A MANTEL-PIECE SEISMOMETER.

By John Milne.

[Read January 20th, 1891.]

The instrument described in the following note is identical in principle with a seismograph described in the Transactions of the Seismological Society, Vol. XII. p. 24. An ordinary pendulum with a bob W is rendered astatic by combination with a inverted pendulum with a bob w. The stems of the inverted pendulum $O\ S\ w$ passes through the main pendulum at S and, if L is the length of the ordinary pendulum and l that of the small pendulum, astaticism for small displacements occurs when :—

$$\frac{w}{W} = \frac{S\,O^2}{L\,l}$$

Inasmuch as only feeble astaticism is required, when setting the instrument w is only raised until when W is diplaced to the right or the left on being released it slowly returns to its central position.

The instrument is not a seismograph but only a seismometer, measuring for ordinary earthquakes the maximum range of horizontal motion as two rectangular components. If in a disturbance there is a distinct shock, the combination of these components gives the direction and extent of such movement. The chief recommendation of the instrument is its compactness, the fact that it can be easily set, its records easily noted, and that it may be used as a useful ornament upon a

mantel-piece. Its construction will be understood by reference to the diagrams.

When the instrument is shaken, W being at rest, the lower parts of the two sets of scissor-like pointers $p\ p$ come in contact with the pins $P\ P$, and are therefore opened. The maximum extent to which they are moved is shown on the scales $m\ m$. To obtain absolute measurements the readings on $m\ m$ must be divided by the ratio $\frac{E\,M}{P\,E}$

To alter this ratio the weight w must be raised or lowered by means of the three screws from which it is suspended. By raising the weight, $P\,E$ becomes small and the multiplication of the instrument is increased. By lowering the weight the multiplication is decreased. With earthquakes such as we experience in Japan a multiplication of 6 is usually sufficient.

MANTELPIECE

SEISMOMETER

J. MILNE. 1890

Scale $\frac{1}{2}$