

TRINIDAD AND TOBAGO.

Council Paper No. 59 of 1937.

M I N E S .

Administration Report of the Inspector of Mines and Petroleum
Technologist for the year 1936.

*Laid before the Legislative Council on the
14th of May, 1937.*

Previous Council Paper No. 60 of 1936.

**Registered No. of Correspondence relating to the subject—M.P. No. 38446.*

1937.
TRINIDAD AND TOBAGO.
PRINTED AND PUBLISHED BY A. L. RHODES, M.B.E.,
GOVERNMENT PRINTER.

[Price 72c.]

MINES.

Administation Report of the Inspector of Mines and Petroleum Technologist for the year 1936.

Council Paper No. 59 of 1937.

M.P. No. 38446.

HON. COLONIAL SECRETARY,

I have the honour to submit, for the information of His Excellency the Governor, the following report on the work of the Mines Department for the year 1936.

THE PETROLEUM INDUSTRY.

2. The steady expansion which has been taking place in the Petroleum Industry of the Colony during recent years has continued with increasing intensity. This is due to various reasons, among which world conditions, in general, and the active drilling policy adopted by operators in Trinidad have played an important part. It is desired, however, to draw attention to the successful manner in which operating companies (particularly the larger organisations) have approached the many problems they have encountered in exploring and developing the oil resources of Trinidad. The geological conditions under which the petroleum occurs in the Colony are extremely difficult and variable, and it is considered that it is mainly due to the exhaustive research work which has been undertaken by the larger operators, coupled with the skillful manner in which modern exploration and development methods have been generally applied, that the present expansion of the industry has been rendered possible.

3. In addition to a general increase in drilling operations, wide-spread exploration surveys have been carried out during the past year, and this important work is still in progress. These exploration surveys have included the examination of extensive areas by geophysical methods (mainly gravimetric).

4. PRODUCTION OF CRUDE OIL.—The total production of crude oil for the year 1936 amounted to 13,237,030 barrels, which is 1,565,806 barrels or 13.41 per cent., more than the production for 1935, and is the highest yet recorded in the Colony.

It is worthy of note that the increased production has been mainly derived from previously known producing structures and their extensions, and also that the Fyzabad structure contributed 56.7 per cent. of the total production of the Colony. Two new producing areas of promise were discovered during the year, but they are as yet insufficiently developed for their potentialities to be determined, and the quantity of oil produced from them during the period under review is of relative unimportance.

5. DRILLING.—During the year 1936 one hundred and seventy-one new wells were commenced, compared with one hundred and thirty-nine during 1935. The total number of wells commenced in the Colony to the end of 1936 is 2,416, of which 1,538 are on lands the oil rights of which are vested in the Crown and 878 are on private lands.

The number of feet drilled during 1936 amounted to 594,529, which represents an increase of 158,230 feet, or 36.26 per cent. on the footage for 1935.

Various companies have undertaken a larger amount of deeper drilling than in former years, and it is worthy of note that at the end of the year there were 19 wells over 6,000 feet deep and 7 wells over 7,000 feet deep, the deepest being 7,673 feet.

6. The following table shows, comparatively, the number of feet drilled and the quantity of oil produced during the years 1934, 1935 and 1936:—

Land.	Number of Feet drilled.			Production (in brls. of 35 gals.)		
	1934	1935	1936	1934	1935	1936
Crown Oil Rights ...	256,455	328,510	381,358	6,391,544	7,544,427	8,182,018
Private Oil Rights ...	95,328	107,789	213,171	4,502,819	4,126,797	5,055,012
Total ...	351,783	436,299	594,529	10,894,363	11,671,224	13,237,030

7. NATURAL GAS.—Much of the petroleum in Trinidad is associated with considerable volumes of natural gas at high pressures (pressures up to 5,000 lb. per square inch having been recorded), and the efficient control and conservation of this natural gas constitutes a problem which is rendered more difficult by the complicated geological conditions which exist. This problem has been, and continues to be, the object of careful study, especially by the larger organizations. With the object of conserving surplus natural gas some of it is being returned to the formation in three different areas for purposes of repressuring or storage, and it is anticipated that this practice will be extended to other areas where suitable conditions are found to exist. It is considered of prime importance, however, that the quantity of gas produced with the oil should be reduced to an economic minimum. This important factor is fully recognised by most of the larger organizations who are well aware that on the efficient control and conservation of their gas resources depends the flowing, and perhaps the economic, life of their wells. Recognising this, most of them have, for some time past, reduced the gas/oil ratios of the majority of their flowing wells to very low figures, and ratios as low as 400-500 cubic feet of gas per barrel of oil are not uncommon. It is hoped that all operators will recognise the vital importance of this practice and take steps to adopt it without delay.

8. OILFIELD OPERATORS.—The number of oilfield operators at the close of the year was 16, compared with 14 at the end of 1935. As an indication of the increased activity which took place on the oilfields during 1936 it may be noted that the daily average number of persons employed increased from 6,193 in 1935 to 7,796 in 1936.

9. LEASES AND LICENCES.—During the year 50 applications for mining leases and exploration licences were received, and 15 mining leases and 5 exploration licences were registered. The total number of mining leases and exploration licences registered at the end of the year amounted to 54, the details of which are as follows :—

	AREA.					
	Crown.			Alienated.		
	A.	R.	P.	A.	R.	P.
25 Mining Leases	46,571	3	06	...	...	...
9 Mining Leases	...	...	...	9,603	0	35
11 Composite Mining Leases on Crown and Alienated Lands	76,863	2	33	8,159	0	23
3 Prospecting Licences* on Crown and Alienated Lands	1,755	0	00	993	2	20
6 Exploration Licences	120,719	0	00	...	...	...
54	245,909	1	39	18,755	3	38

* These Prospecting Licences are now being converted into Mining Leases.

10. TOTAL AREA UNDER LICENCE OR LEASE.—Including privately owned oil rights under lease, the area of which has been supplied by the various operating companies, the total area of Trinidad under Licence or Lease as at the 31st December, 1936, is 325,021 acres (27.25 per cent. of the total area of Trinidad) as follows :—

	A.	R.	P.
Area of Crown Lands under Exploration and Prospecting Licence and Mining Lease	245,909	1	39
Area of Alienated Lands under Mining Lease and Prospecting Licence* the oil rights of which are vested in the Crown	18,755	3	38
Area of privately owned oil rights under Lease, according to details supplied by the Oil Companies	60,355	1	12
	325,020	2	09

* Now being converted into Mining Leases.

The figures given above for Crown and Alienated Lands include Licences and Leases actually registered. When the further Licences and Leases which have been approved but which have not yet been registered are taken into account, the total area under Exploration Licence or Mining Lease (including private lands) will be approximately 40 per cent. of the total area of Trinidad.

11. MARINE CONCESSIONS.—In the month of June, 1936, the Government published a notice stating that it was prepared to receive applications for the grant of exploration licences in connection with oil concessions over marine areas in the territorial waters of the Colony. As a result of this notice nine applications for such licences were received. The terms and concessions under which concessions will be granted are now under consideration.

12. REVENUE FROM ROYALTIES, WAYLEAVES AND FEES.—The revenue collected under these heads amounted to \$622,892.39, as compared with \$508,917.65 collected during the year 1935. For purposes of comparison, the following table shows the amounts collected under each head for the years 1934, 1935 and 1936 :—

Heads.	Amounts Collected.		
	1934	1935	1936
	\$ c.	\$ c.	\$ c.
ROYALTIES in respect of oil produced from Crown and Alienated lands	416,923 51	505,278 46	617,884 86
WAYLEAVES in respect of oil pipelines laid along public roads	1,741 37	1,421 59	1,877 76
FEES charged for pipelines crossing the Trinidad Government Railway and public roads	2,606 40	2,217 60	3,129 77
Totals	421,271 28	508,917 65	622,892 39

13. REFINERIES.—Twelve permits for the refining of oil were issued during the year under the Oil Mining and Refining Ordinance, Cap. 143. Of these permits six were issued in respect of small field topping plants the operations of which are of relative unimportance.

The total capacity of the refineries operating in the Colony amounts to approximately 17,500,000 barrels per annum. During 1936 a total quantity of 13,028,161 barrels of crude oil was refined, compared with 11,148,285 barrels during 1935.

14. GASOLINE EXTRACTION PLANTS.—Three Gas Absorption Plants and one Gas Absorption Plant for the recovery of gasoline from natural gas were in operation during the year.

15. LOADING FACILITIES.—Four deep-water piers equipped for loading tank steamers with petroleum and its products are in use. Facilities for bunkering vessels in the Harbour of Port-of-Spain are also available.

16. PIPELINES.—Approximately 200 miles of main pipelines have been laid down in the Colony. During the year two new permits under the Pipelines Ordinance No. 29 of 1933 were issued, the total number of permits issued now amounting to 176.

17. TANK STORAGE.—The total main tank storage capacity for petroleum in the Colony is approximately 4,030,000 barrels.

18. EXPORTS OF PETROLEUM AND ITS PRODUCTS.—The quantity of petroleum and its products exported during the year increased substantially as compared with the year 1935, the amounts and values for the two years being as follows :—

1935—10,993,540 barrels valued at \$13,321,708.

1936—12,405,222 barrels valued at \$15,910,638.

Petroleum and its products continued to form the largest part of the Colony's exports in 1936, the value being approximately two and a half times that of the products of the next most important of its industries, viz. : sugar (including molasses and rum). Of the total exports petroleum and its products (including asphalt) formed 62.63 per cent.

