

*NOTE ON THE BALL AND CUP
SEISMOGRAPH.*

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At the last meeting, Prof. West exhibited a model and introduced to our notice an instrument on a novel principle.—The heavy mass was guided by link motions so as to move sensibly in a straight line through a considerable range. Prof. Milne thought that rubbing friction would be reduced by making the mass run with its plane under surface on large and light friction wheels.

I now call your attention to the arrangement shewn by the rough model on the table. Small segments of spheres stand in spherical cups of half their curvature. They are three in number. Each is surmounted by a symmetrical upright spike terminating at the extremity of the diameter opposite to the central point of the segment, so that, when the segments roll in the cups the ends of the spikes move in a plane, a horizontal plane if the spikes be placed upright when the segment is at the bottom of the cup. The instrument is to be adjusted, by placing the plate containing the cups roughly horizontal, then putting one of the segments in its cup with the spike upright and placing a cupshaped weight on the top, the spike is to be screwed out till it just topples, when the spike is to be screwed in slightly to give a little stability. Each having been separately adjusted, a platform is placed over the spikes and loaded. The weight ought to rest on springs between it and the platform to prevent the balls from being made to jump in the cups by vertical shocks. The weight ought to be annular to resist rotating in the horizontal plan. The platform, also circular, should be concentric-

cally situated in a circular hole in a rigid platform continuous with the under plate. The upper surfaces of this rigid platform and of the loaded platform are to be flush. A light pantagraph is to have a point fixed on the rigid platform and one moving point, being attached to the centre of the loaded platform, the other moving point will draw its path magnified on the rigid platform.

The instrument may be modified, by having two parts of cylinders rolling in cylindrical cups in lower fixed plate, each with two spikes or one knife edge. On the four spikes or two knife edges rests a platform with two cylindrical cups at right angles, in which parts of cylinders roll on whose spikes or knife edges the loaded platform rests.

If segments of spheres rolling on a plane with spikes terminating at their centres be used, the plane must be accurately levelled and there is also a danger of the whole sliding sideways under the horizontal shock.

The extremities of the spikes in the model shewn may be looked on as spheres of infinite curvature surmounted by cups. This suggests that, for a prolate spheroid standing upright in cups on a lower plate and surmounted by cups in an upper plate, horizontal motion or a slight degree of stability may be obtained by calculating suitable forms for those cups. Prof. Milne thinks this last arrangement suitable for a small earthquake house. The eggshaped boulders to be of hard stone and roll in cups above and below also wrought in stone. The absolute curvature of these cups ought to be sufficient that the boulders may not start out.