THE PRODUCTION OF GOLD, PAST, PRESENT, AND FUTURE.

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TABLE OF CONTENTS

Chapter 1

THE PRODUCTION OF GOLD, PAST, PRESENT AND FUTURE.

The object of this thesis is to attempt to trace the history of the production of gold in the five leading gold producing nations of the world -- South Africa, Russia, United States, Canada, and Australia, in some detail; then to discuss the effect of the increased price of gold on its production, and finally come to a conclusion regarding the future production of this precious metal.

Gold has been known since the very earliest of times and its production has been carried on as far back as the most ancient civilizations. It was equally well known by the great nations of Egypt, Babylon, Greece and Rome, but with the barbarian invasions against the Roman Empire the working of the ancient mines ceased, and from that time until the discovery of America very little gold was produced in the world.

The discovery of America in 1492 was followed almost immediately by what was probably the greatest era of gold production the world had seen up to that time. The exploitation of mines by slave labour, and the looting of palaces temples and graves in Central and South America resulted in a flood of gold and silver that unbalanced the economic structure and unsettled the political control of the whole of Europe. Accordingly the world's annual production of gold rose progressively from 154,000 fine ounces in 1500 to 192,000 fine ounces in 1540, and 229,000 ounces in 1560, around which the figure oscillated until 1660. While the South American output rose to 208,000 ounces at the end of the 17th century, that of ~~Europe~~ AFRICA fell from 84,000ounces

to 54,000 fine ounces, and that of Europe from 53,000 to 27,000 ounces. The 18th century again showed an upward trend. New life was given to it by the output of Brazil, and the more methodical and deeper working of the mines then in existence. In 1700 the annual output was over 268,000 ounces and in 1760 over 643,000 ounces. Brazil alone started at 74,000 ounces a year in 1701, and reached an average annual production of 238,000 ounces during the years 1721-40, and 392,000 ounces from 1741-60. But this was ~~xxx~~ the culminating point. The revolt of the Spanish Colonies gave the death blow to this industry, and from then until 1840 gold production continued to decrease.[1]

To sum up, it is estimated that the total world production from 1492 to 1848, between the discovery of America and the California gold discoveries, amounted to 649,000,000 fine ounces. Of this 32.8% came from America, 40.8% from Africa, 18% from Russia and Siberia, and 8.4% from Europe. Of course it is unnecessary to state that these figures are only approximate.[1]

The First Modern Gold Age.

Three principal periods of gold production on a large scale are recognised in our times. The first corresponds with the almost simultaneous discovery of gold in California and Australia; the second began with the marvellous finds in the Transvaal, followed almost immediately by finds in Western Australia, Colorado, Alaska and the Yukon; and with the invention of new metallurgical processes (e.g. The cyanide process which caused a renovation in mining in South Africa and which is now in common use all over the world.) which caused a parallel revival in the older gold producing countries. The third period began

1 De Launay L. -- "The World's Gold" pp 91-95.

with the depression of 1929 when a great stimulus was given to the industry because of lower mining costs, (a direct result of depressed commodity prices) and the increased price for gold which culminated on January 31st, 1934 when United States began buying gold for $35.00 per fine ounce.

Among the discoveries which marked the middle of the 19th century, the earliest, and also the most sensational was the find in California in 1848. In February 1848 when California was ceded to the United States, the country did not contain more than ten thousand inhabitants. The discovery of the first nuggets took place in March. At the end of the year there were already six thousand gold seekers, and there were twenty thousand in 1849. By 1853 the inevitable exhaustion of the placers made itself felt and the era of the great hydraulic workings began.

It was then that isolated miners set out eastwards for new fields of endeavour. This led to the discovery of the famous Comstock mine in Nevada. In 1858 this marvellous deposit was found in the Washoe district. In all nearly 500 million dollars in gold and silver was taken from it. Miners still poured in and in 1864 the Eureka mine was also discovered in Nevada. This find in fifteen to twenty years produced more than 60 million dollars worth of gold and silver, of which 1/3 was gold. The flood passed into Utah, Colorado, Montana, Dakota, and to Arizona in the South. Prospectors then turned to the north, towards British Columbia, Alaska and the Yukon, or towards the south to Mexico, where the gold industry arose after 1894.

In Australia a little gold had been found in 1823 and 1839, but it was only in consequence of the excitement in California that intensive prospecting began which resulted in 1851 in really important quantities of gold being found in New South Wales, and then at Ballarat in Victoria. The rush which began at that time had by 1869 invaded the Northern Territory and interest became especially marked after 1870. It did not spread to Western Australia however until about 1893.

Finally, another great gold producing country in the 19th century was the Russian Empire. An advance began towards Eastern Siberia, and the Lena district was developed along with Transbaikal, Manchuria and Korea. By 1850 the Russian Empire produced over 600,000 fine ounces of gold a year. After 1870 the amount exceeded 446,000 ounces. In 1888 it was ~~940,000~~ 1,125,000 ounces, in 1895 it rose to nearly 1,280,000 ounces, and then began to recede continuously.[1]

The second notable period of gold production began in 1890 when the application of the cyanide process to the gold ores of the Rand made available an enormous amount of gold ore in that district. The discovery and development of the Rand was followed almost immediately by other important ~~dis~~cov~~v~~eries in the Yukon, Alaska, Nevada and Colorado, resulting in the peak of world production, up to that time, being reached in 1915 when the World's ~~xxxxx~~output exceeded 22,700,000 fine ounces. Between 1915 and 1922 annual production fell to 15,450,000 ounces. Since 1922 the trend has been again upward due chiefly to increasing production in South Africa and Canada. This brings us to our third period which seems destined to become one of the greatest eras of gold production ever experienced. A great deal

1 De Launay L. -- "The World's Gold" pp 95-102.

will be said about this period in the following pages. Let it be sufficient to say here that since the beginning, which we can place in the Autumn of 1929, the gold production of the world has been increasing steadily, and the future gives every indication of a further swing in this upward trend.

Chapter 2

SOUTH AFRICA

It was about 1850 that pioneers from Cape Colony reached the vicinity of what is now the site of Johannesburg. They found a low lying ridge of hills to which they gave the name Witwatersand meaning "ridge of White Waters". However, it was not until 1884 that gold was discovered, and the Main Reef series, from which subsequently most of the gold has been obtained, was not located until 1886.

The Witwatersand goldfield is located on an elevated plateau, nearly 6,000 feet above the sea. The Witwatersand itself projects somewhat above the plateau. The gold is found in conglomerate beds composed of quartz pebbles bound together by a siliceous cement. It is not often visible to the eye, occurring almost invariably in the matrix. There are several series of these conglomerate beds in planes more or less parallel to each other.

The Central and Western portions of the Rand were the first to be worked. Development advanced more slowly Eastward, and it was not until 1914 that the true importance of the Far East Rand began to be appreciated. The Central area was for many years the richest part, but to-day it is the Far East area that yields the most profitable ore and in which the development work is the most active. The ore of the West Rand has mostly been of a lower grade then the Central and Far East Areas, though the difference to-day is not so marked in the case of the Central Area.

In the ten year period 1924-33, the Transvaal mines contributed an average of 50% of the total world production. This percentage has fallen somewhat of late, due in part to the expansion of gold mining in other countries, and in part to the lower

grade of ore treated in the Transvaal since the Gold Standard was suspended in South Africa in January 1933.

The mines of the Rand are organized under what is commonly called the "Group System". There are at present 33 gold producing Companies. Each is a separate entity, having its own body of shareholders and electing its own body of directors. But the control and administration of all the companies with a few exceptions are, within limits, exercised by a few large mining-finance corporations.

The group organization supplements the work of the separate companies. It renders invaluable service of an advisory and supervisory character in large matters of finance. These services are those which would not otherwise be available except at excessive cost.

Along this line also, the Transvaal Chamber of Mines plays a most important part. It formulates a common policy in respect to such matters as wages, conditions of employment, and industrial relations in general. It deals collectively with legislation, accident prevention, and the problem of miners' phthisis. Under its auspices the huge native labour supply of the mines is provided, and it controls the various subsidiary industries and organizations that serve the industry as a whole.

In the early days mining was quite easy and primitive, but as the mines became deeper and costs began to rise, the situation became very serious. The problem was solved by the discovery of the cyanide process, whereby the gold was dissolved from the crushed ore by a weak solution of cyanide of potassium and precipitated from the solution by metallic zinc. It was first tried on a small scale in May, 1890. After the success of the first experiment it was adopted unanimously and the output of gold steadily increased. This led to the boom of 1895 which was checked by political causes. However, in 1898, 3,800,000 fine ounces of gold were produced with a value of almost $80,000,000.

In October, 1899, the Boer War broke out, and from then until peace was declared in May, 1902, very little work was done. With the introduction of Chinese labour in 1904 due to the shortage of native labour owing to the war, production began to increase again and by 1909, 7,300000 fine ounces were extracted. Production still continued to increase until by 1916, 9,300,000 ounces of gold were recovered. After 1916 there was a large reduction due to the World War.

The War, coupled with the increase in cost of stores and wages, reduced production a great deal. An attempt to get back to reasonable conditions resulted in the strike of 1922. However, in 1923 production rose to 9,150,000 fine ounces which increased in the following years until in 1932, 11,550,000 ounces of gold were recovered.

There have been several factors which have greatly aided South Africa in its production of gold:-

1. Cheap unskilled labour.

2. A plentiful supply of good steaming coal within a comparatively short distance. The coal can be delivered at the colliery pit head for 75¢ a ton, and for even less in some cases.

3. Adaptability of the Cyanide Process.

4. Uniform character of the gold bearing deposits.

5. Absence of heavy pumping charges.

6. Good water supply.

However, against these there are also two factors which have hindered gold production:-

1. Government taxation. The taxation on the mines both direct and indirect is heavy, but the existing depression has brought home to the country the importance of the industry from a National standpoint, and there is room for hope that the future will bring about a better understanding of its needs and difficulties.

2. Deepness of the mines. The mines in the Central, Near East, and Near West districts are getting deeper, and as they get deeper, their difficulties increase. This will be explained in more detail in the following pages.

The three vital factors affecting the future, are working costs, the attitude of the Union Government, and the price of gold. To obtain the full significance of the rise in the price of gold to $35.00 a fine ounce upon the production in South Africa, it would first be well to show the conclusions reached by Dr. H. P. Pirow,[1] Government mining engineer for the Union of South Africa, and Mr. Joseph Kitchin in his report to the League of Nations in 1929, and then compare them with the results up to the present time.

1 League of Nations -- "Interim Report of the Gold Delegation of the Financial Committee." Geneva, 1930. pp 24-35.

Dr. Pirow, in an estimate of the future production of gold in South Africa in 1929, says that there are various factors which will affect the future production of gold.

1. Mines whose life is over and will have to shut down.
2. Mines which have altered their rate of crushing.
3. Mines which have acquired further ground.
4. A reduction in working costs, and a "cleaner Mining" policy.

From 1924 to 1929, three mines have shut down, 13 increased their rate of crushing, 2 have decreased their rate, and 16 have acquired more ground either by lease from the Government, by purchase, or by amalgamation. As regards a "cleaner mining" policy, there are certain areas where tonnage has been materially increased due to such a policy.

In 1926 there were 42 producing gold mines, and these produced nearly 10,000,000 fine ounces of gold. Of these,

14 had official lives of 5 years.
15 had official lives of from 5 - 10 years.
8 had official lives of from 10 - 15 years.
3 had official lives of from 15 - 20 years.
2 had official lives of from 20 - 30 years.

From 1926, when crushing capacity was 29,800,000 tons, Dr. Pirow estimated that by the end of 15 years this would be reduced to 6,350,000 tons, a decrease of almost 80%.

This seems to be a very discouraging report. However, as Dr. Pirow points out, there are still promising areas of the Sub-Nigel region and of the Far East Rand which can be leased from the Government. As it would take new mines from 4 to 6 years to reach the producing stage, such production, if provided for now, would commence in time to counteract any serious decline in output which

might be threatening.

A reduction in working costs of tons milled may be attained, but only to a very small degree, as we may expect an increase in working costs as the mines get older, due to excessive depth and limits in atmospheric and heat conditions beyond which human work cannot go. Costs of shaft sinking, stoping, hoisting, and pumping also rise as the mine gets deeper. Rising temperature raises the cost of ventilation, and as the pressure increases more support is needed. However, of a number of mines examined in the Far East Rand in 1924 and 1926, twelve show a reduction in costs, while only two show increases per ton milled. Therefore, one may conclude from the marked downward trend in the working costs of the Far East Rand, that a measure of optimism regarding the opening up of further mines in this area is justified.

However, on the other hand, there are certain factors which may result in a shrinkage of production.

1. A rise in working costs.
2. Shortage of European or native labour.
3. Industrial upheavels.
4. Lack of capital.
5. Increasing depth of mine workings.

1. It is of the utmost importance in the gold mining industry that working costs be kept down, and it is evident that a small increase in such costs will have a serious effect on the industry as a whole. The value of gold unlike most other commodities is not governed by the cost of production of the marginal producer.[1] It is the cost of mining gold which affects its supply. When costs of mining are high, and there is a general rise in prices, it makes things very hard for the poorer mines, and in many cases

1 Taussig F.W. -- "Principles of Economics." vol.1, pp 259-60

forces them to cease production. Thus it is of great importance to the gold mining industry that working costs should be kept as low as possible, and the lower the prices the better it is. In the long run the value of gold determines what mines shall survive and which shall shut down.

2. A shortage of labour either skilled or unskilled may also have serious effects on the mining industry as on any other industry.

3. As regards industrial upheavels; not only can loss of production not be made good, but there is also the danger that some of the lower grade mines, owing to flooding or caving during a complete stoppage, may be seriously or even permanently crippled.

4. Capital is needed to open up new mines. Thus any serious depression in the money market will affect the industry to a very great degree as there always is a considerable risk in opening up a new mine. In times of depression people will not be willing to take this risk.

5. Of course, the deeper the mine the greater the working costs such as has been pointed out before. As many of the South African mines are getting deeper, this problem is a very serious one.

Taking all these points into consideration, Dr. Pirow gives the following statistics regarding the future production of South Africa:-

Year	Thousands of fine ounces.	Year	Thousands of fine ounces.
1930	10,220	1940	6,000
1931	10,000	1941	6,000
1932	10,300	1942	4,730
1933	9,980	1943	4,730

Year	Thousands of fine ounces.	Year	Thousands of fine ounces.
1934	9,590	1944	3,700
1935	9,280	1945	3,700
1936	8,050	1946	2,740
1937	8,080	1947	2,360
1938	8,080	1948	2,350
1939	6,580	1949	2,350

Mr. Joseph Kitchin maintains that there is reason to believe that 1915 with its total of 22,700,000 ounces will prove to be the zenith of the world's gold output. He goes on to say that more than half of the world's production is obtained from the Transvaal, most of whose gold comes from the Rand district, which may be divided into two areas, the Old Rand consisting of the Western, Central, and Near Eastern sections, and the New Rand consisting of the Far East section. The Old Rand reached its zenith in 1912 with a production of £32,400,000 ~~ounces~~, but in 1929 produced less than 2/3 of this quantity. Its production is likely to drop markedly. The new Rand arose some sixteen years later and is likely to continue to increase until about 1932 or 1933, then to decline moderately until 1940, after which it will probably decrease at a more rapid rate.[1]

Mr. Kitchin after a careful study of all possibilities makes the following estimate regarding future gold production in the Transvaal:

1 League of Nations -- "Interim Report of the Gold Delegation of the financial Committee." Geneva 1930. pp 58-60.

Year	Thousands of fine ounces.
1929	10,400
1930	10,300
1931	10,100
1932	10,500
1933	10,320
1934	10,100
1935	9,860
1936	9,750
1937	9,600
1938	9,080
1939	8,360
1940	8,340

It will be noticed that Mr. Kitchin is not quite as pessimistic as Dr. Pirow. However, the two estimates are the same in one respect; that they both show a decided downward trend especially from 1936 on.

Now let us see how these two estimates compare with the figures we have up to 1935.

PRODUCTION OF GOLD IN SOUTH AFRICA (1884-1935).
(thousands of fine ounces)

Year	Production	Year	Production
1884	2	1911	8,249
1885	1	1912	9,108
		1913	8,798
1886	8	1914	8,394
1887	39	1915	9,094
1888	227		
1889	351	1916	9,297
1890	440	1917	9,018
		1918	8,418
1891	688	1919	8,331
1892	1,069	1920	8,158
1893	1,200		
1894	1,805	1921	8,129
1895	2,017	1922	7,010
		1923	9,149
1896	2,025	1924	9,575
1897	2,744	1925	9,598
1898	3,823		
1899 '	3,637	1926	9,955
1900 '	348	1927	10,122
		1928	10,354
1901 '	258	1929	10,412
1902 '	1,718	1930	10,716
1903	2,971		
1904	3,771	1931	10,878
1905	4,908	1932	11,559
		1933	11,014
1906	5,792	1934	10,576
1907	6,451	1935 (a)	10,700
1908	7,056		
1909	7,295		
1910	7,527		

(a) estimated
' War years

Figures taken from the Official Year Book of the Union of South Africa.

It can be seen by a comparison of these figures that Dr. Pirow and Mr. Kitchin have to a considerable extent under-estimated the future gold production of South Africa. Was this under-estimate just an error in foresight, or were there other factors which entered into the field, that were entirely different from anything which these two men suspected?

In the last few years several events have taken place which have materially altered the gold mining industry of South Africa as well as the world. When South Africa went off the Gold Standard and adopted a Sterling Standard in January, 1933, the mining companies were greatly benefited because it enabled them to sell their product at a premium. The abandonment of the Gold Standard enabled the mines to reduce costs of production and work immense tonnages of low grade ore hitherto disregarded in the mines. Increased attention can now be devoted to the opening up of new areas. The prospects of large low grade gold bearing areas where only a very limited amount of work and exploitation had been possible in the past has been improved, and other branches of the mining industry should stand to gain materially. Present operations should expand, and enterprises that have been closed down, will now have a chance of restarting.

In 1931 it was estimated by Dr. Pirow that the operating mines of the Rand had a total of 330,000,000 tons (90,000,000 oz.) of payable ore within their boundaries, and as the rate of production was then about 31,000,000 tons a year, the reserves would last only about eleven years.

