incubation period of 90 minutes; (2) in contrast, clot formation did not occur in the presence of tyrothricin and actinomycin A. The inhibitory effect of tyrothricin and actinomycin A upon plasma-coagulation by *Staphylococcus aureus hemolyticus* could be demonstrated in repeated experiments. These substances also prevented clot formation by supernatants of staphylococcal cultures. Furthermore, this inhibitory effect of tyrothricin and actinomycin A upon plasma-coagulation by staphylococci was observed also when the mixtures were incubated for 18 hours at either 37°C or at 4°C prior to the addition of plasma.

It may be mentioned that neither tyrothricin nor actinomycin A in the above amounts prevented coagulation of human plasma following the addition of calcium chloride; furthermore, that the addition of calcium chloride to mixtures of staphylococcal culture, human plasma and tyrothricin or actinomycin A, that failed to show coagulation of plasma, resulted in prompt clot formation. As yet, it cannot be stated whether or not this inhibitory effect of tyrothricin and actinomycin A upon plasma-coagulation of staphylococcus is due to a direct action upon the coagulase.

There is experimental evidence indicating that fibrinolysin and coagulase play a rôle in the pathogenesis of streptococcal and staphylococcal infections. It remains to be determined whether tyrothricin and actinomycin A inhibit fibrinolysis and plasma-coagulation also *in vivo* and what significance, if any, this inhibitory effect has upon the course of the infection.

Summary. (1) Tyrothricin and actinomycin A inhibit fibrinolysis by *beta hemolytic streptococcus* cultures or supernatants thereof. (2) These substances also interfere with coagulation of plasma by pathogenic staphylococcus.

13501

Improved Mechanical Microtome Knife Sharpener.

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For more than ten years the automatic microtome knife sharpener described by Fanz[1] has been standard equipment in most large

[1] Fanz, J. I., *J. Lab. and Clin. Med.*, 1929, **14**, 1194.

pathology laboratories, saving many hours of tedious labor while producing a far better cutting edge on the knives than hand work could possibly do.

In the apparatus presented here, the glass plate described by Minot and Fanz has been incorporated but the mechanics have been simplified. The time needed for sharpening has been reduced by swinging the knife through an ellipse rather than an arc alone.

Description of Machine. The whole apparatus (Fig. 1) is mounted on a pedestal which has a heavy base fitted with 2-inch casters. P is a 1/20 H.P. geared motor with a ¾-inch shaft, 4 inches in length, presenting vertically. This shaft carries the small gear I and the 8-inch disc C. The disc C in turn mounts the three 3-inch vacuum cups on which rests the 24-inch glass plate B. This type of mounting holds the plate securely in place but absorbs the torque of starting and stopping. The larger 10-inch gear J is mounted on the supporting plate and attached to it is one of the flat bearings which, with its mate, holds the carriage K for the knife F and turning mechanism G-H. In the center of each bearing is a socket for a locking pin which, when placed in the bearing on J rotates the knife through an ellipse, and when placed in the second bearing rotates the knife through an arc only. The knife may be held fixed in any position desired on the plate by disengaging the small gear I with the lever O.

Mounted on the knife carriage K is the fixture bearing the small motor and turning mechanism H as well as the knife arm and

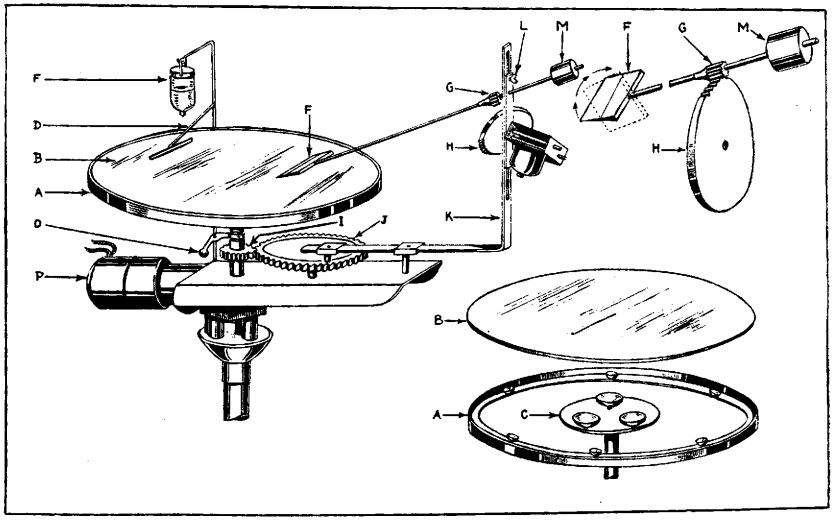

FIG. 1.

counter weight M. This fixture is attached with set screw L and hence is adjustable for any knife bevel without disturbing the relation of the turning gears G and H. H, an elliptical fiber gear, is actuated by a small geared motor which runs continually; the butterfly gear turns H intermittently through one-sixth of the arc every 15 seconds. Hence the knife is turned over every 90 seconds and the actual rotation takes only 5 seconds so that little time is lost from the sharpening procedure.

The drip pan is of light galvanized material and is attached to the under-surface of the glass plate by 6 small vacuum cups.

The solutions are supplied to the plate by a drip bottle F. The bottle support also carries a "Mercury" windshield wiper assembly D, including the spring tension which makes for efficiency and avoids unnecessary dragging on the plate.

The machine operates smoothly and very quietly. The knife is turned quickly and without effort. Little attention from the technician is necessary except for the changing of the knife and various grinding compounds. Simplification of the apparatus reduces the cost of construction to a range well within the means of the smaller laboratory.

13502

Effect of Phosphoric Acid Esters on Fracture Healing.*

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The erythrocytes contain an abundance of phosphoric esters hydrolyzable by phosphatase,[1] but the plasma contains only 0.2-0.5 mg phosphorus per 100 cc[2] in the form of phosphatase hydrolyzable esters. The phosphatase activity of a fracture callus increases rapidly beginning 3-4 days after the injury.[3, 4, 5] Although the site

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