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ASBESTOS PRODUCTION IN SOUTHERN RHODESIA

By W. E. Sinclair, M.I.M.M.

Consulting Mining Engineer

Southern Rhodesia is well known as a producer of chrysotile asbestos, ranking third in order of world output, assuming that the recovery in Russia is next to that of Canada. The most important point about the Rhodesian asbestos, however, is that it is of excellent quality. An interesting feature is that this country, like Canada, possesses only chrysotile, notwithstanding the fact that on its southern border, the Union of South Africa is blessed with every known variety of the asbestiform minerals.

The industry in Rhodesia has made tremendous strides in its comparatively short life, mainly because of the quality of the fibre, but also, no doubt, because a large percentage of the output consists of good spinning grades. The revenue earned from the value of the asbestos produced to-day constitutes an important factor in the economy of the country and indirectly the industry commands a major position in the life and work of the colony, since the asbestos fields cover an extensive area.

The total value of the asbestos produced and sold in 1952 was £6,652,000, which is more than one-third of the whole mineral production of the country for the year.

A somewhat surprising feature of this record output is that the value of asbestos has actually exceeded that of gold. Up to now Rhodesia has depended on gold output as its main revenue earner, which has accounted for the fact that it has been considered a gold producing country first and foremost.

One curious case that may contradict this idea is that the Antelope Gold Mine near Bulawayo, having exposed good "slip" fibre in its underground development tunnels, the Company is seriously changing over from gold to asbestos production.

This, altho a new type of mine to join the list of producers, is only one of many new developments that are steadily building up the record output.



This growing production and the increasing value is clearly indicated in the following table:

Year	Output and Value		Average selling price
	Tons	Value	
1950	71,526	£1,615,490	£64.5
1951	77,663	5,152,108	70.2
1952	83,000*	6,652,000	81.1

* (approximate)

Altho the average selling price shown is based purely on the value of the total output of all grades, it does indicate that there has been a higher price for the mineral which is common in most fields.

These substantial indications of the growth of the industry, together with extensive new developments make it opportune to consider the story of this chrysotile country and its future prospects.

The serpentine rocks are fairly widespread thruout the country. It is in these that most of the main asbestos bearing formations are found and likewise many of the principal mines are located. These are referred to later.

The Great Dyke of Rhodesia is a prominent geological feature of the country and it is responsible to some extent for many of the chrysotile deposits. The most important occurrences, however, are those found in the rocks of the basement schists in which serpentinization has resulted from the influence of intrusive granites.

The ore-bodies generally occur as lenticular masses in the serpentine rocks which form ranges of low hills, a not uncommon topographical feature of the bush-covered terrain.

In most of the deposits, whether occurring in the rocks of the Great Dyke or in those resulting from the Gneiss-granite intrusions just described, the disposition of the asbestos seams in the serpentine assume a stockwerke pattern, with a tendency, sometimes, for a number of the criss-cross seams to follow a general "strike" or dip trend, but rarely to form continuous regular reef-like bodies. Most commonly the asbestos occurs as cross-fibre seams, but there are also many instances where it is found as slip-fibre, lying flat hap-hazardly in the cracks of the

serpentine. The best known spots of slip-fibre occurrences are first south of Shabani, the "slip-fibre" area, secondly near Belingwe and west of Gwanda.

Slip fibre is generally considered to be longer than that occurring in cross-fibre seams but not always of comparative quality. Some of the longest fibre ever found was six inches in length and this came from cross-fibre seams. The average longest commercial grade produced is from two inches to three inches in length. With the increasing production of short fibre grades (even from old dumps) the former high percentage of long spinning grades is being gradually reduced.

Considering the size and importance of the asbestos industry today, it is hard to imagine that this development has taken place in little more than 40 years. Forty years ago the original small prospects were first opened up by enterprising pioneers. Actual production did not start until some years later, indeed it was not until 1919 that the output reached 1,000 tons. In just under 35 years, therefore, the total annual production has risen from 1,000 tons to 83,000 tons. The increase has been fairly steady thruout the period, altho a definite impetus was given by the phenomenal demand following the last war.

Credit for the success of the industry must go to the prospectors who opened up these fields in the face of many physical difficulties in a country which at that time was completely undeveloped. Besides the local handicaps, the asbestos pioneers were faced with keen competition from the old established industries in Italy, Canada and Russia where chrysotile asbestos had already been in production from 40 to 50 years earlier.

The first recorded investigation of asbestos near Mashaba, in the Port Victoria District, was in 1907. Eventually this led to the development of Gaths Mine and others in the Mashaba area where production really started in 1913. At the same time the Shabani developments came into the picture, and ever since, this area has retained its position as the biggest producing centre in the country.

To be concluded in the September number.

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This is the second installment of the article by W. E. Suchan, M.I.M.M. (Consulting Mining Engineer). The first installment appeared in our August 1953 issue.

