transport of firewood.

(ii) The labour force in each State in December was as follows for the last three years:

State	1918	1919	1920
Perak	78,621	64,760	50,622
Selangor	50,009	37,352	29,129
Negri Sembilan	5,842	2,208	2,240
Pahang	10,149	8,787	7,566
Total ...	144,621	113,107	89,557

showing a drop of 23,550 men as compared with 1919, equivalent to 20.8 per cent.

DULANG PASS HOLDERS.

(iii) Dulang passes were issued in each State for the last three years as shown in the following table:

State	1918	1919	1920
Perak	8,957	9,378	7,455
Selangor	5,134	4,608	4,023
Negri Sembilan	764	704	527
Pahang	919	863	862
Total ...	15,774	15,553	12,867

showing a decrease of 2,686 as compared with 1919. The nationalities were for the year under review: Malays, 867; Chinese, 11,624; Indians, 334; and Sakais, 42. Dulang pass holders operating in the three Western States earned on an average \$251 per head, an increase of \$54 per head as compared with 1919.

METHOD OF EMPLOYMENT OF LABOUR.

(iv) The method of employment for 1920 and the preceding year was as follows :

State	1919				1920			
	Open-cast and surface	Under-ground	Hydraulic and lampan	Bucket dredging	Open-cast and surface	Under-ground	Hydraulic and lampan	Bucket dredging
Perak ...	40,783	4,131	17,414	2,432	19,232	1,903	27,360	2,127
Selangor ...	29,230	2,105	5,873	144	20,729	3,837	4,103	460
Negri Sembilan ...	1,101	479	628	...	1,183	233	719	105
Pahang ...	1,518	3,245	3,866	158	710	3,749	2,957	152
Total ...	72,632	9,960	27,781	2,734	41,854	9,720	35,139	2,844

the main decrease being under open-cast and surface workings.

CLASSIFICATION OF LABOUR.

(v) The following table shows the classification of labour :

State	Contract	Wages	Tribute	Individual licensees
Perak ...	9,032	27,299	14,291	...
Selangor ...	14,133	8,171	6,717	108
Negri Sembilan ...	334	345	1,194	367
Pahang ...	2,597	2,093	2,739	137
Total, 1920 ...	26,096	37,908	24,941	612
" 1919 ...	30,505	40,188	41,857	557
" 1918 ...	34,714	45,840	63,224	843

the decrease in tribute labour was 40 per cent. as compared with 1919.

NATIONALITY OF LABOUR.

(vi) The nationality of those employed was under :

State	European	Chinese	Indian	Malays	Others
Perak ...	166	46,069	3,245	1,113	29
Selangor ...	39	27,968	948	174	...
Negri Sembilan ...	7	2,197	11	25	...
Pahang ...	62	6,577	285	592	50
Total, 1920 ...	274	82,811	4,489	1,907	79
" 1919 ...	225	105,912	5,013	1,899	58
" 1918 ...	189	135,900	5,966	2,484	82

the decrease in Chinese amounts to 22 per cent. as compared with 1919.

CHINESE IMMIGRATION AND EMIGRATION.

17. (i) The following return shows the number of Chinese adult male immigrants and emigrants entering and leaving the States *via* ports for the years 1918, 1919 and 1920 :

State	1918		1919		1920	
	Immigrants	Emigrants	Immigrants	Emigrants	Immigrants	Emigrants
Perak ...	5,944	7,262	6,324	7,015	4,770	4,593
Selangor ...	13,107	11,975	11,731	12,294	8,931	11,374
Negri Sembilan ...	2,088	1,358	1,693	1,125	860	870
Pahang ...	1,411	1,564	1,548	1,481	1,778	1,754
Total ...	22,550	22,159	21,296	21,915	16,339	18,591

showing an excess of emigrants in 1920 of 2,252 over immigrants, the number of the latter being 4,957 less than in 1919.

MACHINERY AND HYDRAULIC APPLIANCES ON MINES.

