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THE TREND OF MINERAL DEVELOPMENT IN SWAZILAND

BY

D. A. C. PURSER

INTRODUCTION

Mineral development may be said to have started in Swaziland with the granting of the first mineral concession by the then King of the Swazis, Mbandzeni. This promoted a boom in concession hunting for some years reaching a climax in February 1887 when no fewer than sixteen mineral concessions were granted. The discovery of gold in the Forbes Reef area during the late seventies led to the granting of the first mineral concession on 10th March, 1882. Gold production started soon after this date and dominated the mineral scene for many years until 1913 when a decline in gold production took place. In the meantime tin, in the form of cassiterite, had been discovered in Swaziland in 1892 and, while the value of production only on occasion exceeded that for gold prior to 1913, it eventually assumed a dominant role in Swaziland's economy after that date until the production of asbestos from the Havelock mine began in 1939. From that date tin production began to dwindle and, despite a small but growing revival in gold mining, asbestos has assumed the major role up to the present day.

THE GOLD PERIOD

The history of gold mining, and indeed of mineral development, in Swaziland for the period immediately succeeding the granting of the first mineral concession is the history of the Forbes Main Reef gold mine itself. Work started in 1886 and continued until 1897. During this period old reports indicate that production of gold amounted, on average, to £30,000 annually, although for a short period monthly production was in the region of 2,000 fine ounces or, in value, roughly £7,800. In 1897 the mine workings, then at the 4th (200 feet) level, were abandoned after the shaft timbers had collapsed. It was then reopened and worked on a tribute basis from 1907 to 1909 when it was forced to close again after being flooded out after a severe storm. Prior to this, in 1890, mining had started on other auriferous outcrops in the same area, notable among these being the Ivanhoe, Avalanche and Primrose mines. Prior to 1907, old reports suggest that up to about 1900 some £250,000 of gold was produced from these mines and from the Forbes Main Reef mine.

Another gold mine which has played a large part in Swaziland's gold production, both in the early days and more recently in the 1940's, is the Pigg's Peak gold mine. The Pigg's Peak Gold Mining Company Limited was formed in 1886, the mining rights having been purchased from the original concessionaires who obtained their concession from King Mbandzeni on 7th May, 1882. Gold production started with a 40-stamp battery in about 1887 but in 1890 the mine was in difficulties and was compelled to borrow largely. In 1897 and again in 1899 the company was reconstructed with a view of obtaining further working capital. Although it is reported that in 1890 the ore was found to be unpayable, further development work must have opened up other payable bodies of ore because from 1910 to 1916 the mine, under the Pigg's Peak Development Company, was the major gold producer in Swaziland with an average annual production figure of £37,650.

Other mines, in this early period between 1886 and 1895, were opened up in the north and north-western part of Swaziland. These mines include the Horo, the Havelock (not to be confused with the present day asbestos mine), the Wyldsdale, the Kobolondo, Ruby and Black Diamond Creek. All these mines started off with small stamp batteries, but in every case, in those early days, crushing from the various reefs eventually proved unpayable. That there was an appreciable output from these mines in the early days is undoubted but most records only date from 1907.

It is not surprising that in this early period most of the mines, after a short initial boom, proved to be unpayable. The nearest railhead was at Biggarsberg, Natal, and every item of

machinery had to be transported on waggons over poor tracks at tremendous cost. Transport costs in the region of 25/- per cwt. are reported. The price of gold in those days was £3 17s. 10d. per fine ounce. A total reported production worth £350,000 for the whole of Swaziland up to 1900 is, considering all the difficulties, indicative of the hard work and enterprise of these early pioneers.

As will be seen from the graph (Fig. I) production of gold began to decline in 1912 and ceased altogether in 1917. After the first World War there was a minor revival until the slump period 1929–1931, when production again ceased. It was not until 1943, during the second World War, that gold production increased. The gold came mainly from the Pigg's Peak mine, with smaller amounts from the Wyldsdale and Devil's Reef mines. Owing to financial difficulties the Pigg's Peak and Wyldsdale mines ceased production in 1951, the Devil's Reef mine having closed down earlier. 1956 saw the resumption of gold mining on a small scale in the Territory, namely at the Devil's Reef mine. Production was extremely small however and it was not until the present year, 1960, that the value of gold produced rose appreciably. Most of this gold has come from a completely new mine in the Forbes Reef area and is known as the She gold mine. Discovered in 1953 by the late Mr. Stanley Baragwanath, one of Swaziland's indefatigable prospectors, the mine-to-be was prospected in considerable detail firstly by underground exploration and later by diamond drilling. Several persons, both individuals and companies, showed sporadic interest in the prospect but all, for one reason or another, turned it down. It was not until mid-1959 when a Rhodesian smallworker, Mr. E. Wiseman, had a milling test made on a sample of ore from the prospect that any real interest was shown in the property. He later entered into a Tribute Agreement with the owner and started work there in April, 1960. Work has proceeded on a pilot plant scale since then and the mine has produced a steady average of almost £1,000 worth of gold each month. Extensive underground development work on three levels has shown considerable ore reserves of higher than normal grade and the mine promises to be one of Swaziland's finest gold producers.

