

## *Experimental Work.*

This theoretical work was tested on four distributions \* which had been counted over the whole 400 squares of the hæmacytometer. The particles counted were yeast cells which were killed by adding a little mercuric chloride to the water in which they had been shaken up. A small quantity of this was mixed with a 10 % solution of gelatine, and after being well stirred up drops were put on the hæmacytometer. This was then put on a plate of glass kept at a temperature just above the setting point of gelatine and allowed to cool slowly till the gelatine had set. Four different concentrations were used.

\* One of these is given in Table I.

In this way it was possible to count at leisure without fear of the cells straying from one square to another owing to accidental vibrations. A few cells stuck here and there to the cover glass, but as they appeared to be fairly uniformly distributed and were very few compared with those that sank to the bottom they were neglected: had the object of the experiment been to find the number of cells present they would have been counted by microscope fields, and correction made for them; but in our case they were considered to belong to a different "population" to those which sank.

Those cells which touched the bottom and right-hand lines of a square were considered to belong to the square; a convention of this kind is necessary as the cells have a tendency to settle on the lines.

There was some difficulty owing to the buds of some cells remaining undetached in spite of much shaking. In such cases an obvious bud was not counted, but sometimes, no doubt, a bud was counted as a separate cell, which slightly increases the number of squares with large numbers in them.

In order to test whether there was any local lack of homogeneity the correlation was determined between the number of cells on a square and the number of cells on each of the four squares nearest it; if from any cause there had been a tendency to lie closer together in some parts than in others this correlation would have been significantly positive.

Distributions 3 and 4 were tested in this way (Table II), with the result that the correlation coefficients were  $+0.16 \pm 0.037$  and  $0.15 \pm 0.037$ . This is satisfactory as shewing that there is no very great difficulty in putting the drop on to the slide so as to be able to count at any point and in any order; as good a result may be expected from counting a column as from counting the same number of squares at random.