18. The total effective horse-power of steam, gas, oil, hydraulic and electrical plant employed on mines in the year under review is estimated at 64,360 (including Raub Mine and the Colliery) and is classed as follows:

State	Steam	Steam-electric	Hydraulic	Hydro-electric	Suction gas	Oil engines	Oil-electric	Total, 1920	Total, 1919
Perak ...	17,299	1,161	15,726	2,589	765	3,450	...	40,990	37,889
Selangor ...	7,735	2,491	1,330	26	909	54	600	13,145	11,685
Negri Sembilan ...	813	...	314	...	240	5	...	1,372	1,059
Pahang ...	4,042	...	1,489	2,022	79	221	1,000	8,853	6,710
Total, 1920...	29,889	3,652	18,859	4,637	1,993	3,730	1,600	64,360	57,343
.. 1919...	25,826	2,771	17,497	4,686	1,811	2,552	2,200	57,343	
.. 1918...	27,506	2,427	18,334	4,512	2,219	3,171	2,153	60,040	

an increase of 7,017 horse-power as compared with the previous year.

TIN MINING LANDS.

19. The total acreage alienated for tin mining, exclusive of unsurveyed concessions, was as follows for the years 1918, 1919 and 1920:

State	1918	1919	1920
Perak ...	130,651	132,714	130,259
Selangor ...	65,313	65,527	67,434
Negri Sembilan ...	19,524	17,733	15,619
Pahang ...	23,023	26,988	21,924
Total ...	238,511	242,962	235,236

a decrease of 7,726 acres as compared with 1919.

PART V.

GENERAL REMARKS ON MINING OPERATIONS.

WEATHER AND ITS EFFECT ON MINING.

20. In Perak the average rainfall for the year was less than in 1919; June, July and August were dry months and there was shortage of water in several districts. The latter part of the year was wet and floods occurred in Kinta but not to the same extent as in 1919. Weather conditions in the other States were more or less normal with the exception of a flood in Kuala Lumpur in November.

TIMBER AND FUEL SUPPLY.

21. (i) The consumption on mines was recorded as follows in tons but the figures cannot be regarded as reliable:

State	Coal	Oil	Wood
Perak ...	32,691	946	487,362
Selangor ...	69,464	630	197,088
Negri Sembilan ...	—	—	34,903
Pahang ...	115	1,126	50,337
Total, 1920 ...	102,270	2,702	769,790
.. 1919 ...	88,839	3,397	798,363
.. 1918 ...	66,290	3,488	741,357

an increase of 13,431 tons of coal, a decrease of 695 tons of oil and a decrease of 28,573 tons of wood as compared with 1919.

(ii) Difficulty was experienced at the beginning of the year in obtaining sufficient supplies of firewood due to shortage of rolling stock and difficulties of distribution, but in Kinta a Committee was formed to control the distribution and the result has given general satisfaction.

PROSPECTING.

22. (i) Areas covered by prospecting licences and areas selected were as follows :

State	No. of licences	Area under licences	Area selected
Perak	38	19,440	2,220
Selangor	67	18,600	2,441
Negri Sembilan	19	22,017	1,295
Pahang	22	36,287	50
Total, 1920	146	96,344	6,006
„ 1919	135	74,449	3,793
„ 1918	298	73,251	3,811

a considerable increase in the area prospected and area selected.

(ii) There was great activity in prospecting for suitable bucket dredging areas.

MINING LANDS.

23. (i) According to the Land Office returns the following acreages of mining land were converted to agriculture :

	Acres
Perak	14
Selangor	210
Negri Sembilan	22
Pahang	—
Total, 1920	246
„ 1919	365
„ 1918	72

showing a decrease for the year under review of 119 acres as compared with 1919.

(ii) Acreage of agricultural land converted to mining, similarly ascertained, was as follows :

	Acres
Perak	48
Selangor	484
Negri Sembilan	1
Pahang	—
Total, 1920	533
„ 1919	146
„ 1918	381

showing an increase of 387 acres compared with 1919.

ACCIDENTS.

24. (i) The total number of deaths due to accidents was as follows for the years 1918, 1919 and 1920 :

State	1918	1919	1920
Perak	67	56	46
Selangor	36	34	40
Negri Sembilan	9	1	6
Pahang	31	19	21
Total	143	110	113

the gross death-rate for the year under review on a labour force of 89,557 works out as 1.261 per thousand as against 0.973 in 1919; the true death-rate for 1920 would be slightly lower, owing to labour fluctuations.