After considerable prospecting by the Geological Survey and Mines Department, by the opening up and sampling of old adits and by diamond drilling, interest has once again been focussed on the old Wyldsdale Ridge gold mine. Work has started, not at the mine itself, but on a very rich auriferous outcrop nearby and to date some 133 ozs. of gold have been produced.

It will be seen therefore that Swaziland's gold production is entering a period when it may once again become an important factor in the Territory's economy. By the re-opening and sampling of old mines, such as Kobolondo, Pigg's Peak, Devil's Reef and Horo, every effort is being made to foster interest in the mining of gold. While it is not expected that the value of production will be more than a fraction of that for base minerals it will nevertheless be of significance in the Territory's economy.

THE TIN PERIOD

Tinstone was first discovered in 1892 by a Mr. S. T. Ryan in the Mbabane river drift just below the present bridge. No record remains to show when production started or what production of tin there was prior to 1907. The main mining company in those days was Swaziland Tin Limited who owned mineral concessions Nos. 21, 22, 28 and 39. The bulk of the production, which, by present standards, was considerable, came from Stable Creek and Foy's Creek at Ezulwini on mineral concession No. 21, and from King's Flat, Mbabane Flats, Saunder's Creek and Bailey's Creek at Mbabane on mineral concession No. 28. These two mineral concessions produced the bulk of Swaziland's tin production and to the present day, most of the tin comes from these self-same creeks and flats.

Up to 1912 all the tin alluvials were worked by hand labour using small sluice boxes. In that year, however, at the suggestion of a Mr. F. Douglas Osborne hydraulic sluicing was introduced and monitors and hydraulic elevators were put into operation in the major creeks and flats. The hydraulic elevators were later superseded by electrically driven gravel pumps which boosted production considerably.

The second largest tin producer in the Territory was McCreedy Tins Limited which operated on mineral concessions Nos. 30 and 45. Whether this company operated prior to 1910 is not known but records show a steady production from this date until 1945 when operations ceased. As will be seen from the graph (Fig.2) tin production during the slump period 1930-33 dropped considerably and although it partially recovered later, production has declined from 1939 onwards. Production today averages a mere five tons a year as compared to the hey-day of tin mining when, in 1915, over 600 tons were produced. It is not thought that tin mining will again play any significant part in the Territory's economy, although production may very well increase in time to come.

