

D.F.Poulson: In listening to this most interesting paper it occurred to me that some of the puzzling aspects of the segregations described might be accounted for if the chromosomes of E. coli possess diffuse kinetochore properties rather than the highly localized type of kinetochore (the centromere) which characterizes those organisms on which most of our present genetic knowledge is based. In so far as I am aware no linkage studies have been carried out in those organisms in which diffuse kinetochores have been demonstrated. The work of the Schraders and others makes it clear that this condition prevails in a number of orders of insects and in scattered other forms. Thorough investigation of segregation and recombination in such organisms ought to be undertaken to learn in how far they follow the rules established <sup>in</sup> from other organisms and in what ways they may differ.

The photographs which Dr. Delamater showed this morning left me with the distinct impression that bacterial chromosomes may very well be possessed of diffuse kinetochores. If this should prove to be so, then your work represents the first thoroughgoing study of linkage in an organism with diffuse kinetochores. The four-armed linkage map certainly suggests, as you have emphasized, the presence of a reciprocal translocation or some mechanism of preferential segregation essentially similar in principle. Since our knowledge of the genetics and cytology of translocation heterozygotes has been based on ~~localized~~ forms with localized kinetochores it is by no means clear how the established rules apply to diffuse forms. The relationships between centromeres, crossing over, and disjunction may very well be completely different for the case of diffuse kinetochores. Perhaps the combination of your techniques with those of Delamater will provide the answer. I realize that this is only a suggestion, but I hope it will be of value in stimulating study of the genetics of organisms with the diffuse type of kinetochore.