The devaluation of currency has added 330,000,000 tons of ore assaying between 1/5 and 1/4 fine oz. per ton to existing reserves, and in addition has converted into payable ore a tonnage

as yet unestimated, that assays between 3/20 and 4/20 fine ounces per ton. Also, numerous mines which were abandoned because of unprofitable ore have been reopened and are earning profits on previously uncommercial ore. It is estimated that already well over 100,000,000 fine ounces have been added to the potential gold reserve of 90,000,000 ounces estimated by Dr. Pirou in 1931. With the increase in the price of gold in January, 1934, to $35.00 per fine ounce, the above estimates should be materially increased, and the future of the gold industry of South Africa considerably enhanced.

However, before one takes too optimistic a view of the future, it would be well to consider that operating costs must also be considered, and to note that a rise in wages would considerably hamper and decrease the above future estimates. The mine owners represent that wages were largely increased during the war on account of the rise in living costs, but have not been correspondingly reduced since living costs have fallen, and that all interests depending on the industry will gain by lower operating costs. This is undoubtedly true, but the mine workers contend that wages should increase because the gold is worth more and the companies are making larger profits, and it may be argued that there is a great deal of truth in what they say. Obviously, the effect upon mining will depend upon whether or not operating costs actually are reduced in relation to the value of the product. During 1934 the Miner's Union of South Africa made a demand for a wage increase of 35%.[1]

Taxation is also a vital question in South African mining circles. It has an indirect effect upon gold mining by tending to retard development, and it adds an extra burden to the

1 National City Bank, March, 1933.

cost per ton of ore milled. This burden can be easily assumed by the high grade mines, but it hits the low grade ones very hard, and in many cases forces them to cease production. The South African mines have yielded the Government a good deal of revenue ever since their beginning, due to a substantial degree of taxation. This burden which the mines are bearing will have to be reduced in order that lower grade ores may be profitably worked. But we may assume that the Government will not kill the goose that lays the golden eggs so long as any laying capacity remains.

Indeed, General Smuts in a speech at Johannesburgh, in June, 1935, said that energy would now be concentrated on the encouragement of an enormous expansion of the mining industry. He does not say what changes will be made, but he appeared to foreshadow a revision of the taxation system more in the interests of mining. This will affect the life of various mines and will raise many questions of low grade and high grade ores, and of the effect of different schemes of taxation.[1]

It is thus becoming apparent that two of South Africa's chief hindrances to production, high working costs and taxation, are being solved. The former by an increased price for gold, and the latter by a Government which is leaning more and more towards a policy which is favourable to the mining industry. In consideration of these favourable factors and granting that operating costs will not increase to such an extent as to wipe out the benefits which have accrued to South Africa's gold industry in the last few years, we may safely say that South Africa will play a major part in the gold industry of the world for a much longer time than was expected prior to 1931.

1 London Economist -- June 22nd, 1935.

Chapter 3

RUSSIA

The history of gold production in Russia can really be divided into two periods. The first starts about the middle of the 18th century and continues up to the beginning of the Great War in 1914. The second begins in 1921 after the Russian Revolution. It is this second period which we are most interested in, because of the extraordinary strides taken in the production of gold from 1921 up to the present time.

Gold is found in the Urals, Caucasus, Western, Central, and Eastern Siberia. Before the War, Russia ranked fourth among the gold producing countries of the world; to-day, owing to the enormous expansion which has taken place in this industry, she stands second, South Africa alone having a greater yearly production of this precious metal.

The principal gold mining districts are the Urals, Western Siberia, in the Province of Tomsk, the Altai Mountain region, the Yennissey district, the Irkutsk district, the Aldan region, the Far East region consisting of the Provinces of Transbaikal and Amur, and the Maritime region consisting of Primorskaya and Kamtchatka.

Urals

The Ural gold mining region is situated in the Provinces of Perm, Orenburg, Viatha and Ufa, and represents the old gold bearing district of the U.S.S.R. Gold was discovered there in 1742 near Sverdlovsk, and in this neighborhood there are a number of gold fields which border on the Ural Mountains, and which spread out in a wide plain from North to South, extending for hundreds of square miles. The gold areas start North of the Urals in the basin of the river Sosva and extend to the south Urals close to the

Mugodjar Mountains. The gold strata of the alluvial beds are not deep and in their yield and extent are inferior to those of Siberia. Many of these areas were exploited in pre-war years by Belgian, French, German, and English groups who took over various grounds and worked them to exhaustion. Vast areas, however, are still untouched and although the gold deposits of the Urals have been known for more than 200 years, only a small portion of their mineral wealth has as yet been worked. The average pre-war output was about 350,000 fine ounces per year.

In a report given by the Geological Committee of the U.S.S.R. there are numerous gold bearing conglomerates, similar to the South African formation, in the Bogoslov region which assay from $4.50 to $12.50 per ton of ore. Other original gold reefs are situated in numerous parts of the Urals, and up to the present very little has been done in exploiting the southerly and northerly parts of this region.

Until a few years ago the output was relatively small because most of the gold had been obtained by primitive means. With the development of ore mining in the last few years, the Ural district has shown rapid growth. Output during the first "Five Year Plan" increased by over 100%. Again, new deposits in the Northern Urals discovered in 1933 have opened up great prospect for this region which increased its output in 1933 over the preceeding year by 85%.

Undoubtedly under modern conditions, with modern machinery and greater metallurgical knowledge, the great wealth of these mountains will be brought to light as important producers in the gold mining industry.

The Western Siberian Region.

The gold mining districts of Tomsk, Brianskp and Atchinsk in the Province of Tomsk, were in pre-war years private crown lands. Now they have been nationalized, and concessions can be obtained from the Soviet Government. In neighborhood of Atchinsk gold was first discovered in 1832, and although mining was carried on in a very primitive manner, the workings, nevertheless, proved highly productive. The alluvials in this district are very rich, and the mineral veins frequently contain ore assaying from $20 to $38 per ton. The Trans Siberian railway which runs through the province, and the coal beds which are in close proximity, will promote and greatly facilitate the development of this mining area.

The Altai Mountain Region.

Equally important are the gold beds of the Altai Mountains in the districts of Marminsk and Kuznetsk. In the Altai Marminsk region in the autonomous Province of Oriat, alluvial gold is found in many places. Up to 1923 the production of gold obtained in this region was over 7,000,000 fine ounces. In this area gold is not only obtained from alluvials, but also from reefs in the Altai Mountains. The mine at Kusnetsk is the principal gold producer having a total output of 4,500,000 fine ounces, up to 1917. Alluvial gold is also found in the rivers of the surrounding country, and over 4,000,000 fine ounces had been produced by 1922. Ore mining is now being introduced in this region, and prospects for this type of mining seem very bright. The navigable River Yennissey, and the Trans Siberian railway are great assets for the future development of gold mining in the Altai gold region.

The Yennissey District.

The Yennissey gold fields are situated in the district of Krasnoiarsk and Mariansk and Mimusink. They are some of the oldest known Siberian gold placers. The ground is highly mineralized, and the numerous coal beds situated near by are of course very important. Up to 1923 the production of the Yennissey region was 18,000,000 fine ounces, equal to 20% of the total Russian production. The gold bearing alluvials are mostly situated on the right tributary streams of the river Angara, and the left tributaries of the Tunguska and Pit rivers, which divides the whole country into north and south systems of gold territories.

The Irkutsk District.

In the Irkutsk District of Central Siberia are the gold fields of Burisinsk, Pre-Baikal, and the North slope of the Sayan mountains. The Burisinsk district is eminent for its striking richness. Up to 1917 the gold production amounted to 1,200,000 fine ounces. This region has great mining prospects, as also has the whole western country of the Baikal Sea.

The Lena District.

In the Lena Region gold was first discovered in 1846, and in 1860 the very rich alluvials of Bodaibo produced 56% of the gold recovered in the district. The river Vitim and its tributaries also contain very large alluvial gold deposits. In 1915 the production of the Lena district was over 500,000 fine ounces. Up to 1923 the total output of the whole region amounted to 19,500,000 fine ounces, equal to 21.8% of the total production of the U.S.S.R. The whole region of the Lena goldfields is still very rich in gold, and much of the country is still to be explored. The reserves of this area as regards the extent of the deposits and the average

content of the metal, are undoubtedly one of the richest in the world. The Khomolkho mine in this district contains a great deal of gold which can be extracted by means of open mine work. As yet ore mining has not been introduced into these parts, and the development of this type of mining constitutes one of the chief tasks of the gold industry during the "Second Five Year Plan".

The Aldan Region.

In the Province of Yakutsk are situated the richest known gold fields of Siberia. Geological researches in this region have not only increased known gold reserves, but have opened up new hydraulic workings and ore mines. The richest part of the Province so far known is the celebrated Alakina mine which is one of the richest in the world, and has a possible production of over 500,000 fine ounces of gold a year.

This gold region, first discovered in 1923, has recorded marked development in the years of its existence. The gold deposits have still to be surveyed, but it can already be stated that it is a district of enormous reserves, and now that primitive methods of recovery have been replaced by mechanical and electrical, the Aldan is expected to become one of the Soviet Union's largest gold bearing districts. No railway has as yet been built into this area, but construction of one in the direction of the Stanovoui mountains should only be a question of time. Even at that, during the period 1923-33, the Aldan gold fields together with the Lena district accounted for 60% of the total output of the U.S.S.R.

The Far East Region.

In the Far East a number of new and industrially important fields have been opened up, both of vein and placer gold, with a growing tendency for the predominance of ore gold. The principal

districts of this region are the Provinces of Transbaikal and Amur. In the Province of Transbaikal the most important alluvials are on the rivers Ingod, Onon and Shilka. The reserves here are very large, and a characteristic of the gold alluvials in this area is the presence of large nuggets of gold.

The Amur district is situated on the Amur river and its tributaries, Zeya, Selimja, and Bureya. Up to 1923 the production for this area amounted to 9,000,000 fine ounces, about 10% of the total production of the U.S.S.R. Some of the alluvials are worked out, but large reserves are still available for exploitation. The gold bearing strata of the mines in the Amur are very favourable for exploitation because they lie at no great depth.

Maritime Region.

This district is divided into two sections, the Province of Primorskaya and that of Kamtchatka. The main gold field of Primorskaya is situated on the system of the river Amgum. Up to 1923 the production of this district was about 1,500,000 ounces. The Kamtchatka region is very auriferous. Production of gold to 1919 amounted to only 50,000 ounces, but there are large reserves in store. The country is very little known, not having been explored, but prospectors have proved the presence of rich gold bearing alluvials on many rivers. On the Chukchis Peninsula American prospectors recovered gold on the river Nodo assaying at $16 per ton. The region is quite similar in geological formation to Alaska.

GOLD PRODUCTION OF THE U.S.S.R. (1882-1935).
(fine ounces)

Year	Production	Year	Production
1882	1,000,000	1891	1,250,000
1883	825,000	1892	1,400,000
1884	1,100,000	1893	1,440,000
1885	1,010,000	1894	1,450,000
		1895	1,280,000
1886	1,070,000		
1887	1,120,000	1896	1,680,000
1888	1,125,000	1897	1,160,000
1889	1,200,000	1898	1,200,000
1890	1,250,000	1899	1,229,000

The average production from 1900 to 1908 was 1,325,000 fine ounces.
The average production from 1908 to 1912 was 230,000 fine ounces.

Production of gold almost ceased from 1913 to 1924 because of the Great war, the Revolution, and the chaos which followed for several years after the Revolution.

Year	Production	Year	Production
1924	344,000	1930	1,050,000-1,400,000
1925	800,000	1931	1,030,000-1,700,000
1926	800,000	1932	1,750,000
1927	600,000-820,000	1933	2,500,000
1928	675,000-900,000	1934	4,200,000
1929	800,000-1,050,000	1935	5,500,000

1882-1923 -- Figures taken from the Far Eastern Review, July 1932.

1924-1933 -- Figures obtained from the Statistical Year Book of the League of Nations, 1934.

1934-1935 -- Figures obtained from the American Bureau of Statistics, the 1935 figure being only an estimate.

After a glance at the above statistics it can be clearly seen that the Soviet gold industry has been showing steady progress during the last few years, and modern mechanized production is now rapidly replacing the primitive hand methods which predominated in Tzarist days. From the low point of 1920-21 when, due to the havoc wrought by the Revolution, gold production practically ceased, the industry has been gradually re-established. By 1927 regular production was restored and the Soviet Union had regained its pre-war rank as fourth among the world's gold producers. However, output was still only half of the 1913 figure, and the share of Soviet Union in world gold production had fallen to 5.5% as against 8.3% in 1913. During the succeeding period, that of the first "Five Year Plan", significant strides in the development of the gold industry were made. By 1931, the 1927 production figure had been doubled by an output of approximately 1,750,000 ounces, bringing production above the pre-war level. During 1933 the industry developed at an increasing rate. For the entire year production amounted to 2,500,000 ounces, was 40% above the preceeding year and about double that of pre-war years. The industry made an amazing advance in 1934 with a total production of 4,200,000 fine ounces and raised Russia to second place, following the Transvaal, in world gold production. Production continued to increase during 1935, the output being estimated as 5,500,000 ounces. Thus in the short period of ten years the Soviet Union has increased its production of gold sevenfold. This is truly a remarkable achievement, and goes to show that the U.S.S.R. is making no idle boast when it claims that it will soon rival South Africa as the world's greatest producer of gold.

These results have been brought about by a basic reconstruction of the entire industry, extensive mechanization and administrative reforms, and large scale geological prospecting. The primitive hand methods formerly in vogue have to a large extent been replaced by the most modern equipment produced in large part in Soviet factories. The percentage of gold produced by mechanical methods amounted to 70% in 1933 as compared with 55% in 1932, 25% in 1928 and 20% in 1913. In 1928 there was not a single "American" type enterprise (i.e. a plant handling the complete set of operations in the treatment of gold ores); in 1934 there were six such plants. The number of amalgamation works has increased from 34 to 85, electric dredges from one to sixteen. The number of steam and electric dredges together increased threefold, and in 1934 totalled 85. Hydraulic installations increased from 32 to 190. The supply of equipment and machinery, however, is still far from adequate. During the next few years scores of additional powerful dredges, excavators, crushers, drills and scrapers, as well as a great deal of hydraulic machinery and other equipment will be needed. Domestic production of gold mining machinery is to be expanded, but a considerable portion of such machinery will in all probability be imported.

In connection with the introduction of electric dredges about 40 power plants were built in the gold regions during the first "Five Year Plan". Additional power plants with a total capacity many times that of the existing network are to be completed within a short time. The aim is to raise the share of mechanized production to 85% by 1937, and to increase output to a point where the Soviet Union will approach the level of the Transvaal.

A great deal of capital is also being invested in the industry. The total capital invested before the war amounted to only about $50,000,000. During the four years 1929-32 alone, a sum of nearly $250,000,000 had been invested by the Soviet Government. These investments have made possible extensive geological and other research work, the opening up of new mines, and the introduction of mechanized production. Up to 1918 only 10% of the entire territory of the Soviet Union had been geologically surveyed and mapped. By 1933 this percentage had reached 35 and during 1934 eighty-one geological expeditions charted another 78,000 square miles.

The remoteness of the rich gold bearing districts from the other industrial centres has necessitated the expenditure of considerable sums to improve transportation facilities. Hundreds of miles of railway lines have been laid in the gold mining districts, and road and water transport is being steadily improved. Aeroplanes are becoming more and more important and the 1932 transportation programme included the opening up of new airlines connecting the gold fields with the large industrial centres.

Among the organizational changes which have contributed greatly to increasing the efficiency of production, has been the liquidation of unnecessary administrative organs, the breaking up of unwieldy producing trusts, and the transfer of specialists from office jobs to the field.

Another important factor which has undoubtedly stimulated the gold industry in the U.S.S.R. is the Soviet Union's need for gold. The vast industrial expansion during the last ten years has necessitated the importation of an enormous amount of raw materials, machinery, and skilled labour etc. These goods must be

paid for. At the present time Russian exports and all favourable balances are insufficient to do this, and therefore the only other means of payment is gold. Russia isn't in a position to obtain this gold by trade, and so turns to the only other practical means of obtaining it -- by mining. Thus, by increasing her production of gold, she is not only able to pay for her surplus of foreign imports, but she is also making her credit more secure, and in this way persuading other nations to have more confidence in her, a fact which is of fundamental importance to a country in such a position as Russia finds herself in today.

Despite the considerable development and high rate of growth obtained in the gold industry, Soviet authorities believe that they are far below the real potentialities. The development has been hampered by lack of machinery, scarcity of power and transportation facilities in the gold regions. The transportation problem is particularly acute on account of the great distance of the gold fields from the populated centres and between various mines. These difficulties are rapidly being overcome, and in the near future the result of these improvements will undoubtedly be seen in higher production figures.

According to L. Shlounde, British mining engineer, "the rich gold fields of the U.S.S.R. are destined to be the most important available source of gold production for the world market." He goes on to tell of the vast gold reserves of the Soviet Union, and concludes by saying, "that the gold treasure of Soviet Russia has so far only been partially estimated."

Sir George Paish, eminent British economist also stresses the importance of the U.S.S.R. as a gold producer. He claims that gold is known to exist in large quantities, and had it not been

for the war, Russia to-day would be producing gold on a scale that would remove all anxiety as to future supplies. It might be added that Russia with a production of 5,500,000 ounces in 1935 has expelled all fears of a shortage in this highly important metal.

According to A. Serebrousky, head of the gold industry of the U.S.S.R., the Soviet Union possesses the largest gold reserves of any country in the world. The reserves of placer gold are considered almost inexhaustible, and placer operations still produce most of the gold, although not as much as formerly. Before the war, ore gold constituted only 15% of the total production; in 1932 it had risen to over 30%. Considerable development along this line is still taking place especially in the gold districts of the Urals, Western Siberia and the Yennissey basin.

Considerable remains to be done also in applying the latest technical methods and equipment. Individual prospecting is now being encouraged, inasmuch as there are innumerable comparatively small gold deposits suitable for exploitation by small co-operative groups, or by individual workers. Hitherto, there has been a tendency on the part of local officials to discourage individual prospecting, but this has been stopped. Special privileges are now provided to encourage this important branch of the industry which adds thousands of ounces to the gold production every year.