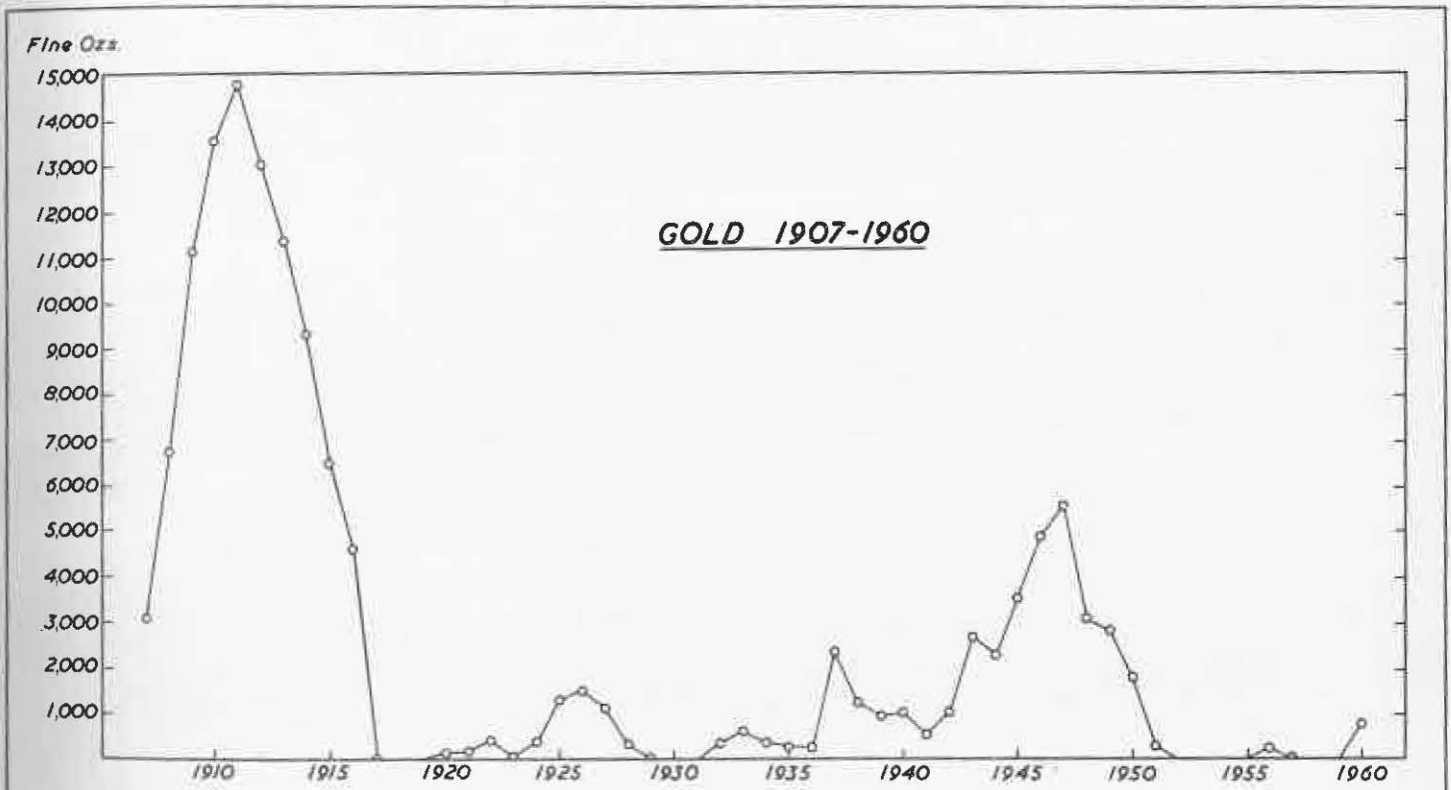

Figure 1. Graph showing production of gold for the period 1907 – 1960.

D.A.C. Purser. 7th. March, 1961. Swaziland Geological Survey & Mines Department. MD 346

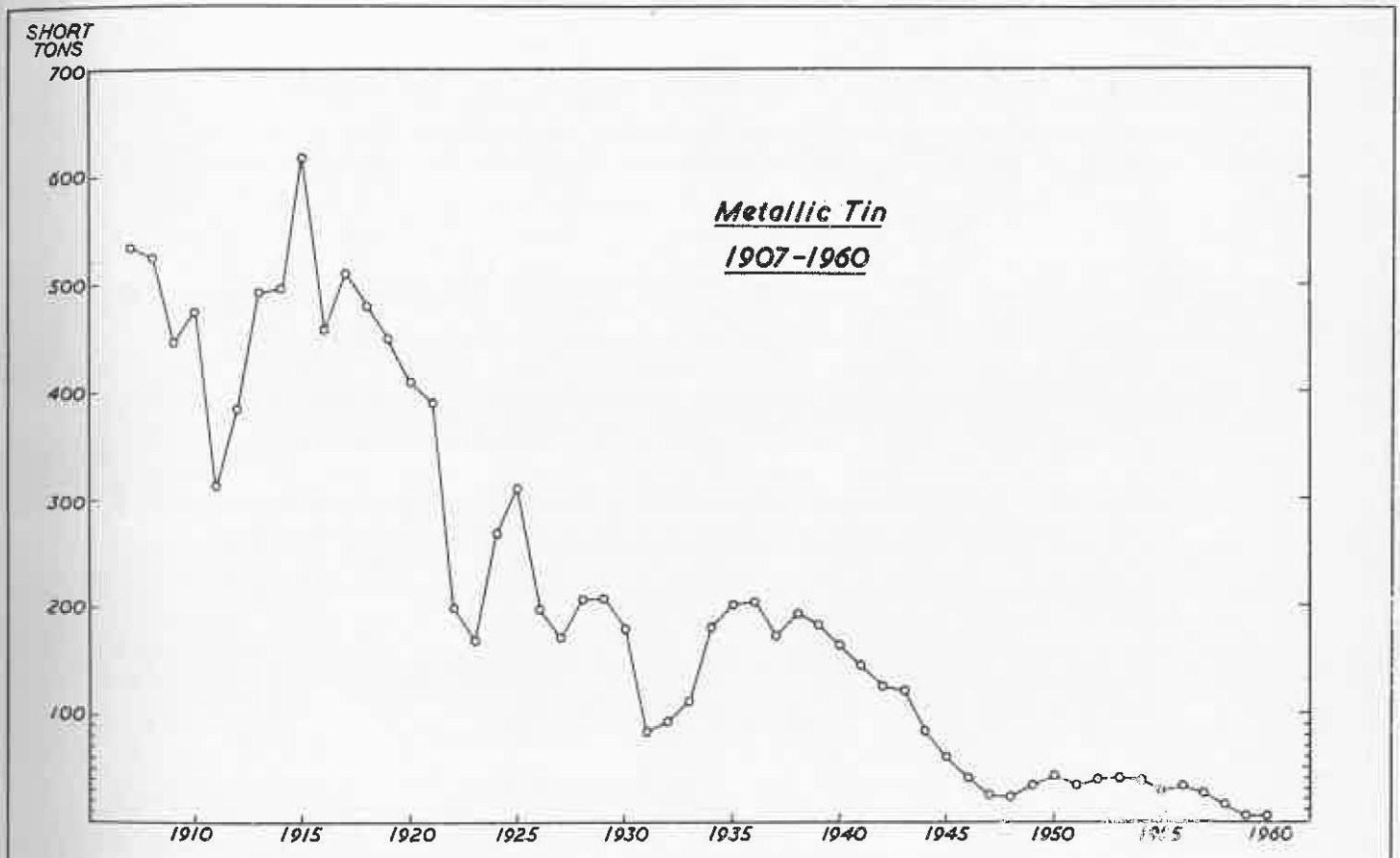

Figure 2. Graph showing production of metallic tin for the period 1907 - 1960.

