makers of microscopic apparatus the need of a foot-focussing device, with the result that one manufacturer has promised to design such an accessory at an early date. In the meantime I have developed a device which is very useful and fulfils most of the requirements which I had laid down for such a contrivance. A small screw-clamp, such as is used for rubber tubing, was fastened on the lower part of the rim of the focussing wheel of a wide-field binocular microscope. To this clamp a strong, smooth cord was attached which was passed upward and back over the wheel in a groove which the maker had provided, conveniently, though for what purpose I have no idea. The cord was lowered from the wheel to the floor, where it was attached by a screw-eye to the end of a light piece of wood about 2½ inches wide and one foot long. The length of the cord was adjusted so that one end of the wood pedal was lifted about 2½ inches from the floor, while the other end rested on the floor and served as a pivot. When the pedal was pushed downward the cord pulled on the wheel so as to turn it and raise the objectives. Downward movement was secured by passing a rubber band of proper strength under the stage of the microscope and fastening it above the stage to an adjusting screw on the inside of the arm. The microscope used has such a screw, so placed that it holds the rubber band well back from the stage where it does not interfere with the examination of large objects, or the use of dissecting trays. With a little alteration the same scheme could be used on other microscopes which do not have a screw on the inside of the arm. Most of the common types of binoculars have the groove in the focussing wheel which serves as a pulley for the cord.

This arrangement provides a sufficient range of focus for ordinary work, and where the objective needs to be raised higher the clamp can be set further around on the wheel. If the rubber band is not too strong the tension needed to hold the microscope in focus is slight, and the effort made is scarcely greater than that of pressing down the accelerator on an automobile. The heel is rested on the floor and the ball of the foot placed crosswise of the pedal at the point found most convenient.

For safety the microscope may be fastened to the table by a small clamp, but this is not essential if the apparatus is properly adjusted and the microscope well oiled. The cord rarely jumps from the wheel and when it does can be replaced in an instant. Unless the microscope is set so as to project a little over the table the cord will rub against the edge of the table, but this does not interfere with the working of the device.

Either foot may be used, and the cord may be attached on either the right or the left side of the microscope, as desired. The apparatus has several advantages. It may be made in a few minutes from supplies available everywhere, and may be attached to or detached from the microscope in a minute. It may be used on any table without marring it in any way. Adjustment to tables of different heights merely involves a change in the length of the cord.

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AN IMPROVED SODIUM BURNER[1]

EXPERIENCE here over a period of several years has revealed the need for an improved sodium burner for use in polarimetry. Burners which have been previously described, or used here, are open to the objections that the light is either too small in size, or that its intensity is inadequate or of insufficient duration. A fairly satisfactory type of burner is that of Caldwell and Whymper,[2] who passed gas through a mixture of salt and sand into a blowpipe for combustion with air. This burner was improved by West,[3] who devised a glass burner with a salt reservoir for introduction of the salt by tapping. Making use of the most obvious advantages of the burners of Caldwell and Whymper, and of West (introduction of powdered salt into the gas flame) we have devised the improved sodium burner shown in Fig. 1. By the action of an electrically driven vibrating unit against the bottom of a funnel salt is introduced into the flame of this burner. The burner is capable of producing a very intense light at the will of the operator. This action at a distance of several feet from the observer permits readings with an intensified light without fatigue of vision caused by direct tapping.

The salt funnel (C) is of brass and 50 mm. square at the top, which contains a filling cap. The bottom of the funnel is grooved and sloped to the opening into the mixing chamber (B), which contains inlets of metal tubing for gas and air. The opening into the mixing chamber may be cleaned through the hole shown capped. The mixing chamber, also of brass, is 35 mm square and 40 mm in height, with a curved bottom and an opening of 20 mm at the top into the brass chimney (A), shaped as shown. This chimney (A) is 160 mm in height, of the Meker type, with a

[1] Contribution from the Department of Physiological Chemistry, Loyola University School of Medicine, Chicago, Ill. Demonstrated by the authors at the twenty-sixth annual meeting of the Federation of American Societies for Experimental Biology, in Philadelphia, April 28, 1932. The burner described in this paper was constructed with the kind cooperation of Messrs. E. H. Sargent and Co., Chicago.

[2] R. J. Caldwell and R. Whymper, Proc. Roy. Soc., (A) lxxxi, 112.

[3] E. S. West, *Jour. Lab. and Clin. Med.*, 14: 267, 1928.

