Mounting Fibres for Microscopical Examination

For examination, a decent compound microscope fitted with a ×10 objective will meet most requirements. The possibility of viewing specimens between crossed polars adds a bit more "sparkle" to this work! The preparation and mounting of material for examination is made much easier if a stereomicroscope is available. In addition to standard fine forceps and mounted needles, some very fine needles are particularly useful; these can be made by making a slit in the end of a matchstick or piece of dowelling and using glue to fix a fine stitching needle into it.

Slide Making

The following notes relate to a method that I used to achieve good results.

Fabrics that are destined for disposal or recycling are a source of suitable threads for learning the slide-making techniques; the same principles apply whatever the origin of the fibres. The threads (yarn) that are easily separated from the warp or weft contain numerous fibres that have been twisted together in the spinning process; it is these individual fibres that we wish to see.

The selection of suitable mountants is an important consideration. There needs to be enough difference between the respective refractive indices (R.I.s) of a fibre and the mountant to give enough contrast for the revelation of details, but not so much that diffraction effects at sharp edges create distracting artifacts. For most fibres, the R.I. falls within the range 1.5–1.7 and a good general-purpose mountant for temporary slides is paraffin oil (R.I. 1.47). Resin mountants such as Canada balsam (R.I. 1.53), "Practamount" and "Numount" are suitable for permanent preparations.

Equipment Required

Stereomicroscope, compound microscope, heating tray, dissecting instruments, watch glasses, pipettes (plastic ones are fine), plain slides, cover slips (square or circular, minimum 16 mm diameter) and the little mounting aid with separated fibres in position over the slide ready for the addition of mountant and application of the cover slip.

Polariser and analyser for viewing between crossed polars are optional.

Absolute isopropyl alcohol, xylene or “Histoclear”, paraffin oil and resin mountant.

Temporary Mounts

1. Cut about 3 to 5 mm from the end of a selected thread and put this on the centre of a clean glass slide.

2. Place a drop of paraffin oil on the fibres.

3. Tease the fibres apart, using mounted needles and fine forceps. Add more oil if necessary.

4. Add a cover slip.

[NB. It is difficult to avoid the inclusion of air bubbles. However, this is a temporary slide and it is usually possible to find some areas under the cover slip where fibres can be viewed – and photographed, if required – with no air bubbles present].

Permanent Preparations

1. Cut a 3 to 4 cm length from the ends of selected threads. Two can be mounted on one slide, if desired.

2. Tease apart the fibres from the end of each thread for a distance of about 1 cm from one end of the specimen.

3. Rinse the “business end” of the specimen in absolute alcohol. <3 minutes.

4. Transfer to xylene or “Histoclear”. <3 minutes.

5. Place a clean slide in the mounting aid and position the sample(s) in position over the central area of the slide.

6. Place a drop of mountant, diluted to 50% with xylene or “Histoclear”, over the area where the fibres are and arrange the fibres in the mountant so that they are nicely spread out.

7. Leave the slide on the warm plate at about 55°C for about 30 minutes.

8. Add a generous amount of full-strength mountant and place a cover slip in position.

9. Leave on the hot-plate overnight, and preferably longer – until the mountant has cured thoroughly. (My experience is that air bubbles tend to disperse over time in this situation).

10. Clean off surplus mountant, ring and label the slide, as required.

Lewis Woolnough

18-10-19