COMMERCIAL TALC IN TASMANIA.

Talc is a soft, flexible, sectile mineral, white to pale green or grey in colour, with a greasy feel and pearly lustre. It fuses at 2,000°F, is chemically inert and a poor conductor of electricity. The various uses of talc depend on one of or a combination of these physical properties and certain properties that are exceedingly important for one use need not be considered for others. In chemical composition, talc is a hydrated silicate of magnesium, with the theoretical formula H_2O, $3MgO$, $4SiO_2$, having 63.5% of SiO_2, 31.7% of MgO and 4.8% H_2O.

In the United States and Canada, commercial talc is subdivided into three grades; talc proper, which is in the form of aggregates of flakes or fibres; steatite, which is the compact cryptocrystalline variety: and soapstone which is a soft impure talcose rock. In Australia, however, the name talc is applied to the foliated types and steatite or soapstone to the massive types.

Although there are occurrences of talc in veins, most commercial deposits are in the form of either lenses or beds. Talc is a deuteric mineral and is usually the result of dynamic (or regional) metamorphism in the presence of hydrothermal waters. As it is a magnesium mineral, it is usually an alteration product of primary magnesium bearing rocks, that is of either magnesium carbonates or silicates. Thus talc can be formed either from siliceous dolomites, when tremolite is probably an intermediate mineral, or from such ferro-magnesium silicates as olivine, enstatite or hypersthene, which occur in ultra-basic rocks. In this latter case, serpentine may be an intermediate mineral.

Talc has been reported at numerous localities in Tasmania, but the only deposit that has been used commercially occurs near the village of Gawler, two miles south of Ulverstone, where it is located on the property of R. Templar. Here, near the right bank of the Gawler River in flat country covered by basalt soil and boulders various small pits and adits have been opened in Pre-Cambrian quartz-mica schists. The planes of schistosity of these rocks strike at 110° and dip steeply to the south at 80°.

The prospecting and development work here have revealed the presence of two lenses of talc which parallel the planes of schistosity. The western lens is said to have a length of 90 feet and a width of 6 feet and the eastern a length of 60 feet and a proved width of 5 feet. Due to the partial collapse of the main adit, these figures could not be checked but a sample taken from the adit showed talc of a high quality.

Production figures show the following yield of talc:-

1928	32 tons
1929	23 "
1930	13 "
1931	15 "
1932	5 "
1933	9 "
1934	5 "
1936	3 "
1944	4 "
1945	153 "
1946	49 "
1948	22 "
Total	333 tons

No reliable figures as to the value of this talc are available but three different grades, grade 1 (white), grade 2 (bluish-white) and grade 3 (iron-stained) have been sold.

In order to assess the possibility of the occurrence of further lenses it is necessary to examine the origin of the talc. Unfortunately this is rather obscure. Most of the commercial talc deposits of the world have been formed in either of two ways :-

1. By the alteration of dolomite or magnesium limestone beds.
2. By the alteration of ultra-basic igneous intrusions.

In the altered dolomite deposits, there is always some of the unchanged dolomite present. Thin sections of the Gawler talc and of the enclosing schists have been examined. The talc itself is composed almost entirely of that mineral and shows a little iron staining. No other minerals are present. The schist is composed of only two minerals quartz and muscovite mica. The presence of quartz seems to preclude the formation of the talc from basic igneous rocks.

A chemical analysis of a sample of this talc showed that it is very close to the theoretical figure for that mineral and therefore is very pure.

Gawler Talc (698/50)		Theoretical Talc	
SiO_2	61.6	SiO_2	63.5%
MgO	30.76	MgO	31.7
Ig.Loss	5.22	water	4.8
Al_2O_3	1.91		
Fe_2O_3	0.57		

Two analyses of the enclosed schist were made as it is impossible to distinguish under the miscroscope, fine grained mica from talc. These showed -

	1.	2.
SiO_2	64.5%	64.3%
$Al_2O_3 + Fe_2O_3$	21.6	22.8
CaO	Nil	Nil
MgO	3.0	2.6
Ig.Loss	3.8	3.7
K_2O	6.2	5.7
Na_2O	0.2	0.2

indicating that the rock is a quarts-mica schist probably containing little talc (the MgO portion of the analysis is indicative of talc).

There is no direct evidence to suggest that the Gawler talc has been formed in either of the two normal ways. It has been suggested that a talc deposit on Vancouver Island has been formed by the circulation of magnesium bearing waters along a fault plane. The Gawler talcs may have had a somewhat similar genesis, that is the introduction of magnesium charged waters along zones of weakness in siliceous sediments. Whatever the origin however, it is always likely that further lenses may be encountered parallel to those known, that is striking in the same direction as the planes of schistosity of the enclosing Pre-Cambrian schists.

Unfortunately these schists, because of the soil cover, do not outcrop extensively on the surface and organised prospecting would have to be initiated to reveal any further lenses. This could either be done by boring or by trenching. Shallow angle bores could be put down in a direction at right angles to the strike, that is on a bearing of 20°. Long narrow pits could be dug in the same direction.

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23rd February, 1951.

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