

secondly, because a surveyor's level is essential, neither of which the farmer has. Nor until recently has he been able to obtain assistance in the matter. In the autumn of 1905, however, the department of Physics, which had for some years been teaching the subject of drainage, was authorized to go out through the Province, when farmers applied for assistance, and make a general survey of the land, locate the outlets and the drains, determine the grades and size of tile, and finally send the farmer when ready a map of his farm showing the complete system of drains, the grades, the sizes of tile, etc. It is the writer's intention to give here a brief description of the method of surveying the land and laying out the system, and a detailed description and interpretation of a map, not in the hope of enabling farmers to undertake these general surveys, for we know the work is too involved and the instruments needed too delicate



Fig. 11. Dumpy level (on tripod) used in drainage surveying.

and expensive for that, but in order that when we have made a survey for a man and sent him his map, a copy of this bulletin will enable him the better to understand the map and construct his drains according to it.

The first operation consists in taking the levels and working out the elevations every 100 feet square all over the area in question. The instrument used for this work is an ordinary dumpy level, shown in Fig. 11. The telescope is mounted on an axis and rotates horizontally so that it may be set in the centre of a block of land and readings taken in every direction all around it, instead of in only two as with the home-made level.