A word of warning might not come amiss at this stage. As the contents of what has gone before has originated from a strictly Russian source, it might be well to take the facts mentioned with a grain of salt. Knowing Russian propaganda as it is, and knowing of their aptness to exaggerate the benefits of their regime as much

as possible, it appears to be wise to discount a little some of the rosy facts shown to us. Again true figures of production are very hard to obtain, especially since 1923, and many of the figures are only based on percentages which leaves us with a feeling that many things are none too clear. However, the general trend cannot be denied, and that trend is obviously leading to a greatly stimulated output of gold. The growth of that industry in the last few years is indeed phenomenal, and in view of the steady advance of technical methods, the growth so far shown is only a beginning. It is probable, and this is said in all seriousness, that in the not distant future, the production of gold in Soviet Russia will overtake the output of South Africa and bring the U.S.S.R. first in world gold output.

Chapter 4

UNITED STATES

Although production of gold in the United States began in the South Eastern States as early as 1800, and has been continuous ever since, the total production has come mainly from the Western States, in the Cordilleran region, where mining first began with the Californian gold rush in 1848. Up to that time the maximum annual production was 58,000 fine ounces in 1843, but, after the discoveries in California, production increased rapidly, mainly from placers, and attained a peak of 3,114,375 ounces in 1853. It then declined rather rapidly until 1862 as the most easily worked placers became exhausted. However, prospectors soon spread rapidly over the whole area of the Cordilleras, and discoveries in other Western States caused fluctuations in production, but the total output on the whole declined until 1883 when it was about 1,451,000 fine ounces. It remained between that amount and 1,687,000 ounces until 1892, when the discovery of gold at Cripple Creek, Colorado, began a great advance which continued with minor fluctuations until 1915. This advance was aided to some degree by the introduction of the cyanide process in 1890 and by the lowest general cost level for many years, which made it possible to work deposits that were not workable before. But comparison of production by States with that of the whole country, shows that the increase was mainly from Colorado whose output since 1892 has come chiefly from the Cripple Creek district. The development of dredging in California in 1896 further accelerated the advance, and successive discoveries, mostly of placers in Alaska beginning in 1904, and of lodes at Tonopah and Goldfield in Nevada in 1903 and 1905, more than offset declines in production from some

of the older districts. In 1915, high costs and the shortage of labour caused by the World War resulted in a general rapid decline in production that continued until 1920. Slight recoveries were recorded in 1923 and 1924 as a result of increased production of by-product gold from copper ores, but on the whole the output gradually declined until 1929, when 2,208,000 fine ounces were produced. The higher costs after the war partly account for this continued decline, but it is generally recognized that many of the leading districts had reached or passed their maximum output before the World War began. However, with the falling prices due to the depression beginning in 1929, costs of production decreased and production began slowly to rise. The Gold Act of January, 1934, gave a further stimulus with the result that the output increased very rapidly and by 1935, the United States with a total yield of 3,426,000 fine ounces had again forged ahead of Canada, to become the third largest gold producer in the world.

The gold output of the United States can be divided into three categories:-

(1) That obtained from placer mining.

(2) That obtained from quartz mining.

(3) That obtained as a by-product from silver, copper and other ores.

Early production in both Eastern and Western States as well as in Alaska came chiefly from placer mining. Lodes became an important source soon after 1850 when the Comstock Lode in Nevada and the Mother Lode and Grass Valley districts in California attained prominence, and by 1875 their annual production exceeded that of the placers. The Comstock mine alone, discovered in the

Washoe district, Nevada, produced during its lifetime over 7,000,000 ounces of gold with a total value of almost $140,000,000. This Lode type of mining has continued to be the chief source of gold up to the present time. Placer production after being maintained at the annual rate of about 600,000 ounces from 1896 to 1904, by dredging mainly in California, increased rapidly with the discoveries in Alaska, and remained above 1,000,000 fine ounces until curtailed by war activities in 1916.

Base metal ores contributed only a small fraction of the total output until recent years, when their increased output has accompanied the marked decline in production from dry and siliceous ores and placers. Copper ores have steadily out-ranked the others except in 1921 when extremely dull industrial conditions caused the suspension of copper mining. Production on a substantial scale from low grade copper ores began in 1907, but the total by-product gold from copper ores did not increase appreciably until 1915 when copper mining was stimulated by war conditions. Recovery from the depression of 1921 was marked by another pronounced increase of gold production from copper ores, which by 1929 closely approached that from placers and is expected to exceed it in the next few years after the dredging in California has been exhausted. Lead ores have contributed about 50,000 to 100,000 ounces annually. Lead zinc ores furnished a smaller amount until 1924, when their output began to increase owing to the introduction of selective flotation, and it has exceeded that from lead ores since 1925. The State of Utah is especially important for this type of mining, producing over 50,000 ounces of gold from lead zinc ores in 1927.

California is outstanding as the first and most consistent large gold producer. It was surpassed by Nevada from 1876 to 1878 and again in 1910 and 1911, by Colorado from 1897 to 1910, and by Alaska in 1906 and 1907; but its great quartz lodes and dredging ground have outlasted the richest deposits of other states. Even since the war years California has maintained its high rate of production the longest, and then declined by far the most gradually. Colorado's rapid gain from 1890 to 1900, and its subsequent decline was due mainly to the discovery, rise and decline of the Cripple Creek district, and Alaska's gain has resulted from successive discoveries of placer deposits, and a few extensive low grade lodes. Nevada's record of production contrasts with those of other leading States in having two widely separated peaks, the first, due mainly to the production on the Comstock Lode in 1872 to 1879, and the second to production in the Goldfield district in 1905 to 1915. South Dakota's production has come mainly from the Homestake mine discovered in 1876 in the "Black Hills". The output of this mine has been very evenly maintained, and at present is the leading producer in the United States.

In 1933, California with an output of 595,000 fine ounces was the leading gold producer of the United States. Approximately three fifths of the production was from lode mines and two fifths from placers. South Dakota and Alaska with 520,000 ounces and 457,000 ounces respectively were next in importance, the Homestake mine in South Dakota accounting for the greater portion of the output in this State. The alluvial mines of Alaska are of great importance accounting for more than half of the total production for this area. Colorado with an output of 265,000 ounces is in next

place, the principal mines being in the Cripple Creek district which yielded bullion in 1933 equal to almost half of the total production. Nevada with a production of 101,000 fine ounces in 1933 is next in importance. Utah, Arizona, Montana, Idaho, New Mexico, and Oregon together produced about 320,000 ounces in 1933. The production of Utah is obtained from gold copper and lead-zinc ore, while that of Arizona is almost entirely of gold ore. Montana's production is also made up of gold and copper ore, as is that of Idaho, while in New Mexico lead-zinc ore yielded 73% of its entire production. Gold is found in numerous other states, but only in small amounts and their output is of very little importance.[1]

Seventy percent of the mine output of the United States in 1933 represented the yield of twenty five companies. The Homestake mine in South Dakota ranked first, the Alaska Juneau ranked second and the Fairbanks Exploration Co. of Alaska third. Of the largest producers 10 were in California, 4 in Alaska, 3 each in Colorado and Utah, 2 in Arizona, and 1 each in Idaho, New Mexico and South Dakota. Of these Companies, 15 produced gold from dry and siliceous ores, 5 were placer properties, and 5 mainly from copper, lead, and zinc ores.[2]

1 "Annual Report of the Director of the Mint." 1934. pp 19-30

2 Dunlop J.P. -- "Gold and Silver." Statistical Appendix to Minerals Yearbook, 1934, U.S. Department of the Interior.

PRODUCTION OF GOLD IN UNITED STATES.

(thousands of fine ounces)

Year	Production
1792-1847	1,187
1848-1850	4,838
1851-1855	14,271
1856-1860	12,384
1861-1865	10,716
1866-1870	12,226
1871-1875	8,826
1876-1880	10,301
1881-1885	7,730
1886-1890	8,078
1891-1895	9,107
1896-1900	15,729
1901-1905	19,304
1906-1910	22,993
1911-1915	22,968
1916-1920	17,246
1921-1925	12,194
1926-1930	11,206
1931-1935	13,743

Year	Production
1891	1,605
1892	1,597
1893	1,739
1894	1,911
1895	2,255
1896	2,568
1897	2,775
1898	3,118
1899	3,437
1900	3,830
1901	3,806
1902	3,870
1903	3,560
1904	3,892
1905	4,266
1906	4,565
1907	4,375
1908	4,574
1909	4,822
1910	4,657
1911	4,687
1912	4,521
1913	4,300
1914	4,573
1915	4,888
1916	4,479
1917	4,051
1918	3,321
1919	2,919
1920	2,476
1921	2,422
1922	2,363
1923	2,503
1924	2,529
1925	2,412
1926	2,335
1927	2,197
1928	2,233
1929	2,208
1930	2,286
1931	2,396
1932	2,449
1933	2,556
1934	2,916
1935	3,426

Gold produced by States in the United States (1906-1933)

State and Period	Total amount produced.	Placers %	Lode %	Base Metals %
Alaska				
1906-1910	940,582	81.49	18.20	0.31
1911-1915	794,244	68.73	30.42	0.85
1916-1920	572,485	60.32	38.58	1.10
1921-1925	330,425	56.70	43.89	0.37
1926	324,425	56.20	43.21	0.52
1927	286,719	50.31	49.69	----
1933	465,285	53.20	46.80	----
Arizona				
1906-1910	134,491	1.23	57.69	41.08
1911-1915	189,260	0.83	62.29	36.89
1916-1920	230,084	0.19	55.71	44.10
1921-1925	209,216	0.19	52.29	47.52
1926	234,011	0.14	21.66	78.20
1927	209,495	0.15	15.17	84.64
1933	79,922	6.25	31.25	62.50
California				
1906-1910	911,146	42.94	54.37	2.69
1911-1915	189,260	40.88	58.20	1.91
1916-1920	861,406	45.58	51.74	2.68
1921-1925	676,957	42.68	55.50	1.82
1926	576,798	43.85	53.84	2.31
1927	564,485	50.02	46.92	3.06
1933	613,579	42.50	57.48	0.02
Colorado				
1906-1910	1,052,967	1.10	94.62	4.28
1911-1915	948,493	2.54	93.43	4.03
1916-1920	629,820	4.56	90.53	4.91
1921-1925	344,628	4.59	90.97	4.44
1926	342,400	0.66	93.75	5.59
1927	255,377	1.79	91.89	6.22
1933	242,827	2.10	94.60	3.30
Idaho				
1906-1910	61,912	23.76	65.67	10.57
1911-1915	62.212	46.91	41.71	11.38
1916-1920	36,980	30.49	54.49	14.02
1921-1925	27,118	52.97	29.02	19.01
1926	13,669	61.16	21.91	16.93
1927	15,316	49.10	31.49	19.41
1933	64,592	36.06	62.78	1.16

Period & State	Total amount produced.	Placers %	Lode %	Base Metals %
Nevada				
1906-1910	666,077	0.63	96.29	3.08
1911-1915	641,745	2.29	90.93	6.78
1916-1920	295,609	3.76	81.68	14.56
1921-1925	185,825	3.98	82.17	13.85
1926	175,382	1.63	72.19	26.18
1927	150,346	1.20	62.99	45.81
1933	98,590	6.00	77.00	17.00
Oregon				
1906-1910	46,660	28.15	71.13	0.72
1911-1915	62,737	28.35	71.12	0.53
1916-1920	64,433	44.00	47.54	8.46
1921-1925	27,630	56.52	37.14	6.34
1926	13,243	44.84	50.91	4.15
1927	14,676	60.55	33.92	5.53
1933	20,239	75.00	25.00	----
S. Dakota				
1906-1910	296,221	0.07	99.92	0.01
1911-1915	361,752	0.08	99.91	0.01
1916-1920	299,245	0.01	99.99	----
1921-1925	306,081	0.01	99.99	----
1926	279,529	----	100.00	----
1927	322,032	----	100.00	----
1933				
1933	512,403	0.01	99.99	----
Utah				
1906-1910	215,560	0.15	23.13	76.72
1911-1915	187,720	0.08	22.43	77.49
1916-1920	135,966	0.02	16.32	83.66
1921-1925	133,969	0,02	24.18	75.80
1926	182,763	0.01	13.18	86.81
1927	193,909	----	11.71	88.29
1933	109,129	----	48.00	52.00

These figures have been obtained from "The Interim Report of the Gold Delegation to the Financial Committee of the League of Nations, 1930." pp 44-45.

The figures are the estimated mine production and are slightly different from the official United States figures.

Chapter 5

CANADA

Canada's gold industry has a remarkable and impressive history. It goes back to 1824, when gold is said to have been found in the valley of the Chaudière River in Quebec. Gold was discovered in British Columbia in 1858, and in Nova Scotia in 1862. Up to 1895 the greater part of the gold produced in Canada had come from these sources; but production, though important was not very large. In 1896 the famous Klondike discovery was made, and with it came a second period of intensive gold production.

At this time also the rich copper-gold deposits of Rossland in Southern British Columbia were opened up, marking the beginning of lode mining in that Province. There was also a revival of activity in Nova Scotia. The peak of prosperity for this period was attained in 1900 when the value of Canada's gold output reached some $27,500,000. Production decreased in the following years, but with the discovery of the Porcupine camp in 1909, followed by that of Kirkland Lake in 1912, Canada entered on her third major period of gold mining activity.

Remarkable success was made in the development of these two areas, and they paved the way for intensive prospecting in other parts of Ontario and Quebec. In 1924 discoveries were made at Rouyn that have now made Quebec the second largest producer of of gold in the Dominion. Manitoba and British Columbia also shared in the expansion during this period.

Actually there are four great periods in the history of Canada's gold industry, and in a sense the fourth is the most important. It began with the recession of industrial activity late in the Fall of 1929. Whereas there are associated with the first three periods discoveries of great importance, this last

period is notable for the unparallel incentive it gave, and is still giving to the industry.[1]

As business activity receded, so did commodity price levels. Consequently since 1929 the margin of profit on gold has increased. This increase was sharply accentuated in October, 1931, when Great Britain went off the gold standard, in April, 1933, when the United States followed suit, and culminated in the Gold Act passed by the United States on January 31, 1934, when the United States agreed to pay $35.00 per fine ounce for gold.

Thus as we embark upon this fourth period in the history of our gold industry, it will be seen that the outlook is decidedly bright. But before going into the future any farther, let us first obtain a more intimate knowledge of the background of this -- Canada's most prosperous industry.

Canada has been a gold producing country for over seventy-five years. During the last half of the 19th century production came chiefly from placer operations in British Columbia and the Yukon, while during the present century there has been a rapid growth of production from lode mining, both of auriferous quartz and gold in association with other metals. Gold production in Canada reached its earlier maximum in 1900, when the Yukon production reached its highest point and 1,350,057 fine ounces of gold were produced.

Gold mining in Canada is classified under three principal industries:

1. Placer mining -- the recovery of gold from the gravels and sands of stream channels, and is called the "Alluvial Gold Mining Industry".

2. The recovery of lode gold, which is called the "Auriferous

1 Robinson A.H.A. -- "Gold in Canada." 1935 pp 23-24.

Quartz Mining Industry".

3. Gold is often found in other mineral deposits, more particularly in those of copper.

The sources of Canadian production of fine gold in percentages in 1933 ~~was~~ WERE -- in alluvial gold 2%, in crude gold bullion 79.8%, in base bullion (from silver, lead ores etc.) 0.7%, in blister copper 14.2%, and in ores, matte and slags 3.3%.[1]

The great part of the gold from Canada comes from the Canadian shield, an immense area of Precambrian rocks extending from the Labrador coast westward, almost to the mouth of the McKenzie River. It is not only Canada's greatest reservoir of the precious metals, but in all probability the most fruitful region for the discovery of new deposits.

The Alluvial Gold Mining Industry.

Placer gold was reported in Canada as early as 1824 when the metal was discovered on the Chaudière River in Quebec. Later in 1858 alluvial gold was found at the mouth of the Pend D'Oreille River in British Columbia, and by 1859 placer mines had penetrated to Cariboo and Quesnal. Later years witnessed many important discoveries of placer gold in both British Columbia and the Yukon, the outstanding of which was the finding of the sensationally rich Klondike deposits in 1896. At the present time the greater part of alluvial gold comes from the Yukon and British Columbia with smaller amounts from Alberta and Quebec.

Quebec.

Placer deposits in the Chaudière River were mined extensively between 1875 and 1885, and sporadically since. However, the production is really insignificant, and any finds that have been discovered since have been too small to warrant much consideration.

1 Robinson A.H.A. -- "Gold in Canada". 1935 p 26.

Alberta.

Placer gold was discovered on the North Saskatchewan River in 1859 or 60, and mining has been carried on at intervals down to the present time. During 1932 recoveries of small quantities of crude alluvial gold were reported by small operators working on the Peace River and its tributaries. There were also small shipments of crude gold made from the McLoed district in 1932. The alluvial gold mining industry in Alberta is much similar to that of Quebec, and consequently is of very little significance.

British Columbia.

Gold first was discovered in British Columbia in the late fifties, and in 1858 the famous Fraser River rush took place. The rich Cariboo district was discovered in 1859, and three years later this area had a production of alluvial gold valued at $4,000,000. Since then production has slackened off, but in the last few years a decided turn for the better has taken place. Production in 1932 amounted to 16,320 fine ounces, while in 1934 it had risen to 19,142 ounces, an increase of 17.3%. The Atlin and Cariboo districts were responsible for this increase and in both these fields the possibility for a continued increase in output is likely. In a number of other camps large placer operations are expected to reach production in 1935, and this will probably be reflected in an increased production for that year.

Placer testing and small scale operations in the past have not been conclusive in many placer properties, and as better technical control and study is brought to bear on this type of mining, the industry is regaining some of its former importance.

Yukon.

Prospecting for placer gold in the Yukon Territory was conducted for at least fifteen years prior to the discovery of the Klondike in 1896, when one of the greatest gold rushes in history took place. The main production of placer gold in Canada has come from this field. The output reached a maximum in 1900 when it exceeded $22,000,000.

Production from placers in 1933 totalled 39,174 fine ounces, a decrease of 3% from 1932. The value however estimated to include equalization exchange was 18.3% more than in 1932. In these years the major portion came from the Dawson District, the Glacier district being next in importance, while the remainder was recovered from old abandoned creeks in the Mayo and Whitehorse areas.

The Auriferous Quartz Mining Industry.

This industry includes the mining and milling of ore in which gold is the predominant metal in value.

Nova Scotia.