(ii) The analysis of fatal accidents is :

MISCELLANEOUS.

Nature	Perak	Selangor	Negri Sembilan	Pahang
Electrical	—	—	—	—
Auxiliary operations ...	—	—	1	2
Surface	—	—	—	1
Shallow workings ...	2	9	4	10
Cliff workings	1	—	—	—
Bucket dredges	3	—	—	—
Total	6	9	5	13

DEEP OPEN-CASTS.

Nature	Perak	Selangor	Negri Sembilan	Pahang
Falls of earth or rock	21	23	—	—
Rushes of water or mud	2	—	—	—
Other causes	15	6	—	—
Total	38	29	—	—

UNDERGROUND.

Nature	Perak	Selangor	Negri Sembilan	Pahang
Falls of earth, rock or timber	—	1	—	5
Rushes of water or mud	—	—	—	—
Foul air or gas explosions	—	—	—	1
Falling down shafts	—	1	1	—
Blasting	1	—	—	2
Other causes	1	—	—	—
Total	2	2	1	8

the death-rate on underground workings is estimated at 1.337 per thousand as compared with 1.501 in 1919.

LABOUR SUPPLY.

25. Labour costs at the beginning of the year were still high but were considerably reduced towards the end of the year when the price of tin fell and cost of production had to be cut down. The labour force is the lowest recorded for 21 years. There was a shortage in the first half of the year but labour was plentiful towards the end of the year.

PLANT.

26. Plant was not so difficult to get but was still enhanced in price. The use of gravel pumps is on the increase and very few open-casts in Perak are now worked by old fashioned methods.

BUCKET DREDGING.

27. At the end of the year there were twenty bucket dredges operating of which eighteen were in Perak. Bucket dredges proposed and under construction amounted to thirty-two.

TAILINGS.

28. (i) In Perak, the control of tailings received the strict attention of the department. A new dam was built across the Sanglop Valley and will greatly improve existing conditions. A scheme of control for the retention of tailings from the mines at Intan was under consideration which should prove effective for several years.

(ii) In Selangor, the position at Kuala Kubu and Serendah was not satisfactory. It has been decided to divert the railway and move the town at Kuala Kubu. The question of Serendah town was under consideration by a committee.

(iii) An extensive survey is required to deal with the tailings question at Bentong and this has been provided for in the 1921 Estimates.

PART VI.

MINERAL ORES, NON-FERROUS METAL INDUSTRY AND
DANGEROUS TRADES ENACTMENTS.

MINERAL ORES ENACTMENT.

LICENCES.

29. (i) The number of ore-buyers' licences issued in 1918, 1919 and 1920 was as follows:

State	1918	1919	1920
Perak	178	182	184
Selangor	103	107	106
Negri Sembilan	23	17	16
Total	304	306	306

being the same number as issued in the previous year.

SUB-LICENCES.

(ii) The number of sub-licences issued was:

State	1918	1919	1920
Perak	306	293	268
Selangor	97	75	69
Negri Sembilan	14	13	12
Total	417	381	349

showing a further decrease of 32 as compared with the previous year.

REVENUE COLLECTED.

(iii) Fees were collected as follows:

State	1918	1919	1920
Perak	\$17,953	\$18,346	\$18,534
Selangor	10,348	10,737	10,634
Negri Sembilan... ..	2,307	1,706	1,606
Total	\$30,608	\$30,790	\$30,774

a decrease of \$16 compared with the previous year.

COST OF STAFF.

(iv) The cost of the staff employed under the Mineral Ores Enactment was \$22,111 as compared with \$15,847 in 1919.

PROSECUTIONS.

(v) Four prosecutions were undertaken during the year under review, three in Perak and one in Selangor, convictions were obtained in all cases and fines amounting to \$250 were inflicted:

INSPECTIONS.

(vi) Periodical inspection of all licensed premises were made during the year.

ORE-BUYING BUSINESS.