The value of the leading staple products of the Colony exported during 1936 is shown in the following table :—

<i>Staple Products Exported.</i>	<i>Value.</i>	<i>Percentage of total.</i>
Petroleum and its products	\$15,910,638	59.07
Sugar, Molasses and Rum	6,425,533	23.86
Cocoa	2,340,377	8.69
Asphalt	959,759	3.56
Fruits and Fruit Products	430,290	1.60
Coconuts, Copra and Coconut Oil	324,832	1.21
Bitters	76,577	.28
Coffee	84,969	.31
Other Exports not enumerated	382,101	1.42
	<u>\$26,935,076</u>	<u>100.00</u>

19. RETURNS.—The various returns required to be submitted by the Oil Companies under the various Ordinances and Regulations in respect of their operations have been regularly received in the Department, where, after being checked, they have been filed with the records of the Department.

20. INSPECTIONS.—The operations on the various oilfields were inspected by officers of this Department as frequently as possible, and I have pleasure in recording that the Managers have readily co-operated with the Department in ensuring that the provisions of the Ordinances and Regulations were effectively carried out.

21. Included in this report as Appendix " B " will be found some interesting notes and statistics relating to the progress of the petroleum industry which have been prepared by the Assistant Petroleum Technologist.

THE ASPHALT INDUSTRY.

22. The Asphalt Industry continued to operate normally. The total production of asphalt for the year amounted to 111,965 tons. The following table shows, comparatively, the quantity of asphalt produced and exported during the years 1934, 1935 and 1936 :—

	1934	1935	1936
Production (in tons)	92,829	134,578	111,965
Export (in tons)	56,089	82,349	70,543

FACTORIES.

23. During the period under review 178 factories were in operation in Trinidad and Tobago. During the inspections carried out in these factories recommendations were made for ensuring the safety of the workmen, and such recommendations were always readily carried out by the Managers concerned.

QUARRIES.

24. The number of quarries worked during the past year was 109, as compared with 86 quarries in operation during the year 1935. Most of these quarries are very small and relatively unimportant. As a result of inspection it was found that, as a general rule, the quarries were being worked in a careful manner. The various recommendations made by officers of this Department for increasing the safety of the workmen were usually carried out without delay.

PETROLEUM ORDINANCE, CAP. 145.

25. The premises where dangerous petroleum products are stored have been carefully inspected, and all possible care has been taken to ensure safety. During the year 573 licences were issued for the storage and sale of petroleum and its products, the revenue derived from such licences amounting to \$1,972.80.

APPENDICES.

26. Appendix " A " shows the list of oil companies operating in the Colony during the year 1936.

27. Appendix " B " gives notes and statistics relating to the Petroleum Industry.

28. Appendix "C" is a statement of the quantity and value of minerals obtained and the daily average number of persons employed in the petroleum, asphalt and quarry industries.

29. A statement of oil produced and exported is shown in Appendix "D."

30. Appendix "E" shows the amount of oil refined year by year.

31. Appendix "F" consists of a series of charts depicting in graphic form the progress made in various industries during the past few years.

32. Appendix "G" shows the relation of mineral exports to agricultural exports.

STAFF.

33. Mr. C. E. Capito, O.B.E., Petroleum Technologist, retired from the Service on the 4th April, 1936, on completion of six years service with the Department. Mr. H. W. Reid, B.Sc., Assistant Petroleum Technologist, who had occupied that position for over seven years, also retired from the Service with effect from the 3rd December, 1936. Mr. W. N. Foster, M.A. (Cantab), was appointed to the post of Assistant Petroleum Technologist on the 24th November, 1936, to succeed Mr. Reid.

In August, 1935, the proposal that the posts of Inspector of Mines and Petroleum Technologist should be amalgamated was agreed to, and this decision was carried into effect on the 4th March, 1936, when Mr. R. S. Mackilligin, O.B.E., M.C., was appointed to the joint post. Mr. Mackilligin arrived in the Colony on the 20th May, 1936, on which date Mr. Nelson Betancourt, Assistant Inspector of Mines, who had been acting as Inspector of Mines for the period 4th April, 1934 to 19th May, 1936, reverted to his substantive post.

Mr. Betancourt was granted six months vacation leave with effect from the 15th September, 1936, during which period a part of his duties were carried out by Mr. T. C. C. Harding, Draughtsman in the Department. Mr. A. C. Francis-Lau, 2nd Clerk, was also granted 66 days vacation leave as from the 27th July, 1936. During his absence Mr. R. V. O'Neill, 3rd Clerk, performed his duties.

I have great pleasure in recording the very able and willing assistance I have received from all members of the Staff.

R. S. MACKILLIGIN,
*Inspector of Mines and
Petroleum Technologist.*

10th April, 1937.

APPENDIX A.

No.	Company.	Nature of tenure of lands on which operations took place.		Disposal of Oil.			Remarks.
1	Antilles Petroleum Company (Trinidad) Ltd.	Private Lands	Brighton Vessigny	Crude exported	...	...	Operating on Private Lands taken over from Trinidad Lake Petroleum Co., Ltd. in December 1935. An active drilling programme on the Vessigny field has resulted in a considerable increase in production.
2	Apex (Trinidad) Oilfields, Ltd.	Crown Oil Rights under Lease Prospecting Licence and Private Lands	Fyzabad and Siparia	Crude oil sold to Trinidad Leaseholds, Ltd. Casing head gasoline sold to United British Oilfields of Trinidad, Ltd.	...	...	This Company is the largest producer in the Colony. Both the footage drilled and the production showed an increase over those for 1935.
3	Coldan Oil Company, Ltd.	Private Lands	Fyzabad	Refined	...	...	Small amount of footage drilled and production obtained.
4	Kern Trinidad Oilfields, Ltd.	Crown Lands under Lease	Guapo and Rousillac	Some exported Some sold to Trinidad Leaseholds, Ltd. Some sold to United British Oilfields of Trinidad and other Companies	...	...	There was a considerable increase in both footage and production won by this Company.
		Private Lands					
5	Mitchell, F. W.	Private Lands	Point Fortin				A small amount of footage was drilled.
6	New Dome Oilfields, Ltd.	Private Lands	Fyzabad				A small amount of footage was drilled and production slightly increased.
7	Petroleum Options (1925), Ltd.	Private Lands	San Francique				No drilling was done and production decreased.
8	Scottish Trinidad Oilfields, Ltd.	Private Lands	Rio Claro				One well was started.
9	Siparia Trinidad Oilfields, Ltd.	Crown Lands under Prospecting Licence	Palo Seco Morne Diablo				A certain amount of drilling was done and production increased.
10	Stollmeyer, C. C.	Crown Lands under Lease	Palo Seco				A small amount of drilling was done and the production considerably increased.

Appendix A.—Continued.

No.	Company.	Nature of tenure of lands on which operations took place.	Disposal of Oil.	Disposal of Oil.	Remarks.
11	Trinidad Central Oilfields, Ltd. ....	....Crown Lands under Lease	Tabaquite, Guapo and Lizard Springs	Production from Tabaquite and Lizard Springs refined and sold locally That from Guapo is sold to Trinidad Leaseholds, Ltd.	Productions from Tabaquite, Lizard Springs and Guapo were maintained. Operations were started at Barrackpore and production obtained.
12	Trinidad Consolidated Oilfields, Ltd.	....Crown Oil Rights under Lease and Private Lands	Fyzabad	....Sold to Trinidad Leaseholds, Ltd.	Took over lands at Fyzabad from Trinidad Investments, Ltd. in July.
13	Trinidad Investments, Ltd. ....	....Crown Oil Rights under Lease and Private Lands	Fyzabad	....Sold to Trinidad Leaseholds, Ltd.	Mining Lease in Fyzabad area assigned to Trinidad Consolidated in July.
14	Trinidad Lake Petroleum Co., Ltd.	....Crown Lands under Lease	Brighton	....Pitch refined and exported	....Producing and refining pitch only. Private Lands including the Brighton and Vessigny oilfields taken over by Antilles Petroleum Company (Trinidad).
15	Trinidad Leaseholds, Ltd. ....	....Crown Lands and Crown Oil Rights under Lease Private Lands	Fyzabad, Barrackpore and Guayaguayare	Pumped to the Company's refinery at Pointe-a-Pierre and there refined Most of the refined products are exported in bulk.	The most important marketing and refining Company in the Colony. Both the footage drilled and production obtained have been considerably increased this year. Production from the Guayaguayare Field has nearly doubled.
16	Trinidad Oil Lands, Ltd. ....	....Private Lands	....Point Fortin		....Have acquired lands formerly operated by the Globe Oilfields, Ltd. No drilling was done during the year.
17	Trinidad Petroleum Developing Co., Ltd.....	....Crown Oil Rights under Lease Private Lands	Palo Seco and Siparia	Sold to United British Oilfields of Trinidad, Ltd.	Both drilling and production have decreased slightly.
18	United British Oilfields of Trinidad, Ltd.....	....Crown Lands under Lease Private Lands	Morne L'Enfer Forest Reserve Point Fortin	Pumped to the Company's refinery at Point Fortin and there refined	A considerable increase in footage drilled. Just maintained production at last year's level.

6

APPENDIX B.

HON. INSPECTOR OF MINES AND PETROLEUM TECHNOLOGIST.

The production of crude oil reached a record figure of 13,237,030 barrels, which is an increase of 13.41 per cent. over that for 1935. The footage drilled was 594,529 feet. This is also a record and 36.26 per cent. greater than that in 1935.