The mining of this metal dates back to the early sixties. Annual yields varying from 6,863 to 30,348 fine ounces were recorded from 1862 to 1902. In 1904 the production fell to 10,362 ounces, and remained close to this quantity until 1910. Since then there has been no appreciable increase in production. However, in 1935 production totalled 7,967 ounces as compared with 3,525 ounces for 1934, and 1,382 ounces for 1933. This increase in output reflects a stimulated mining activity throughout the gold bearing areas of the Province.

Quebec.

In Quebec lode gold in payable amounts had been found up to 1932, only in the Rouyn-Horricanaw region, the Eastward expansion

of the Porcupine and Kirkland Lake districts in Ontario. However, in the last few years other fields have been discovered and are in the process of being opened up. Among these are areas in the North West part of the Province, the region around Senneterre, and the Chibougamau district in Central Quebec about 150 miles North of the Transcontinental Railroad.

In 1935 the production of fine gold in Quebec amounted to 474,746 fine ounces, with a value of $16,706,000 in Canadian funds. This is an alltime record for Quebec which now stands as the second largest gold producer in Canada.

Ontario.

Gold was first discovered in 1866, but no permanent gold mining industry was established until 1909 when the Porcupine camp was opened up. Three years later the discovery of gold in the Kirkland Lake area led to the opening up of this district. These two areas are responsible for almost all the production of gold in this Province. The Porcupine camp until recently has been the largest of the two. However, in 1931 it was surpassed by the Kirkland Lake district, but at the present time both camps are about equal. The Lakeshore mine in the Kirkland Lake district now has the largest production in Canada, being closely pursued by the Hollinger mine of the Porcupine area.

In the last few years other mining fields have sprung up, the most important being the districts of Red Lake, Matachewan, Pickle Crow, Little Long Lac and others, where a number of profitable gold mines are being developed. The combined production for the gold mines of Ontario for 1935 outside of Porcupine and Kirkland Lake ~~will~~ amount to approximately 10% of the total production of the Province. This figure is double that for 1934.

Ontario is by far the largest gold producing Province in Canada. In 1935 it produced 2,225,082 fine ounces, or approximately 70% of the total Canadian production.

PRODUCTION OF GOLD IN ONTARIO

Year	Total Production $20.67	Porcupine	%	Kirkland Lake	%	N.W.Ont.	%
1866-91	(a) 190,258						
1892-09	(b)2,509,492						
1910	68,492	35,500	51.8				
1911	42,637	15,000	36.2				
1912	2,114,000	1,730,000	81.8				
1913	4,558,000	4,294,000	94.1	86,361	1.9		
1914	5,545,000	5,206.000	93.8	114,000	2.0		
1915	8,501,000	7,462,000	88.6	551,000	6.5		
1916	10,339,000	9,391,000	90.8	703,000	6.8		
1917	8,699,000	8,230,000	94.5	404,000	4.6		
1918	8,502,000	7,768,000	91.4	632,000	7.4		
1919	10,452,000	9,942,000	95.1	487,000	4.7		
1920	11,686,000	10,597,000	90.7	1,033,000	8.8		
1921	14,692,000	13,103,000	89.5	1,524,000	10.4		
1922	20,580,000	18,375,000	89.3	2,160,000	10.5		
1923	20,136,000	17,313,000	85.9	2,720,000	13.5		
1924	25,669,000	22,135,000	86.2	3,447,000	13.4		
1925	30,206,000	24,733,000	81.8	5,385,000	17.8		
1926	30,951,000	23,680,000	76.5	7,174,000	23.2		
1927	33,627,000	23,852,000	70.9	9,674,000	28.7		
1928	32,629,000	20,246,000	62.0	12,234,000	37.5		
1929	33,535,000	19,281,000	57.6	14,047,000	41.8	22,988	.07
1930	35,887,000	17,759,000	49.6	17,173,000	47.9	461,730	1.3
1931	43,118,000	19,892,000	46.2	21,735,000	50.4	1,007,000	2.3
1932	47,283,000	21,422,000	45.2	23,782,000	50.3	1,608,000	3.4
1933	44,559,000	21,624,000	48.5	20,817,000	46.7	1,352,000	3.0
1934 #	70,063,046	33,034,674	47.2	33,379,865	47.7	3,041,701	4.3
1935 #	74,517,019	33,317,833	45.0	33,010,974	44.2	6,698,375	9.0

(a) estimated.

(b) Maximum yearly output was $424,568 in 1899.

In 1933 in addition to the values given, exchange equalization amounted to $8,249,000 at the Porcupine camp, $7,448,933 at Kirkland Lake, $495,309 at North Western Ontario, and an estimated

equalization of $292,874 on the precious metal contained in nickel-copper mattes; or a total of $16,486,437.

The 1934 and 1935 figures are calculated with the new price for gold, beginning January 1934. The price being $35.00 an ounce, plus a few cents per ounce obtained from exchange premiums. The Matachewan district with a production of $606,816 in 1934 and $1,489,836 in 1935, is also included in the total. This district in 1934 produced 0.8% of the total, and in 1935 1.8% of it.

Manitoba.

Gold bearing ores in Manitoba have been known for several years, and production is now mounting. Several small mines have come into production since 1932 and these should show an increasing productive capacity. However, the major part of the gold in this province continues to be produced as a by-product from the Flin Flon smelters which treat$ copper-zinc ores. The 1935 production of 146,544 fine ounces is an alltime record for Manitoba.

British Columbia.

Lode mining was carried on in British Columbia some time before 1900, and resulted in a rapidly increased production until 1902, when all previous records were surpassed by an output of 288,000 fine ounces. Except for the maximum output in 1913 of 297,000 fine ounces, the 1920 record was not surpassed until 1934. Although the bulk of gold in the Cordilleron Region was derived from placer deposits, yet a large amount averaging 178,000 ounces between 1913 and 1921 was obtained by lode mining, largely from the copper-gold ore of the Rossland and Yale Boundary districts. The Premier mine on the Portland canal and the mines in the Bridge River district have done a great deal to maintain the output of gold in British Columbia.

In 1934 the five leading mines in British Columbia were the following:-

The Pioneer	with a production of	84,000	fine	ounces.
The Premier	" " " "	50,000	"	"
The Bralorne	" " " "	26,000	"	"
The Reno	" " " "	12,000	"	"
The Cariboo	" " " "	8,000	"	"
Miscellaneous	" " " "	37,000	"	"
Total----------		217,000	fine	ounces.

Copper-Gold-Silver Mining Industry.

This industry is becoming more and more important in its share of the production of gold. It comprises a group of mines producing ore in which copper is usually the predominating metal in both value and quantity. The precious metals, especially during periods of depressed base metal prices, are often very deciding factors in the economic working of many mines of this type.

The Noranda mine in Quebec and the Flin Flon district in Manitoba are the two outstanding examples. There are also several smaller mines of this kind in British Columbia. In 1932 the amount of gold produced from this type of mining in Canada was 460,000 fine ounces. In 1933 it fell to 408,000 fine ounces.

In the following table giving the production of gold in Canada in fine ounces from 1862 to 1935, it can be clearly seen that production was greatly stimulated in 1931 when it rose to 2,693,892 fine ounces, and in 1932 when it reached an alltime high up until then of 3,044,387 ounces. The years 1933 and 1934 showed a slight decrease, but 1935 gave us a production of 3,290,000 fine ounces

which is an alltime record for Canada. This great increase is, without question, due to the rise in price of gold from $20.67 an ounce to not less than $35.00 effected in January, 1934, by the treasury of the United States.

The immediate result of the rise in the price of gold to $35.00 an ounce was to reduce for atime the Canadian output, but to increase its value. Owners of mines who had been treating only high grade ore turned again to low grade, realizing that they could make quite a profit by doing so. This accounts for the slight decrease during 1933 and 1934. However in 1935, new mines which had been launched under the stimulous of price increase began to produce gold, and by the end of the year their output offset the decrease experienced by the older mines. The 1935 records were shared by all the Provinces except Prince Edward Island and New Brunswick, which do not produce the metal, and by the Yukon.

Production of Gold in Canada (1862-1935).
(in fine ounces)

Year	Production
1862-1866	882,947
1867-1870	549,019
1871-1875	497,972
1876-1880	406,121
1881-1885	284,442
1886-1890	309,660
1891-1895	291,564
1896-1900	3,469,791
1901-1905	4,592,244
1906	556,415
1907	405,517
1908	476,112
1909	453,865
1910	493,707
1911	473,159
1912	611,885
1913	802,973
1914	773,178
1915	918,056
1916	930,492
1917	738,831
1918	699,681
1919	766,764
1920	765,007
1921	926,329
1922	1,263,264
1923	1,233,341
1924	1,525,382
1925	1,735,735
1926	1,754,228
1927	1,852,785
1928	1,890,592
1929	1,928,308
1930	2,102,068
1931	2,693,892
1932	3,044,387
1933	2,949,309
1934	2,969,680
1935 '	3,290,664

' Preliminary figure.

Increase around 1900 caused by the discoveries in the klondike. Slight decrease from 1916-1920 due to the higher operating costs due to the Great War. Great increase from 1929 on caused by low prices and the new price for gold.

Production of Gold in Canada by Provinces (1862-1935). (in fine ounces).

Year	N. Scotia	Que.	Ont.	Man.	B.C.	Yukon
1862-1866	86,713				796,234	
1867-1870	80,735				385,344	
1871-1875	60,870				437,102	
1876-1880	64,541	4,116			337,364	
1881-1885	73,138	4,953			205,341	
1886-1890	110,835	575	327		159,513	
1891-1895	99,895	3,948	6,081		155,432	32,823
1896-1900	135,756	722	62,368		792,735	2,470,753
1901-1905	106,409	1,047	38,375		1,391.287	3,053,720
1906	12,223	165	3,202		269,886	270,900
1907	13,675		3,212		236,216	152,381
1908	11,842		3,212		286,858	174,150
1909	10,193	193	1,569		250,320	191,565
1910	7,928	124	3,089		261,386	221,091
1911	7,781	613	2,062		238,496	224,197
1912	4,385	642	86,525		251,815	268,447
1913	2,174	701	219,801		297,459	282,838
1914	2,904	1,292	268,264		252,730	247,940
1915	6,636	1,099	406,577		273,376	230,173
1916	4,562	1,034	392,481		219,633	212,700
1917	2,210	1,511	423,261	440	133,742	117,667
1918	1,176	1,939	411,976	1,926	180,163	102,474
1919	850	1,470	505,739	724	167,252	90,705
1920	690	955	564,995	781	124,808	72,778
1921	439	635	708,213	207	150,792	65,994
1922	1,042		1,000,340	156	207,370	54,456
1923	655	667	971,704	31	200,140	60,144
1924	1,047	883	1,241,728	1,180	245,719	34,825
1925	1,626	1,602	1,461,039	4,424	219,227	47,817
1926	1,678	3,680	1,497,215	188	225,866	25,601
1927	3,151	8,331	1,627,050	182	183,094	30,935
1928	1,290	60,006	1,578,434	19,813	196,617	34,364
1929	2,687	90,798	1,622,267	22,455	154,204	35,892
1930	1,272	141,747	1,736,012	23,189	164,331	35,517
1931	460	300,075	2,085,814	102,969	160,069	44,310
1932	964	401,105	2,280,105	122,507	199,004	40,608
1933	1,382	382,886	2,155,519	125,310	238,995	39,493
1934	3,525	390,075	2,105,981	98,504	293,315	38,799
1935'	7,967	474,746	2,225,082	146,544	384,797	39,452

' Preliminary figures.

Figures obtained from the "Canadian Year Book."

Alberta has had a very small production of gold for many years, and Saskatchewan in 1935 produced 11,925 fine oz. of gold.

Leading Gold Producing Mines in Canada.
(1933-34)

Mine	Province	Area	Fine oz. Produced 1933	1934
1. Lake Shore	Ont.	Kirkland Lake	499,800	472,768
2. Hollinger	"	Porcupine	481,279	434,257
3. Noranda	Que.	Rouyn	284,675	248,615
4. McIntyre	Ont.	Porcupine	261,528	239,099
5. Wright Hargreaves	"	Kirkland Lake	177,190	218,203
6. Dome	"	Porcupine	218,485	206,157
7. Teck Hughes	"	Kirkland Lake	220,036	167,412
8. Flin Flon	Man.	The Pas	94,745	99,334
9. Pioneer	B.C.	Bridge River	83,827	87,536
10 Int. Nickel	Ont.	Sudbury	21,355	74,375
11 Siscoe	Que.	Horricanaw R.	54,771	63,394
12 Beattie	"	Duparquet	22,598	52,905
13 Sylvanite	Ont.	Kirkland Lake	44,608	50,337
14 Howey	"	Red Lake	40,460	45,985
15 Bralorne	B.C.	Bridge River	18,911	26,000
16 Premier	"	Salmon River	51,863	50,000
17 Macassa	Ont.	Kirkland Lake	3,682	32,056
18 Coniaurum	"	Porcupine	33,906	28,436
19 San Antonio	Man.	Central Man.	22,778	21,638
20 Buffalo-Ankerite	Ont.	Porcupine	22,343	20,503
21 Toburn	"	Kirkland Lake	23,020	20,400
22 Kirkland L. Gold	"	"	18,465	20,316

Figures taken from "Gold in Canada" 1935, by A.H.A. Robinson, p 33.

The great increase in the production of gold has been due to several reasons, along with the main one -- the rise in the price of gold. They are as follows:-

1. The Premium on Gold.
2. The United States Gold Act of January 31, 1934.
3. Increase in the ease of communication.
4. Discovery of new inventions and processes.
5. Methods of prospecting.
6. Government help in the form of geological surveys.

The Premium on Gold.

Producers of gold have been greatly benefited in recent years by a great reduction in their operating costs due to a decline in the prices of other commodities, and also by a rise in the price of gold in the world market. On April 19th, 1933, the U.S. went off the gold standard. Up until then the exchange premium had netted the Canadian producer a fair price. When the United States went off the gold standard, Canadian producers turned to the London market where better prices were being offered, and in the last six months of 1933, were receiving anywhere from $29.00 to $34.00 per fine ounce. But on January 31st, 1934, the United States announced that they would pay $35.00 an ounce for gold. This caused another change in the marketing of Canadian gold which commenced to find its way to New York again. At the present time Canadian producers receive $35.00 an ounce plus exchange, and minus, of course, shipping, insurance and marketing charges, etc.

Under this stimulus of higher prices, prospecting for gold has been more active during the past few years than ever before. Favourable results from these activities, with new mines coming into production, and expansion in numerous producing mines gives every

prospect for a continued increase in gold production.

The effect of the new price on the Canadian gold mining industry was discussed recently by the Hon. Charles McCrea, former minister of mines for Ontario. He says: "Thirty-five dollar gold will not only enhance the value of our known gold reserves by about 70%, but it will also increase in volume our available resources of mineable gold. These resources will henceforth include not only lower grade sections of our mines which were regarded as useless, but new deposits as well. The bringing of this lower grade ore within the range of profitable milling will extend the life of our mines; and give greater stability to our mining communities by the opening up of lower grade gold properties in the vicinity of the producing mines. Furthermore, gold at $35.00 means the creation of new mining communities in many centres, and many abandoned projects will be revived. Also with our improved mining and milling methods, an increased price for gold, and fuller geological information, together with greater confidence and financial backing, many of the metallurgical and geological difficulties hindering the development of many properties will be overcome.

Prospecting will undoubtedly be stimulated. Areas that have been combed over in the past by the prospector who was looking for gold deposits that would pay to mine at the standard price for gold, might well be reprospected in view of the present valuation. ..... Along with this, profits from mining will increase and dividends will enlarge, while the mining industry will be stabilized on a broader basis.

This may appear like a rosy dream, but it is a dream that is based upon reality. Canada's position as a gold mining country was assured under the standard value of $20.67 an ounce. It is

doubly assured under gold at $35.00 an ounce."

Increase in the Ease of Communication.

In recent years the ease of communication has greatly increased due to the aeroplane. Aeroplanes now will take you into almost any part of the North, and what is more will bring fresh supplies at stated intervals. This transportation although still somewhat expensive, is becoming less and less so, until now, in many cases it is really cheaper to take supplies in by aeroplane instead of packing them in. It saves a good deal of work and, what is more important, a great deal of time. The aeroplane indeed is playing a very important part in the opening up of our North Country.

Discovery of New Inventions and Processes.

Hardly a year ever goes by without several new discoveries any inventions being made which are continually making the mines more efficient in production. The discovery of new processes and compounds widen the field of their use. Metallurgical difficulties in complex ores are continually being overcome. All this leads to greater efficiency, lower mining costs, and consequently increased production.

New Methods of Prospecting.

Methods of prospecting are also changing. The old days when men obtained grubstakes and went out in search of gold alone, and on their own, have passed. Exploration companies are becoming more and more numerous, and are usually under the leadership of trained mining engineers. The areas are covered more systematically, and a great deal of information otherwise unobtainable can be put at the disposal of these companies. Good maps are secured and given for the use of the men composing their parties. The aeroplane is

also used extensively, not only to bring in supplies, but also to transport the prospectors quickly from one place to another. Most of this would of course be impossible if each prospector were out on his own.

The mining companies are also becoming interested in prospecting. It is now quite common for them to send men out into favourable areas in the hope of securing new prospects, and in this way enlarging their holdings. Prospecting, therefore, is being undertaken more scientifically than ever before, and it is not hard to believe that the results obtained will show the influence of these highly improved methods.

Government Help.

The Canadian Government has also taken steps to encourage the production of gold. Aeroplanes of the Canadian Air Force have been photographing our northern country, and from these photographs accurate and large scale maps are being made which show every creek and lake. Needless to say, these maps will prove invaluable to prospectors.

Last year the Canadian Government sent out 180 Geological parties into all parts of Canada, in order to explore and map areas in which prospectors may hope to meet with success. These maps when completed will furnish prospectors with a detailed knowledge of the country, and will enable them to see the favourable areas for prospecting. Many unfavourable districts will then be passed over, and there will be a concentration in those districts in which the geology is favourable. Much of this mapping is yet to be done. However, the Canadian Government by its actions during the last few years has done a great deal to improve the lot of the prospector.

and encourage the exploration of new areas favourable to the production of gold.

The results of this million dollar programme by the Federal Government cannot be expected to be available for some time. While the ultimate benefits will be great, it is inevitable that some time must elapse before concrete returns in the form of mineral production begin to accrue.