(vii) The following table gives an idea of the ore-buying business in the three Western States and, as in former years, two large European companies operated smelting works in the Colony:

State	Places licensed	Smelting houses	Men smelting	Men buying and dressing	Total men	Roasting furnaces	Smelting furnaces	Lau-chutes	Foot stamps
Perak... ..	157	3	91	850	941	2	11	142	68
Selangor	98	3	90	324	414	1	15	87	54
Negri Sembilan	15	...	...	48	48	...	...	...	...
Total, 1920 ...	270	6	181	1,222	1,403	3	26	229	122
" 1919 ...	276	8	194	1,492	1,686	3	29	301	125
" 1918 ...	270	10	191	1,450	1,641	4	33	300	145

In addition a light steam-driven 10-head battery was also in use in Selangor. Not included in this table are twenty-four licences issued to European companies.

GENERAL.

(viii) The total business transacted under this Enactment is estimated at \$112,310,400 as compared with \$120,048,700 in 1919 and \$135,998,000 in 1918.

(ix) The staff continued the compilation of records of purchases and the records of outputs from mining leases were kept up.

(x) Returns of export of tin, tungsten ores and gold were recorded for publication in the *Gazette*.

(xi) The date appointed for the coming into force of the Mineral Ores Enactment, 1915, Pahang, was the 1st of June, 1920, but it was ruled that licences issued under Enactment 16 of 1901 must run their course in spite of the repealing Enactment so that re-licensing under the new Enactment was not necessary until the existing licences expired at the end of the year.

NON-FERROUS METAL INDUSTRY ENACTMENT.

30. This Enactment was brought into force during 1919 when 292 licences were issued and fees amounting to \$2,920 were collected. During the year under review a further 30 licences were issued and the fees collected amounted to \$300.

DANGEROUS TRADES ENACTMENT.

31. One licence for a roasting furnace was issued in Selangor.

PART VII.

THE MACHINERY ENACTMENT.

PLANT UNDER INSPECTION.

32. (i) The total horse-power of plant installed and registered under the Machinery Enactment was 129,427 (inclusive of hydro-turbines aggregating to 3,460 horse-power), of which 87,075 horse-power was in employment as against 121,948 horse-power registered in 1919 and 83,823 horse-power in operation that year, showing for the year under review an increase of applied energy of 3,252 horse-power.

DISTRIBUTION OF STEAM BOILERS.

(ii) Two thousand and forty boilers were registered with a collective horse-power of 86,720 and were distributed as follows:

State	Number	Collective horse-power
Perak	977	47,197
Selangor	702	28,901
Negri Sembilan	219	5,257
Pahang	142	5,365
Total, 1920	2,040	86,720
" 1919	1,987	82,379
" 1918	1,968	79,817

an increase of 53 boilers and 4,341 horse-power as compared with 1919.

EMPLOYMENT OF STEAM BOILERS.

(iii) The following table shows the employment of steam boilers:

State	Mining		Agricultural		General		Government	
	Working	Idle	Working	Idle	Working	Idle	Working	Idle
Perak	409	361	20	44	32	33	63	15
Selangor	253	356	9	2	14	...	47	21
Negri Sembilan	16	145	10	9	...	1	36	2
Pahang	36	58	9	1	4	...	28	6
Total, 1920	714	920	48	56	50	34	174	44
" 1919	711	897	52	42	35	31	176	43
" 1918	809	714	54	106	30	41	173	41

The horse-power of steam plant in employment in the year under review aggregated to 49,565 and that of unemployed to 37,155, figures for the previous year being 48,180 and 34,198, respectively.

OIL AND GAS ENGINES.

(iv) Nine hundred and thirty-four oil engines with an aggregate horse-power of 22,661 and 304 gas engines with a total horse-power of 16,586 were registered and were distributed as follows:

State	Oil		Gas	
	Number	Horse-power	Number	Horse-power
Perak	551	11,963	129	7,332
Selangor	250	7,071	126	6,723
Negri Sembilan	108	2,119	46	2,412
Pahang	25	1,508	3	119
Total, 1920 ...	934	22,661	304	16,586
.. 1919 ...	855	19,541	293	15,828
.. 1918 ...	792	19,314	275	15,129

showing an increase of 79 oil engines of 3,120 horse-power and 11 gas engines of 758 horse-power as compared with 1919.

