stations have been read as far as the levelman can see. In case there are any marked knolls, depressions or watercourses between the 100-feet stations, readings are taken there also. The instrument is next moved to a new block and set up, *e.g.*, at L_2. The first reading in the new block is always taken on some station already read in the old block, so that the elevations in the two may be reduced to the same datum or sea-level. When all the readings in block 2 have been taken, the instrument is moved to L_3, and so on until the whole area has been "levelled." The levelman keeps the notes in a form similar to that given on page 5 for the home-made level, save that there is only one column for "readings" instead of two. The "elevations" are worked out for all the stations as with the individual ditch.

The levels are next taken along the outlet. Knowing what the elevations are over the area to be drained, we are in a position to tell when we have gone far enough down the outlet to get clearance for all the drains.

Making the Map.

When the elevations have all been determined, we are in a position to construct our map. Fig. 13 shows one of these maps complete. The different steps in the making of a map are as follows:

(1) We procure a piece of cross-section paper (see Fig. 9) large enough to hold a map of the survey, allowing 1 inch=100 feet, and at the corners of the squares all over the map we mark the elevations. In the map shown the small figures appearing at regular intervals over the field indicate the elevations at those points.

We are now in a position to compare the levels of different parts of the farm. For instance, the N.W. corner has an elevation of 32.7, and the N.E. corner an elevation of 17.9 feet, hence along that north side there is a fall of 32.7 minus 17.9=14.6 feet in a distance of 2,200 feet. The fall along the south side is much less, however, being only 23.3 minus 19.8 =3.5 feet. If, however, we undertake to compare many of these elevations two at a time in this way, we see at once that we have an endless and confusing task.

(2) To render the comparison of elevations easy, and to show at a glance the general slope of the land, we next put in *contour lines*. They are the dotted lines curving in and out across the field. Notice the first of these on the east end of the field. It begins with an elevation of 18.0 feet on the north side, and ends with an elevation of 18.0 on the east end, and moreover every point along it has the same elevation, as may be seen by observing that when it crosses between two elevations one is a little less than 18.0, and the other a little greater, and the contour always divides the intervening distance proportionally. Now look at all the elevations to the east of the 18-foot contour—they are all less than 18 feet, and all those on the west of it are greater; hence, the low land is to the east, the high land to the west.