controlled by the light reflected off the film, so exposures are just right. By placing tracing paper between flash and subject softer lighting can be obtained and the reflection of the flash tube on shiny subjects avoided. Obviously it is inappropriate to go into more detail as regards illumination since this is a large subject, but one which is very important and should not be casually taken for granted if good results are wanted. To light a subject is easy, to light it and give it some 'life' is not - use lots of film to get good results. As to film, well for macro-flash work I use 25 ASA Kodachrome; this can also be used for micro work with tungsten light (provided a blue filter is used); I use 200 ASA for flash micro work (using stereo-microscope) . I recently gave a talk on pollen and used a Poinsettia plant as my introductory example (simply because it was flowering magnificently at the time, in mid-winter). A sequence using the camera and a Tamron macro lens was used for a general shot of the plant as a whole, for a close-up of a group of flowers and for single flowers. The camera body was then set up on a Wild stereo microscope and flash used to take shots of the individual flowers, then focusing on their structural elements right down to groups of pollen grains! The equipment was all arranged above the plant and the plant moved to the microscope objective. Pollen was then removed and slide mounted and photographed using conventional lighting, both unstained and stained in basic fuchsin.

Photomicrography is fun! You do not need lots of expensive equipment. A good SLR camera back can easily be used. Try it!

G.Legg

Spike Walker has sent for the Bulletin a paper which will undoubtedly be of interest to all members. Because of limitations on space it will, unfortunately, have to appear in two parts.

NOTES ON TIIE CLEANING AND RESTORATION OF MODERN MICROSCOPES M. I. (Spike) Walker

INTRODUCTION

The article describes methods that I have found useful during the restoration of (mostly) post-war instruments rendered shabby by years of neglect or careless use There is no pretence that it represents the last word on the subject and one of the main reasons for writing it is to encourage readers to reveal their own techniques. Please note that the cleaning methods advocated would prove lethal to lacquered brass!

When first obtained, second-hand microscopes, particularly those disposed of by research laboratories after twenty or more years of hard use, often present a sorry sight to the enthusiast, who, if the truth were told, probably gains almost as much pleasure from looking at a fine instrument as *through* it. Grimy and chipped enamel, dull or discoloured chrome and rusty screws are, however, all more or less redeemable with a little effort (and more patience) and the resulting transformation brings with it a rare sense of achievement.

INSTRUCTION MANUALS

Most larger microscopes were supplied along with a fairly comprehensive users' manual which has usually been lost by the time the instrument is disposed of. Should this have happened, make every effort to borrow one for photocopying and hence avoid making possibly expensive mistakes

DUST

Instruments are occasionally found which are so dusty that it is difficult to get anything but the most general impression of the condition of what lies underneath. Since such dust may be highly abrasive it must be removed from the stand with the greatest of care, using a vacuum cleaner and/or dabbing with moist paper towel. On no account attempt try to operate the mechanical stage or other movements before this has been done or particles may be forced into the slideways. Once the superficial dust is removed, it is time to take a long hard look at the patient in order to see what remedial work needs to be undertaken and at this juncture it is probably best to remove the objectives, substage condenser, eyepiece(s) and any other part which is obviously meant to be detachable by the user, such as a binocular tube or a rotating nosepiece fitted with a dovetailed slide, carefully sealing the resulting apertures with corks, plugs or masking tape against the entry of dust or cleaning fluids.

GREASE

Where an instrument has not been used for some time, slideways and centring adjustments may be more or less immovable and attempts to force them may well cause permanent damage. The most common cause for seized movements is thickened grease but on better class microscopes, tension adjustments are usually provided for the coarse, fine and substage focusing and the X and Y movements of the mechanical stage and it is worth while checking if these have been over-tightened. The rotation of the stage may have been clamped. If the grease *has* solidified, run WD 40 into the ends of slides, the bearings of rotating stages and the mating surfaces of centring rings, gently actuate the movements, add more WD 40 and wipe off the (usually black) lubricant which oozes out. Gummed up iris diaphragms should be treated in the same way. Eventually this treatment will free almost any seized movement but it may require repetition on a number of occasions before the grease is suitably thin again. Should it prove necessary (and possible) to re-lubricate bearing surfaces, remove any old grease and dirt with a rag moistened with petrol or xylene and apply a small quantity of a suitable instrument lubricant such as a light or medium grade of *Kilopoise* grease, keeping it away from rackwork, pinions or other gears.

SCREWDRIVERS AND THEIR USE

If you are forced to take a screwdriver to a microscope

(1) Make sure that its blade is in good condition,

(2) Thoroughly clean the slot or other recess in the screwhead with a toothpick so that the blade will "seat" properly,

(3) Ensure that the blade of a slot-head screwdriver is (almost) as wide as the slot in the screw and fits it snugly to *the bottom of the slot*. (Since some instrument makers

used screws with tapered or unusually narrow slots, it may be necessary to grind the blade to fit.) The penalty for using a screwdriver with too narrow (or too thin) a blade, or one which does not "bottom" is the eternal reproach of a mauled screw head
(4) Hold the screwdriver exactly in line with the screw and apply as much force to the seating of the blade as you do to turning it, otherwise the blade will "ride up" and maul the head, particularly if it be domed.
(5) Fully support the microscope or component being dismantled so that it cannot move as force is applied to the screwdriver, otherwise the blade will slip and scratch the surrounding enamel or chrome.
(6) When finally replacing the screw, lightly oil the thread and do not over-tighten it.
(7) Where a component is fixed by a number of screws, do not tighten any until all are in position.
(8) Magnetized screwdrivers (just stroke with a magnet) are sometimes useful in replacing steel screws where access to the hole is difficult, but in these situations, it is generally easier to choose a driver which fits in the slot of the screw really tightly. They can also be used to retrieve ball bearings or screws which have fallen into the "works". (Non-magnetic screws, etc., can often be rescued with the help of pearl forceps or a knitting needle with a small blob of grease or Blu-tack on the end).

[The second part of this paper, dealing with chrome, paint, glass and electrical aspects will appear in the next Bulletin.]

THE QUEKETT MICROSCOPICAL CLUB ANNUAL EXHIBITION :

Saturday October 7th 1995

This was perhaps the most successful Club exhibition to date. Among the exhibits were panels of photos showing Club activities such as the QMC weekends at Belstead House, Pembroke College Oxford and Buckingham; excursions to Bookham Common; meetings of the South Thames group and children pond-dipping etc. at St. Albans museum under the guidance of QMC members.

Other exhibitors were:-

K.Brownlee: Micro-fungi - the moulds

The moulds are relatives of the more obvious gill fungi but are frequently over-looked by mycologists. However, unlike their larger more flamboyant cousins, they are readily available all the year round, do not need the adoption of inelegant and uncomfortable postures for their acquistion and may be studied without leaving the comforts of home. If bread is left in its wrapper, kept in a warm place or if vegetable parings are left a day or so before disposal then you will soon have a fine collection of mould.

There are three common mould families; the blue-green moulds called the Penicillia, the Aspergilli, often found on mouldy jam and the pin moulds or Mucorales. The exhibit showed cultures and photomicrographs of all three families.