

takes the home-made level and places it between stakes 0 and 100, as shown in Fig. 2, sinking the upright *firmly* into the ground as nearly perpendicular as possible about half way between the stakes and in line with them. If it is windy, special care should be taken to set the upright deep and firm, as otherwise it will tremble too much. He next places the level on the cross-piece and makes it horizontal by tilting and then using the thumbscrews. Two men are required to do the "levelling," A to sight and B to hold the staff (or measuring pole), and place a target (pencil or something similar) across the staff where directed. Fig. 3 shows them at work. The staff is first stood on the ground at stake 0 and A sights *backward* along the top of the level and directs B to raise



Fig. 3. Showing men taking reading with the home-made drainage level.

or lower the target until it is in line with the level, and when correct B makes a note of the number of feet and inches the target is from the ground. When this is done B moves forward to stake 100 and stands the staff on the ground there and A, without moving the level, turns around and sights *forward* to the staff, directing B as before. When the target is just level with the instrument B again notes the reading.

In Fig. 2 the back reading was 4' 10" and the foresight 4' 1". In both cases the target was level with the instrument, consequently the difference in reading must be due to the rise in the ground, and, therefore, the amount of rise must be 9 inches. The *height of the instrument* is immaterial—the *difference* between the two readings will be the same,