A comparison of footage and production figures for 1935 and 1936 is given below:—

	Footage.		Production.	
	1935	1936	1935	1936
Crown	185,788	235,804	5,288,943	5,982,993
Alienated	142,722	145,554	2,255,484	2,199,025
Private	107,789	213,171	4,126,797	5,055,012
	<u>436,299</u>	<u>594,529</u>	<u>11,671,224</u>	<u>13,237,030</u>

DRILLING.—During the year 171 wells were started bringing the total number of wells started in the Colony up to 2,416 at the end of the year. The following table gives an analysis of the drilling operations carried out during the year.

	Crown.	Alienated.	Private.	Totals.
Unfinished at end of 1935	24	7	10	41
Started during 1936	59	39	73	171
	<u>83</u>	<u>46</u>	<u>83</u>	<u>212</u>
Completed as oil wells	57	33	54	144
Completed as gas wells ....	....	1	1	2
Completed as water wells ....	....	3	2	5
Completely abandoned	4	3	5	12
Unfinished at end of 1936	22	6	21	49
Old wells abandoned in 1936	2	....	8	10
Old wells re-completed in 1936	9	10	7	26

There was no outstanding advance in drilling equipment or technique during the year but several minor improvements are noted.

The condition of drilling mud was generally carefully controlled, one of the results of which was the larger amounts of open hole which could be carried without trouble being experienced from caving.

An electrically operated gun perforator which was first introduced on the Trinidad oilfields in December, 1935, has rapidly become an indispensable tool, and its general use has resulted in a tendency to set and cement strings of blank casing afterwards gun perforating at selected points.

Three companies started using a wire line retractable core barrel. This device permits the taking of cores while drilling and the withdrawal of the core barrel to the surface without pulling the drillpipe.

One company installed steam operated blow-out preventers and pressure drilling equipment while another experimented with a vertical steam drilling engine directly coupled to the rotary table.

Full hole tool joints were steadily replacing the older types while the wooden derrick has been entirely replaced by steel for drilling.

At the end of the year the deepest well in the Colony was 7,673 feet deep.

There were 144 wells over 4,000 feet deep, 39 over 5,000 feet, 19 over 6,000 feet and 7 over 7,000 feet deep.

PRODUCTION.—The number of wells producing per month ranged from 999 to 1,092, the average being 1,041 per month.

The following table gives an analysis of the average number of producers per month and a comparison with the three previous years.

	1933	1934	1935	1936
Wells flowing	231	222	235	273
Wells pumping	443	465	466	469
Wells bailing or swabbing	124	140	146	140
Wells on air or gas lift	29	70	105	107
Wells on plunger lift ....	....	....	8	38
Wells on displacement pumps	9	9	14	14
	<u>836</u>	<u>906</u>	<u>974</u>	<u>1,041</u>

The Fyzabad structure contributed 56.7 per cent. of the total production of the Colony.

During the year under review there was a laudable tendency on the part of the larger companies to produce flowing wells through smaller chokes than formerly with the effect, in general, of reducing gas/oil ratios.

The recording of casing and tubing pressures and metering of gas from flowing wells notably increased during the year.

The installation of high pressure gas and oil separators became more general—the high pressure gas obtained being used for gas lift and displacement pumping direct—a considerable economy compared with former methods of low pressure separation followed by compression.

The gas actuated plunger lift was extensively used by two companies, the number of units in operation increasing from 8 in December, 1935 to 38 in December, 1936.

There was but little alteration in surface pumping equipment. The Band Wheel type of pumping power is steadily replacing older types of installation and surface equipment is being made heavier.

Surplus gas was being replaced in formation by three companies; in two cases for repressuring producing sands, in the other with a view to storage for future use.

Four small fires occurred on oilfields during the year. They caused but little damage to property and were promptly extinguished.

There were 54 reportable accidents on the oilfields during the year. Investigation of these showed that only 16 were unavoidable. Of the remainder 24 were classed as due to carelessness, 13 to bad practice and one to disobedience. Five of these accidents were fatal. Minor injuries to rigmen are increasing.

Three boiler explosions occurred during the year, and it is fortunate that these extremely dangerous explosions were unaccompanied by loss of life. In at least two of the cases negligence was a contributory cause.

The following tables are attached :—

- No. 1 showing the monthly drilling and production figures for 1936.
- No. 2 showing the number of wells started and footage drilled since the commencement of the industry in 1867.
- No. 3 showing the annual production since returns were first sent to the Government in 1908.
- No. 4 showing the number of wells started annually and the status of these wells at the end of the year.

W. N. FOSTER,
Assistant Petroleum Technologist.

25th March, 1937.

TABLE I.
DRILLING AND PRODUCTION RETURN FOR 1936.

Month.	Wells started, 1936.			Wells completed as Producers.			Recompleted as Producers.			Completed fresh water wells.			Wells abandoned.			Total wells started in Colony.	Footage drilled during month.	Production (barrels).	Flowing.			Pumping.			Bailing or swabbing.			Air/or Gas Lift.			Plunger Lift.			Displacement pumps.			Total number of wells producing.			Grand Total.	Percentage wells producing to total drilled.
	C	A	P	C	A	P	C	A	P	C	A	P	C	A	P				C	A	P	C	A	P	C	A	P	C	A	P	C	A	P	C	A	P	C	A	P		
Jan.	4	5	9	7	6	3	2					1			2,263	58,173	1,079,082	139	45	88	202	61	205	104	1	42	26	52	25	14	8	5	6	471	178	374	1,023	45.21			
Feb.	4	3	7	3	2	3	2						1		2,277	42,661	983,424	142	49	89	185	61	204	99	1	39	24	44	23	19	8	6	7	450	180	370	1,000	43.92			
March	4	6	4	3	4	5						1		2,291	43,279	1,081,191	134	49	87	183	62	208	106		43	28	42	25	20	10	6	7	451	179	380	1,010	44.09				
April	4	1	5	3	1	3	1							2,301	45,653	1,026,423	130	45	82	182	60	211	101	1	45	30	42	24	22	11	6	7	443	176	380	999	43.42				
May	5	2	4	5	3	6	1	1	2		1			2,312	39,628	1,066,728	139	43	83	182	60	213	95	2	40	32	50	23	23	13	6	7	448	184	379	1,011	43.73				
June	4	1	5	5		4								2,322	38,645	1,078,186	140	41	86	201	62	218	96	2	41	34	51	24	22	12	7	8	471	185	389	1,045	45.00				
July	3	3	8	3	1	3		1	1					2,336	50,076	1,121,583	145	44	86	196	60	219	90	1	43	34	53	25	24	14	6	8	465	188	395	1,048	44.86				
Aug.	6	2	7	4	3	8		1	1			1		2,351	60,323	1,108,974	147	40	96	196	61	217	91	1	36	37	53	24	26	15	7	8	471	188	396	1,055	44.87				
Sept.	7	4	6	6	*1	2		3	1					2,368	53,238	1,126,420	142	38	88	203	64	220	104	1	38	35	55	22	27	17	7	7	484	192	392	1,068	45.10				
Oct.	5	4	4	6	3	7		2						2,381	49,717	1,179,561	143	33	90	205	61	220	99	3	40	35	55	25	32	18	7	7	482	191	400	1,073	45.07				
Nov.	7	5	6	3	5	*4		1	1	1		1		2,399	61,418	1,154,093	149	33	100	195	65	215	94	2	40	38	51	25	34	15	7	8	476	192	403	1,071	44.64				
Dec.	6	3	8	9	5	7		2	1	1			5	3	13	2,416	51,718	1,231,365	156	37	106	199	68	212	98		40	36	50	24	36	15	7	8	489	198	405	1,092	45.16		
Totals	59	39	73	57	34	55		9	10	7		3	2	6	3	13	2,416	594,529	13,237,030	142	41	90	Averages 194	62	213	98	1	41	33	50	24	Averages 25	13	7	7	467	186	388	1,041	44.59	
Grand Totals	171			146			26				5		22			2,416	594,529	13,237,030	273			469			140		107		38		14		1,041			1,041	44.59				

* Including 1 Gas Well.

C=Crown. A=Alienated. P=Private.

W. N. FOSTER,
Asst. Petroleum Technologist.

TABLE 2.
COLONY OF TRINIDAD.

Number of Wells started and Footage Drilled Annually.