D.A.C. Purser. 7th. March 1961. Swaziland Geological Survey & Mines Department. MD 347

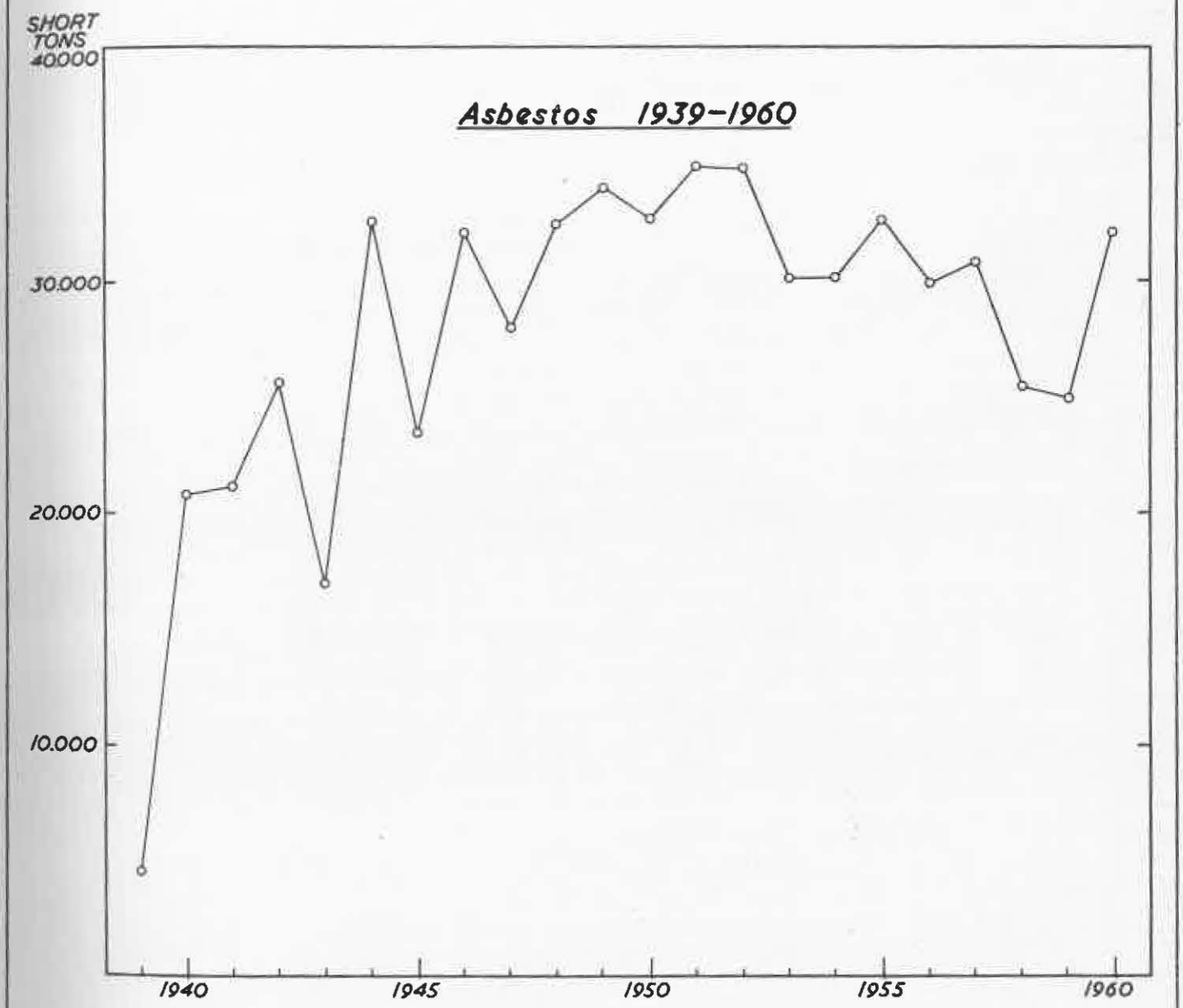

Figure 3. Graph showing asbestos production for the period 1939 – 1960.

