

MICROSCOPICAL EXPLORATION TEN

ADAPTING A VINTAGE VICKERS M10A MICROSCOPE TO ENABLE POLARISED LIGHT OBSERVATIONS

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Shortly after the beginning of this century I was given a Vickers M10A microscope which had been 'condemned' due to a failed PAT test, and had been replaced by a more modern instrument. It had sat neglected and 'awaiting disposal' in a remote store room for several years, and when I got it home and inspected it I found that the power cable had been damaged near where it entered the base of the instrument. It was then a simple matter to remove the microscope base plate and re-wire the power lead. That done, and my then having deemed the instrument to be electrically safe, it worked perfectly, and continues to afford me many happy hours of microscopical observation. The Vickers M10A was developed in the 1960s as a robust student microscope, capable of withstanding mal-treatment in a classroom environment. The instrument incorporates both transmitted and incident incandescent illumination and also a slideable and clampable head to enable the observation of deep specimens and the use of objectives of different working distance (see pictures 1 & 2).



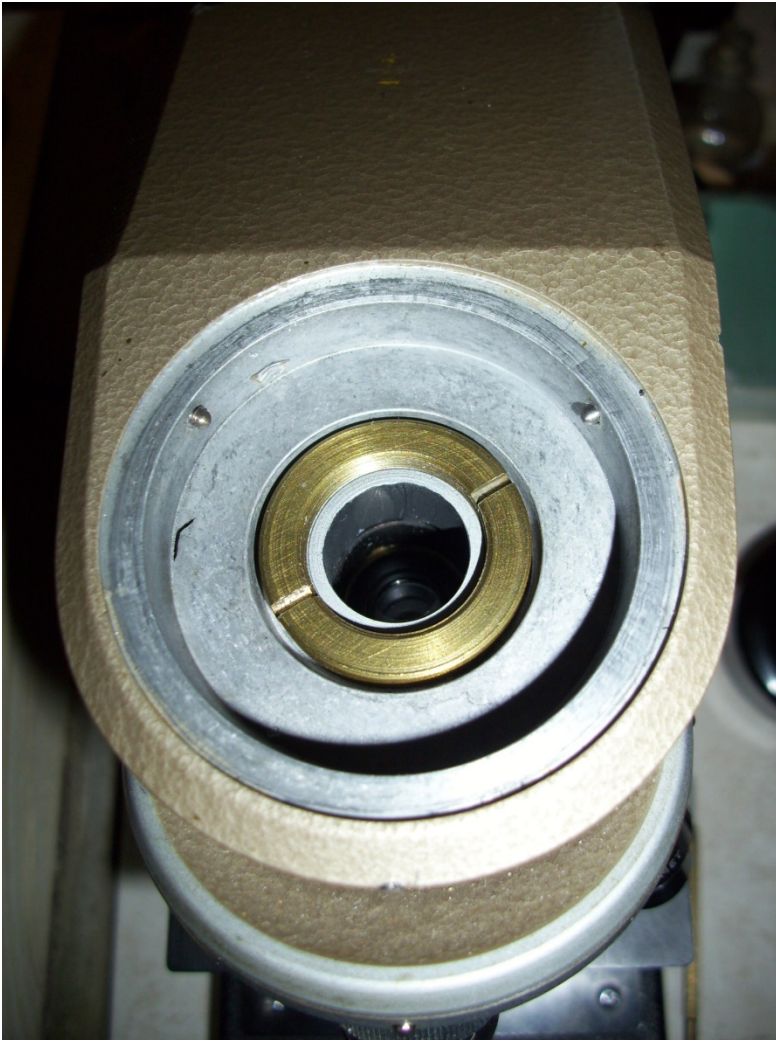
Picture1

Vickers M10A with head fully raised



Picture 2
Vickers M10A with head fully lowered

The inclined rotatable body tube assembly is secured to the head by means of three small grub screws which, when slackened, allow the easy removal of the body tube to facilitate access to the inside of the head (picture 3).



Picture 3
Vickers M10A head with body tube removed

The microscope has a sub-stage Abbe condenser and a filter holder which is located in a fixed position on top of the condenser housing by means of two small pins. The outer rim of the condenser has 24 grooved graduations set at 15° intervals around its circumference, which were highlighted using a correction fluid pen and which provide a convenient means of knowing the orientation of any installed filter relative to the other components of the microscope. This orientation is critical when using polarising and analysing filters in conjunction. For the purposes of this adaptation the polarising filter was fixed in position in the holder by a small drop of super-glue, and the holder was then located on top of the condenser using the two pins (pictures 4-5)



Picture 4
Vickers M10A condenser



Picture 5
Vickers M10A condenser with filter holder and polarising filter in place