YEAR.	WELLS STARTED.								FOOTAGE DRILLED.								YEARLY TOTALS.	CUMULATIVE.
	CROWN.		ALIENATED.		PRIVATE.		TOTALS.		CROWN.		ALIENATED.		PRIVATE.					
	Annual.	Cum.	Annual.	Cum.	Annual.	Cum.	Annual.	Cum.	Annual.	Cum.	Annual.	Cum.	Annual.	Cum.				
1867	—	—	—	—	1	1	1	1	—	—	—	—	964	964	964	964		
1900	—	—	—	—	1	2	1	2	—	—	—	—	600	1,564	600	1,564		
1902	1	1	—	—	2	4	3	5	600	600	—	—	1,315	2,879	1,915	3,479		
1903	1	2	—	—	—	4	1	6	1,172	1,772	—	—	1,060	3,939	2,232	5,711		
1904	1	3	—	—	—	4	1	7	860	2,632	—	—	—	3,939	860	6,571		
1905	—	3	—	—	—	4	—	7	—	2,632	—	—	—	3,939	—	6,571		
1906	1	4	—	—	2	6	3	10	1,104	3,736	—	—	1,499	5,438	2,603	9,174		
1907	1	5	—	—	2	8	3	13	798	4,534	—	—	1,563	7,001	2,361	11,535		
1908	—	5	—	—	4	12	4	17	—	4,534	—	—	2,352	9,353	2,352	13,887		
1909	—	5	—	—	6	18	6	23	—	4,534	—	—	5,362	14,715	5,362	19,249		
1910	5	10	—	—	7	25	12	35	3,771	8,305	—	—	4,319	19,034	8,090	27,339		
1911	8	18	—	—	38	63	46	81	4,902	13,207	—	—	34,010	53,044	38,912	66,251		
1912	10	28	—	—	35	96	45	126	6,839	20,046	—	—	32,881	85,925	39,720	105,971		
1913	25	53	—	—	18	114	43	169	13,813	33,859	—	—	26,388	112,313	40,201	146,172		
1914	50	103	—	—	16	132	66	235	35,146	69,005	—	—	23,283	135,596	58,429	204,601		
1915	31	134	—	—	19	151	50	285	29,208	98,213	—	—	25,652	161,248	54,860	259,461		
1916	28	162	—	—	20	171	48	333	30,866	129,079	—	—	28,035	189,283	58,901	318,362		
1917	38	200	—	—	6	177	44	377	41,227	170,306	—	—	9,557	198,840	50,784	369,146		
1918	38	238	—	—	4	181	42	419	47,700	218,006	—	—	6,796	205,636	54,496	423,642		
1919	40	278	—	—	13	194	52	471	49,741	267,747	—	—	16,769	222,405	66,510	490,152		
1920	43	321	1	1	23	217	68	539	53,002	320,749	1,665	1,665	24,009	246,414	78,676	568,828		
1921	49	370	4	5	32	249	85	624	71,318	392,067	2,896	4,561	44,631	291,045	118,845	687,673		
1922	68	438	4	9	20	269	91	715	88,299	480,366	8,701	13,262	39,463	330,508	136,463	824,136		
1923	70	508	5	14	33	302	108	823	79,907	560,273	7,060	20,322	58,805	389,313	145,772	969,908		
1924	67	575	8	22	34	336	110	933	90,141	650,414	6,190	26,512	55,197	444,510	151,528	1,121,436		
1925	46	621	16	38	37	373	99	1,032	86,904	737,318	18,446	44,958	63,543	508,053	168,893	1,290,329		
1926	69	690	13	51	46	419	128	1,160	109,234	846,552	18,732	63,690	72,691	580,744	200,657	1,490,986		
1927	73	763	13	64	73	492	159	1,319	101,920	948,472	17,288	80,978	122,465	703,209	241,673	1,732,659		
1928	43	806	33	97	64	556	139	1,458	71,481	1,019,953	58,842	139,820	112,863	816,072	243,186	1,975,845		
1929	52	858	58	155	48	604	159	1,617	92,590	1,112,543	118,583	258,403	96,309	912,381	307,482	2,283,327		
1930	76	934	31	186	56	660	163	1,780	170,389	1,282,932	85,561	343,964	116,706	1,029,087	372,656	2,655,983		
1931	9	943	25	211	26	686	60	1,840	42,972	1,325,904	95,410	439,374	80,260	1,109,347	218,642	2,874,625		
1932	21	964	20	231	20	706	61	1,901	44,568	1,370,472	67,162	506,536	61,557	1,170,904	173,287	3,047,912		
1933	36	1,000	22	253	23	729	81	1,982	85,946	1,456,418	87,550	594,086	62,206	1,323,110	235,702	3,382,614		
1934	56	1,056	30	283	38	767	124	2,106	167,952	1,624,370	88,503	682,589	95,328	1,328,438	351,783	3,635,397		
1935	55	1,111	46	329	38	805	139	2,245	185,788	1,810,158	142,722	825,311	107,789	1,436,227	436,299	4,071,696		
1936	59	1,170	39	368	73	878	171	2,416	235,804	2,045,962	145,554	970,965	213,171	1,649,398	594,529	4,666,225		
		1,170		368		878		2,416		2,045,962		970,965		1,649,398		4,666,225		

W. N. FOSTER,
Assn. Petroleum Technologist.

TABLE 3.
Yearly Trinidad Production.

Year.	Crown.	Accu- mulative Total.	Alienated.	Accu- mulative Total.	Private.	Accu- mulative Total.	Yearly Totals.	Grand Accumu- lative Total.
1908	—	—	—	—	37	37	37	37
1909	—	—	—	—	47,295	47,332	47,295	47,332
1910	55	55	—	—	105,023	152,355	105,078	152,410
1911	3,994	4,049	—	—	217,298	369,653	221,292	373,702
1912	9,104	13,153	—	—	476,801	846,454	485,905	859,607
1913	52,153	65,306	—	—	533,029	1,379,483	585,182	1,444,789
1914	512,299	577,605	—	—	480,917	1,860,400	993,216	2,438,005
1915	392,389	969,994	—	—	512,330	2,372,730	904,719	3,342,724
1916	478,815	1,448,809	—	—	449,060	2,821,790	927,875	4,270,599
1917	1,065,945	2,514,754	—	—	536,357	3,358,147	1,602,302	5,872,901
1918	1,588,805	4,103,559	—	—	493,115	3,851,262	2,081,920	7,954,821
1919	1,539,973	5,643,532	—	—	301,063	4,152,325	1,841,036	9,795,857
1920	1,758,039	7,401,571	—	—	325,071	4,477,396	2,083,110	11,878,967
1921	1,751,943	9,153,514	300	300	601,916	5,079,312	2,354,159	14,233,126
1922	1,534,796	10,688,310	147	447	909,727	5,989,039	2,444,670	16,677,796
1923	1,847,118	12,535,428	63,334	63,781	1,140,335	7,129,374	3,050,787	19,728,583
1924	2,410,737	14,946,165	76,467	140,248	1,570,856	8,700,230	4,058,060	23,786,643
1925	2,647,095	17,593,260	200,781	341,029	1,538,634	10,238,864	4,386,510	28,173,153
1926	2,630,100	20,223,360	310,953	651,982	2,030,426	12,269,290	4,971,479	33,144,632
1927	2,039,363	22,262,723	297,761	949,743	3,043,676	15,312,966	5,380,800	38,525,432
1928	2,652,981	24,915,704	1,470,333	2,420,076	3,561,273	18,874,239	7,684,587	46,210,019
1929	2,987,795	27,903,499	1,627,439	4,047,515	4,100,554	22,974,793	8,715,788	54,925,807
1930	3,429,030	31,332,529	1,831,338	5,878,853	4,158,589	27,133,382	9,418,957	64,344,764
1931	2,795,572	34,128,101	2,530,175	8,409,028	4,417,751	31,551,133	9,743,498	74,088,262
1932	3,200,083	37,328,184	2,410,813	10,819,841	4,515,225	36,066,358	10,126,121	84,214,383
1933	3,684,148	41,012,332	1,606,595	12,426,436	4,270,610	40,336,968	9,561,353	93,775,736
1934	4,586,366	45,598,698	1,805,178	14,231,614	4,502,819	44,839,787	10,894,363	104,670,099
1935	5,288,943	50,887,641	2,255,484	16,487,098	4,126,797	48,966,584	11,671,224	116,341,323
1936	5,982,993	56,870,634	2,199,025	18,686,123	5,055,012	54,021,596	13,237,030	129,578,353

W. N. FOSTER,
Asst. Petroleum Technologist.

TABLE 4.

Table showing number of Wells started in each year and status of these Wells at 31st December, 1936.

YEAR.	WELLS STARTED.			PRODUCING.			IDLE.			ABANDONED.			UNFINISHED.			TOTALS.			
	C	A	P	C	A	P	C	A	P	C	A	P	C	A	P	Producing.	Idle.	Abandoned.	Unfinished.
1867 ...	—	—	1									—	—	1					
1900 ...	—	—	1									—	—	1					
1902 ...	1	—	2									1	—	2					
1903 ...	1	—	—									1	—	—					
1904 ...	1	—	—									1	—	—					
1906 ...	1	—	2									1	—	2					
1907 ...	1	—	2				—	—	2			1	—	—		—	2	1	
1908 ...	—	—	4	—	—	1	—	—	—			—	—	3		1	—	3	
1909 ...	—	—	6	—	—	2	—	—	2			—	—	2		2	2	2	
1910 ...	5	—	7	—	—	1	3	—	1			2	—	5		1	4	7	
1911 ...	8	—	38	1	—	4	3	—	8			4	—	26		5	11	30	
1912 ...	10	—	35	2	—	5	3	—	6			5	—	24		7	9	29	
1913 ...	25	—	18	8	—	6	6	—	2			11	—	10		14	8	21	
1914 ...	50	—	16	12	—	6	15	—	3			23	—	7		18	18	30	
1915 ...	31	—	19	7	—	9	14	—	9			10	—	1		16	13	11	
1916 ...	18	—	20	7	—	—	11	—	7			10	—	4		16	18	14	
1917 ...	38	—	6	16	—	1	7	—	2			15	—	3		17	9	18	
1918 ...	38	—	4	17	—	—	10	—	—			11	—	4		17	10	15	
1919 ...	40	—	13	17	—	2	12	—	2			11	—	9		19	14	20	
1920 ...	43	1	23	17	—	6	12	—	2			14	1	15		23	14	30	
1921 ...	49	4	32	22	—	9	12	—	7			15	4	16		31	19	35	
1922 ...	68	4	20	24	1	5	22	—	4			22	3	11		30	26	36	
1923 ...	70	5	33	26	1	11	17	—	5			26	4	17	1	—	—	—	1
1924 ...	67	8	34	24	1	11	23	—	11			20	7	12	—	—	—	—	—
1925 ...	46	16	37	23	4	12	11	1	11			12	11	14	—	—	—	—	—
1926 ...	69	13	46	27	2	23	21	3	12			21	8	11	—	—	—	—	—
1927 ...	73	13	73	21	4	32	27	6	18			25	3	23	—	—	—	—	—
1928 ...	43	33	64	18	24	35	14	7	20			11	2	9	—	—	—	—	—
1929 ...	52	58	48	19	30	32	16	21	6			16	7	10	1	—	—	—	—
1930 ...	76	31	56	34	15	32	28	11	9			13	5	14	1	—	1	—	—
1931 ...	9	25	26	4	16	18	3	7	4			2	2	4	—	—	—	—	—
1932 ...	21	20	20	9	12	13	8	8	4			4	—	3	—	—	—	—	—
1933 ...	36	22	23	16	16	18	10	6	2			7	—	3	3	—	—	—	—
1934 ...	56	30	38	35	23	31	12	5	5			6	2	2	3	—	—	—	—
1935 ...	55	46	38	39	35	27	10	8	6			3	3	2	3	—	3	—	—
1936 ...	59	39	73	43	28	49	4	2	4			2	3	3	10	6	17	—	—
Totals ...	1,170	368	878	488	212	410	334	85	174	326	65	273	22	6	21	1,110	593	664	49
	=			=			=			=			=			=			
	2,416			1,110			593			664			49			2,416			

W. N. FOSTER,
Asst. Petroleum Technologist.

APPENDIX C

Statement of the Quantity and Value of Minerals obtained and the Daily Average Number of Persons employed in the Petroleum, Asphalt and Quarry Industries during the years 1935 and 1936.

