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A Deposit of Fine Silica at Wivenhoe

by Terence D. Hughes

Wivenhoe is an Eastern suburb of Burnie, the third town and port of Tasmania, situated on the North-West Coast. The deposit investigated forms part of a larger silica sand area adjacent to Bass Strait, near the crossing of the Emu River by the main North-Western railway and by the Bass Highway. The enquiry was instigated by Mr. R. T. Williams, who owns the land under which the silica sand occurs. This land is situated on the south side of Anglesea Street and is about half an acre in extent.

Mr. Williams has already entered into a verbal agreement to supply a sand soap manufacturer with portion of the finer sizes of the sand, and is negotiating with a brick manufacturer to supply coarser sizes.

Origin of Deposit. The silica has been derived from Precambrian quartzites which outcrop at various parts along the north-west coastline. Boulders of these quartzites are mixed with the sand and can be seen in the road cutting on the southern side of the block. Probably the sea has been the chief agent in the pulverising of these quartzites as well as in sorting and purifying the silica sand. Some of the finer silica grains have doubtless been formed by precipitation.

Quantities available. The area owned by Mr. Williams is small, and portion of it is occupied by a house, which could, if necessary be moved. In the meantime, however, estimates can be made of the quantities available outside the house area. The dimensions are 100 feet along the lower side rising in a distance of 80 feet to a height of 25 feet. Overburden is negligible, averaging about one foot of soil but there are some rocks among the sand, visible along the southern boundary and 25% of the volume should be subtracted because of these. This would indicate a quantity of three thousand yards above the lower road level. A bore put down by Mr. Williams below this

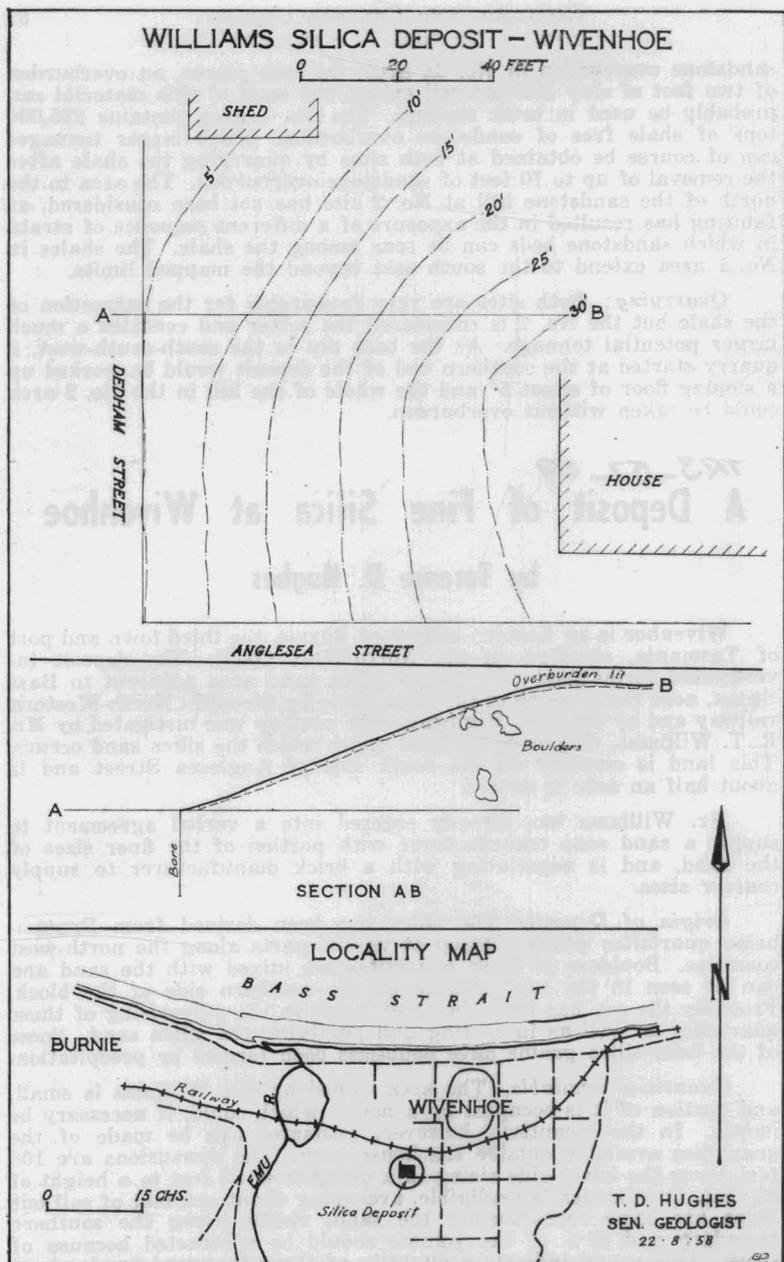
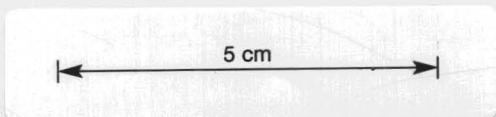


Figure 16



level for 15 feet showed material of similar quality and assuming that this is constant over the whole area, another 4,000 yards should be available. For every yard of depth below this, there should be a quantity of 300 yards.

Quality. This is a particularly high grade silica deposit. Analyses have been made of three samples, two from the surface and one (No. 2) from the bore and these showed:—

	No. 1	No. 2	No. 3
SiO ₂	99.1	99.6	97.1
Fe ₂ O ₃	0.1	0.1	0.16
TiO ₂	—	—	0.66
Al ₂ O ₃	—	—	1.04
Loss on Ignition	0.7	0.4	0.85

It has been stated that the white surface material, on exposure to strong light, becomes grey in colour. This is probably due to the organic matter content and it is difficult to suggest how to remove it. The most inexpensive method probably would be by controlled washing. The sand could be agitated with water in a tub or trough and the top water run off. It is expected that as the sand becomes farther from the surface, the percentage of organic matter will diminish and the quality improve. Small patches near the surface of the deposit are stained by brown iron oxide but these patches are small in area and should not extend to any great depth.

Sizing. As well as being of particularly high grade, this sand is remarkably fine. Two series of sizing tests have been carried out—the first down to 200 mesh and the second to much finer sizes. The results are as follows:—

B.S. Sizes	No. 1	No. 2
+6	0.7%	1.2%
+25	2.8	4.8
+36	1.3	1.6
+44	1.0	1.5
+60	1.3	2.1
+72	0.7	1.3
+100	2.0	3.0
+150	2.9	4.2
+200	2.9	5.3
—200	84.4	75.0

B.S. Fraction.	No. 3. Micron Size.	Percent.
+60	+252	12.5
+100	+152	5.3
+200	+76	12.2
I.S.1	+56	8.4
—2	40—56	12.6
—3	28—40	13.5
—4	20—28	11.8
—5	14—20	9.4
—6	10—14	6.6
—7	—10	7.7