DESCRIPTION OF A MODIFIED PENDULUM-MYO-GRAPH. By JAMES J. PUTNAM, M.D., *Boston, U.S.A.*

SOME months ago I undertook to make in the Physiological Laboratory of Harvard Medical College, certain investigations which involved the accurate notation of the time of muscular movements, for which purpose a pendulum-myograph such as is described and figured by Wundt in his *Mechanik der Nerven* seemed best adapted.

Our apparatus would, therefore, have been modelled from the account there given, but for the fact that its cost would have been too great.

This compelled certain modifications, the adoption of which we have had but little if any cause to regret.

Wundt's pendulum was made mainly of iron, bearing at the lower part two glass plates which exactly balanced each other, and were so arranged that by the motion of a single screw, one plate was raised and the other lowered, so that their motion did not change the centre of gravity of the pendulum as a whole, while it brought the writing pens in contact with new surfaces of the smoked glass or paper attached to its face.

Our pendulum is made entirely of heavy plate-glass, in one sheet. The bearings are of hard steel, imbedded in brass, which in its turn is firmly fastened to an upright strip of well-seasoned wood about 3 c.m. thick, and 30 c.m. wide. Attached to this strip, just below the pendulum, is a wooden stage bearing the moveable connections described by Wundt[1]. This strip of wood, with the pendulum and stage, is counterpoised by an iron weight, and can be moved up and down by a rack and pinion, in a wooden bed, to which it is accurately fitted.

To confine the pendulum at either end of its swing, pieces of brass are strongly screwed to the edges of the glass plate in such a manner that they are engaged by spring-catches fastened to the apparatus behind. These catches are adjustable on a heavy brass rod, flattened on one side, to which is given the same curve with that described by the pendulum in its swing. In this way the utmost delicacy and freedom of adjustment are secured.

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[1] *Op. cit.*