Industry.	1935					1936				
	Quantity.	Approximate Value.*	Daily average number of persons employed.			Quantity.	Approximate Value.*	Daily average number of persons employed.		
			Males.	Females.	Total.			Males.	Females.	Total.
Petroleum	11,671,224 brls.	\$9,192,338 20	6,098	95	6,193	13,237,030 brls.	\$10,254,853 96	7,680	116	7,796
Asphalt (a)	111,077 tons	333,231 00	616	1	617	91,333 tons	273,999 00	640	2	642
Private Quarries (Limestone, Gravel, &c.)	248,725 tons	129,574 40	710	172	822	257,333 tons	120,625 95	761	226	987
Government Quarries (Limestone, Gravel, &c.)	58,048 tons	30,631 83	250	68	318	67,714 tons	39,158 47	275	73	348

* The values given are those returned by owners and managers and represent value at place of production.

(a) In addition to the figure shown against this item, the following quantities were extracted from the Pitch Lake by the Public Works Department for use on the roads of the Colony, viz. :-

1935 23,501 tons. 1936 20,632 tons.

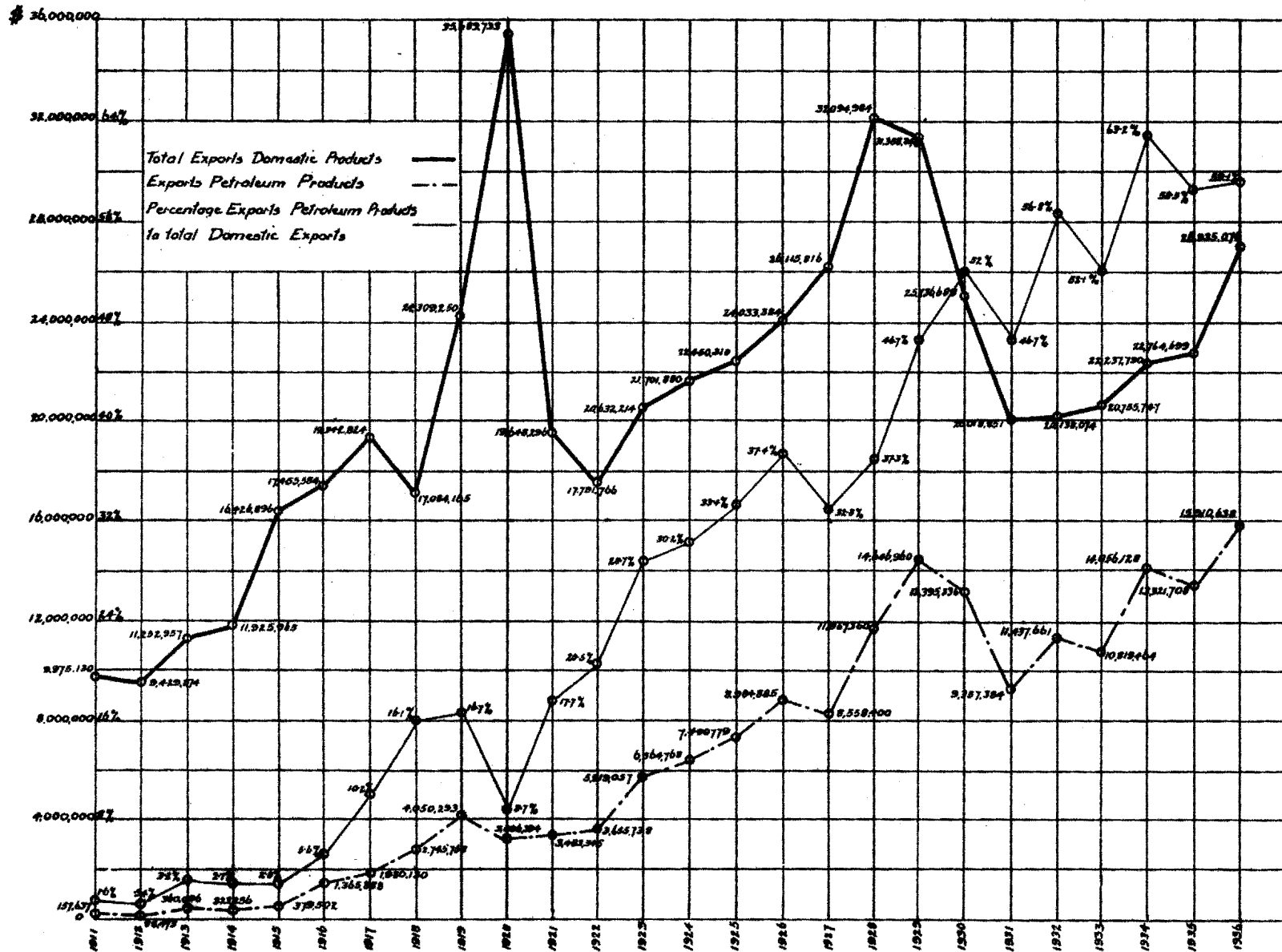
APPENDIX D.

Statement of Oil produced and exported year by year since the inception of the Petroleum Industry in the Colony.

Year.								Production in barrels.	Quantity of Crude oil and Refined oil exported in barrels.
1908	...	...	...	...	...	...	37	—
1909	...	...	...	...	...	...	47,295	46
1910	...	...	...	...	...	...	105,078	—
1911	...	...	...	...	...	...	221,292	219,582
1912	...	...	...	...	...	...	485,905	122,734
1913	...	...	...	...	...	...	585,182	387,719
1914	...	...	...	...	...	...	993,216	348,351
1915	...	...	...	...	...	...	904,719	408,188
1916	...	...	...	...	...	...	927,875	975,142
1917	...	...	...	...	...	...	1,602,302	1,079,369
1918	...	...	...	...	...	...	2,081,920	1,305,407
1919	...	...	...	...	...	...	1,841,036	1,406,264
1920	...	...	...	...	...	...	2,083,110	1,034,907
1921	...	...	...	...	...	...	2,354,159	1,223,346
1922	...	...	...	...	...	...	2,444,670	1,615,740
1923	...	...	...	...	...	...	3,050,787	2,432,470
1924	...	...	...	...	...	...	4,058,060	3,224,529
1925	...	...	...	...	...	...	4,386,510	3,606,608
1926	...	...	...	...	...	...	4,971,479	3,988,308
1927	...	...	...	...	...	...	5,380,800	4,456,770
1928	...	...	...	...	...	...	7,684,587	6,361,675
1929	...	...	...	...	...	...	8,715,788	8,243,023
1930	...	...	...	...	...	...	9,418,957	7,678,807
1931	...	...	...	...	...	...	9,743,498	8,964,303
1932	...	...	...	...	...	...	10,126,121	9,637,474
1933	...	...	...	...	...	...	9,561,353	8,909,298
1934	...	...	...	...	...	...	10,894,363	9,981,774
1935	...	...	...	...	...	...	11,671,224	10,993,540
1936	...	...	...	...	...	...	13,237,030	12,405,222
								129,578,353	111,010,596

