Again, we have for the departure of distance 1: Sum of all the distances, 151.50: distance 1, 11.25:: total departure error, 1.64: departure error distance 1, .12.

As the departure of distance I is last it must also be lengthened, hence it becomes 10.04 + 12 = 10.16, as figured out on the new or second table.



Fig. 1.

Proceeding thus with each side, we obtain all the corrected latitudes and departures shown in the new table. If we now add up the four columns of corrected N. S. E. W. values, we find that the northings equal the southings, and the eastings equal the westings, thus proving that the work is now correct. The corrected latitudes and departures must necessarily change the bearings and departures must necessarily charge bearings and distances of every side, but without knowing either of these we can plot the survey by means of the corrected latitudes and departures alone, and without the loss of the corrected latitudes and departures alone, and without the use of the protector at all. When the closing error is small this is unnecessary, but when the closing error is large is large, as in this case, in balancing the errors of lati-tudes and this case, in balancing the errors of latitudes and departures, the surveyor usually interprets those errors by inspection, and without taking the trouble of calculation by inspection, and without taking the total of calculating them. By judicious inspection the total errors of them. errors can be approximately apportioned to each course in both latitude and departure.

Plotting by the Methods of Co-ordinates.-The method of plotting by co-ordinates, i.e., traverses may be perform the stations shown in be performed in two ways: First, the stations shown in Fig. I min the ways: First, the stations of latitudes Fig. I might be laid down from the columns of latitudes and departures, but it would be necessary, in order to plot them, to it would be necessary, in order to plot them, to draw parallel meridians through each station, as shown arallel meridians through each successive as shown in Fig. 1, and to lay down each successive station from the interval of the successive station from that which had been plotted before it. As each operation will thus be referred to a new point, in itself dependent will thus be referred to a new point, the sources itself dependent on that which preceded it, the sources of error h of error become increased with the number of fresh sta-tions to become increased with the number of the tions to be plotted. But by referring each station to the meridian meridian of Station I, both for latitude and departure, as in Fig. as in Fig. 2, any error which may occur in laying down one point : one point is not carried on through the series, the fixing of that point is not carried on through the series, the fixing of that point is not carried on through the series, the point being an isolated operation, independent of

every other in the survey. The advantage of such a mode of protection is too apparent to need further comment.

Instead, therefore, of picking off these northings and southings in succession from each other, it is much more proper to prepare the column of total latitudes (column eight) showing how far each of the points, 2, 3, etc., is north or south from Station 1. This being done. the points can be located on Fig. 2, north and south from without moving the scale each time and, of course, with greater accuracy. Such a column is readily formed. Its accuracy is proved by the final result being Zero. A similar column of total departures is prepared (shown in the ninth column of the table) which gives the distances of the points 2, 3, 4, etc., each from the meridian line. Thus, starting from point I with side 2, the work likewise proves itself by the final result being Zero.

Starting from the meridian, passing through I and the point 1, the first station, mark a point 2' southward on the meridian, 517 links, and from 2 on a line perpendicular to the meridian, mark a point to the west 1,016 links, which will be station 2, 1-2 representing the amount of southing, and 2'-2 the amount of westing of the point, as referred to the first station I. Similarly for the others, join stations 1-2, 2-3, etc., which will represent the distance measured, and in the present case the complete lines of the boundary. The details of the survey and the features of the country, offsets, etc., where necessary, are supposed to be put in, as usual, from the field book. The practised surveyor will find the above description sufficient to enable him to plot boundaries or maps, and their lines of road.

In all tables of this kind it is usual to make north and east, plus (+) and south and west minus (--). The use of the symbols save a lot of work. For instance, one column answers instead of two in the table.



Calculating the Area .- The adaptation of the tables to the calculation of areas may be explained as follows: In calculating the area of an enclosure or boundary survey, it is necessary to assume a meridian to which to refer the departures of all stations in the survey. This should in all cases be that of the most westerly station in a boundary survey, as the north differences of latitude become then all positive, and the south all negative multipliers.