

December 13, 1864.

CHARLES HUTTON GREGORY, Vice-President,  
in the Chair.

The discussion upon the Paper No. 1,115, "On the River Tees," &c., occupied the whole of the evening, to the exclusion of any other subject.

#### LEVEL SUPPORTED UPON A GIMBAL JOINT.

After the Meeting, Mr. F. B. Doering exhibited and explained a Level which, for readier adjustment, was supported upon a gimbal joint, instead of on parallel plates; and he stated that the plan was applicable to other Surveying instruments. The method was similar to that adopted for a ship's compass, with the addition of vertical arcs, at right angles to each respective axis, which were clamped to each other and to the frame that was screwed on to the ordinary tripod stand. In the field, when using this instrument, however uneven the ground might be, the legs were put down in the most convenient manner irrespective of level. The clamps holding the telescope rigid with the stand were then slackened, and the telescope set approximately level by hand. The clamping screws were then tightened, and the final adjustment was effected by two tangent screws at right angles to one another, and connected respectively with each arc at the clamps. On moderately level and firm ground, it was not necessary to unclamp the joint of the instrument; as it might be set up approximately level in the ordinary way by the legs, and be brought to a perfect adjustment at once by the tangent screws. By dividing one of the arcs into degrees, the instrument could be used for measuring vertical angles, and thus the height of any point at a distance, required for checking, might be obtained. It was believed that, by this method, a level could be set up on sidelong, soft, or broken ground, with as much ease as on firm, level ground; and that, as none of the movable parts were liable to become jammed, as in the parallel plate system, a more perfect adjustment was practicable. A level constructed in this manner had been tried in wet weather and during high winds, and proved to be as steady as any instrument hitherto made.