

# LIMESTONE DETERMINATIONS OF TILL IN THE GÄVLE REGION

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**Abstract.** In conjunction with an investigation of the limestone content of till in the Gävle region, some problems concerning the technique have arisen. It has been found that it is very important from what depth the samples are taken. At two suitable localities, which have been specially investigated, it has been shown that no lime is found down to a depth of 170 cm. It is suggested that the limestone has disappeared for some reason, probably by leaching. At one of the localities the lime content tends to decrease with increasing depth. Due to the fact that only a few localities have been studied, the results of this investigation are not statistically valid. However, they show a tendency which calls for further investigation.

## DISTRIBUTION OF $\text{CaCO}_3$ IN A TILL SECTION

An investigation was carried out in the Gävle region to see if the content of  $\text{CaCO}_3$  in the till could indicate anything about the recession of the land ice. HCl was used as an indicator of  $\text{CaCO}_3$ . A fizzing sound was noticed when the till contained  $\text{CaCO}_3$ . From the very beginning, it was noticed that the fizzing was related to the depth from which the samples were taken. This technique was only used in the field. It showed that the samples must be taken considerably below the layer that has been influenced by wave action. In the field it was also noticed that there was no reaction with HCl in the zone influenced by leaching. In order to check this phenomenon in the laboratory, a suitable locality was chosen. Eight samples were taken from different depths below the surface as follows:

Sample no.	Depth, cm	Sample no.	Depth, cm
1	90	5	170
2	115	6	175
3	150	7	190
4	165	8	210

The limit between the zone that has been influenced by wave action and the zone that has not been influenced is seen from the stratigraphy to lie 60 cm below the surface. The results show a sudden increase of the  $\text{CaCO}_3$  content at 175 cm. This confirms what

was observed with the HCl technique. At 175 cm the  $\text{CaCO}_3$  content was 7.5 %, while at 170 cm it was 4.6 %, at 165 cm 1.9 %, and at 150 cm 0.9 %. With increasing depth, the content tends to decrease a little. At 190 cm the content was 6.3 % and at 210 cm 5.4 %. This decrease may be explained as natural variations of the  $\text{CaCO}_3$  content in the till, but it may possibly also be the result of ground-water action. It is not known how deep the bedrock lies, but from what is known from other localities in this region, it is thought to be between 3 and 5 m.

This investigation shows that samples in this region must be taken at a depth of at least 175 cm below the surface. One has to avoid the zones that have been influenced by wave action and leaching. It is concluded that samples taken in till from which  $\text{CaCO}_3$  determinations are required must be taken from considerable depths below the surface.

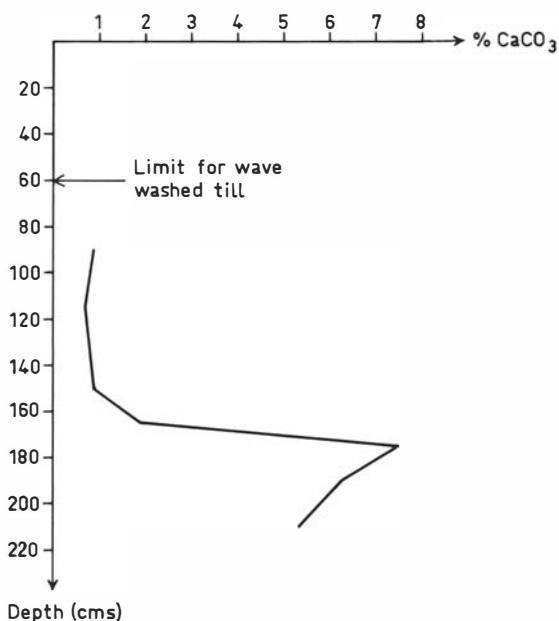


Fig. 1. Diagram showing the changes of  $\text{CaCO}_3$  content with increasing depth.