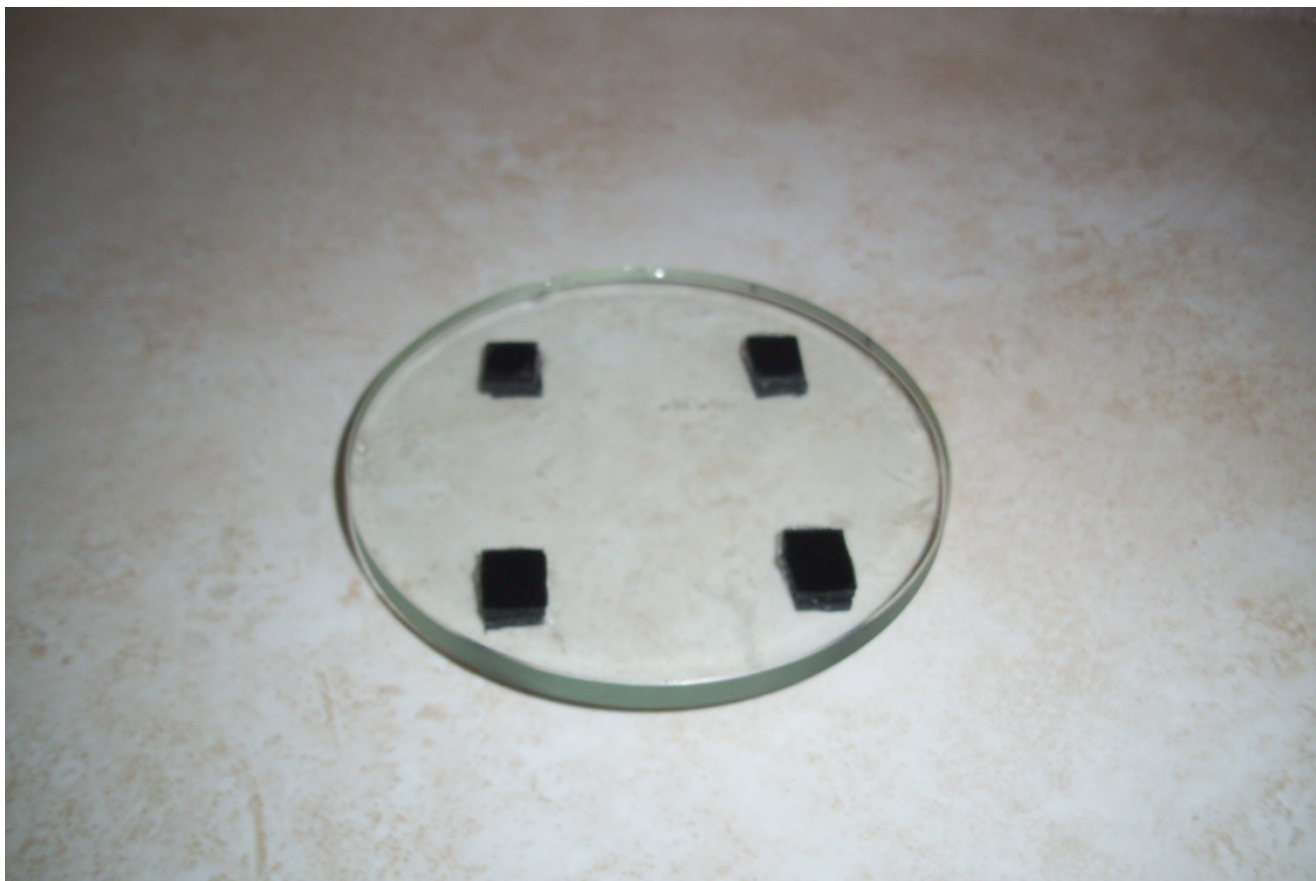
The cross graduation, on the front of the condenser in Pictures 4 & 5, when aligned with the condenser retaining screw on the microscope stage, is there to indicate the position of 90° crossed polars and maximum extinction.

With the condenser and polarising filter positioned below the microscope stage as described, and with the body tube removed, an analysing filter was inserted into the brass collar in the top of the head. The sub-stage illumination was then switched on and, whilst looking down the centre of the light path, the analysing filter was rotated until maximum extinction was observed (picture 6).



Picture 6
Vickers M10A head with analysing filter in place

The final modification, to complete this adaptation, was the addition of a plane glass stage plate to enable the interposition of optical retarders/waveplates in the light path between the polariser and the specimen (picture 7)



Picture 7

Plane glass stage-plate with improvised rubber feet



Picture 8
Adaptation complete

The old microscope pictured above, with the addition of a Brunel Microscopes Eyecam Plus eyepiece camera, is the instrument which was used in all my previous Microscopical Explorations for *Micscape* Magazine, and continues to be my 'go to' instrument for polarised light observation.

Any comments would be most welcome.

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