Forest Fire Research.

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I have read with a great deal of interest, the article "Forest Fire Research", by Mr. James Kay. As he points out, "experiment means a trial and deals with effects". He also states that "research means a careful search or critical inquiry into the cause of things".

I have spent some years which have been very closely connected with the forest fire problem, and as a result of this experience, my reaction to Mr. Kay's article is that he is building a conclusion on premises that are incomplete and therefore misleading.

Thus his history of the fires at the Robert Dollar Logging Company, the Alberni Pacific Logging Company, etc., shows that R.H. readings on the days the fires occurred, was above the so-called danger point.

There are at least two important points which have been left out of the "careful search into the cause of things".

One is, how were the relative humidity readings secured - and, by whom? Did a trained or partially trained weather observer take these readings? Was the instrument accurate? What size were the thermometers? Were they calibrated? What reliance can be placed upon the instrument used, and the readings secured?

The other point is, what was the R.H. history for the period of two or more days prior to the outbreak of these fires? Surely a history of this sort is necessary, before the assumption that rising relative humidity is accompanied by an increasing fire risk is accepted. Relative humidity in itself does not constitute a fire risk - it is, of course, the effect that this condition has upon the fuels present upon the forest floor.

This being so, it becomes an essential to know the history, as outlined above. We know that a low relative humidity, even 25 or 20% which just touches these points and immediately rises, providing there was a prior history of high humidities for several days, has little or no effect upon the slash or forest debris. Yet such a "flash" following a continued period of hot weather and drought accompanied by moderate humidities, say the upper forties and the lower fifties, might, and often

does, result in disastrous fires starting. This latter point must be emphasized - once a fire is started, it creates its own relative humidity in the proximity of the flames or heat thus engendered. It must have sufficient volume to overcome the resistance to fire offered by fuels that are moisture laden, and must do this quickly. Mr. Kay reports a temperature of 700° Fahrenheit. Obviously, the R.H. would be lower where such temperatures are recorded, and under the same weather conditions, higher humidities will prevail away from the effects of such heat. Therefore, the quantity and nature of the fuel present must have a bearing upon the spread of fire.

The effect of fire upon snags, noted in the article, is of a not uncommon occurrence. When snags have been recently burned, the dry flaky sap wood, which is as tinder under low R.H. conditions, is missing. When present, this material, because of its light comparatively fibrous condition, readily ignites from a spark during and immediately following what is termed "fire weather", or low R.H., and it takes some time to take up, throughout its structure, the air moisture present when a higher relative humidity follows.

It is a pity that the record of the recording Hygrothermograph from the Blodel, Stewart & Welch camp is not available, or was not published in the article "Fire Weather Research".

Perhaps the accompanying curve will show that, whatever there is in the gas theory, that there is a direct connection between low relative humidity and fire occurrence. This curve further shows that increasing R.H. results in decreased fire occurrence.

The curves are averaged to flatten the graph, the humidity readings are taken from the report of the U.S. Weather Bureau - the fire occurrence is for Western Washington only, exclusive of those areas which lie within the boundaries of the National Forest. If the fires occurring within these boundaries were chartered in conjunction with the curve erected, the association between the two would be even more marked.

In conclusion please let me state that I do not wish to criticize unjustly, my desire is merely to give the benefit of such experience I possess.

It would appear to the writer, that such decomposition as would set up the generation of gases, is present mainly, perhaps only, when low relative humidities have not sufficiently influenced the drying out of the fuels - thus rotten logs, throughout the summer, often contain moisture in suspension. At such times, the process of decomposition is taking place and apparently any gases

which would be generated, would be present then. Yet, fire will not spread rapidly in such material. When the effects of the low R.H. is felt, such materials assume the same, or nearly the same, moisture content as the air itself. During this period, the process of decomposition has either ceased or slowed up considerably, and the formation of "known" gases would also appear to have ceased. It is at such times that the fire risk is most pronounced.

It would hardly appear that the dust present in the forest, under any condition of the range of temperature could constitute a factor in fire risk. My understanding is that such dust would necessarily have to be confined, and that when open to a free circulation of air, can hardly be considered a factor.

I do not know if the theory outlined by Mr. Kay will be accepted by foresters generally or not - certainly he has given a lead for the need of research into his thesis; but I do think that he is tearing down certain established premises upon insufficient and incomplete data.

Certainly, there is a big field for investigation, and I feel very glad to know that it is recognized. The field men need all the help that science can provide.