D. A. C. Purser. 7th. March 1961. Swaziland Geological Survey & Mines Department. MD. 348

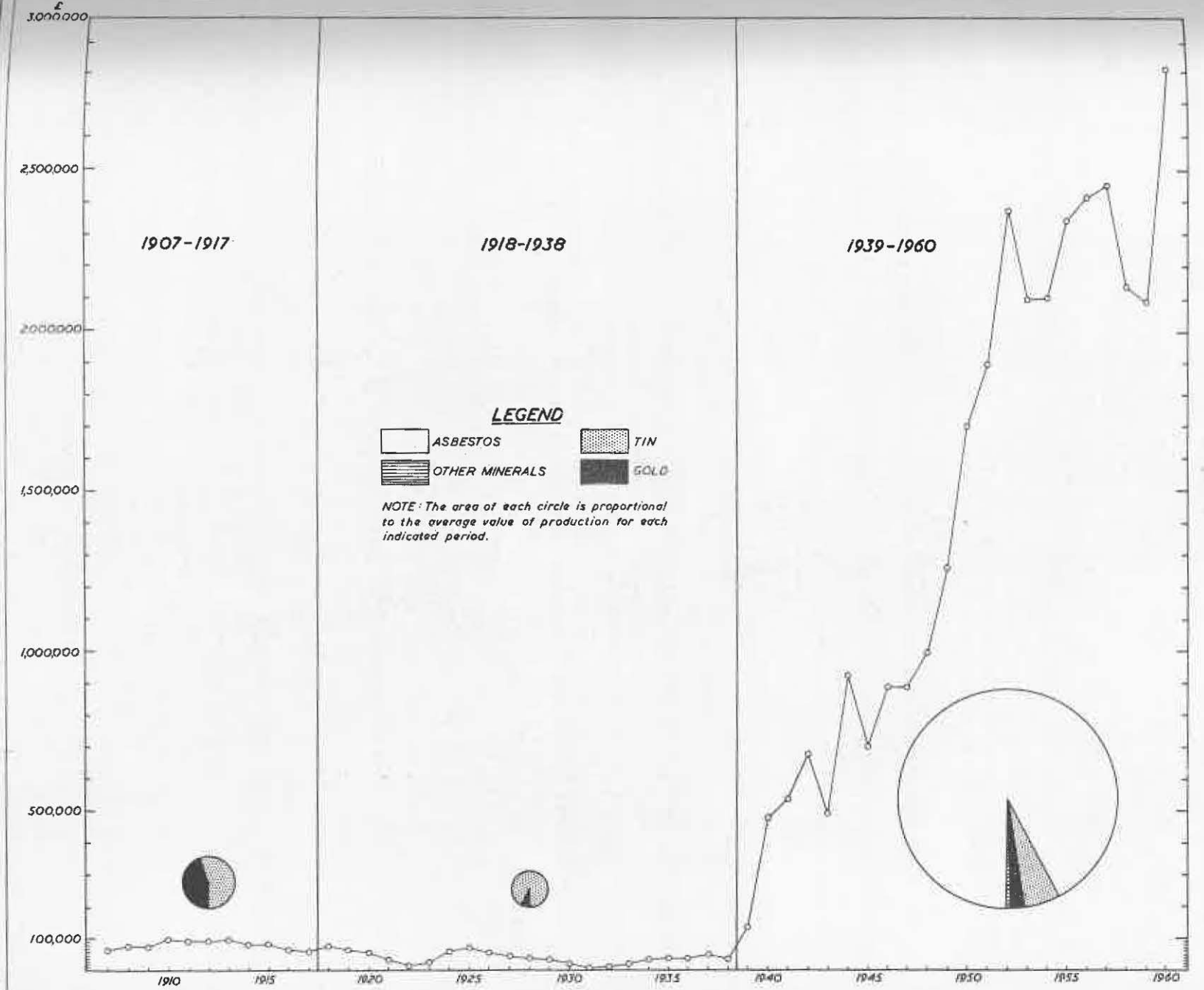

Figure 4 Graph showing annual value of production for the period 1907-1960 together with a diagrammatic representation showing comparative values of each mineral produced for the periods 1907-1917, 1918-1938, 1939-1960.

D. A. C. Purser. 7th. March 1961. Swaziland Geological Survey & Mines Department. MD 349

THE ASBESTOS PERIOD

In 1929, by agreement with the owners of mineral concession No. 41, Messrs. S. and L. Franklin and Mr. H. H. D. Castle first pegged the area of 100 claims on which the Havelock asbestos mine stands. The claims were subsequently taken over by Messrs. Williamson and Castle who later purchased the rights to asbestos only from the concessionaires for £49,062 in 1930. These rights they subsequently sold in the same year to Messrs. New Amianthus Mines (Pty.) for £240,000. This was the largest amount at that time, ever paid in South Africa for a base mineral prospect. Prospecting and development continued until December 1932 when operations came to a temporary halt. In 1936 it became necessary for the company to prepare the mine for production. Operations to this end were started in June, 1936, and exactly three years later the first despatch of fibre, 690 tons, was made by the aerial ropeway.

The value of fibre produced in 1939 amounted to £95,903; by 1949 it had topped the million pound mark and in 1952 was worth over £2-million. Since 1939 asbestos has dominated the mineral scene and has indeed been the mainstay of Swaziland's economy for nearly twenty years. The rapid and steady rise in asbestos production can be clearly seen in the graph (Fig. 3).

The Havelock mine today provides work for some 125 to 130 Europeans and 1,500 to 1,600 Africans.

