A portable micro-centrifuge[1]

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The apparatus described was designed primarily for the use of the maternity flying squad for cross-matching blood for transfusion at the patient's bedside at home.

GENERAL DESCRIPTION OF MICRO-CENTRIFUGE

The unit is enclosed in a wooden box six inches cube with a metal carrying handle on top, the box being mounted on four rubber feet. The weight of the prototype was approximately four and a half pounds.

1 The centrifuge is of the angle head type and is machined in aluminium and has to be precision engineered by virtue of its size. It is a 'press' fit on the 3/32 in. shaft of the motor. It carries four tubes, size 25 mm. × 7 mm. each, with a capacity of 0·5 ml. These are cut-down precipitin tubes, size 50 mm. × 7 mm.

2 These are two switches, the one on the left controlling the centrifuge, the other operating a panel light on the right.

3 This is the panel light for viewing slides, over which is placed a fixed magnifying lens.

4 Forceps for handling the small tubes.

5 Small rack containing four spare centrifuge tubes.

The chassis contains the control panel and batteries. To remove the batteries from the box is a simple operation requiring the removal of a single screw in the side of the box. The batteries are clipped in and held in place by large Terry clips.

MICRO MOTOR This motor, specially designed by Victory Industries Ltd. for industrial application, such as servo and instrument use, has also been approved and accepted after exhaustive tests by the Ministry of Supply. It weighs 1·3 oz. and is 2 in. × 1 in. approximately and uses standard voltages 6 and 12 v. D.C. It is self starting and reversible and is totally enclosed. It is fitted with self-oiling phosphor bronze bearings and replaceable copper-carbon brushes. It has a continuous running life of approximately 300 hours and this can be further extended by replacing brushes. The speed is 4,500 to 7,000 r.p.m.

It will be seen that this little motor gives a good power/weight ratio and is therefore ideal for this apparatus. It should be regarded as expendable, and apart from replacing brushes no other servicing need be considered, the price of a replacement motor being only 30s. It should be noted that the motor only needs to be run for about two or three minutes at a time.

The 6-volt D.C. motor was chosen as the more suitable; this requires four U2 batteries whereas a 12-volt motor would require eight such batteries and this would, of course, add to the total weight and size of the machine. While current consumption is lower with a 12-volt motor, when the centrifuge is running at speed the 6-volt motor consumes only 0·3 amp, the same amount of current as required for the torch bulb (6·2 volts, 0·3 amp) used for slide illumination, which incidentally can be used as a visual indication of the state of the battery.

continued on p. 91

[1]Parts for this centrifuge, or a complete unit may be obtained from A. F. Harding, 3A, Clarendon Road, Redhill, Surrey.

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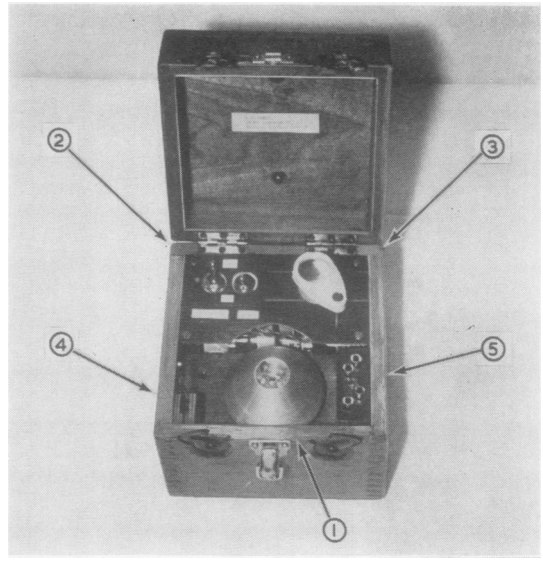

FIG. 1. *Photograph of the box with the lid open showing the layout of the micro-centrifuge.*

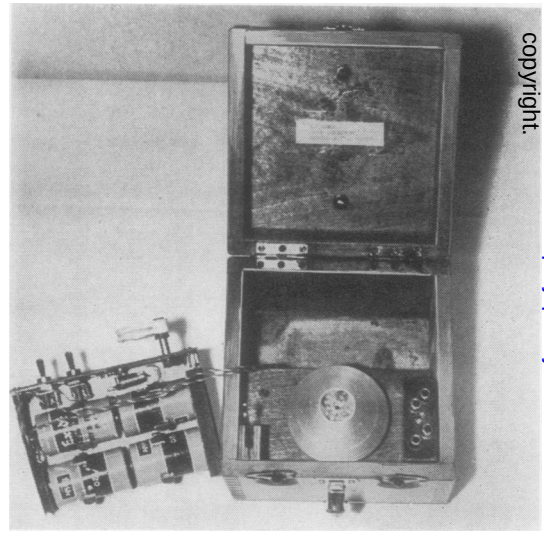

FIG. 2. *Photograph of the box with control panel removed.*

Acrylic picture varnish for thin stained films

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The bright pigments of cave pictures in Spain have been preserved from Paeleolithic times by the accidental formation of a surface film of calcite (Kühn, 1952), and since then many glazes have been used deliberately for the protection of colours. The idea of varnishing glass slides is not novel, but practical difficulties concerning preparation, *p*H, and especially viscosity, have discouraged its use.