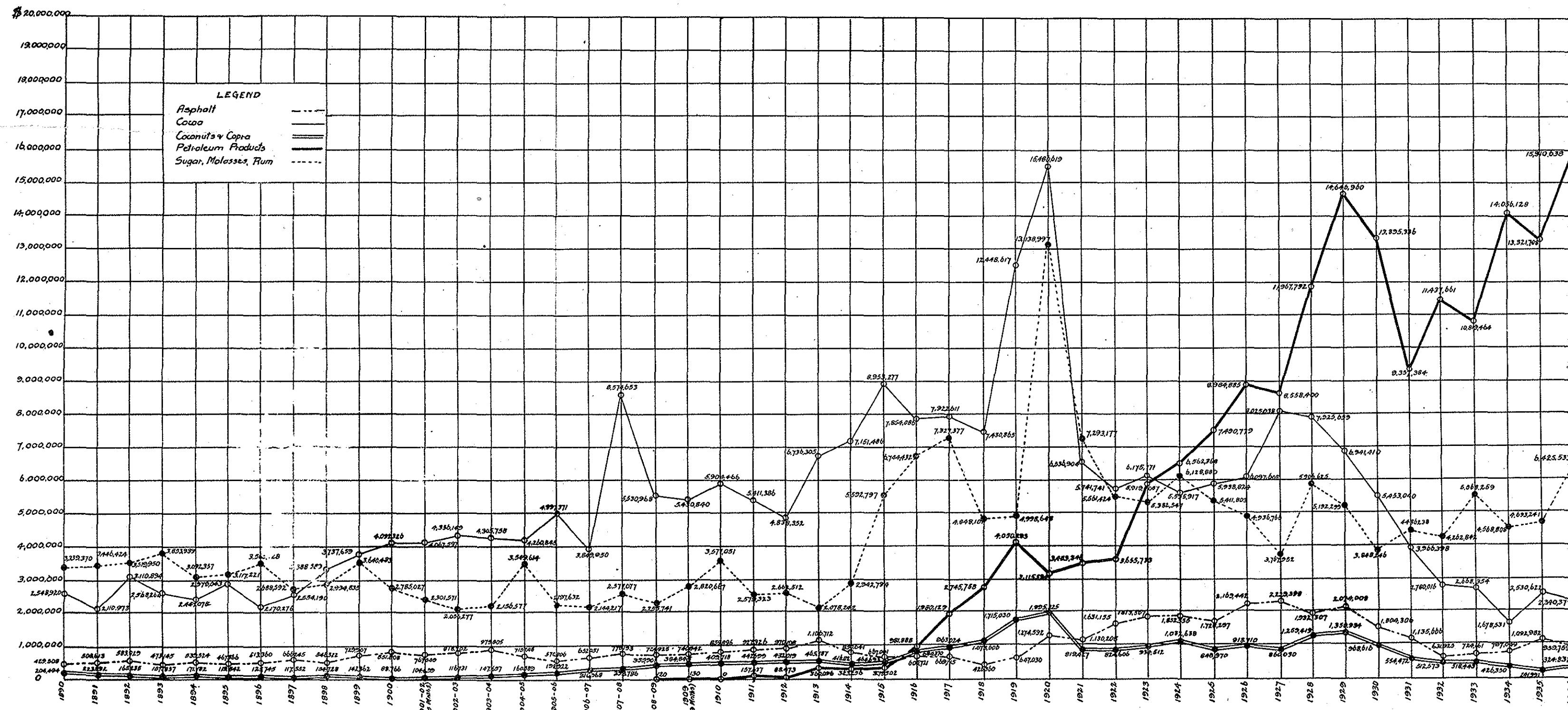
A
TRINIDAD AND TOBAGO

APPENDIX "F"

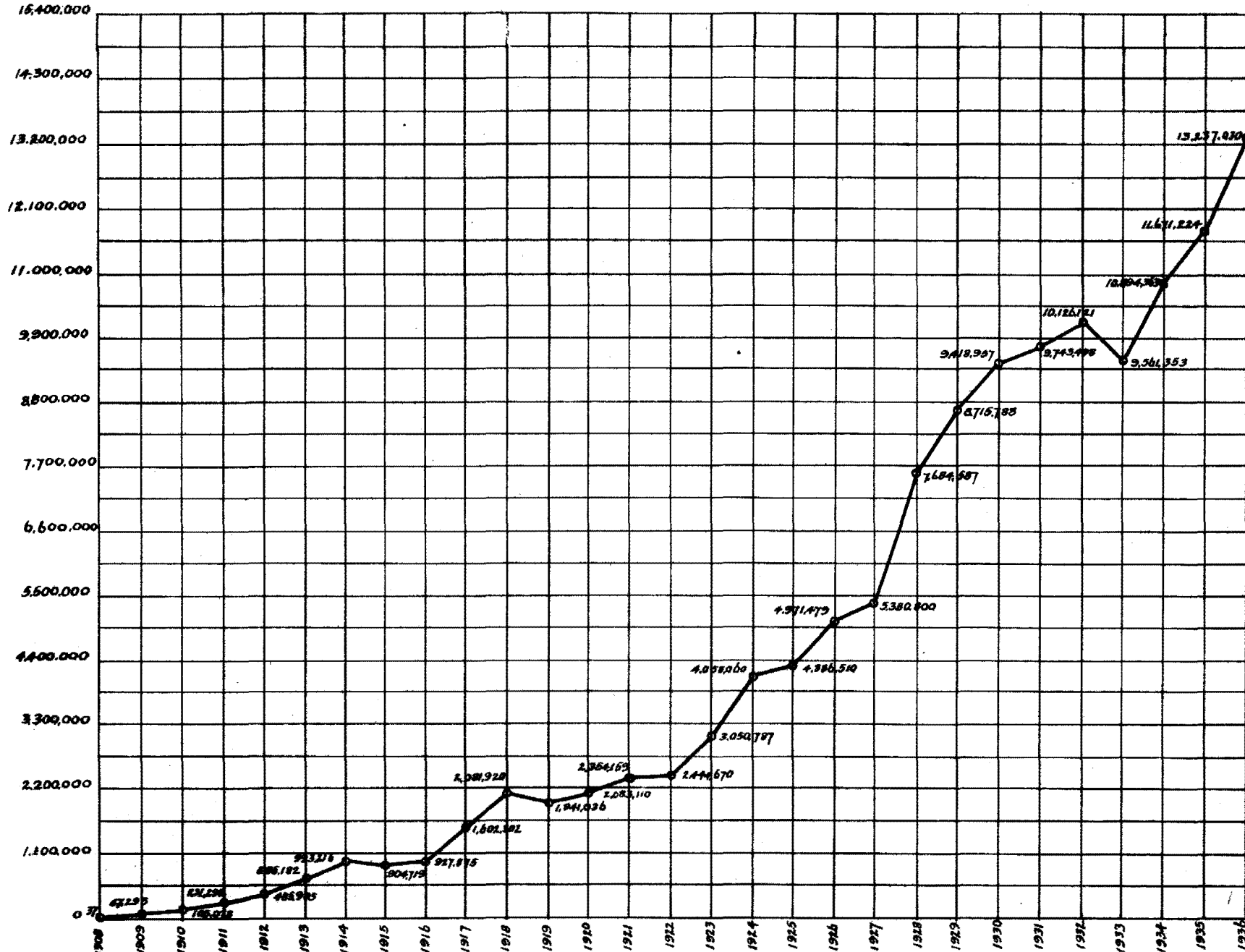


"B"

EXPORT OF LOCAL PRODUCE

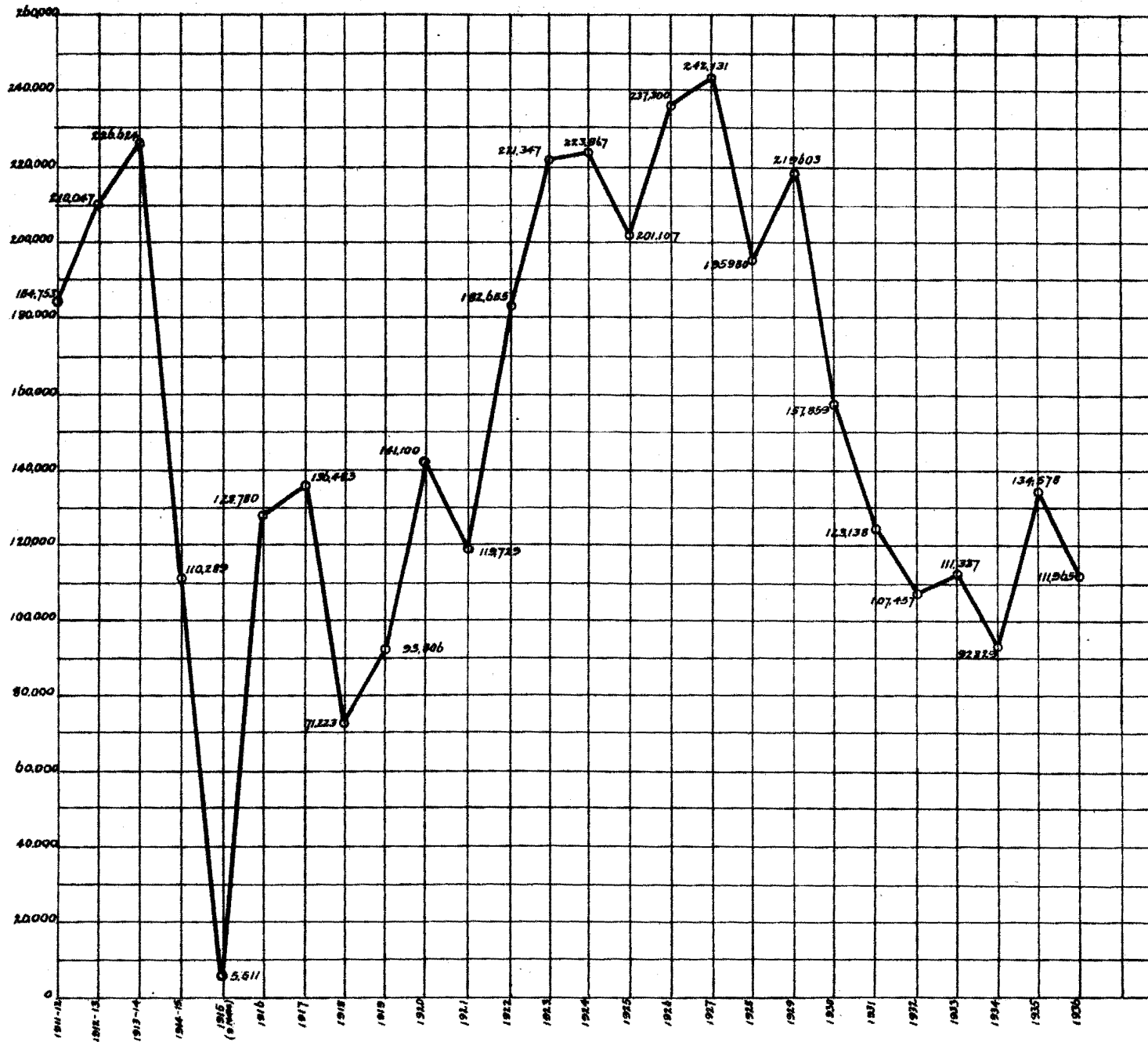


C
Total Annual Production of Crude Oil in Barrels
One Barrel = 35 Imperial Gallons



