

## DAVIES SPRINGS ALONG THE WEST SLOPE OF PALATINE HILL

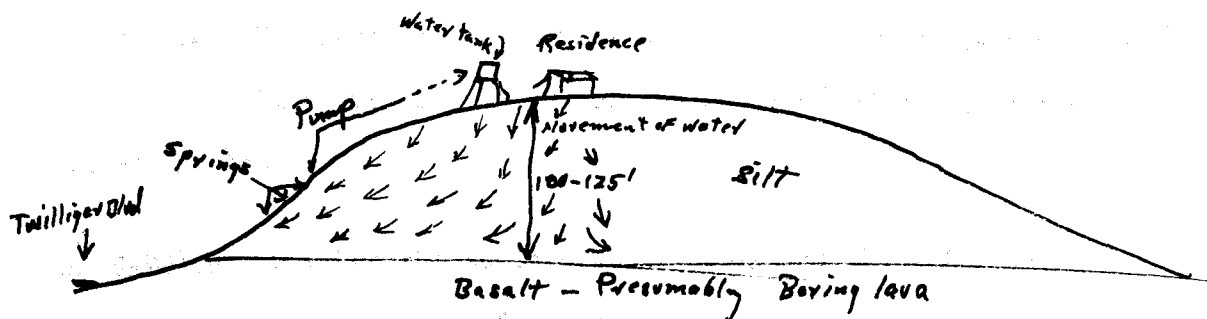
MULTNOMAH COUNTY

**Location:** The specific springs studied seep out along the west slope of Palatine Hill facing Tryon Creek and above Terwilliger Blvd. which runs parallel to the line of springs. The springs studied were on the property of Mr. David L. Davies.

**Problem:** The problem was to see if geological conditions would indicate a continued flow of approximately the same magnitude as at present and if the present flow could be concentrated into a reservoir of some type from which it could be pumped about 80 feet higher to the top of the hill for irrigating. The general geologic stratigraphy and structure of Palatine Hill was also to be noted for both its specific relationship to the problem as well as regional bearing.

**Geology:** Palatine Hill at this vicinity is capped by 100 to 125 feet of relatively soft sediments, presumably silt. The silt overlies basalt, but the line of springs lies above the contact with the basalt.

The following generalized idealized cross-section shows the approximate geologic conditions involved:



*Springs occur where water table intersects steep slope*

The silt, where observed in the roadcuts, is the typical buff, mottled, fine-grained silt so common along the Portland hills and elsewhere. It contains a noticeable amount of mica. The silt is generally altered to clay near the surface. It is capable of absorbing a large quantity of water and it usually yields it slowly but more uniformly than more permeable rock. The water table fluctuates somewhat with the season, the driest season of the year being in the fall - say late September or October, depending upon rainfall. Because of the steep slope facing Tryon Creek, the water table reaches the surface at the line of springs. Although the presence of basalt was not proved, evidence disclosed in a nearby well shows that its level would be perhaps 30 to 50 feet below some of the higher springs, particularly the one at the old homestead and much less below the lower springs. The presence of the layer of basalt may be a partial cause of seepage but it is believed that the springs would be there even though the silt were a much greater thickness.

A well on the nearby property of Dr. Kingery penetrated:

100-125 feet relatively soft rock (silt)  
6-7 feet basalt  
Alternating hard and soft rock to bottom  
Total depth 310-320 feet. It flows 10 gal. per min.

A similar section would be encountered beneath Mr. Davies' property.

Operation: The problems of corralling the water, pumping, and distribution are largely out of the scope of such a geologic investigation.

Conclusion: Whether the springs will supply all the water desired will depend upon a further test by actual operation. There seems

little doubt that the flow that may be seen at present can be largely caught, stored, and will supply enough water to justify a moderate expenditure for pumping equipment, etc.

The geological set-up is such that the flow from year to year should be nearly constant and past history would indicate no great fluctuation in flow during the months that the supply would be critical. Water used for irrigation will seep into the ground barring the small percentage that evaporates and in this way help for it would have otherwise continued toward Tryon Creek.

Ewart M. Baldwin  
August 22, 1946