It was very many years later, however, before the industry was operating smoothly. Mining and hand-cobbing of the asbestos ore created a number of initial problems and these were to be followed by even greater difficulties in the matter of mechanically treating the ore to recover satisfactory grades of asbestos. Despite the example of Canadian milling practice, it took nearly ten years of experimenting before an efficient plant was evolved to produce classified grades which were acceptable to the manufacturers. The reason for the initial difficulties experienced is accounted for by the greater quality of long fibres in the ore and the fact that the Rhodesian asbestos is more tender than most others.

During these early years several large mines were opened up and Turner & Newall Ltd. assumed control of the Rhodesian & General Asbestos Corporation, Ltd., followed by other strong combines, all of which gradually put the industry on a more stable basis.

The steady and ever increasing output has naturally been encouraged by the persistent demand and better prices; indeed in the last few years the consistently upward trend in price values has given an added impetus to the intensive development of the mineral. Many large and important new mining Companies have entered the field, and in some cases their efforts are already contributing to the growing output.

Some of the older mines in the Mashaba and Shabani areas are mining by underground methods, because the ore bodies tend to dip at a flat angle which limits the depth at which they can be worked economically by open-cast methods. In many other cases, methods of exploitation most favorably suited to geological and topographical conditions are usually adopted. This often consists of quarrying or benching hillside deposits or by open-cut

shots or wide orebodies below the surface of the ground. In such workings, the ore is usually hoisted to the surface in the mill by means of an open incline or by means of inclined shafts placed below the orebodies.

About ten mines in the Shabani area produce more than half of the total of the whole country. The bulk of this recovery is accounted for by the Rhodesian & General Asbestos Corporation from their mines and mainly the Val Desperandum (19,000 tons). Other well known mines in the district are the Biltong and Sabi Hill, each producing about 350 and 210 tons per annum respectively. Whites Asbestos and other smaller producers add their quotas to the total of nearly 50,000 tons from this area.

In the Mashaba district 27,000 tons were recovered last year by some twenty different mines, the most important of which are Gathis and Kings controlled by the Rhodesia & General Asbestos Corp. Other well known producers are the D.S.O. and Muriel Mines (Mashaba Rhodesian Asbestos Ltd.) and the Temeraire Mines. The Kilmarnock group are represented by the Princess, Parallel, Alpha and Shashi Mines. The Blue Bird, Boss, Fibre Coy. and Rex Mines are among many other smaller concerns.

In the western extension of the Shabani formation, in the Belingwe area, the main producers consist of the Vanguard and the Gumbaba Tumba Mines. There are other smaller propositions.

The next good producing area is that at Filabusi near Bulawayo. The principal producers here are The Croft (African Asbestos), Wynnes (Dominion Base Metals) and the Norma Mines, besides a few smaller concerns. About six other companies are operating in the Bulawayo district on the Gwanda and Shangani serpentine bodies, but these as yet are only small producers.

The main mine in the Lomagundi area is the Ethel Mine which has been in existence for some time.

Milling operations at all these mines vary considerably despite the application of the general basic idea of mill design. Originally, milling procedure followed Canadian practice, where the first milled asbestos was

roduced in 1878. As the Canadian plant design was not suitable for Rhodesian fibre, most of the mines planned their own methods to suit the ore from their mines. The Turner & Newall groups designed and built the most efficient plants for their mines and many of the older mines attempted to follow their plans.

In recent years newly developed mines built mills which have been hurriedly assembled to meet the urgent need for asbestos. In some of these little regard was given to the classification and standard grading of the fibre. Shipments from these mills was frowned upon by manufacturers, with the result that today more attention is being paid to efficient milling processes to produce good clean fibre suitably graded for export.

The excellent quality of the Rhodesian chrysotile is so well known that its reputation is sufficient assurance of a regular and steady demand, especially for good quality spinning and shingle grades. Most of the spinning fibre possesses high tensile strength, albeit it is soft and silky in texture.

The potential reserve of the Rhodesian fields is unknown, but to judge by the interest being shown by many large mining companies established in South Africa, it would appear to be assured. The General Asbestos Corporation under the technical control of the Anglo-Rand Mining & Finance Corp., have opened up the Biltong Extension and Shabani Kloof Mines in the Vukwe Hills south of Shabani. Also the African & European Investment Corporation whose Company Rhodesia Monteleo Asbestos have opened up mines in the "slip" serpentine formation (Biltong Mine). Another interesting feature is the fact that the American Economic Cooperation Administration is financing the operation of three of the Mines of the Associated Asbestos group.

One of the big foreign newcomers in the Rhodesian field is the Johns Manville Company who, in association with British Metals Corporation, Anglo-Huronian, Southern Minerals and other interests, have formed Rhodesian Asbestos to develop and exploit asbestos orebodies in the Mashaba area.