OTHER BASE MINERALS

During the period that asbestos production has played its leading role, and after the Second World War, the mining of other base metals was started and, with some exceptions, has continued to the present day. These include barytes, yttrotantalite, diaspore/andalusite, pyrophyllite, fluorspar, beryl and, latterly, coal. None of these minerals has individually made any impact on the value of the Territory's mineral production nor, with the exception of coal, is this to be expected, but taken together they add some £20,000 annually to the value of Swaziland's mineral exports.

THE FUTURE

For the future it would appear that the mineral position will be dominated by three minerals, namely iron ore, asbestos and coal, together calculated to be worth between £7-million and £8-million annually in exports.

As has been noted previously it is hoped also that gold production will steadily increase to well beyond the maximum recorded production of earlier days.

Non-metallic industrial minerals are also expected to play their part and the production of such minerals as barytes, kaolin, diaspore and pyrophyllite is expected to increase and add its valuable quota to Swaziland's total mineral exports.

TABLE SHOWING GOLD PRODUCTION AND VALUE FOR THE PERIOD 1907-1960

Year	*Fine ozs.*	*Value—£*	*Average Price—£*	*Year*	*Fine ozs.*	*Value—£*	*Average Price—£*
1907	3,108	13,203	4.25	1934	376	2,608	6.88
1908	6,749	28,669	4.25	1935	314	2,132	6.79
1909	11,202	46,707	4.17	1936	276	1,938	7.02
1910	13,544	57,530	4.25	1937	2,410	16,873	7.00
1911	14,781	62,783	4.25	1938	1,246	9,035	7.25
1912	13,011	55,266	4.25	1939	983	7,314	7.44
1913	11,325	48,104	4.25	1940	1,080	8,266	7.65
1914	9,310	39,551	4.25	1941	568	4,512	7.94
1915	6,497	27,595	4.25	1942	1,129	8,814	7.81
1916	4,633	19,682	4.25	1943	2,734	21,870	8.00
1917	15	63	4.20	1944	2,299	18,391	8.00
1918	—	—	—	1945	3,583	28,666	8.00
1919	—	—	—	1946	4,914	39,471	8.03
1920	128	631	4.93	1947	5,637	45,603	8.09
1921	218	1,056	4.84	1948	3,110	24,994	8.04
1922	428	1,926	4.50	1949	2,841	25,443	8.96
1923	93	418	4.50	1950	1,794	22,182	12.36
1924	376	1,693	4.50	1951	322	3,974	12.34
1925	1,308	5,561	4.25	1952	—	—	—
1926	1,510	6,324	4.19	1953	—	—	—
1927	1,135	4,795	4.22	1954	—	—	—
1928	347	1,475	4.25	1955	—	—	—
1929	90	382	4.25	1956	252	3,092	12.27
1930	—	—	—	1957	7	86	12.29
1931	—	—	—	1958	—	—	—
1932	365	1,542	4.22	1959	—	—	—
1933	630	3,914	6.21	1960	806	10,140	12.60

TABLE SHOWING TIN PRODUCTION AND VALUE FOR THE PERIOD 1907-1960

Year	*Short tons*	*Value—£*	*Average Price—£*	*Year*	*Short tons*	*Value—£*	*Average Price—£*
1907	355	49,568	93	1934	181	37,628	208
1908	526	42,005	80	1935	204	39,351	193
1909	447	28,368	63	1936	205	39,351	192
1910	447	42,250	89	1937	174	37,158	214
1911	314	32,397	103	1938	195	33,129	170
1912	385	37,946	99	1939	183	36,528	200
1913	493	51,220	104	1940	165	37,812	229
1914	496	43,256	87	1941	147	34,467	234
1915	618	56,067	91	1942	127	28,257	222
1916	459	46,732	102	1943	122	28,470	233
1917	511	60,221	118	1944	86	26,733	311
1918	480	78,870	164	1945	60	18,346	306
1919	449	66,676	149	1946	42	12,653	301
1920	411	59,254	144	1947	25	8,828	353
1921	391	29,767	76	1948	23	11,017	479
1922	200	16,420	82	1949	35	17,528	502
1923	169	29,240	173	1950	42	25,884	616
1924	270	59,082	219	1951	35	31,961	916
1925	311	67,722	218	1952	40	32,501	813
1926	199	52,947	266	1953	40	24,931	623
1927	172	42,776	249	1954	39	24,654	632
1928	208	39,706	191	1955	30	20,629	688
1929	208	38,692	186	1956	33	22,602	685
1930	180	23,414	130	1957	28	18,283	653
1931	85	8,875	104	1958	17	11,260	662
1932	94	11,497	122	1959	6	4,000	702
1933	113	19,665	174	1960	7	4,991	706

