

A Moist Chamber for Nerve-Muscle Experiments¹

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The moist chamber herein described was developed in order to save the student time in performing routine laboratory experiments involving the use of the nerve-muscle preparation. The standard moist chamber in use in most laboratories is rather cumbersome and requires considerable wiring prior to starting an experiment. If two muscles are used simultaneously in the chamber or if more than one pair of electrodes are used, the actual setting up is indeed time consuming.

This moist chamber (Fig. 1) weighs only 3½ ounces, is 1½ inch deep, 2½ inches wide, and 3½ inches high. It is made of 1/16-

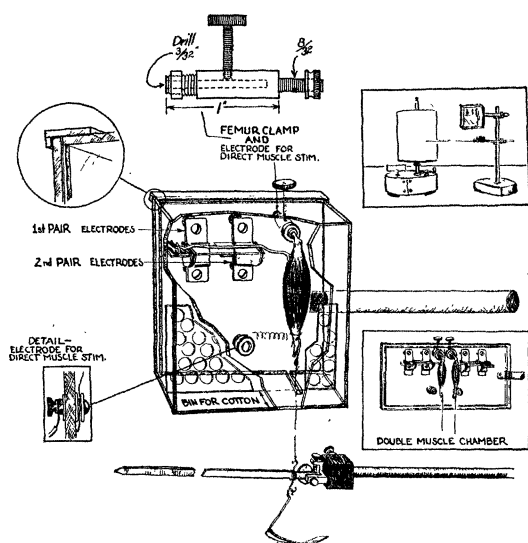


FIG. 1. Drawing of lucite moist chamber with lid partially cut away, showing a nerve-muscle preparation in place and attached to a muscle lever.

inch lucite. The femur clamps and aluminum electrodes are mounted near the top of the back panel, which is 1/8 inch thick. The two pairs of electrodes are arranged 3 cm. apart, to the left and slightly below the femur clamp. Between these pairs is mounted a shelf of lucite so arranged that the nerve can be placed on it perfectly flat, thus forming a straight line for 3 cm. This group of electrodes is advantageous for experiments in which the student can determine roughly the speed of impulse conduction through the sciatic nerve.

Provision is also made for direct stimulation of the muscles. At the bottom of the back panel and near the level of the distal end of the muscle an electrode is introduced. This is an 8-32 roundheaded bolt with spaced washers and nuts around which a fine copper wire can be wrapped to conduct current to the lower part of the muscle (see detail, Fig. 1). On the back

¹ This moist chamber was developed while the writer was teaching physiology at Georgetown University Medical School. A report was not published at that time because during the war years plastic material was not obtainable.

of the femur clamp is a binding post, forming a terminal for the opposite side of the electric circuit.

The cover is also of lucite and fits a flange that has been routed into the moist chamber base, forming a tight fit and thus preventing any appreciable moisture loss. The thread leading from the muscle tendon to the writing lever passes through a narrow saw cut in the lower side of the cover.

Near the front of the cover and extending for approximately two-thirds of its height is cemented a perforated plate of lucite, thus making a bin into which moist cotton can be placed. The perforations provide openings through which the moisture passes.

The electrodes, of thin sheet aluminum, are arranged so as to take up a minimum of space and are insulated from each other by any suitable nonconducting material such as mica or thin sheets of plastic, which are held together with De Kotinsky or plastic cement. All of the binding posts are equipped with standard 8-32 dry cell nuts.

The one disadvantage of this chamber is that it is not equipped with nonpolarizable electrodes. However, this type of electrode is rarely used in routine teaching of students. Furthermore, this disadvantage is more than offset by the speed with which the preparation can be put into use. A nerve-muscle preparation can be installed and all connections made in approximately two minutes. Moreover, with the humidity almost at the saturation point, a well-made nerve-muscle preparation will stay viable for several hours without any extra precautions being taken. Once the preparation is in the chamber, it need not be touched again for the duration of the experiment, thus eliminating any possibilities of mechanical or chemical damage which might give artifacts and other faulty results.

The lower right insert shows the back plate of a moist chamber in which two nerve-muscle preparations can be mounted simultaneously. This has a decided advantage over the single chamber, since it can be used on such experiments as the relative fatigability of the parts of the nerve-muscle preparations and on those in which one nerve is narcotized.

Homogenization of Sputum Specimens With a Paint-conditioning Machine

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To obtain adequate digestion of sputum with either dilute alkali or dilute acid, forceful agitation of the specimen is necessary. Sputum specimens can be shaken mechanically in the ordinary Kahn shaking machine, but much more thorough and rapid agitation is obtained by the use of a paint-conditioning machine. The adaptation of these rugged machines to sputum work was first suggested by Steenken and Smith (1) in 1942. At that time the 1-gallon capacity machine was recommended, the gallon container being arranged to accommodate 10 individual sputum bottles. Recently it has been found that a machine similar in type¹ but of 1-quart capacity can be utilized.

¹ Made by Landon P. Smith, Inc., Irvington, New Jersey.