It is becoming more and more apparent, with the continued good price for gold, and the many other favourable conditions which have just been mentioned, combined with the vast territory in Northern Canada which has still to be explored, that Canada's gold production in the future will be substantially higher than it is to-day. Although there are a great many factors which have a direct bearing on the production of gold in Canada, they all boil down in the end to one, and that is the price of gold. As long as gold is worth $35.00 an ounce, such a stimulation will be given to gold mining, that the industry in Canada cannot help but prosper. Canada indeed has a bright future as a gold mining country -- thanks to $35.00 gold.

Let us now turn for a moment to the mines already in production, and try to form an estimate as to whether they too will share in the general activity and prosperity, and show an increased production in the years to come. Approximately 70% of the gold produced in Canada comes from the Porcupine and Kirkland Lake districts. In looking over the figures for these two areas, it can be clearly seen that they show few signs of declining. The small decline in 1933 was due to the milling of lower grade ore in order to take advantage of the high gold price. There seems to be no

reason why these older producing areas should not share in this great revival. Their ore reserves will be greatly increased, which will prolong the length of their life, and there is every reason to expect that these two camps will maintain if not increase their production during the next few years.

Thus, not only are the prospects for new discoveries and the opening up of new mines favourable, but the production of mines already in existence has shown no indication of decreasing. The two greatest producing areas in Canada are the Porcupine and the Kirkland Lake districts in Ontario, and as has been shown above, they show no signs of an alarming decrease in production. Then, too, the appearance of new gold fields in North Western Ontario in the last few years is also a very encouraging sign for the future.

Chapter 6

AUSTRALIA

Gold has been extensively mined in Australia ever since the first important discoveries were made in New South Wales in 1851; and from 1851-60 Australia produced over 40% of the world's gold. It was the discovery of gold in payable quantities that first attracted population to Australia in large numbers and thus accelerated its national development.

New South Wales.

The first discovery of gold in New South Wales was made in 1823, but very little mining was done until 1851, when new and important finds were made. The result of these discoveries was that in 1852 its total output amounted to 622,000 fine ounces, which is the highest output for any single year ever recorded in this Province. These earlier rushes were to surface alluvials, many of which were soon worked out. With the exhaustion of these deposits, discoveries were made by sinking what are called deep alluvial leads, representing the beds of old drainage channels. The most important of such discoveries were made at Forbes in 1862 and at Gulgong in 1871.

At present the method of dredging is being used extensively for winning gold from alluvial streams and from other wet ground where shaft sinking would be impracticable. Hydraulic sluicing is employed also in several places. The Cobar district was for many years the principal producer, but since 1923 it has been surpassed by the Tumut and Adelong, and the Lachlan regions. Production in New South Wales has increased to some extent in the last five or six years, but it is still far below the general average for the period 1850-1900.

Victoria.

Larger and more important discoveries were made in the Province of Victoria, the first being at Clunes in 1850. In the following year discoveries were made in the Yarra Range, the Pyrenees Mountains, and in Mount Alexander. Production reached its maximum in 1856 when 2,850,000 fine ounces of gold were recovered.

Lode mining predominates in Victoria although small amounts of gold are obtained from alluvial workings. Owing to the exhaustion of much of the payable auriferous area, the yield has been on the down grade for several years and the 1933 production of 58,000 ounces represents only a fraction of the output during the boom years of the fifties. The largest output from quartz mining comes from the Bendigo district. The Ballarat, Beechworth, Castlemaine, and Maryborough areas once of great importance, are still producing but not to any great extent. Some of the older mines in this Province are operating at very great depth; especially those in the Bendigo and Ballarat districts, several of which are over 3,000 feet deep.

Queensland.

The news of the discoveries in the Southern divisions of the continent fired the minds of the few remaining settlers of Queensland, which at this time was still a portion of New South Wales, with the hope that an eldorado would be discovered in the North. It was not, however, until 1858 that payable deposits were found. Almost immediately a rush set in from all parts of Australia. The alluvial deposits were soon worked out, and many who reached the diggings suffered great hardships through lack of sufficient food and clothing. From 1863-73 other small finds were made on numerous creeks, and in 1882 the celebrated Mount Morgan mine was

opened up. This marked a new era in the gold mining industry of Queensland, and production quickly increased up to 1900 when 675,000 fine ounces of gold were mined. During the next few years production fell gradually, and then more and more rapidly, until by 1930 the output was only about 8,000 ounces. During the last few years production has been steadily increasing, but it is still far below the 1900 figure.

The operations in Queensland have been chiefly confined to lode mining, and the production of gold in connection with the smelting of copper and other ores. Most of the gold produced in the Mount Morgan district has been obtained almost entirely from the treatment of copper and other ores. This area, along with the Chartered Towers gold field, has been responsible for more than 3/4 of the gold produced in this Province. The Chartered Towers district is now, however, practically exhausted.

South Australia.

Gold is found in widely scattered localities in South Australia. The first discovery was made in 1846, but little mining was done. Within recent years the chief source of the metal has been from the copper ore of Wallaroo and Moonta. Compared with other states, however, the total yield is small.

Western Australia.

The discovery of gold in Western Australia took place at a much later date than in the Eastern States. Nevertheless, the present production far exceeds that of any other portion of the Continent. It seems that the precious metal was first detected in 1848, and in 1852 rich specimens were found by shepherds in the eastern districts. Various small finds were made up to 1882, and in 1886 the Kimberly gold field was opened up, followed by the

Yilgarn field in 1888. The Murchison deposits were discovered in 1892, and in the same year the famous Coolgardie gold fields which have accounted for more than half of all the gold produced in this Province, were found. These discoveries along with several others have made Western Australia the chief gold producer of Australia.

Western Australia reached its zenith as a gold producer in 1903 with a total output of 2,065,000 ounces, but since then there has been a more or less steady decline due to the following causes:-

(1) Exhaustion of the known rich deposits.

(2) Unwise development - i.e. - "picking the eyes" of good mines.

(3) Increased cost of stores, equipment and labour, rendering it unprofitable to treat low grade ores.

Northern Territory.

This district has never been a great gold producer, and production in 1933 was only about 600 ounces. The potentialities of the older fields, however, have been by no means exhausted, although a revival of the industry depends on the expenditure of large sums of money.

Tasmania.

Gold was first discovered in Tasmania in 1849, and from then until 1859 a few small finds were made. The yield is chiefly obtained from copper-lead ores, gold bearing quartz veins, and from alluvial workings. The industry has never been very important, and the chief producer is the Mt. Lydell Co. where gold is obtained from blister copper.

Production of Gold in Australia (1851-1934)
(In thousands of fine Oz.)

Year	N.S.W.	Vict.	Queens.	W. A.	Tas.	N. T.	S.A.	Total
1851	106	199	3					310
1852	622	2,119						2,780
1853	415	2,536						3,000
1854	181	2,068						2,675
1855	153	2,740						2,893
1856	163	2,850					2	3,040
1857	158	2,745						2,903
1858	258	2,425						2,750
1859	294	2,200						2,540
1860	342	2,040	3					2,450
1861	421	1,900	1					2,340
1862	552	1,615					3	2,206
1863	457	1,584	3					2,050
1864	323	1,516	16					1,850
1865	282	1,505	17					1,823
1866	270	1,420	16					1,735
1867	246	1,400	35		1			1,695
1868	232	1,730	111		1		4	2,100
1869	227	1,442	98				1	1,785
1870	218	1,215	91		2		6	1,550
1871	292	1,280	115		3		1	1,700
1872	384	1,245	123		4		1	1,770
1873	327	1,090	134		4		--	1,570
1874	243	1,026	233		4		1	1,540
1875	205	996	260		3		2	1,500
1876	143	900	258		11		2	1,330
1877	110	766	382		5		--	1,250
1878	103	708	268		24		--	1,108
1879	95	709	234		54		--	1,106
1880	104	780	222		47		--	1,155
1881	135	785	225		51		26	1,220
1882	124	813	185		44		20	1,159
1883	108	735	173		42		21	1,108
1884	84	733	250		38		22	1,135
1885	89	690	250		36		23	1,085
1886	86	625	280		28		23	1,040
1887	93	580	349	4	37		33	1,095
1888	75	588	398	3	35		16	1,111
1889	104	588	638	14	28		20	1,380
1890	109	554	514	20	18		24	1,240
1891	132	543	478	27	34		30	1,242
1892	135	615	509	53	38		32	1,387
1893	153	632	510	99	33		30	1,456
1894	271	675	548	185	51		34	1,770
1895	309	695	505	204	49		30	1,840

Year	N.S.W.	Vict.	Queens.	W.A.	Tas.	N.T?	S.A.	Total
1896	252	757	500	250	56		22	2,325
1897	259	765	600	605	69		28	2,740
1898	282	787	647	935	69		22	3,320
1899	382	805	668	1,470	77		19	3,195
1900	252	760	675	1,420	74		19	3,290
1901	174	730	597	1,700	69		22	3,412
1902	161	721	640	1,871	71	15	7	3,487
1903	254	767	669	2,064	60	13	9	3,836
1904	270	766	639	1,983	66	1	18	3,742
1905	274	747	593	1,955	74	7	11	3,661
1906	254	772	545	1,794	60	11	8	3,445
1907	247	696	466	1,698	65	4	6	3,182
1908	225	671	465	1,648	57	6	3	3,074
1909	205	654	456	1,595	45	7	7	2,969
1910	189	570	441	1,471	37	6	7	2,721
1911	181	504	386	1,371	31	7	4	2,484
1912	165	480	348	1,283	38	5	7	2,326
1913	150	435	266	1,314	33	3	7	2,207
1914	125	413	249	1,233	26	2	6	2,055
1915	132	329	250	1,210	19	1	6	1,947
1916	108	257	215	1,061	16	1	8	1,666
1917	82	179	179	970	14	1	7	1,273
1918	87	159	134	877	11	1	6	1,120
1919	66	135	121	734	8	1	3	1,068
1920	49	153	115	618	6	1	2	944
1921	51	105	40	553	5	--	3	758
1922	25	107	81	538	3	--	1	755
1923	19	95	89	505	4	--	1	712
1924	19	67	99	485	5	--	1	675
1925	19	47	46	441	4	--	1	559
1926	19	49	10	437	4	--	1	521
1927	18	39	38	408	5	--	--	508
1928	13	34	13	392	4	--	1	458
1929	7	26	9	377	6	--	1	427
1930	12	24	8	416	4	--	1	467
1931	20	44	13	511	5	1	3	595
1932	28	48	23	606	6	1	3	714
1933	29	58	92	637	7	1	6	830
1934								975

Figures taken from the Official Year Book of the Commonwealth of Australia.
1934 figure from"Monthly Bulletin of Statistics"
League of Nations, Number 5, May 1935.

The above figures showing the production of gold in fine ounces, explain the enormous increase in population of Victoria during the period 1851-61, when an average of over 40,000 persons reached the state each year. With the exception of the year 1889, when the output was surpassed by Queensland, Victoria maintained its porition as the chief gold producer for a period of 47 years, or up to 1898, when its production was outstripped by Western Australia. This latter state, from that year onward, contributed practically half, and so far as the last ten years are concerned, nearly 4/5 of the entire yield of Australia.

From 1930 onward it can be seen from the table that production in every state has been increasing fairly rapidly. This result has been due to lower commodity prices caused by the depression, and the action of the Government in passing the Gold Bounty Act to encourage this particular branch of the mining industry. The Gold Bounty Act of 1930 provided that for a period of ten years, from the first of January, 1931, a bounty of £1 per ounce was payable, under conditions prescribed by the Commonwealth, on each ounce of fine gold produced in excess of the average production for the three years 1928-30. Under the Financial Emergency Act of 1931, the bounty was reduced to 10s, subject to an increase of 1s according to each decrease of 3s in the average rate of exchange. The rate of exchange on which the 10s was taken was 30%. Under the Financial Emergency Act of 1932, the bounty was temporarily suspended, and is still in that condition.[1]

The Gold Bounty Act, along with lower prices and costs, seems to have given the first stimulus to Australia's, up to then, declining gold output. This stimulus has been greatly aided by the increased price for gold ($35.00) which came into effect on the 31st

1 Official Year Book of the Commonwealth of Australia, 1934. p 518.

of January, 1934. It is now quite reasonable to expect that from that date onward, the Australian gold production will show ever increasing signs of reviving.

Chapter 7

CONCLUSION

From the foregoing chapters it can be concluded that imulus the stimulus to increased gold production from the higher price of the metal depends for its continuance upon,

1. New discoveries
2. Lower working costs.
3. New metallurgical and mechanical devices.

Of these, the first and second are the most important. Aside from Russia and Canada, the possibility of new gold discoveries of any importance are very slight. The introduction of new metallurgical devices and more efficient mining machinery will in all probability be of little importance, as any new discovery along these lines would hardly be of sufficient importance to revive the industry to any great extent. Therefore, in order to anticipate the future production of gold, greatest attention should be focused on the possibility of new discoveries, working costs, and the effect of the increased price for gold, on the gold mining industry in general.

The two factors, lower working costs and an increased price for gold, really have the same effect on the industry. Lower operating costs enable the companies to mine lower grade ore, because their cost of production is lower and this ore can be mined at a profit; whereas if prices were higher and cost of production were greater, this low grade ore would be unprofitable to mine. The same result is obtained when the price of gold is increased as was the case in January 1934. A great deal of low grade ore which was unprofitable to mine when gold was worth $20.67

an ounce, can now be worked at a profit at $35.00 an ounce. It is thus easy to see that these two factors really have the same effect, namely -- to make lower grade ore available for production.

Since the beginning of the depression in 1929, world prices have fallen considerably. This coupled with the rise in price of gold has given a great stimulus to all the gold producing countries of the world. It has resulted in an increase of production from 19,500,000 fine ounces in 1929 to an all time record of approximiately 30,000,000 ounces in 1935.

Now we meet the problem, will the price of the metal continue at $35.00 an ounce, and working costs remain at the low point at which we have seen them during the last six years? As regards the former, there seems to be no reason to doubt that the price of gold will not remain as it is for some time to come. If there is any change to be expected indications seem to point to a higher instead of a lower price. However, as to the latter, that of working costs, it must be admitted that the world since 1929 has been in an abnormal financial condition which has seen prices sink to a very low level. We have every reason to believe that prices will not forever remain thus, and all signs point, in the near future to a general rise in prices to a level more in accordance to pre-depression times. The advantage of these very low operating costs will therefore soon be lost to the mining companies, and the favourable conditions in which they are now working in regard to this factor, cannot be expected to last a great deal longer.

Thus, in discussing the aspects as to the future of the production of gold in the world, I will deal with the countries discussed in the preceeding chapters separately each in the light of new discoveries, lower operating costs, the effect of the new price for gold, and any other factor which may be of ~~xxffixxxxx~~ signigicant importance to any particular country. Then in conclusion I will try to sum up all the facts available and attempt to make a reliable estimate as to the future of the world's gold production.

South Africa.

As South Africa is the world's largest gold producing country, the question of the future of this industry is a very important one. The great stimulus given to other gold producing countries since 1929 has not been reflected to the same extent in South Africa, which has only increased its production very slightly since that time. It is now becoming more and more apparent that South Africa has reached its peak as a gold producing country, and the low operating costs and the high price for gold will not have the effect of increasing greatly its yearly production. On the other hand it will find its importance in greatly increasing the existing reserves by bringing into that category a large amount of low grade ore which would otherwise be unprofitable to work.

It is to be expected that the mines of South Africa are now working this lower grade ore, which may account for the fact that production has not risen very much during the last few years. From 1929 on, the mining industry has been in a very favourable position~~xxxxx~~ since it has had the advantage of low operating costs and a very good price per ounce for gold. It is obviously

to their advantage to mine as much low grade ore now as possible, and thus take advantage of the above two very favourable factors. It may not be long before their operating costs will begin to rise in response to higher prices as the world slowly emerges from the depression.

The probability of new discoveries in South Africa ~~is~~ is very slight. New metallurgical devices and better machinery are not likely to be very important, and the low operating costs now in existence may not continue very much longer. South Africa's future as a gold mining country now depends on $35.00 gold. Practically all the gold deposits in the country are known now. The new price for gold will not greatly increase production, but it will greatly increase the known gold reserves and in this way lengthen the life of the industry.

The gold production of South Africa will probably remain about the same as it is now until prices have risen causing a rise in operating costs. When this takes place production should decline somewhat. Then as the mines gradually become exhausted, production should decrease rapidly until it reaches a point where it is negligible. The end of the South African gold industry is in sight, it is only a question of time.

Russia.

The amazing advance in the gold industry of the Soviet Union in the last five years has been phenomenal. This advance has been caused by:-

1. New Discoveries.
2. The introduction of mechanical methods of mining.
3. The new high price for gold.

Judging from the production figures, Russia is the coming gold producer of the world. It stands in a very different position from South Africa as important discoveries are being made and in all probability will continue to be made. Whereas South Africa has had highly mechanized production for many years, this type of mining is only just being introduced into Russia, and the benefits obtained from it can be easily seen by looking at the production figures for the last five years. The new high price for gold has also stimulated the gold production of the U.S. S.R. as it has done to every other gold producing nation.

The Russian gold districts are still in the process of being opened up, they are not yet fully mechanized, the Government is fully behind the industry and gold is needed in the country to pay for imports and to help establish the country on a sound financial and crdit ~~xxix~~ basis. On top of all this comes an increased price and a world demanding gold. What more favourable conditions could anyone ask for this industry in the U.S. S.R.? True there are some problems such as lack of transportation facilities, and better mechanical devices, but these are rapidly being overcome so that all things point ~~et~~ to a steadily increasing production of gold.

The Russian gold industry is obviously on the up grade. It has been given a new lease of life as it were, by the high price for gold (notice the increase in production of 1934 over 1933) which has done a great deal to bring new mines into operation, and at the same time has greatly increased the known gold reserves both of placer and quartz, as well as stimulating Government and private activity in this field. The gold industry of

the Soviet Union is one of development and expansion, two words that prophecy greater production in the future.

United States.

The production of gold in the United States has increased from 2,208,000 ounces in 1929 to 3,426,000 ounces in 1935. This increase was at first caused by lower operating costs due to the depression, and from 1934 on, to the increased price for gold. This new price for gold was by far the most important cause of the increased gold output in 1934 and 1935.

