enlargements. The length of the horizontal portion of the capillary tube is such that the pipette fits in the frame designed for the original form. This horizontal portion can be shortened somewhat by bringing the first bulb of the pipette over to the left edge of the pipette frame and changing the form of the frame accordingly. It was not thought desirable to extend the capillary tube in a vertical direction¹ from the first bulb of the pipette since that would necessitate the use of a longer capillary in making the connection with the burette.

These pipettes are furnished by Greiner and Friedrichs, Stützerbach in Thüringen, Germany. In ordering, emphasis should be laid upon the *actual* size of the enlargement, since on account of the magnifying action of the glass, an enlargement *apparently* 3 mm. in diameter is considerably less than that, and is not as satisfactory as the larger one.

CORNELL UNIVERSITY, ITHACA, N. Y.

AN EFFICIENT METHOD FOR CUTTING GLASS

By J. I. HARDY

Received December 8, 1913

There is often great difficulty in satisfactorily cutting glass in the scientific laboratory, and this is especially true in the case of glassware of large diameter. There are several methods in common use. Probably the fine flame of the blowpipe applied upon a file scratch is one of the best known methods. The diamond point is often used with satisfaction. A metal rod may be bent to the shape of the object to be cut, heated red hot, and passed over the surface on the line where the glass is to be cut, then if the glass is plunged into water it will separate on this line of contact. There is a method by Kunz,² using an electrically heated nickel wire on a rather complicated apparatus which requires an electric current of about

eleven amperes. In this method a few drops of water are applied to the heated glass, causing it to crack.

The writer believes the following method to be capable of wide application, and that the desired results can be rapidly and efficiently obtained in the average laboratory. The equipment consists of an electric system giving at least six amperes electric current, a resistance apparatus consisting of a rheostat or a bank of twelve lamps (16 c. p.) arranged in parallel, and a piece of No. 24 nickel-chromium wire. When long tubing is to be cut, a steady rest will prove helpful and can be arranged to suit the convenience of the operator. The method of procedure is as follows: Bind a piece of wire around the glassware, twisting the ends together and making sure that the wire follows the line where the glass is to be cut. This wire serves only as a guide, and may be of any inexpensive

material. In the diagram, *R* indicates the bank of lamps, which is used on account of being both inexpensive and easily adjusted to definite resistance. At binding posts *A* and *B* connection is made with the electric light system of the building. Between *C* and *D* is inserted the No. 24 nickel-chromium resistance wire *E*, and *F* is the switch.

After the lamps *R* are loosened sufficiently to break their connection, the switch at *F* is turned on, and the lamps are screwed in one at a time until the wire *E* is a dull red. The glassware which has been prepared with guide wire is given a slight file scratch of about one-quarter inch length on the line to be followed in cutting, and is brought into the loop *E* and revolved two or three times, holding the nickel-chromium wire

1—Graduated Cylinder, cut above 1 L. mark.
2—2.5 L. bottle. 3—Similar to 2.
4—2 L. Erlenmeyer Flask.
5—Battery Jar, cut 1/4 in. below break.
6 and 9—Jena beakers, 1 L. and 150 cc.
7—Brittle Thin-walled Tubing, poor grade of glass.

close to the metal guide. After the glassware has been revolved two or three times in the loop *E* more lamps are connected in the bank *R* until the wire *E* is a bright red. Now the wire loop *E* is held in contact with the file scratch for a few seconds until a crack is started. The glassware is now revolved, keeping the heated wire slightly ahead of the crack until the glass is cut off. If the wire cools it may be released slightly from the glass until it regains its heat.

This method is very effective and can be used to cut any kind of glass from cheap bottle glass to the best Jena. It will work successfully on glassware with cylindrical, spherical or conical walls, and will cut the glass in any direction in which the guide is placed. A 2 1/2 liter bottle was split (after having its neck cut off) horizontally, although it required more time than any of the ordinary glass-cutting problems because of the thickness of the bottom of the bottle.

The accompanying photograph shows nine samples which were cut by this method in about one-half hour.

AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF TENNESSEE, KNOXVILLE

APPARATUS FOR TAKING DUST AND BACTERIA SAMPLES OF AIR

By CHARLES BASKERVILLE

Received February 12, 1914

In the investigation¹ of the air of the schoolrooms of New York City, carried on with Professor C.-E. A. Winslow at the request of the School Inquiry Committee of the Board of Estimate and Apportionment, it early became apparent on account of the large num-

¹ See White and Campbell, *J. A. C. S.*, **27** (1905), 734.

² *Chem. Ztg.*, **37**, 406-407.

¹ See *THIS JOURNAL*, this issue, p. 251.