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Dr. S. S. Prentiss
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New York City

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Dear Dr. Prentiss:

I am replying to your letter of September 16 regarding the loss of moisture from the salcomine during the life tests. At present, we are not certain just how much this loss of moisture affects the results. There are indications that the effect observed was not due to a dehydration but was the result of other conditions. However, I do not believe the present results are conclusive on the effect of moisture content. The chief reason we believe that the effect of moisture content may not be as important as we once considered is due to the fact that we have a test unit through which dry nitrogen at atmospheric pressure is passing while the compound is carried through the usual temperature cycle. A complete water balance has been kept on this unit and the absorbent is continually losing water to the nitrogen gas, but there has been no deterioration of the absorbent. This test is probably not conclusive, but it does indicate that a loss of water alone does not cause a loss in activity of the salcomine.

For several weeks we have been running complete water balances on the various units under test. As would be expected, most of the moisture leaves the absorbent during the regeneration period when the temperature is high. We have considered several methods of replacing this lost moisture and I am fairly certain that our ideas have been written up in one of the monthly reports or letters, but will outline them briefly in the following paragraph.

The amount of moisture lost per cycle is relatively small and therefore the amount to be replaced is not large, (order of 1 milligram of water per 40 gms. of compound per cycle). Introducing the moisture with the inlet air is probably a poor method of accomplishing the desired results since this would tend to "soak" one end of the bed and overdry the other. It would appear that the most opportune time to replace the moisture would be during the cooling period. Of course this assumes that moisture that has been lost can be replaced and thereby restore the activity of the compound. Actually we do not have any results

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that would prove this is the case. Assuming that the water can be replaced, our proposal was to flush the bed after desorption was complete with air or oxygen containing a definite humidity. During cooling this moisture would be absorbed and the calculations indicated that it would be very easy to replace the amount lost.

As soon as the deterioration studies are on a firmer basis, we plan to make a detailed study of this dehydration effect. If the loss of moisture is a serious problem, we will attempt to arrange cycles to replace it or avoid its loss. We will be glad to have any suggestions along this line.

Yours very truly,

E. R. Gilliland

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cc: Dr. Diehl
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