This paper describes the easy and successful application of modern synthetic resin varnish to preserve stained microscope slides for repeated examination.

USES

The varnish has advantages over traditional Balsam and cover-slip mountings for blood films, thin smears of such materials as pus, sputum, and vaginal secretions, and for bacteriological films.

It is probably not satisfactory for histological specimens, although it is possible that very thin sections might be so mounted.

MATERIALS

The most useful varnish found so far has been a solution of synthetic resin in petroleum spirit.[1]

Many other sprays, varnishes, and polishes were tried. Most were discarded because they were too acid, too viscous, or too expensive; or because they were removed too easily with the microscope oil.

It is probably wise to check each batch for excessive acidity.

[1]Winton picture varnish, Winsor & Newton Ltd. at about 1/6d. for an ounce and Rowney clear picture varnish no. 800, 2/6d. for 2 oz.

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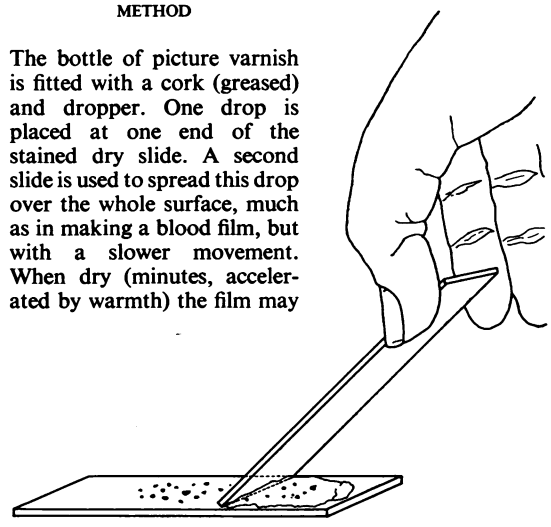
METHOD

The bottle of picture varnish is fitted with a cork (greased) and dropper. One drop is placed at one end of the stained dry slide. A second slide is used to spread this drop over the whole surface, much as in making a blood film, but with a slower movement. When dry (minutes, accelerated by warmth) the film may



be studied under dry or oil-immersion objectives. Oil may be simply wiped off with a dry paper tissue, and the film is then clean for storage and re-use. Xylol is not needed and must not be used as it will dissolve this glaze.

Particulars or numbers written with ink or crayon at one end of the glass slide can be varnished over to provide permanent labelling.

COMMENT

There is no fogging of the image. Leishman-stained blood films appear a little clearer when varnished. Films stored eight months have not faded.

Stains tested so far are Gram, Ziehl-Neelsen, Albert, methylene blue, Leishman, and Giemsa.

Films under the varnish are protected from oxidation, damp, and scratching. So long as the slide is unbroken, viable organisms and spores are safely under seal, a consideration of importance when demonstrating pathogens to large classes.

SUMMARY

An easy method of glazing stained microscope slides with acrylic picture varnish is described. Immersion oil can be wiped off such slides with a paper tissue. They can be examined repeatedly and kept indefinitely. The varnishes described do not have the disadvantages of excessive acidity and viscosity which have discouraged the use of slide glazes in the past. For many purposes varnishing is superior to coverslip mounting.

REFERENCE

Kühn, Herbert (1952). 'Die Felsbilder Europas'. Kohlhammer Verlag, Stuttgart. Trans. 1956 by Alan Brodrick as *The Rock Pictures of Europe*. Sidgwick and Jackson, London.

A portable micro-centrifuge (*cont.*)

OPERATION Place equal amounts of clotted or defibrinated blood in two or four of the centrifuge tubes. The tubes so balanced are placed opposite each other in the angle head. Switch centrifuge control switch to the 'on' position and close the lid. Leave for two or three minutes. Open the lid and switch off the motor; extract the tubes with forceps.

Do not use the panel lamp while the centrifuge motor is switched on, as this places an unnecessary drain on the batteries.

No variable speed control has been included as this has not been found necessary.