We believe that this method represents a considerable improvement in the provision of sections of renal biopsy tissue embedded in epoxy resin, and we are now investigating its application to small biopsy specimens from other organs and tissues.

References

Requests for reprints to: Dr W Lawler, Department of Pathology, University of Manchester, Stopford Building, Oxford Road, Manchester M13 9PT, England.

Detection of asbestos fibres by dark ground microscopy

K R JAMES, T B BULL, B FOX From the Department of Histopathology, Charing Cross and Westminster Medical Schools, London

The identification and quantification of asbestos fibres from human lung tissue is important in the assessment of the role of asbestos in the pathogenesis of disease, especially in medicolegal cases. Most studies have used phase-contrast microscopy for the counting of fibres at light microscopy level. We describe a method using dark ground illumination that has distinct advantages over the phase-contrast method.

Method

TISSUE DIGESTION AND PREPARATION OF LIGHT MICROSCOPY SLIDES
1 A piece of lung about 1 cm³ is gently blotted to remove excess moisture and weighed. Do not dry the specimen.
2 Cut the lung into small pieces and place in a 10 ml centrifuge tube.
3 Fill the tube with 5% aqueous sodium hydroxide, seal, and place in an oven (60°C) for 24 hours. Agitate occasionally during the day.
4 Centrifuge at 500 g or more for 10 minutes.
5 Carefully remove most of the supernatant and resuspend the deposit in distilled water. Mix to wash and leave for two to three minutes.
6 Repeat steps 4 and 5 twice. It is important to wash away the sodium hydroxide or crystals will form which interfere with the microscopy.
7 Centrifuge again and remove supernatant.
8 Resuspend the deposit in 1 ml distilled water.
9 Using a glass pipette drop a measured amount of suspension on to a clean microscope slide and evaporate on a hot plate. Examine with dark ground illumination. If fibres appear very scanty add one or more more drops of suspension to the same area of the slide and dry. If fibres are so numerous as to make counting difficult make a fresh preparation diluting the drop of suspension on the slide with distilled water before drying.
10 Mount preparation under a coverslip using any routine mountant.
11 Examine using dark ground illumination for both coated and uncoated fibres.

DARK GROUND ILLUMINATION
To a routine microscope with a good light source, objectives × 10 to × 40 magnification and × 10 eyes, a dark ground condenser is added with a numerical aperture the same as or higher than that of the objective. Click-stop models that permit rapid switching from normal to dark ground illumination are available from most leading microscope manufacturers. Fibres, both coated and uncoated, appear bright and shining against a dark background (fig 1).

QUANTIFICATION
a = all fibres counted on slide; b = volume of suspension on slide (taken from an original 1 ml); c = weight (g) of tissue digested.

Accepted for publication 13 May 1987
Technical methods

Both coated and uncoated fibres can also be seen in unstained and Perls's stained paraffin sections using dark ground illumination (fig 2). Over the past three years we have found that dark ground illumination microscopy gives similar results to those obtained by phase-contrast microscopy and has three advantages. The equipment required is cheaper, it is simpler to set up and use, and most important, it is much less tiring when counting fibres. The method of preparation of the lung tissue is simple, and we have found that it is suitable for electron microscopy and for electron microprobe analysis.

We thank RS Barnett for the photography.

Reference


Request for reprints to: Dr KR James, Department of Histopathology and Experimental Pathology, Charing Cross and Westminster Medical School, St Dunstan's Road, London W6 8RF, England.
Detection of asbestos fibres by dark ground microscopy.

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doi: 10.1136/jcp.40.10.1259

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