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FAULT ON PROPERTY OF MR. HARRY GRANT IN WHITEFISH BAY

by

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IN WHITEFISH BAY

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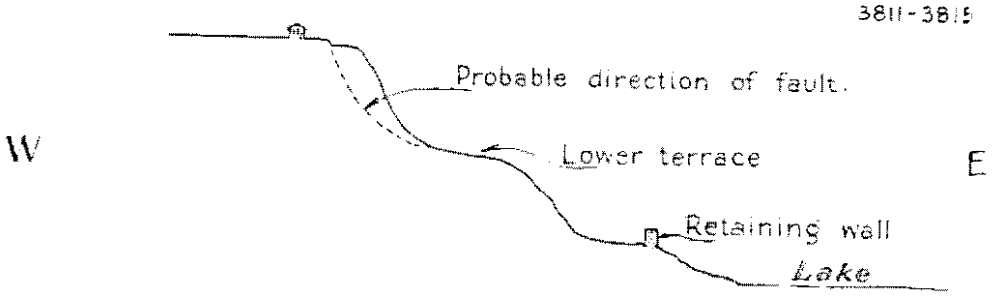
In company with Mr. Grant and Mr. C. R. Weymouth the writer examined the fault on March 18, 1927. The fault trace extends from the south line of Mr. Grant's property at the bluff, in a northerly direction past Mr. Grant's residence, through his neighbor's property, and disappears in the bluff edge near his neighbor's north line. A prism on the east side of the fault has dropped a maximum of three feet near Mr. Grant's north line. This subsidence has occurred during the last few weeks.

The upland upon which the homes are built is about 100 feet above the lake. This has been stable for many years as indicated by



the presence of very old oak trees. The bluff has not been in equilibrium for so long a time as the tree growth is relatively young. The lower terrace is probably a landslide terrace formed by the sliding of a mass of clay from the bluff above.

The material in the bluff is largely clay. The contractor reports lenses of sand. These would carry water and lubricate the underlying clay and on a steep slope furnish conditions favoring a slide.

Thus far the fault has not affected Mr. Grant's house. The fault runs so close to his neighbor's house, however, that the earth has pulled away from the footings and a crack has developed in the brick work. He has exaggerated the danger of landslide by dumping earth over the bluff and the use of large quantities of rock.

The causes of the fault on Mr. Grant's property are probably as follows:

1. The steep upper face of the bluff. This leaves a prism of earth which is unstable.
2. The dry period during the summer of 1926 when cracks were formed.
3. The wet fall followed by the unusually mild weather in February and March favored an excessive saturation and overloading of the unstable prism. The saturated clay made a lubricant which favored slipping.

The treatment of the condition will involve considerable study. The following steps are suggested:

1. Have a line of levels run from the street to the house and down over the bluff, setting hubs firmly. These levels can be checked later to determine exactly where movement is taking place. I believe that the house is absolutely stationary at present and is in no danger, providing the fault situation is remedied.
2. It might pay to determine the trace of the fault, that is find where the fault plane emerges from the bluff face. There is no physical evidence of this at present. I believe, however, that

all movement is in the prism above the lower terrace. If this theory is correct, the lower terrace will act as a brace to hold back the slide. By pouring water colored with a brilliant aniline dye into the fault and determining where this water emerges the location of the fault could be quite accurately determined.

3. Take care of all drainage around the house by building an intercepting ditch parallel to the bluff face. This should receive also the water from the house conductor pipes.

4. Take care of bluff drainage by drains near the toe of the steep slope.

Nos. 1 and 2 should be done immediately; 3 and 4 cannot be done until later. In no event should the effect of subsidence be corrected by filling in front of the house as this fill would merely add more weight to the unstable prism.

5. If the above measures fail, there are several alternatives. One such measure is a retaining wall at the foot of the upper slope. The footings and face of this should be well drained. Another measure is to regrade the slope from the house to the present retaining wall. An engineer should determine whether this should be one uniform slope or several slopes broken by retaining walls.