TABLE SHOWING ASBESTOS PRODUCTION AND VALUE FOR THE PERIOD 1939-1960

Year	*Short tons*	*Value—£*	*Average Price—£*
1939	4,591	95,903	20.9
1940	20,804	436,756	21.0
1941	21,127	507,364	24.0
1942	25,595	647,200	25.3
1943	16,907	444,413	26.3
1944	32,659	886,090	27.1
1945	23,416	665,362	28.4
1946	32,138	844,631	26.3
1947	27,955	840,535	30.1
1948	32,431	995,767	30.7
1949	33,967	1,223,486	36.0
1950	32,667	1,662,741	50.9
1951	34,964	1,869,346	53.5
1952	34,769	2,352,827	67.7
1953	30,104	2,080,110	69.1
1954	30,142	2,085,514	69.2
1955	32,613	2,332,151	71.5
1956	29,875	2,398,531	80.3
1957	30,727	2,437,917	79.3
1958	25,261	2,130,952	84.3
1959	24,807	2,085,353	84.1
1960	32,026	2,786,479	87.0

TABLE SHOWING VALUE OF TOTAL MINERAL PRODUCTION FOR THE PERIOD 1907–1960

Year	*Gold—£*	*Tin—£*	*Asbestos—£*	*Other Minerals—£*	*Total*
1907	13,203	49,568			62,771
1908	28,669	42,005			70,674
1909	46,707	28,368			75,075
1910	57,530	42,250			99,780
1911	62,783	32,397			95,180
1912	55,266	37,946			93,212
1913	48,104	51,220			99,324
1914	39,551	43,256			82,807
1915	27,595	56,067			83,662
1916	19,682	46,732			66,414
1917	63	60,221			60,284
1918	—	78,870			78,870
1919	—	66,676			66,676
1920	631	59,254			59,885
1921	1,056	29,767			30,823
1922	1,926	16,420			18,346
1923	418	29,240			29,658
1924	1,693	59,082			60,775
1925	5,561	67,722			73,283
1926	6,324	52,947			59,271
1927	4,795	42,776			47,571
1928	1,475	39,706			41,181
1929	382	38,692			39,074
1930	—	23,414			23,414
1931	—	8,875			8,875
1932	1,542	11,497			13,039
1933	3,914	19,665			23,579
1934	2,608	37,628			40,236
1935	2,132	39,351			41,483
1936	1,938	39,351			41,289
1937	16,873	37,158			54,031
1938	9,035	33,129			42,164
1939	7,314	36,528	95,903		139,745
1940	8,266	37,812	436,756		482,834
1941	4,512	34,467	507,364		546,343
1942	8,814	28,257	647,200	156	684,427
1943	21,870	28,470	444,413	1,487	496,240
1944	18,391	26,733	886,090	—	931,214
1945	28,666	18,346	665,362	215	712,589
1946	39,471	12,653	844,631	962	897,717
1947	45,603	8,828	840,535	1,638	896,604
1948	24,994	11,017	995,767	1,209	1,032,987
1949	25,443	17,528	1,223,486	659	1,267,116
1950	22,182	25,884	1,662,741	3,111	1,713,918
1951	3,974	31,961	1,869,346	3,355	1,908,636
1952	—	32,501	2,352,827	2,860	2,388,188
1953	—	24,931	2,080,110	3,081	2,108,122
1954	—	24,654	2,085,514	3,744	2,113,912
1955	—	20,629	2,332,151	3,129	2,355,909
1956	3,092	22,602	2,398,531	4,669	2,428,894
1957	86	18,283	2,437,917	6,530	2,462,816
1958	—	11,260	2,130,952	8,763	2,150,975
1959	—	4,000	2,085,353	11,495	2,100,848
1960	10,140	4,991	2,786,479	28,773	2,830,383
	734,274	1,803,585	31,809,428	85,836	34,433,123

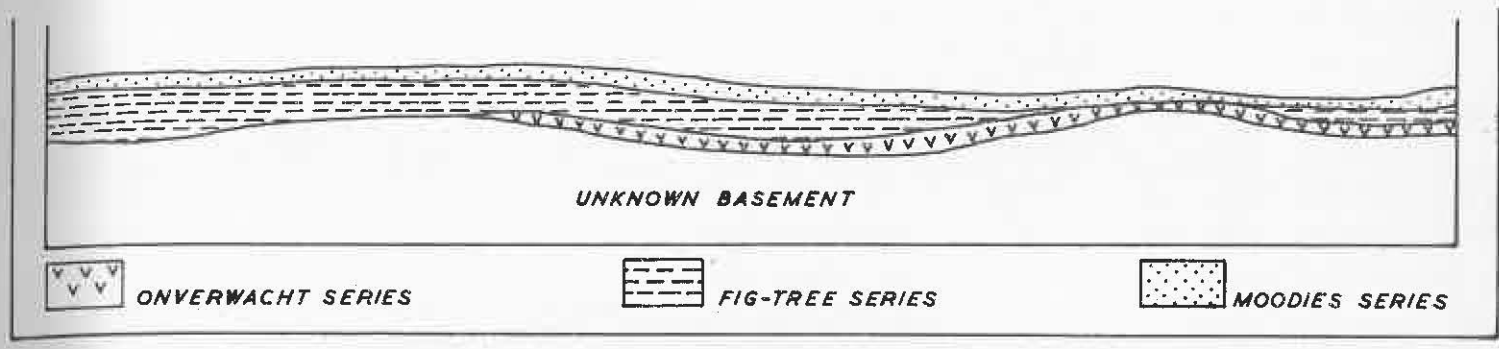

FIGURE I.—The first period of sedimentation. Onverwacht Series indicated by v symbol, Fig-tree Series by dashes, and Moodies Series by dots.