$35.00 gold in the United States as in South Africa will have the ~~f~~ effect, not of greatly increasing production, but of increasing the reserves of gold, and in this way lengthening the life time of the industry. The discovery of new and large gold fields is becoming less likely every year as the United States has been pretty thoroughly prospected. Alaska is the only state which is still in the early stages of development, and production from both lode and placer mines will continue for some time yet. In Arizona, Utah and Nevada, large deposits of disseminated copper give promise of long continued production of gold as a by-product. In California few of the lodes now being mined have a probable life exceeding twenty-five years. South Dakota is the only State in which a deposit valued chiefly for gold gives promise of continued production beyond a period of twenty- five years.

For the other States the possibility of continued production beyond 1950 depends to a greater or less degree on possible future reductions in costs, or on the possibility of new discoveries.[1]

In Accordance with the above facts there seems to be no

1 League of Nations -- "Interim Report of the Gold Delegation of the Financial Committee." Geneva, 1930. p 43.

likelihood of a greatly increased gold production for the United States. $35.00 gold has undoubtedly increased the reserves of low grade ore, and because of this production will increase to some extent. The gold reserves however are being exhausted more rapidly than new sources are being developed, and accordingly gold output from such must continue to decline. It is likely that except for Alaska, the trend of decreasing gold production both of placer and lode will soon begin again. On the other hand however, the production of gold from base metals will show a continuing although moderate increase, to the end that the future of gold production in the United States will even more than at present depend upon that of copper.

As in the case of South Africa operating costs will not always be as low as they are now, even though the price remains the same. If new discoveries are not made in a country, that country cannot expect to continue as a major gold producer, even though other factors are very favourable to the industry. $35.00 gold while stimulating production for a time, and increasing the reserves of low grade ore a great deal, merely puts off the inevitable -- decreasing production, that much longer.

Canada.

A great deal has been said regarding the probable future production of gold in Canada in the chapter dealing with the history of the Canadian gold industry. It should only be necessary here to sum up the most important factors which have significant bearing upon the future of this industry.

Similar to Russia and to a lesser extent Australia,

the prospects of new and important gold discoveries in Canada are very favourable. New areas in North Western Ontario, and in the Matachewan district between Timmins and Sudbury have come into prominence during the last few years, and they will undoubtedly be of great importance in a short time to come. New areas in other Provinces, especially in Quebec and Manitoba are destined to become important producers in the near future.

The great activity in this industry in Canada during the last few years has been the result of lower operating costs and the new gold price. The latter has been especially responsible for the increased enthusiasm shown by prospectors and explorers in search of gold. In this way it is indirectly responsible for the opening up of large tracts of land hitherto almost unknown. Modern facilities such as the aeroplane are now being used to great advantage by these prospectors. The lure of gold -- $35,00 gold has given the stimulus, the results of which we shall reap in the near future. Along with this great activity in exploration the new price has immensely increased the reserves of gold ore in our existing mines, and will have the result of prolonging their lives much longer than would otherwise be possible.

Such is the position of the Canadian gold industry. It is young , prosperous and expanding, and the possibilities of new discoveries are great, all of which makes the outlook for the future very encouraging. Granting the price of gold remains the same, all indications point to a rapidly increasing production for some time to come.

Australia.

In attempting to estimate the future output of Australia, the possibility of discovering a major field is one that must be reckoned with. Areas incompletely explored and formerly inaccessible are so vast that the development of aviation gives quite some hope that they may be covered by adequately equipped prospecting parties with some hope of success. It is reasonable to assume that some new discoveries will be made in Australia before 1950.[1]

As witnessed by production figures the output of gold has more than doubled since 1929. This has been for the most part due to Western Australia whose production has greatly increased along with all the other states. These increases have been brought about by lower operating costs since 1929 and the new high price. The Australian fields have been known for many years and by 1929 were rapidly nearing exhaustion. However the present high price for gold has materially increased the reserves of the old mining districts, and much ore that in former times was considered worthless is now being mined at a profit. The search for new mines in the remote parts of the country has also been stimulated, and this expansion will undoubtedly be reflected in higher production figures for some time to come. However unless new mining districts are discovered, we may look for an increase in production for a few years, and then a continually decreasing output as operating costs increase as a result of higher prices. The position of Australia is much the same as that of South Africa and United States, although the prospects for the discovery of new deposits are much better in

1 League of Nations -- "Interim Report of the Gold Delegation of the Financial Committee." Geneva, 1930, p 49.

Australia, and for this reason the future of the gold industry there can be viewed with more optimism than in those countries. As Western Australia produces almost all the gold in Australia it is to be expected that the gold yield of Australia will gradually decline as the Western Australian mines now working are exhausted.

In predicting the future output of gold in the world the theoretical possibility of wide variations in prices in either direction influencing the output should not be overlooked. At the present time prices are low, but in all probability the next few years will see an increase in the price level and a corresponding increase in operating costs. Beyond this however, it is impossible to predict.

Of the five leading gold producing countries of the world, only Canada and Russia have any hope of increasing their output to any great extent in the future. United States, South Africa and Australia have reached their peak and no great increases can be expected from them. Regarding the many other small gold producing countries of the world, they are not of sufficient importance to make any considerable change in the output figures, unless of course, a remarkable new discovery is made. They will however share in the prosperity due to low operating costs and the high price for gold, and should because of these factors show increasing yields in the future.

The effect of $35.00 gold on world production has been to stimulate it to a considerable degree. In those countries

where gold mining has already reached its peak and where all the land has been well prospected as in the United States, South Africa, and to a lesser extent Australia, it will have the effect of increasing the ore reserves, and many mines with low grade ore will be able to resume operations at a profit. Of course this advantage will be lost to some extent if prices begin to rise, as operating costs will then also increase. In those countries such as Canada and the Soviet Union where the industry is young, the price of gold will not only greatly increase the reserves of low grade ore, but it will also give an added stimulus to the search for new deposits.

It seems probable therefore, that because of the impetus given to the world gold industry by low operating costs and the high price for gold, production in the world should steadily increase. This will be checked somewhat as the general level of prices rise and again when the low grade ore reserves of the older producing countries begin to reach exhaustion. This decrease will to some extent be counterbalanced by new discoveries in Russia and Canada which will enable these countries to take the place of South Africa and the United States whose output should begin to decrease rather rapidly ten to fifteen years from now.

In Conclusion it might be stated that there is every reason to expect that the world's output of gold will continue to increase slowly for a period of ten to fifteen years, then as the output from South Africa and the United States declines, and their places being taken by Russia and Canada, to remain comparatively stationary for perhaps another ten to fifteen years, and finally, unless new discoveries are made, to decline from that time on.

Appendix

WORLD GOLD PRODUCTION
(thousands of fine oz.)
1493-1935.

Year	Production
1493-1520	5,221
1521-1560	9,903
1561-1600	9,143
1601-1640	10,815
1641-1680	11,493
1681-1720	15,165
1721-1760	28,092
1761-1800	24,752
1801-1840	20,489
1841-1850	17,605
1851-1860	61,353
1861-1870	53,696
1871-1880	50,473
1881	4,977
1882	4,826
1883	4,615
1884	4,903
1885	5,003
1886	5,044
1887	5,061
1888	5,176
1889	5,611
1890	5,727
1891	6,320
1892	7,094
1893	7,619
1894	8,765
1895	9,615
1896	9,784
1897	11,420
1898	13,879
1899	14,837
1900	12,315
1901	12,626
1902	14,355
1903	15,853
1904	16,804
1905	18,396
1906	19,471
1907	19,977
1908	21,422
1909	21,965
1910	22,022
1911	22,397
1912	22,605
1913	22,354
1914	21,301
1915	22,737
1916	22,032
1917	20,346
1918	18,614
1919	17,698
1920	16,130
1921	15,975
1922	15,452
1923	17,791
1924	19,031
1925	19,026
1926	19,349
1927	19,431
1928	19,700
1929	19,500
1930	20,836
1931	22,330
1932	24,151
1933	24,962
1934	27,339
1935 (a)	30,000

(a) estimated.

Total production from 1493 to 1935 is 4,540,000,000 fine ounces.

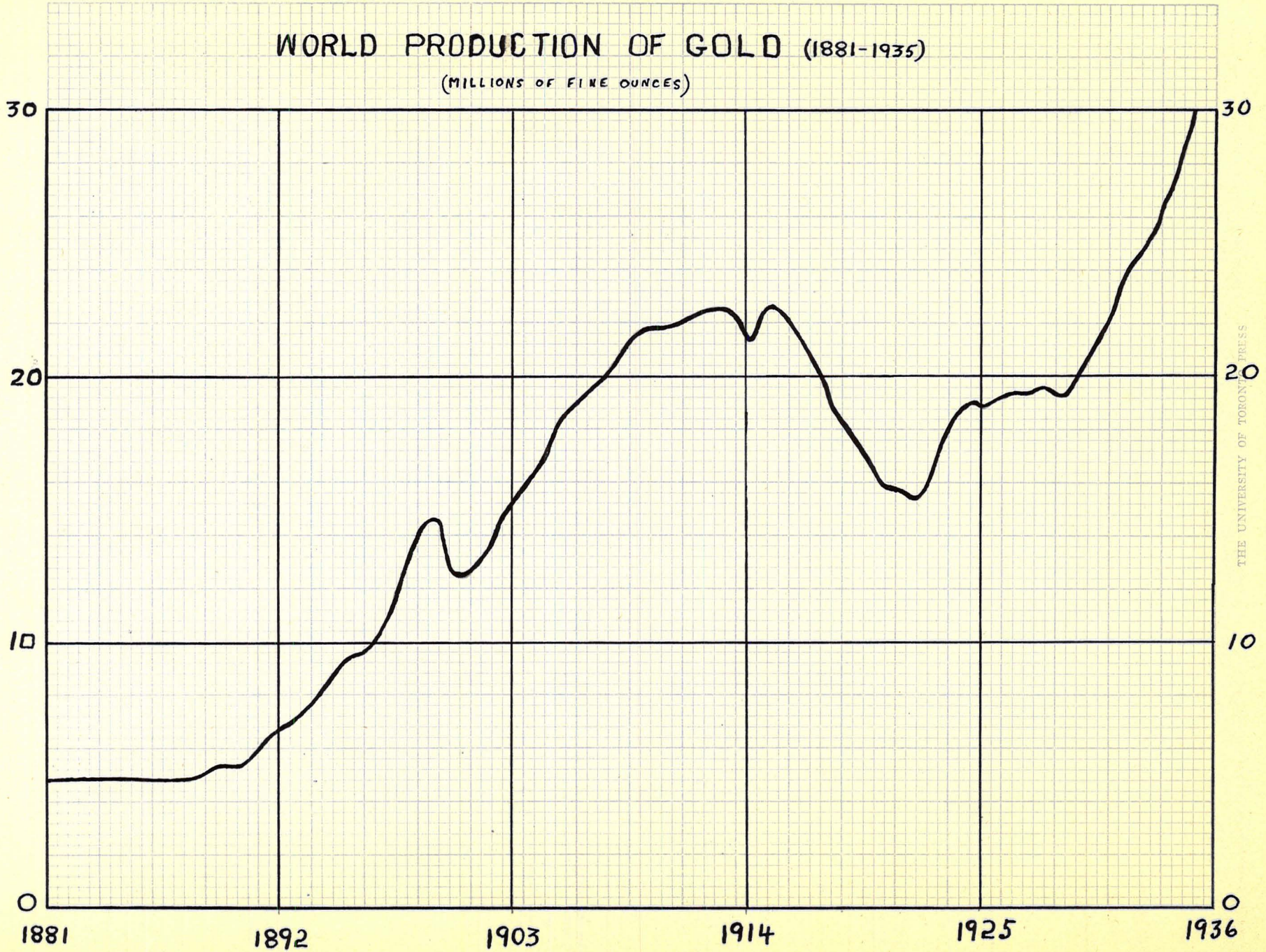
From 1493-1840 the figures are in forty year periods and are taken from the Commercial Year Book, 1932, vol. 11.

From 1851-1880 the figures are in ten year periods, and are taken from the Official Year Book of the Commonwealth of Australia.

From 1881-1890 the figures are taken from the Encyclopedia Britannica.

From 1890-1929 the figures are taken from the World Almanac, 1933.

From 1930-1935 the figures are taken from the Canadian Year Book.



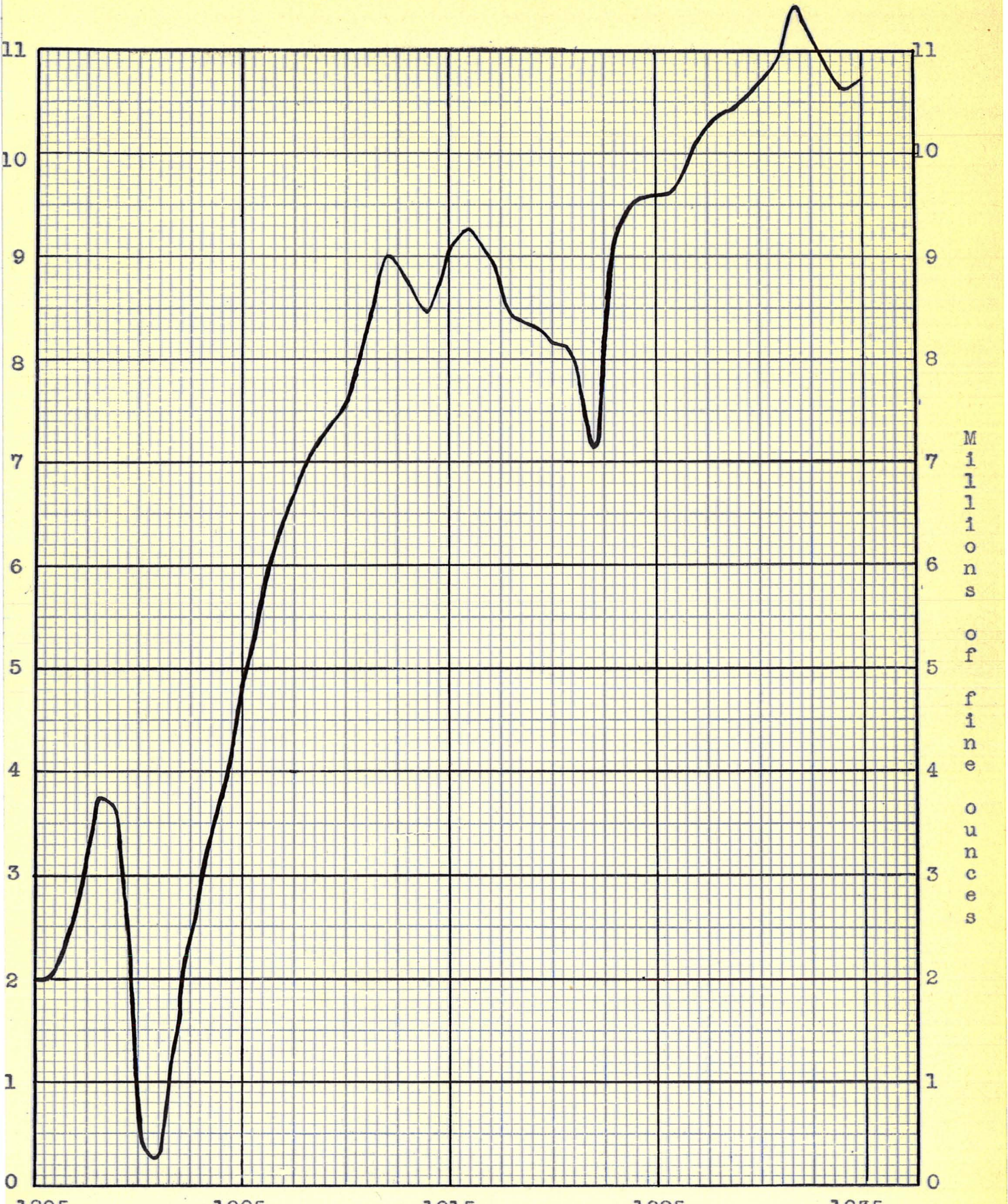
Lesser Producing Gold Countries.
(thousands of fine oz.)

	1925	1930	1934
Rhodesia	637,	600	757
Gold Coast	218	264	358
Belgium Congo	133	215	412
Mexico	866	734	725
Columbia	276	174	389
Chile	28	23	262
Brazil	126	158	226
Japan	299	425	530
India	433	366	350
Philippine Islands	103	197	362
Sweden	1	50	353
New Zealand	122	130	163
New Guinea	5	25	208
Total	3,247	3,361	5,095

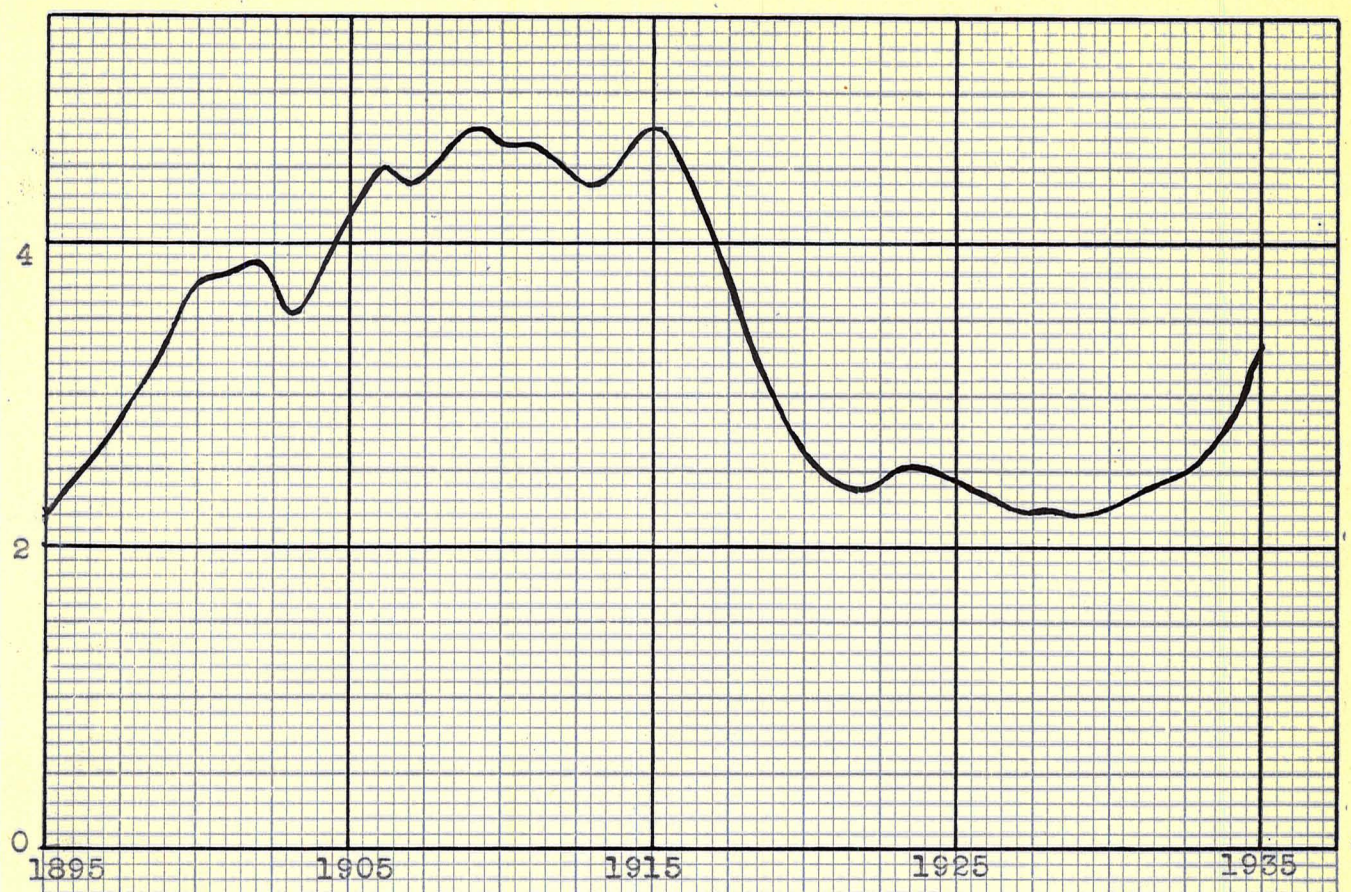
Figures taken from the "Monthly Bulletin of Statistics" League of Nations, May 1935.

