The Effect of Local Changes in Topography
on the Temperature and Relative Humidity
of the Atmosphere.

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It is generally accepted among foresters that the relative humidity of the atmosphere plays an important role in the suppression of forest fires. However, some foresters have been somewhat sceptical about using humidity readings to any extent during the actual conduct of fire suppression work, as it has been supposed that relative humidity might be seriously affected by local topographical conditions, particularly aspect and forest cover.

During the summer of 1927, an effort was made at the Aleza Lake Forest Experiment Station of the British Columbia Forest Service, to ascertain the effect of different sites on the temperature and relative humidity of the atmosphere. This experiment station is situated in the spruce-balsam forest type, in the upper portion of the Fraser River watershed in central British Columbia, thirty-five miles east of the town of Prince George, at an approximate elevation of 2100 feet.

Two stations were chosen for observation, one having a northern aspect and the other a southern aspect, situated respectively on the south and north sides of a small valley approximately 200 feet in width, with fairly steep slopes on either side heavily timbered with spruce and balsam. The two observation stations were situated one on either side of the valley about 50 feet up the slopes in the green timber.

Temperature and relative humidity were determined with a wet and dry bulb sling psychrometer, and the usual psychrometric tables. The wet bulb of the psychrometer was kept moist with a clean wick saturated with distilled water. In taking the readings the psychrometer was held at a height of four feet above the surface of the ground and whirled in the air until the readings on both thermometers were constant. Readings were taken on both stations three times daily from July 1st, 1927, to September 15th, 1927, at 8: A.M., 1:00 P.M.,

and 5:00 P.M.

The following tables show the daily records and the average values for the relative humidity and the temperature for the different months on each site. As an example, the 1:00 P.M. readings for the month of July are also shown in graph form in Figures 1 and 2. From an analysis of the temperature and relative humidity in these tables conclusions can be drawn as follows for the conditions and locations referred to;

1. The temperature was generally lower and the relative humidity higher on the north slope than on the south slope throughout the summer.

2. The difference in temperature between north and south slopes was usually less than two degrees during periods of cool weather or of falling or rising temperature. During periods of high temperatures the difference was generally greater, in some instances as much as nine degrees.

3. While the relative humidity was generally higher on the north slope than on the south slope, the difference did not exceed two percent except in a few instances when the relative humidity was changing rapidly, when the difference was as high as 10%.

4. It would appear that during periods of low or medium temperatures, with consequent high humidity, local changes in topography will have very little influence on both the temperature and the humidity. Under these conditions, readings from one station may be expected to give satisfactory indications of conditions over the surrounding region as a whole.

However, during periods of hot weather, with consequent low humidity, the difference between the relative humidity on north and south slopes may be sufficient to create a considerably greater fire hazard on the south slope.