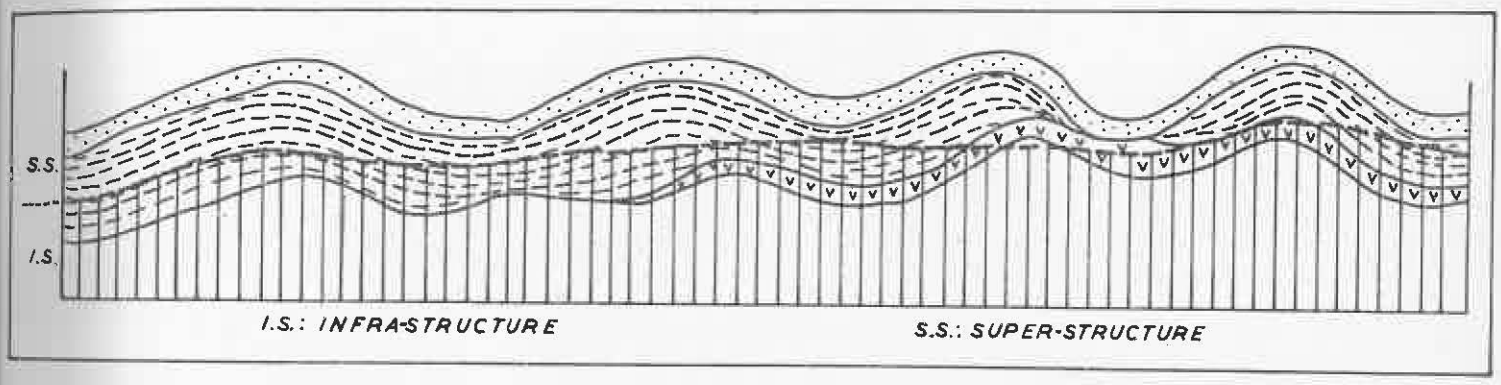

FIGURE II.—The first stages of folding with the formation of infra-structure (I.S. Vertical ruling) and super-structure (S.S.).

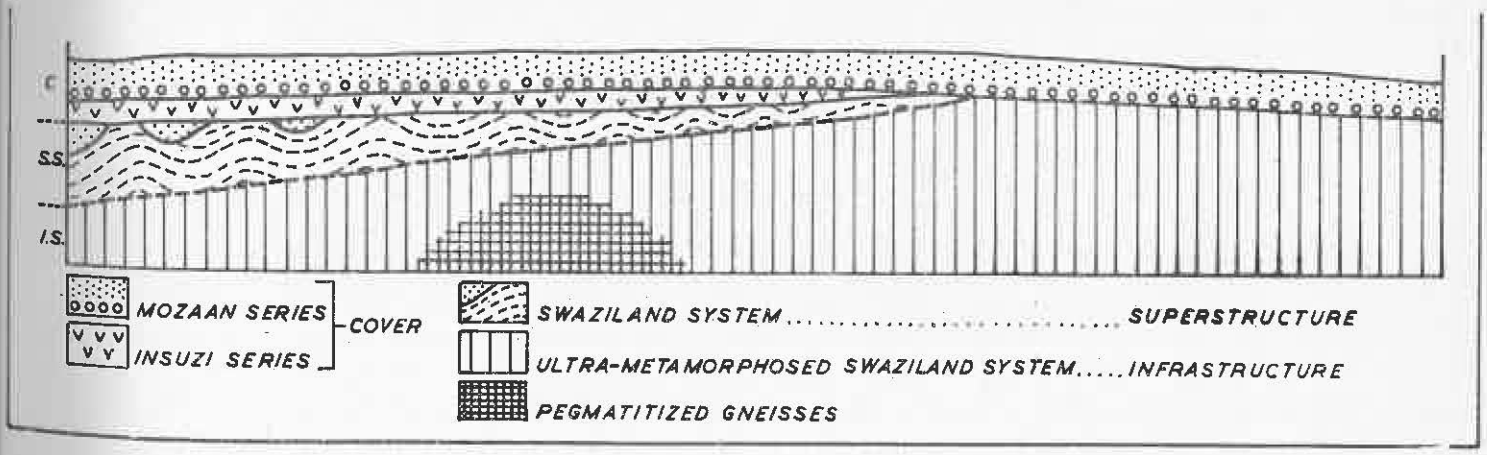

FIGURE III.—The cover (c) of Insuzi Series (v symbol) and Mozaan Series (circles and dots) is deposited on the eroded surface of the Swaziland System. At depth formation of pegmatized gneisses (cross-hatched).