The total production in the lesser gold producing countries increased from 3,247,000 fine oz. in 1925 to 3,361,000 oz, in 1930 and leaped to 5,095,000 oz. in 1934. This increase was undoubtedly caused by lower operating costs made possible by low prices since 1929. It is also probable that as soon as the effects of the new price for gold becomes apparent, we will see a further rise in the above figures.

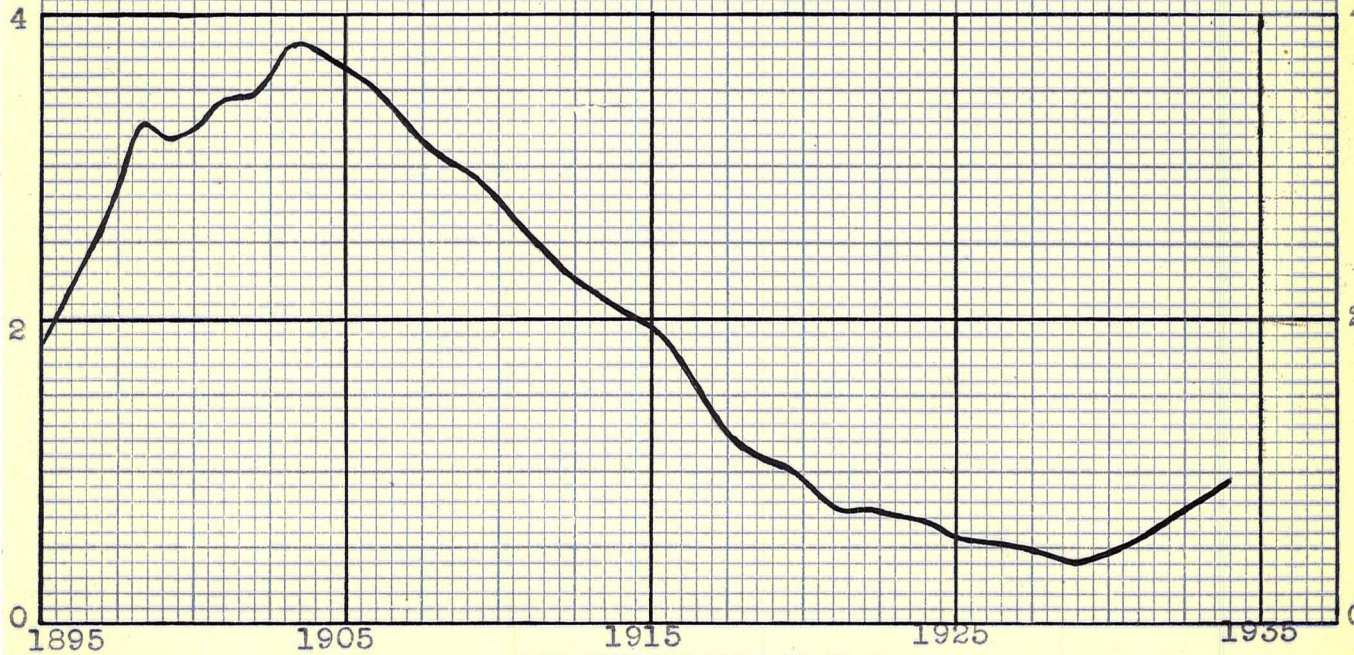
PRODUCTION OF GOLD IN SOUTH AFRICA (1895-1935.)
(millions of fine ounces.)



PRODUCTION OF GOLD IN UNITED STATES (1895-1935)
(Millions of fine ounces)



PRODUCTION OF GOLD IN AUSTRALIA (1895-1934)
(Millions of fine ounces.)



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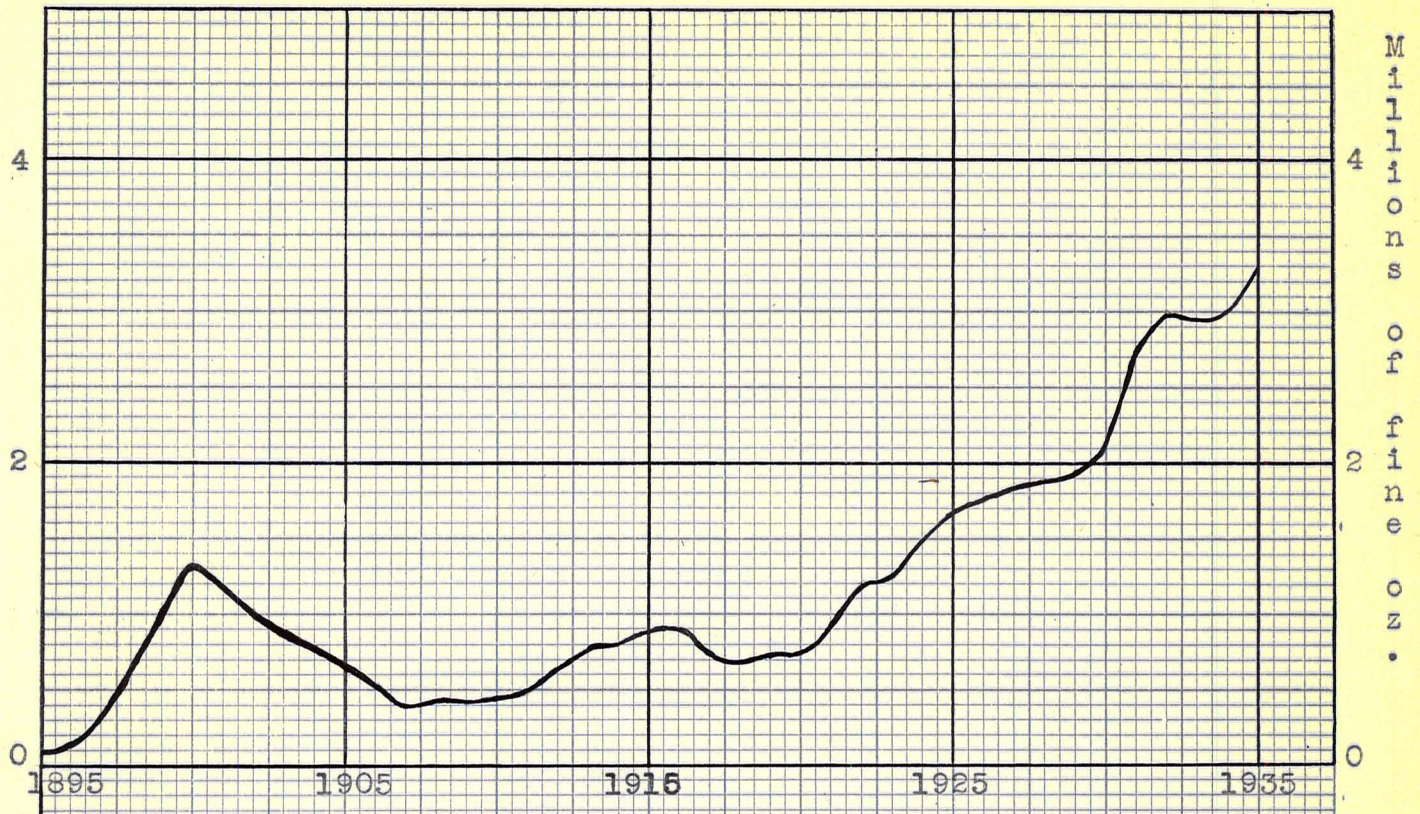
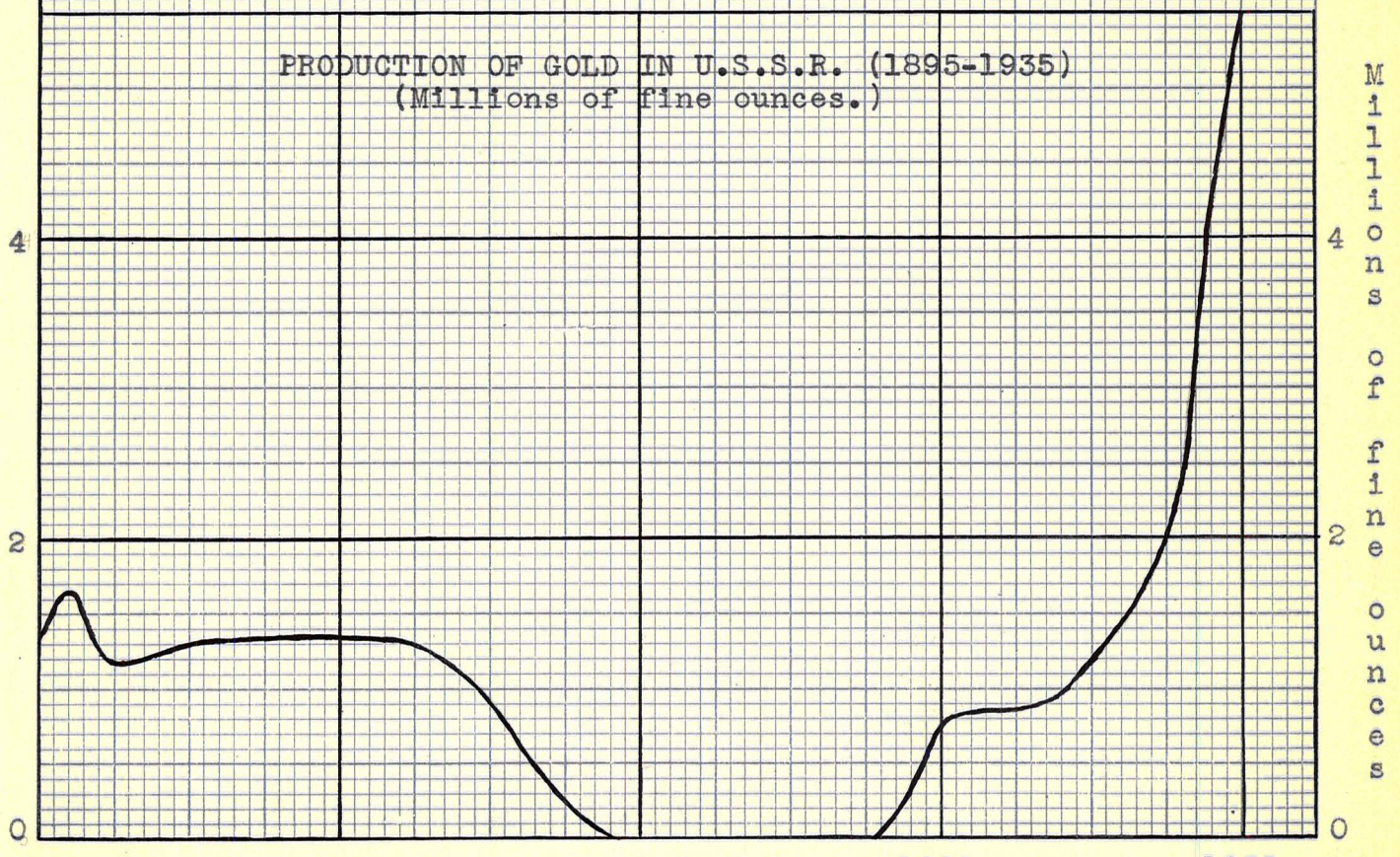
PRODUCTION OF GOLD IN CANADA (1895-1935)
(Millions of fine ounces.)



PRODUCTION OF GOLD IN U.S.S.R. (1895-1935)
(Millions of fine ounces.)



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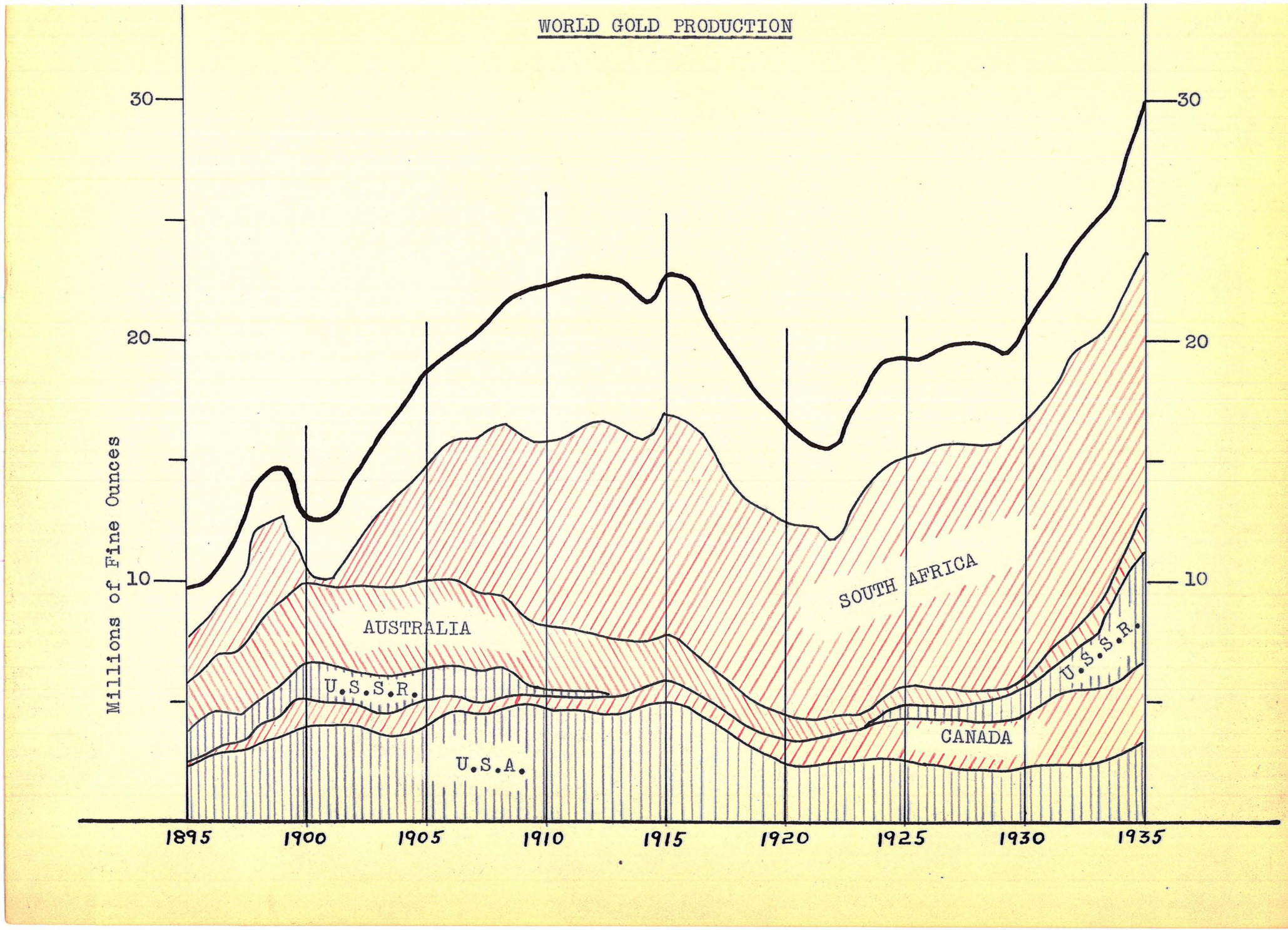

WORLD GOLD PRODUCTION
Millions of Fine Ounces
30
20
10
AUSTRALIA
U.S.S.R.
U.S.A.
SOUTH AFRICA
CANADA
U.S.S.R.
1895
1900
1905
1910
1915
1920
1925
1930
1935