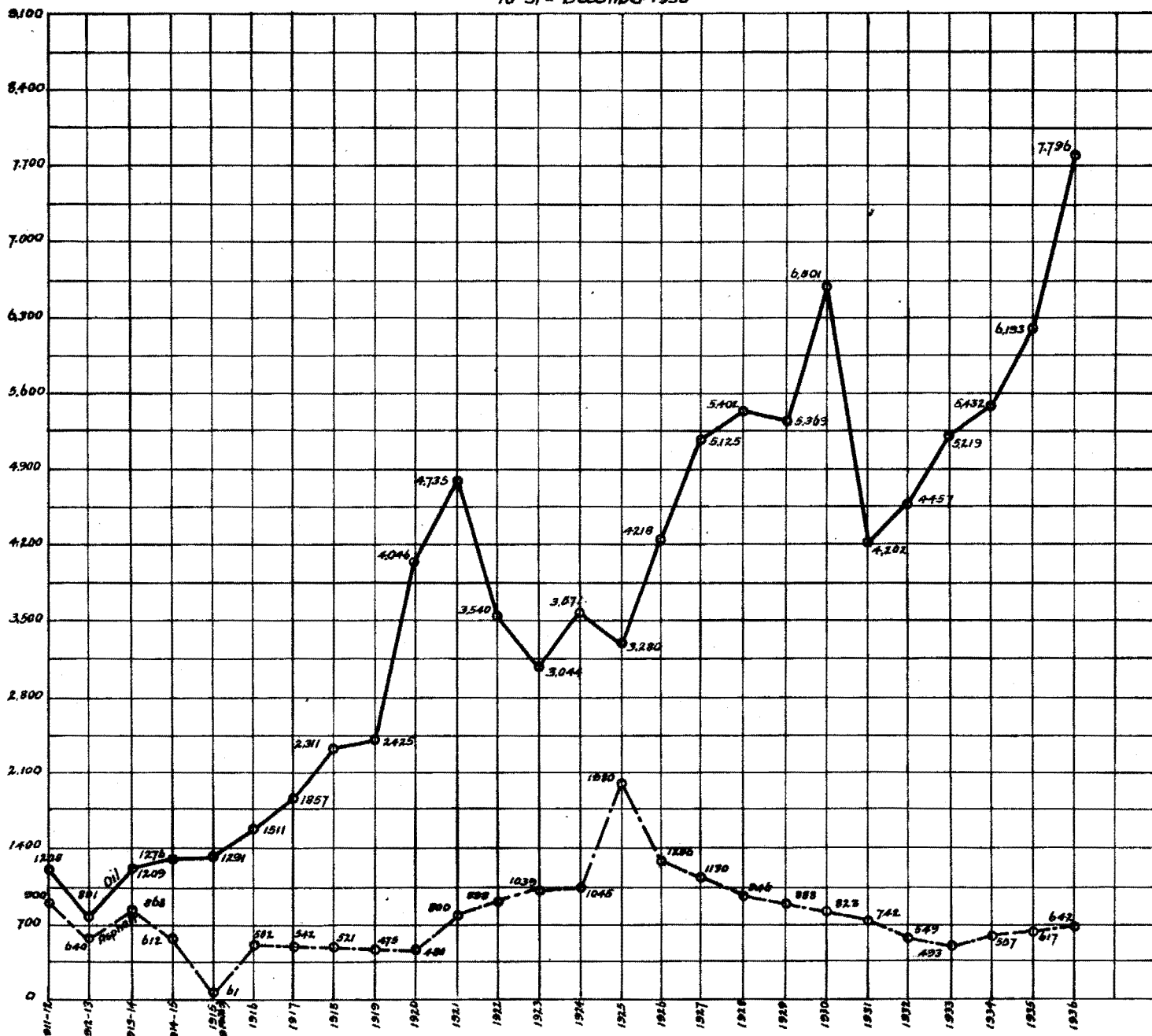
D

Curve showing yearly output of Asphalt from the Colony
in Tons from 1st April 1911 to 31st December 1936



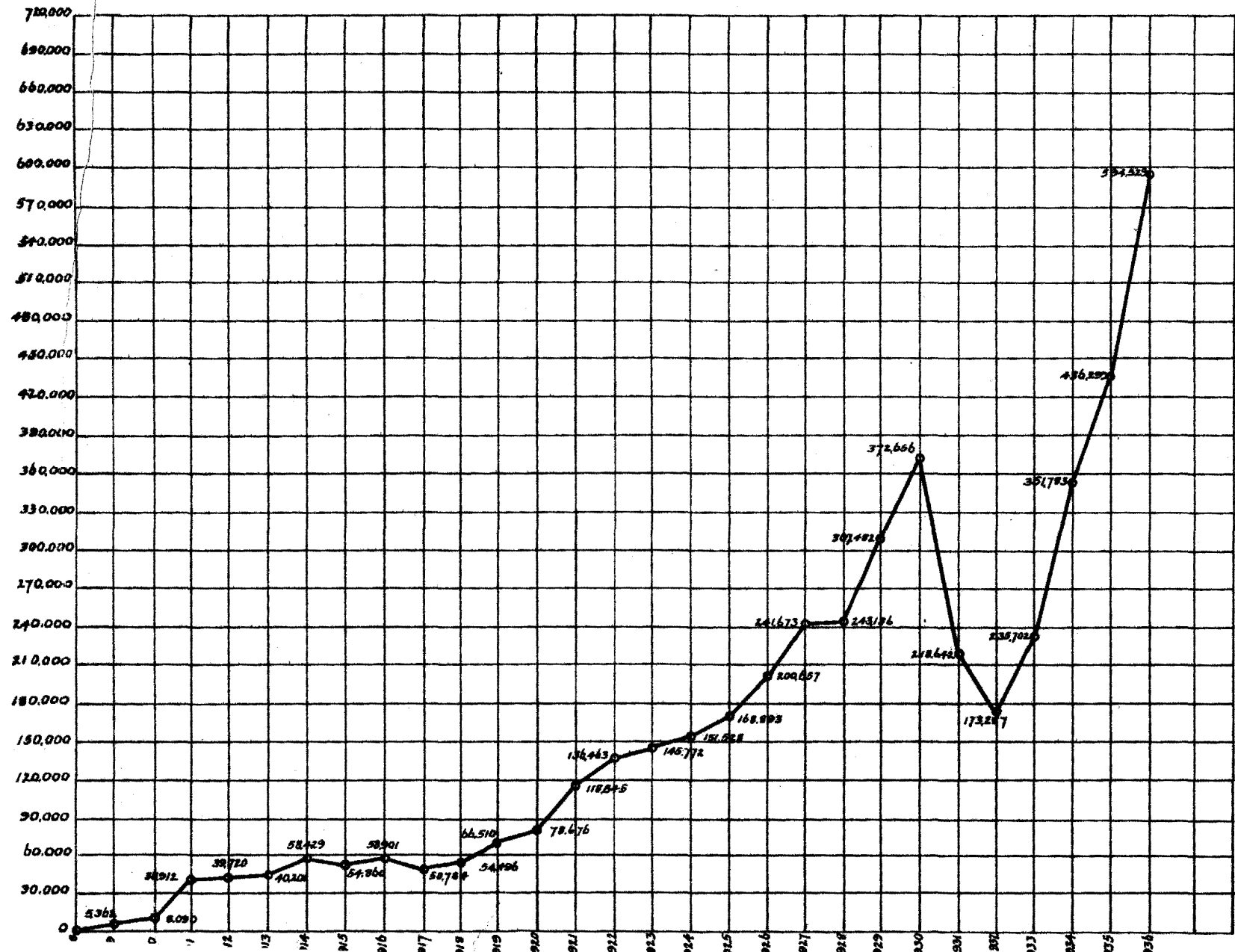
E

Curve showing comparison of daily average number of persons employed in the Oil and Asphalt Industries of the Colony from 1st April 1911 to 31st December 1936



