

An oiled glass rod (R) of  $\frac{1}{8}$ " diameter forms a support for a sliding wire collar to which is attached a writing lever (L), resting against a horizontal kymo-

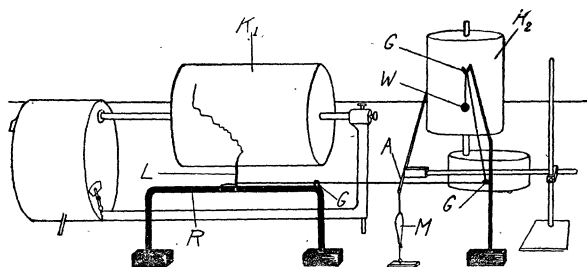


FIG. 1

graph drum (K1). Less than 50 milligrams were required to produce movement of the writing lever, even when no special precautions were taken to insure ease of movement of the sliding collar and the writing lever. A silk thread passes from the sliding collar through three glass loops (G). The thread is weighted with a small piece of plastic clay (W). The short arm of a muscle lever (A) extends over the thread. Two glass rods (not shown in figure) on either side of the muscle lever allow only vertical deflection of the thread. The contraction of the muscle (M) pulls down lever (A) causing the thread to be depressed. The depression of the thread causes the writing lever to be pulled to the right, since the weighting arrangement does not permit the other end of the thread to move. When the muscle relaxes the weight drops slightly, pulling the thread taut without further displacing the writing lever. Thus, the lever will move only during contraction, and the curve produced will be cumulative as the muscle contracts. The greater the frequency of contraction the more rapid will be the rise of the curve. The curve will also rise more rapidly if the amplitude of contraction is increased. Simultaneous with the making of the cumulative record on K1 another record of the usual type is being obtained on K2. Both the change in frequency and amplitude will be indicated in the cumulative curve, although less clearly than in the ordinary record, since each contraction is represented by a discrete step in the curve. The height of the curve at any point will be proportional to the total contraction up to that time.

By a slight modification of the apparatus records may be obtained from levers moved by rubber tamboours.

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### ANOTHER CARBORUNDUM PENCIL

We have been using in our classes a method of mounting engravers' points for marking microscope

slides which seems both simpler and more satisfactory than that devised by Chatters.<sup>1</sup>

Glass tubing just large enough for insertion of an engravers' point is selected and cut in four-inch lengths. With the aid of heat the blunt end of a piece of carborundum is coated with a thin layer of sealing wax, and while the wax is still soft the carborundum is inserted to about half its length in one end of the glass tubing. The student's name is then written in India ink on a narrow piece of card, which is pushed into the tube far enough to avoid scorching when the open end is either fire polished or sealed.

Pieces of carborundum mounted in this way have been in use in the histology class at Yale for several years. The insertion of a name card was the idea of a student at Smith.

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<sup>1</sup> SCIENCE, 85: 128, January 29, 1937.

### BOOKS RECEIVED

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