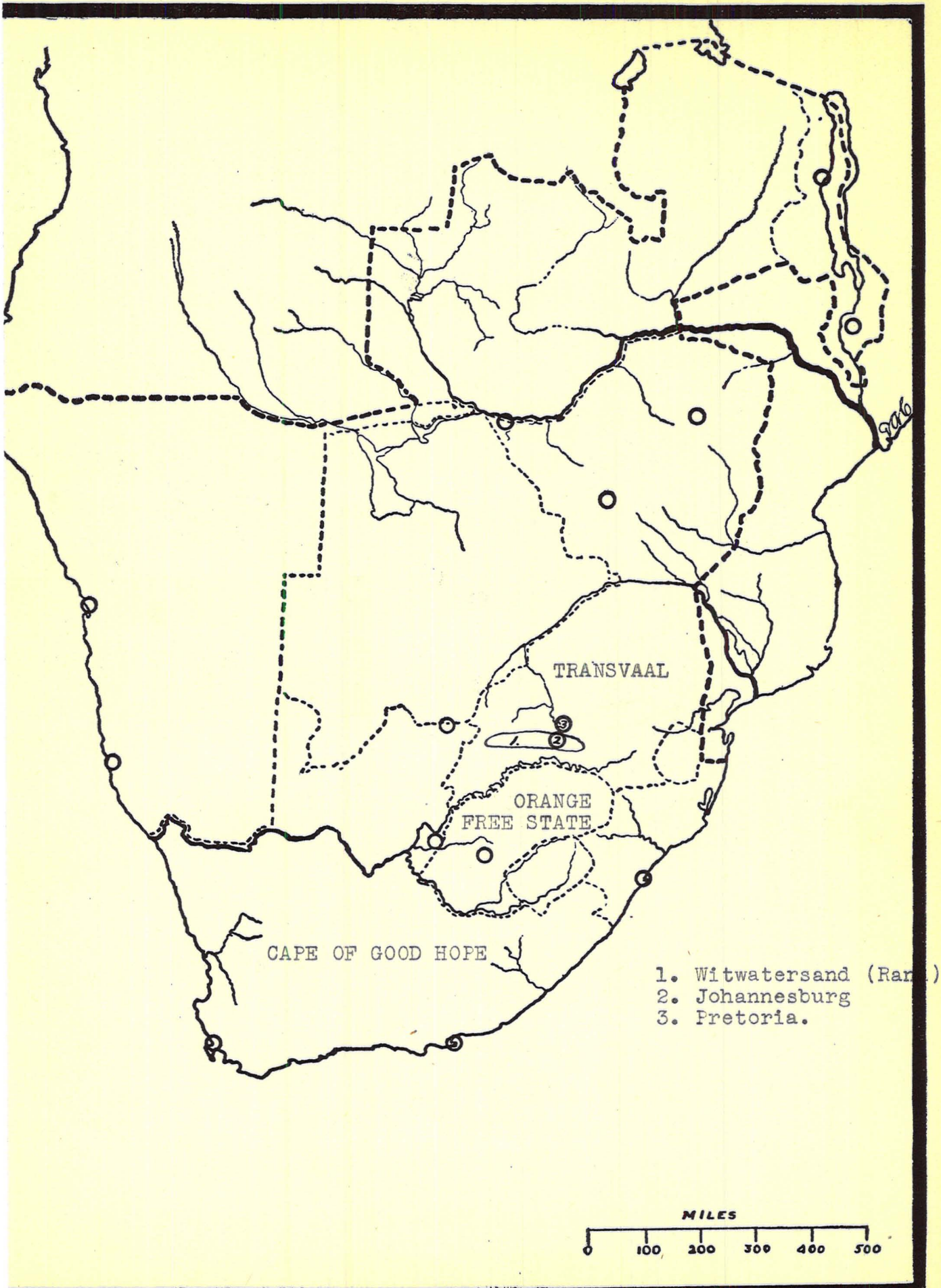
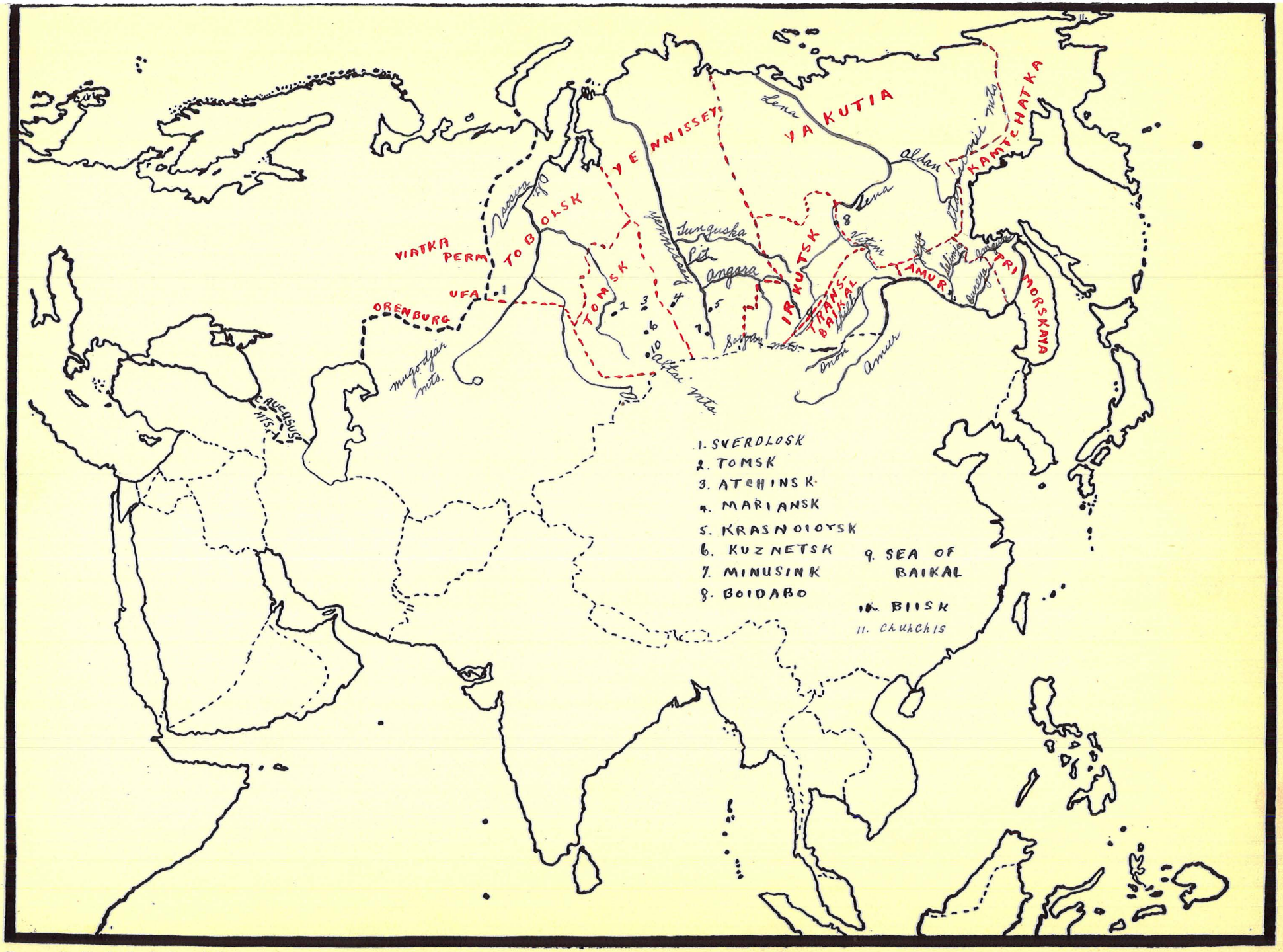


PLATE 31

n by Prof. G. A. Cornish

SOUTH AFRICA

C.C.C.
T.



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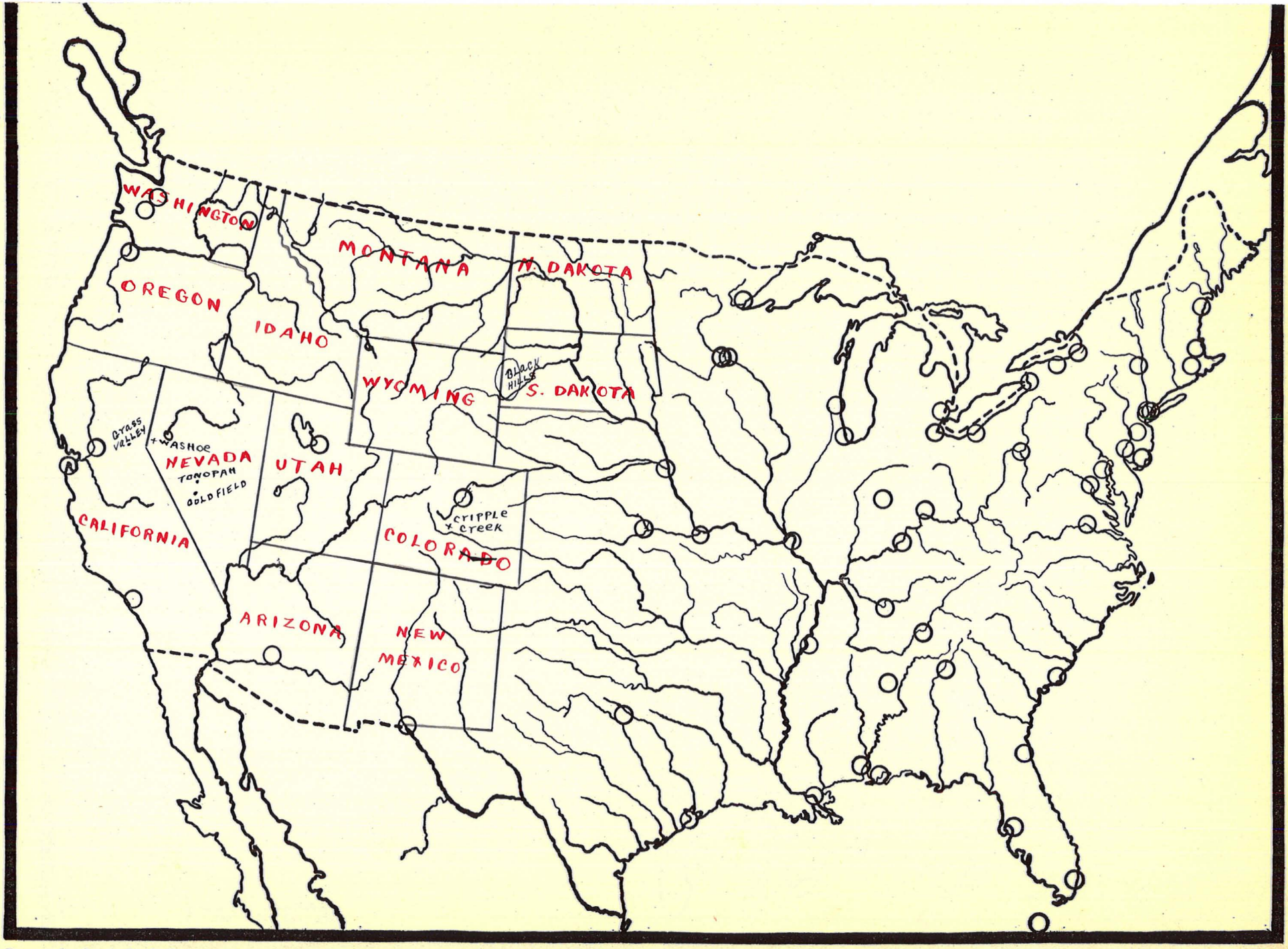
ASIA—POLITICAL

C.C.C.



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UNITED STATES

C.C.C.
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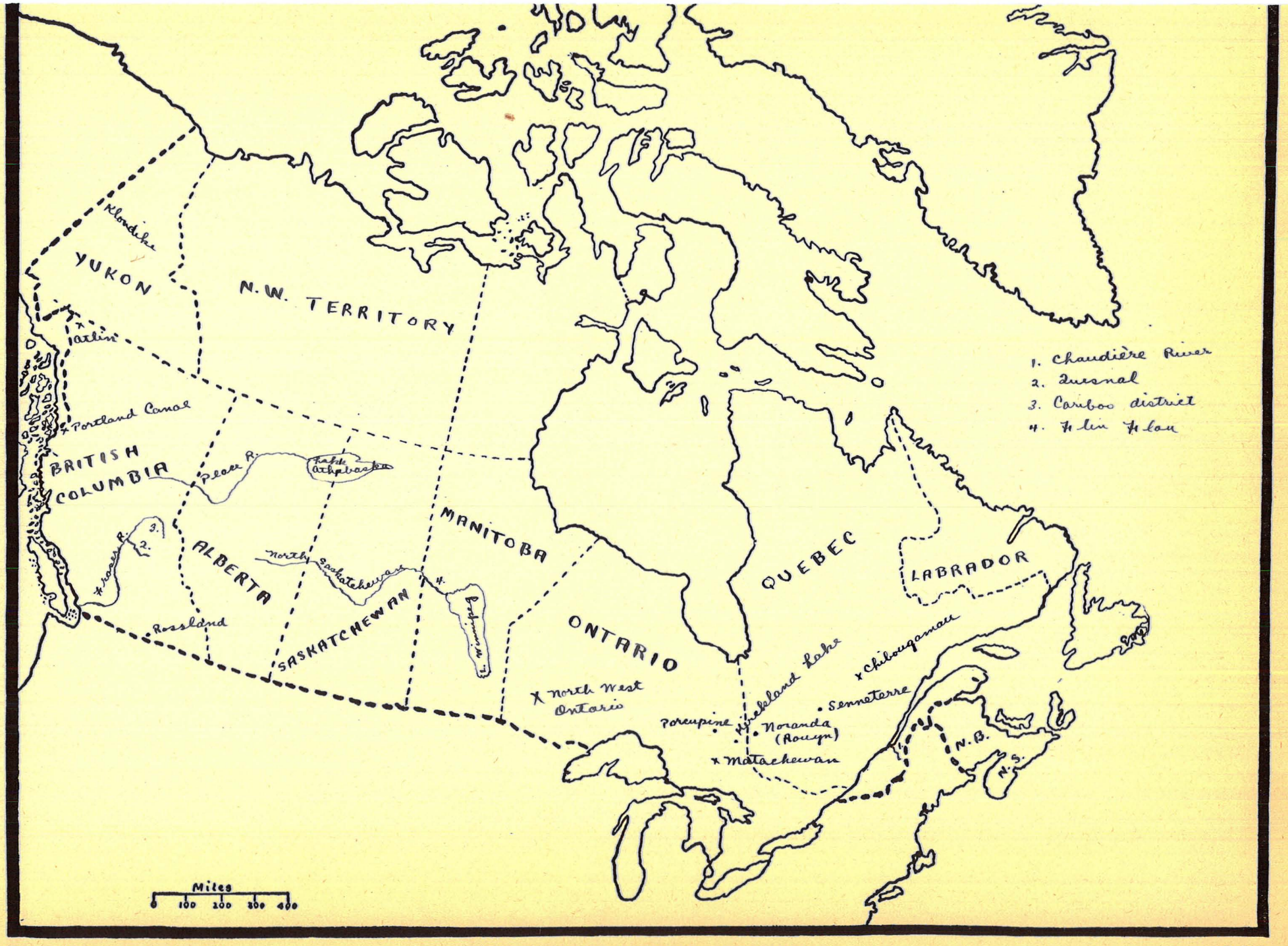

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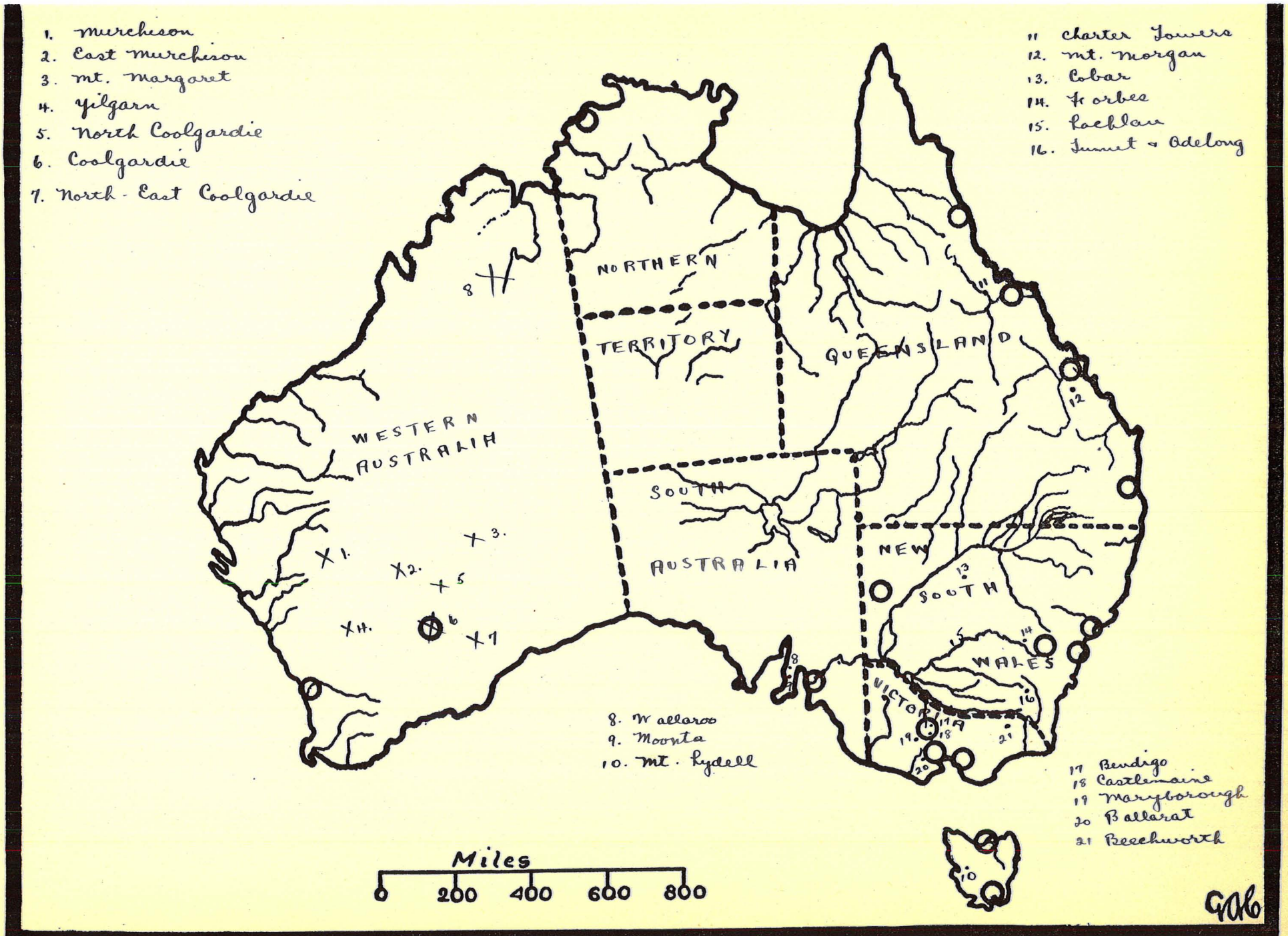
DOMINION OF CANADA—POLITICAL

C.C.C.
T.



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AUSTRALIA—POLITICAL

C.C.C.
T.

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