F

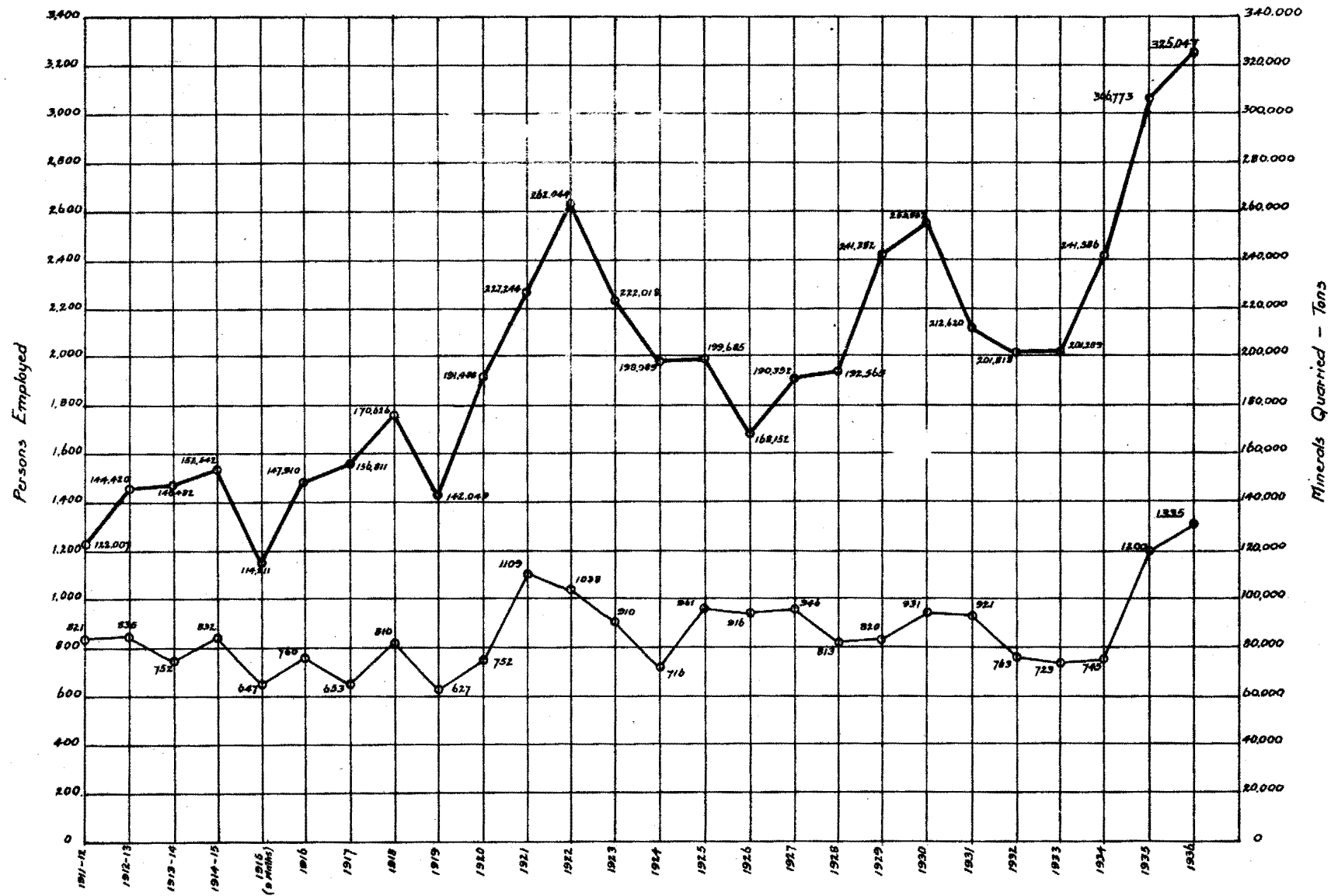
Total number of feet drilled annually
in the Colony



"G"

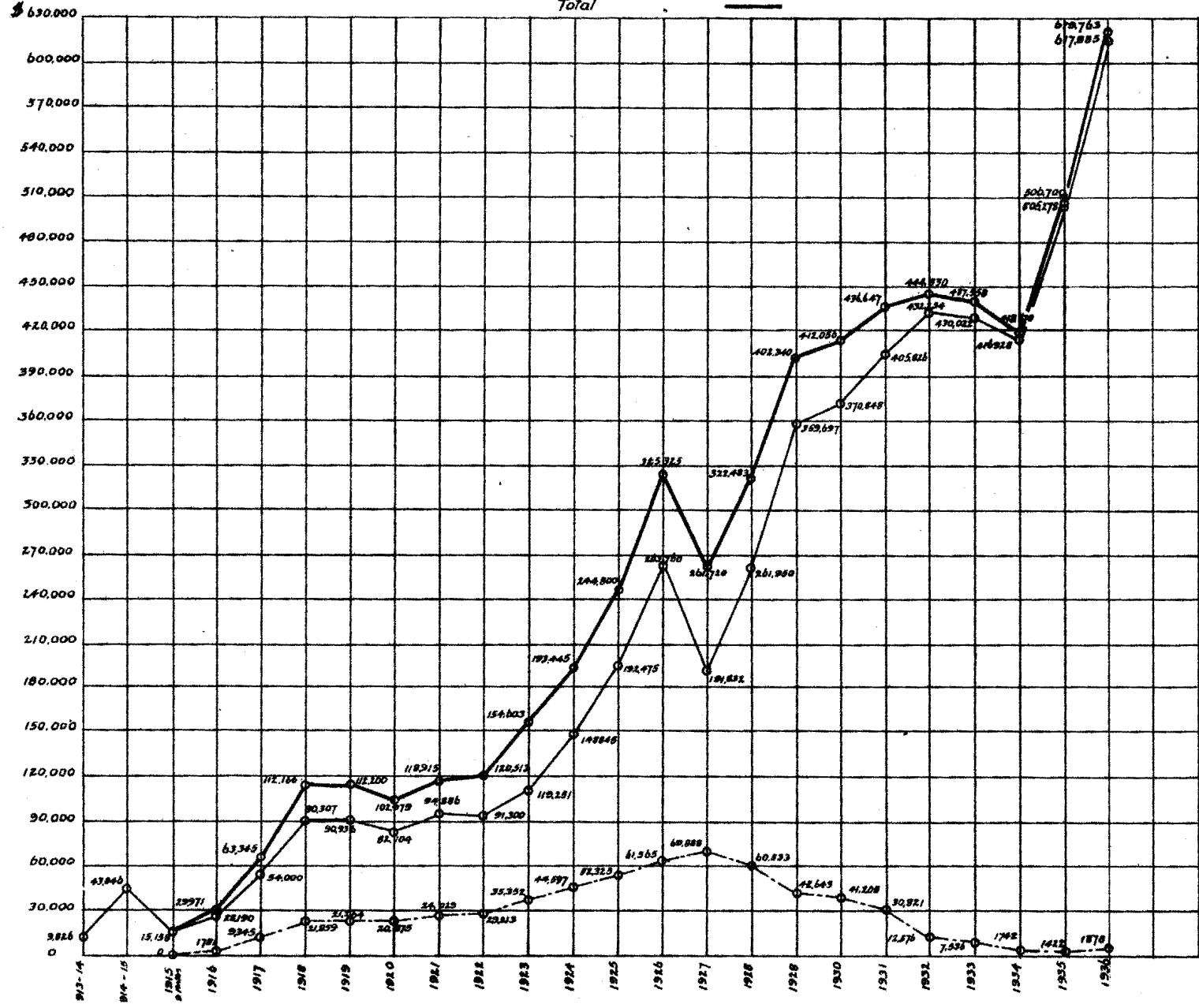
Chart showing the yearly total quantity of Minerals quarried and a comparison of the daily average number of persons employed in quarries in the Colony from 1st April 1911 to 31st December 1936

Minerals quarried — Persons employed —

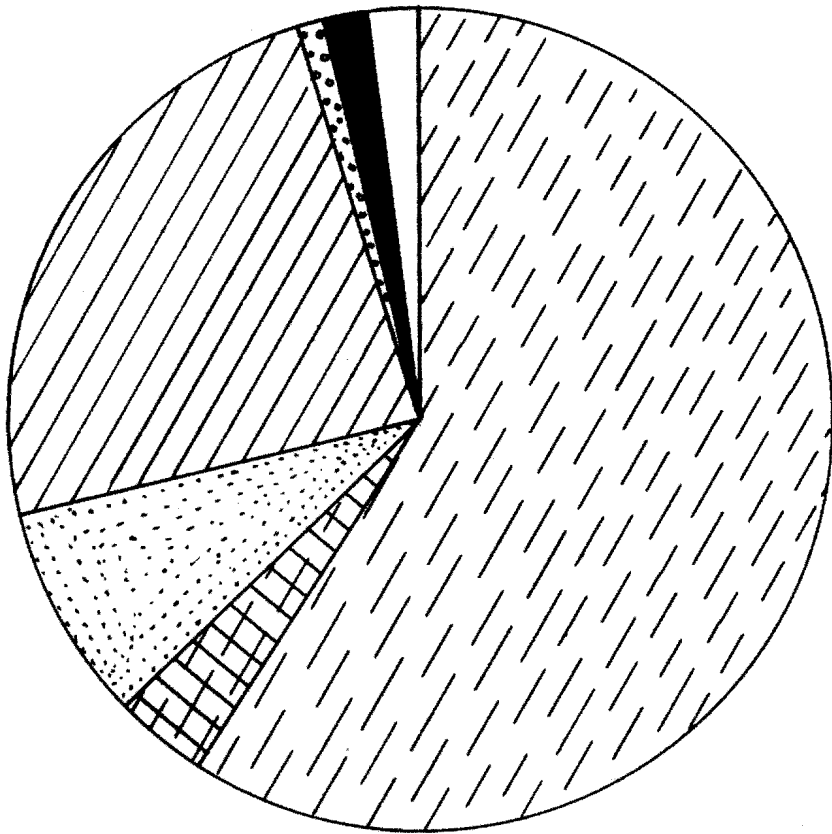








ROYALTY AND WAYLEAVE

Royalty shown thus ———
Wayleave - - - - -
Total



APPENDIX 'G'



<u>Mineral Exports</u>	62.6%	
Petroleum Products	59.1%	
Asphalt	3.5	
<u>Agricultural & other Exports</u>	37.4%	
Cocoa	8.7%	
Sugar, Molasses, Rum	23.9	
Coconuts, Copra, Coconut Oil	1.2	
Fruity & Fruit Products	1.6	
Other Exports	2.0	