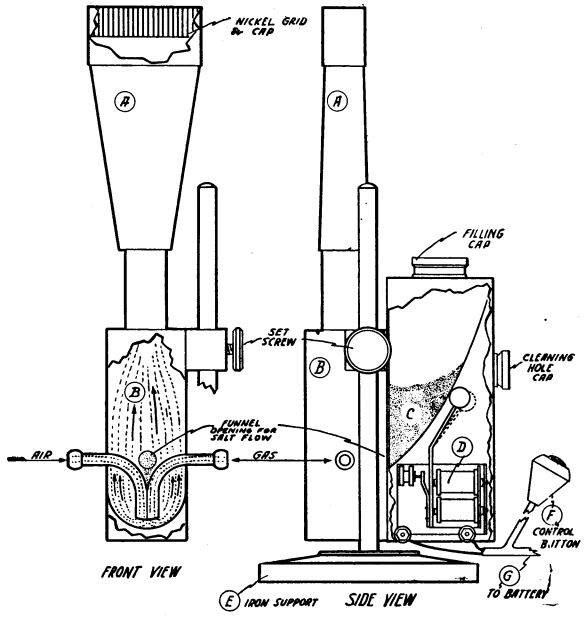

FIG. 1. An improved sodium burner, showing: I—Side view of the complete burner with one side wall cut away to expose the vibrating mechanism (D) and funnel (C) containing salt; II—Front view of chimney (A), of Meker type, and attached mixing chamber (B), into which gas, air and powdered sodium chloride flow before combustion. (Drawn to scale and reduced to about one fourth of actual dimensions.)

nickel grid inside a cap, 30 x 55 mm at the rectangular top. Fixed under the salt funnel is the vibrating unit (D), connected by five feet of insulated wire to the press button (F), and to a battery (G) of one or two dry cells. The entire burner is clamped on a short iron stand which permits adjustment for height.

In order to operate the burner the funnel is first filled with salt and capped. Air is then blown through the mixing chamber to displace any salt which may have fallen in during the filling of the funnel. The air is turned off and the gas is ignited to give a final flame of the desired size. Air is then introduced to give the most efficient combustion of the gas. The burner is placed with the front toward the polariscope. A short period of action of the vibrating unit causes the salt to flow into the mixing chamber from whence it is carried up by the forced draft of air and gas and burned in the flame.

As a sodium salt we have found the chloride, finely powdered for 24 hours in a ball mill and dried at 110 degrees C., most satisfactory, although the anhydrous powdered sulphate has also given an intense light. The burner may be used to produce monochromatic lights from non-hygroscopic salts of other metals. The size of the flame may be reduced for spectroscopic studies. If operated for long periods of time, particularly without critical adjustments of gas and air, the burner should be placed in a well-ventilated hood for removal of fumes.

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SPECIAL ARTICLES

THE PRESENCE OF BACTERIA WITHIN THE EGGS OF MOSQUITOES

IN connection with certain experiments on the food of mosquito larvae (to be described elsewhere) the investigator was astonished to find evidence of viable organisms within the ova of *Aedes aegypti*. Six eggs, after a thorough disinfection in hexyl resorcinol,[1] were introduced into sterile 0.5 per cent. dextrose bouillon and the cultures incubated at 80° F. In one instance a larva hatched after 48 hours and the media remained sterile for 9 days, at the end of which time a second larva hatched and within 24 hours a spontaneous contamination appeared in the culture. Throughout the course of the experiment the plug was not removed from the flask. This sudden appearance of bacterial growth could not be explained on the basis of a slow growing organism, otherwise a heavy growth would not have suddenly arisen in a flask which had previously remained perfectly clear for a period of nine days. This first observation was made in January, 1931, and since then in several hundred experiments, with different types of media, only seven additional clear-cut instances have been found. The length of time these eight cultures remained sterile, previous to the appearance of contamination, varied from 5 to 11 days, the average being 9 days. The organisms isolated include the following—gram negative and gram positive bacilli, staphylococci and yeast.

It is only in cases where the hatching of certain of the eggs is delayed for several days that this phenomenon could be demonstrated. If the contamination had arisen within the first 72 hours or had appeared slowly it might be assumed that the exterior of the eggs had not been sufficiently sterilized or their introduction into the media not carefully executed. It is felt that in many such cases where contamination did appear promptly this may be accounted for by the presence of bacteria in the eggs. To the writer only one explanation of the above quoted experiments seems tenable—namely, that bacteria were present in the eggs which were delayed in hatching and upon emergence of the larva the bacteria multiplied rapidly in the bouillon. In media other than that suitable for rapid growth of bacteria there could be no indica-

[1] E. H. Hinman, *Amer. J. Trop. Med.*, 12: 263, 1932.