

April 1, 1940

Dear Besse,

The procedure we used at Edinburgh and with the London Society's collection, and which worked very well, was as follows: four solutions are made up, all containing 2% sugar, of which three contain different quantities of phenyl-thiocarbamide. The quantities we used were $6\frac{1}{4}$, 50 and 400 parts per million. It is convenient to make up half quantities of 4% sugar and mix with equal quantities of (1) plain water, (2) $12\frac{1}{2}$ p.p.m, 100 p.p.m. and 800 p.p.m. of phenyl-thiocarbamide.

The quantities used for apes are much larger than we need for humans, since we offer them 40 or 50 cc in cup or mug at each trial. Nearly always they like the sugared water sufficiently to make them give the other solutions a fair trial. I do not like to use stronger sugar for fear that some of them, if hungry for sugar, would go on taking solutions, even though they tasted unpleasantly bitter.

The ape may either eject its sip or show reluctance towards taking another, such as turning its back, or going to another part of the cage. With tasters we sometimes get this reaction with the weakest solution, and always with the medium strength. When possible

we confirm with the strongest strength, though this really adds little to the evidence. Non-tasters are ready to go on taking the solutions up to the strongest strength without any sign of aversion. I think there are very few snags in the test when applied to so intelligent an animal as the chimpanzee, but the gibbons may be less easy to interpret. We have made rather too limited tests on these on this side for me to be able to give any useful advice. It seems possible that some of them taste, but relish the bitter flavour.

The taste-testing makes a most amusing show. I ought to warn you that I was a good deal spat at at the London Zoo, though that is the sort of thing we must get used to, especially if we work in statistics.

With reference to the mean squares of timber density, weighted and unweighted, I wonder if you have overlooked the fact that the dimensions of the weighted mean square are different from those of unweighted. For this reason I think only an indirect comparison is possible in judging of precision. For example, on the figures you send from Boone County within compartments contributes 34.91% of the S.S. when no weighting is used, but 44.95% using weights. This suggests that using weights has lowered the precision, though perhaps not very greatly. In Schuyler County, on the other hand, the 66 D.F. within compartments takes 75.44% without weighting and 73.95% with weighting. In this case the greater apparent precision occurs when weighting is used. This effect is much less than it appears to be when mean square values are directly

compared, whereas in Boone County the comparison is the same. The reason I presume is that larger samples were used in Schuyler than in Boone County.

Using the weighted mean squares for the estimation of the precision of weighted averages, you should divide the mean square obtained in the analysis by the total area averaged and not, as in the unweighted case, by the number of items averaged.

I hope this will clear up the point that was bothering you on the Farm Wood Lots Survey. I shall look forward to your other letter with interest.

You say at the end, about the Galton Laboratory, "I shall want to make my personal contribution." Now, please understand that I do not want you to think of doing this personally. If the U.S. Forest Service thinks that my advice and help to you is worth a fee, it would be very welcome, as I need some outside source of funds if my breeding programme with mice is to be continued. I do not mind plying for hire as a consultant statistician, but you must not let this get mistaken for begging from my friends.

Yours sincerely,