Whittingehame Lodge,
44 Storey's Way,

16 December 1944

55822

Dear Mr Wood,

If there are g experiments, the estimates of error derived from each could be set out as in the parallel columns below:

Degrees of freedom	Sum of squares
$n_1 - 1$	$(n_1 - 1)s_1^2$
.	.
.	.
$n_g - 1$	$(n_g - 1)s_g^2$
$N - g$	$\sum (n-1)s^2$

There are $g-1$ other degrees of freedom representing discrepancies between different experiments, and these with the $N-g$ set out above make up $N-1$ which exist in all, but the sums of squares corresponding with these $g-1$ comparisons are not included in the summation $\sum (n-1)s^2$.

I think that is what is what is wrong with your equation 2. On general principles, I think one should always take different experiments in the first instance as independent (even if they are planned with a view to combination later) and then examine questions like the homogeneity of estimated variances before attempting the combination. This is very troublesome, full of theoretical obstacles, and, I suppose, for these reasons too often omitted. However, very often even a scrupulous examination fails to provide reasons which would prevent one from combining data in the simplest way.

Yours sincerely,