10th January, 1953.

Prof. R.A. Rankin,
University,
Birmingham.

Dear Sir,

My colleague here, George Owen, has suggested that you might be able to help me in framing certain distinctions of nomenclature which seem to be needed in respect of partitions in two or more dimensions.

A few years ago, writing on the classification of genotypes in organisms with a fairly complex mode of inheritance which we call polysomic, I had to enumerate certain configurations which I spoke of as partitions in two or more dimensions, but which do not correspond I feel with what McMahon has called partitions <u>in plano</u> and <u>in solido</u>.

Starting with the notion of a univariate distribution of some whole number in any number of classes, one may conceive as of a partition "as being" or corresponding with the aggregate of all distributions to be generated from it by permutation of classes. If we were to start with a multivariate distribution and permute independently the classes of each variate, we should arrive at what I have termed a partition in more than one dimension.

This is clearly quite different from McMahon's use of the term which I conceive to be that his partitions in two dimensions correspond with all the arrangements of the parts of a simple partition which can be made in non-ascending rows and columns. On this view corresponding to any simple partition, there will be a number of partitions in two, three or more dimensions all referable to the same simple partition, whereas in the approach to which I have been led, a partition in two dimensions has also two corresponding simple partitions as its univariate margins.

It would indeed seem possible to generalize the notion of a simple partition in other intermediate ways e.g. all of McMahon's partitions _in plano_ having the same marginal totals might be counted as one. But I have no reason to think that such further concepts have any special mathematical interest. At the moment I am only looking for a basis of agreed nomenclature which will avoid confusing of the immerate formulae which I have given for partitions in my   with those which McMahon and others have discussed for his alternative method of generalization.

It may be noticed that in McMahon's concept the different dimensions are intrinsically permutable _inter se_ whereas in my case permutation of the dimensions may generate a number of mutually conjugate partitions.

Sorry to bother you with all this, but I think you will agree that the few people interested in the subject have a certain obligation to set out an unequivocal language.

Sincerely yours,