

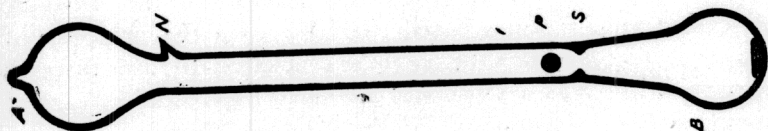
A SIMPLE DEMONSTRATION TUBE FOR EXHIBIT-
ING THE MERCURY HAMMER, GLOW BY MER-
CURY FRICTION, AND THE VAPORIZA-
TION OF MERCURY AT REDUCED
PRESSURES

ABSTRACT

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When the pressure over mercury is reduced to that of mercury vapor only, vaporization with heat takes place at surprisingly low temperatures, and the resulting mechanical pressure exerted by the issuing vapor from the mercury surface is even more surprising. The magnitude of this pressure over a surface confined in a large bulb, so that the vapor stream is not concentrated, is sufficient even at temperatures as low as 130° C, to freely support bits of cork. That small drops of mercury

may be thus supported is common observation when working with mercury vapor lamps. To make this easy of demonstration the writer has designed a tube to show the above, together with the familiar mercury hammer, and glow by friction phenomena—all in one.



The tube should be about 35 cm. long by $1\frac{1}{2}$ cm. in diameter, and have the usual bulb at each end that obtains for the mercury hammer. A stricture reducing the diameter to $\frac{1}{2}$ cm. is placed near one end. A small quantity of mercury (about 5 grams) is put in the tube, and also a spherical pith ball about $\frac{3}{4}$ cm. in diameter is placed in the bulb farthest removed from the stricture. The tube is pumped out carefully and sealed off (the sealing off nipple should be attached to the stem and not to one of the bulbs). The tube is now ready for the exhibition of the three phenomena referred to above. To show the pressure of the mercury vapor it is only necessary to hold the tube by the upper bulb (the one farthest from the stricture) over a bunsen burner and allow it to heat gently. Soon condensed mercury vapor appears on the walls of the lower bulb and its progress up the tube is readily followed. The bombardment of the mercury vapor lifts the pith ball which, oscillating up and down, is forced into the upper bulb where it is violently agitated by the expanding mercury vapor stream. Removing the apparatus from the heat allows the oscillating pith ball to descend the tube until it again rests upon the stricture. At this moment if the bulb is shaken slightly the ball is again shot up momentarily. There is no danger of cracking the tube if it is blown out of pyrex glass.