14th. December 1948.

Dear Tukey,

There is a real clutch to clutch variation, but I do not think it is nearly of the magnitude required to increase the sampling variance by a factor nearly as large as the average size of clutch. Clutch size varies greatly in different groups, for example, with the doves one scarcely has clutches larger than two, and in most of the more common species the bulk of the data is supplied by isolated measurements. The opposite extreme is supplied by game birds, with clutches of ten or fifteen, and here I think there may have been two or three species which could reasonably have been thrown out on the ground that the effective number of laying hens represented was materially less than 100. I once did a number of measurements on hens eggs and, speaking from memory, I should say that eggs from the same bird were materially less variable in breadth, but not in length, as compared with heterogeneous material. It might be, therefore, that the additional residual variation in breadth compared to length might be ascribable to there having been in many cases less than 100 different mothers represented. The correlation of length and breadth is quite small whether one takes the same or different birds, again speaking from memory.

With respect to your second point, the argument does look at first sight to be circular, and I am not immediately able to demonstrate that it isn't. I must at the time of doing the work have satisfied myself either that no bias was introduced, or that it was entirely negligible. There seem to be two questions, 1) are the three species colinear? and 2) is the intercept ratio 2 : 1? I imagine your question refers ot the test of significance in the middle of page 187, where I try to test the 2 : 1 theory. I should be very much interested to hear the result if you find time to look into the validity of the test.

Yours sincerely,