(v) Employment of oil and suction gas engines was as under:

State	Mining		Agricultural		General		Government	
	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas
Perak	200	17	117	65	75	18	4	1
Selangor	35	11	127	97	33	8	6	...
Negri Sembilan ... ..	...	2	75	42	6	1	6	...
Pahang	10	1	6	2	4	...	...	...
Total, 1920 ...	245	31	325	206	118	27	16	1
.. 1919 ...	244	39	305	205	97	22	20	...
.. 1918 ...	281	38	287	195	92	23	20	...

The total horse-power of oil engines in employment was 19,944 and of gas engines 14,106, aggregating in 1920 to 34,050 horse-power as compared with 31,443 in 1919.

INSTALLATIONS OF MACHINERY.

(vi) Five hundred and sixty-eight installations of machinery were inspected and were distributed as follows:

Perak	230
Selangor	225
Negri Sembilan	97
Pahang	16
Total, 1920 ...	568
.. 1919 ...	545
.. 1918 ...	523

showing an increase of 23 installations as compared with 1919 and 45 in comparison with 1918.

EXAMINATION OF ENGINEERS AND DRIVERS.

(vii) Five candidates presented themselves for first grade engineers' certificates and all passed; ten came up for second grade engineers' certificates and passed. One hundred and sixteen candidates were examined as first grade drivers and 89 qualified. Of 249 applicants for second grade drivers' certificates, 195 were successful.

ACCIDENTS.

(viii) Sixteen accidents occurred, of which seven were fatal, as compared with a total of eight and two fatalities in 1919: for the year under review eight accidents happened on mining machinery, three resulting in death and seven on rubber machinery with four deaths. Three of the fatal accidents resulted from broken belts.

GENERAL.

(ix) The staff during the year was fully taxed owing to officers being on leave. Three Inspectors retired on pension during the year and three new Inspectors were appointed.

PART VIII.

THE ELECTRICITY ENACTMENT.

INSPECTIONS.

33. (i) One hundred and one inspections were made during the year, three orders and one circular on the subject of earthing were issued.

(ii) Nine licences for private installations were issued, of which four replaced licences lapsed or surrendered. The periods of two small public supplies at work in Ipoh were extended.

EXAMINATIONS.

(iii) The results of the examinations were as follows:

Grade	Passes	Restricted certificates	Failed
First grade engineers	4	—	—
Second " "	2	—	1
First grade chargemen	5	6	2
Second " "	4	27	5
Wiremen	9	4	8

a total of 77 candidates presented themselves for examination.

DISTRIBUTION OF PLANT SUBJECT TO THE ELECTRICITY ENACTMENT.

(iv) The distribution of plant subject to the Electricity Enactment was as follows—for generating plant only—at the end of the year under review:

State	No. of installations	Kilo-watts
Perak	72	5,011
Selangor	27	3,002
Negri Sembilan	7	84
Pahang	4	2,279
Total, 1920	110	10,376
" 1919	109	9,544
" 1918	106	9,360

In addition to the above there were forty-five self contained low voltage lighting plants installed in private houses. About 900 kilo-watts of plant was in course of erection at the close of the year.

EMPLOYMENT OF ELECTRICAL PLANT SUBJECT TO THE ELECTRICITY ENACTMENT.

(v) The employment of electrical plant subject to the Electricity Enactment was in kilo-watts:

State	Mining	Agricultural	General	Government
Perak	4,670	152	130	59
Selangor	2,793	66	143	—
Negri Sembilan	26	52	6	—
Pahang	2,279	—	—	—
Total, 1920	9,768	270	279	59
" 1919	8,947	284	256	57
" 1918	8,838	265	215	42

THE CLASSIFICATION OF ALL ELECTRICAL PLANT IN THE FEDERATED MALAY STATES.

(vi) Classification of all electrical generating plant employed in the Federated Malay States is as follows:

State	Power K.-W.	Light K.-W.
Perak	4,545	516
Selangor	3,204	2,309
Negri Sembilan	20	244
Pahang	2,278	1
Total, 1920	10,047	3,070
" 1919	9,067	3,088
" 1918	8,911	3,000

a generating aggregate of 13,117 kilo-watts, the employment of which was as follows:

Employment	Power	Light
Mining	9,551	217
Agriculture	56	214
General	109	170
Government	331	2,469
Total, 1920	10,047	3,070

ACCIDENTS.

(vii) No accidents were reported during the year.

GENERAL.

(viii) From the study of the tables it will be seen that very little progress has been made during the last three years in the utilisation of electrical energy which is to a great extent due to the prevailing high price of machinery and the difficulty in getting orders executed. Two Diesel-driven alternating current plants aggregating 900 kilo-watts were in course of erection at the end of the year: units of this type of moderate size have proved themselves to be reliable and economical in this country.

PART IX.

CONCLUSION.

34. Health on mines continued good and there were no disturbances amongst mining labour. The reports that a great many mines were closing down at the end of the year were exaggerated as the number of mines which closed down was comparatively small.

MINING SUPPLIES.

35. The cost of mining supplies remained high for the greater part of the year but showed some signs of coming down in price at the end of the year.

MINING COSTS.

36. Mining costs were very high at the beginning of the year but the slump at the end of the year made it necessary for miners to seriously consider reducing the cost of production with the result that wages were considerably reduced to, in some cases, as much as twenty to twenty-five per cent. and it is to be remarked to the credit of those concerned that the situation was accepted without trouble.

OUTPUT OF ORE PER UNIT EMPLOYED.

37. The output of tin-ore per unit employed, excluding dulang pass holders who won 2.85 pikuls per head and allowing eight units to one horse-power of plant employed, was 1.059 pikuls as compared with 1.487 pikuls in 1919. In 1913 the amount was 2.27 pikuls.

PROPORTION OF OUTPUT FROM CHINESE MINES.

38. The recovery by mines under Chinese management amounted to approximately 64 per cent. compared with 68 per cent. in 1919. In 1913 this percentage was 74.

OUTPUT FROM LODE MINING.

39. The proportion of the total output won from lode mining was 9.6 per cent. for the year under review compared with under 7 per cent. in 1919.

PROSPECTING FOR OIL.

40. In North-west Selangor, near the mouth of the Bernam river, prospecting for oil was carried on during the last half of the year but it is not yet sufficiently far advanced to prove or disprove the presence of oil.

PROSPECTING FOR COAL.

41. (i) At Enggor in Perak a syndicate has been formed to work the coal deposit but from the prospecting there are no indications that the deposit is extensive.

(ii) There is a prospecting licence in force to prospect for coal in South Perak but prospecting has not yet commenced.

NEW FLOATATIONS IN THE FEDERATED MALAY STATES.

42. The principal floatations during the year under review were Papan Tin Mines, Limited, Bataang Padang Tin Dredging, Limited, Talam Mines, Limited, Rawang Tin, Limited, Kepong Tin, Limited, Petaling Tin, Limited, and Mambau Tin, Limited, with capital aggregating to £851,661.

BRITISH CAPITAL INVESTED IN MINING IN FEDERATED MALAY STATES.

43. Thirty-seven sterling companies, with issued capital totalling to £3,643,692, and thirty-three dollars companies, with an aggregate issued capital of \$13,081,250, are operating in the Federated Malay States, and in addition there are four French companies, whose total capital amounts to f. 10,890,000.

CHINA CLAY.

44. The Malayan China Clay and Pottery Company, Limited, had an experimental plant running at Gopeng and was producing 20 tons of China clay per diem. It is the intention of the company to install larger works for the production of China clay and pottery in other places in the country.

TIN PURCHASES BY GOVERNMENT.

45. The Straits Trading Company, Limited, and the Eastern Smelting Company, Limited, were appointed Government buying agents when Government notified their intention of purchasing tin on the 4th December but no purchases were made on behalf of Government until the 14th December.

CONCLUSION.

46. The prosperity occasioned by the high price of tin at the beginning of the year resulted in higher wages, and the price of food-stuffs and stores rose in like manner, so that when the slump came at the end of the year the difficulties before the miner who had not the advantages of cheap power and who had not built up reserve funds were great. The action of the Government in purchasing tin at the end of the year undoubtedly saved many of the smaller mines from closing down, but the slump showed the necessity for miners to store up reserve funds in times of prosperity for use in times of emergency.

11th March, 1921.

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