FUNGI IN SCHOOLS

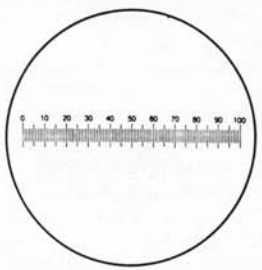
for
CHILDREN
TEACHERS
PARENTS

and other interested parties

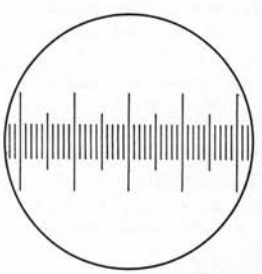
MEASURE A SPORE

In the third and final part of this very basic 'do it yourself' introduction to microscopy we prepare to measure a spore. Measurements are made in metric units (e.g. cm, mm) and, for microscopic work, the micron with the symbol 'μm'. One micron is equal to 0.001mm.

You need an eyepiece scale or micrometer and a slide micrometer. The eyepiece scale is etched on a circle of glass which is placed in the eyepiece of the microsope — it usually goes in upside down — but this is soon rectified. The scale that you will see is shown in Fig. a. This must now be calibrated against the slide micrometer which has a scale of 1mm divided into 100 parts so that each division represents 10 μm (Fig.b). Put the slide on the stage of the microscope positioned so that its scale partially overlaps the scale seen in the eyepiece (Fig. c). Count the number of divisions on the eyepiece scale that agree exactly with a certain number on the slide scale. Fig. c shows that 10 divisions of the slide scale are equivalent to 62.5 on the eyepiece scale. One division on the slide scale equals 10μm so that each division of the eyepiece scale will be $\frac{100}{62.5} = 1.6$ μm. Always do several checks by fitting together other numbers of divisions on the two scales and repeating the calculation. It is only too easy to make mistakes. Each eyepiece and objective that you use for measuring must be calibrated separately and it is a good plan to prepare a table of values of the eyepiece scale for each objective in order to avoid unpleasant mental arithmetic each time you measure.



a



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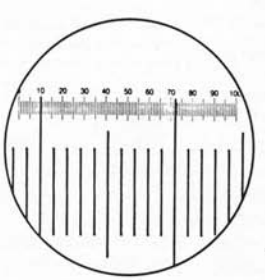

c

Fig. a. Eyepiece micrometer scale.
Fig. b. Slide micrometer scale.
Fig. c. Scales from (a) and (b) superimposed.

You will need to buy an eyepiece scale if all this work is not to be repeated at frequent intervals! The slide, however, you only use once with an occasional later check to see that all is well. They are expensive so — if possible — borrow one.

Now to the measurement of a spore. Start with spores mounted in water and measure the length first (e.g. 10 divisions of the scale) then rotate the scale and measure the width (e.g. 2 div.); consult your newly prepared table and you have a spore of length 16 microns (10 x 1.6) and width 3.2 microns (2 x 1.6). This is written as 16 x 3.2μm.

There is of course a great deal more to learn about spore measurement. Helpful information is given in the *Mycologist's Handbook* and very detailed advice (in German) in *Pilzmikroskopie*. The latter book was the inspiration for these three articles and from which the figures are taken with kind permission of the authors and publisher.

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Erb, Bruno & Matheis, Walter (1983). *Pilzmikroskopie*. Kosmos, Franckh'sche Verlagshandlung. W. Keller & Co. Stuttgart. ISBN 3-440-05127-7

Hawksworth, D L (1974). *Mycologist's Handbook*. CAB International, Wallingford, Oxon OX10 8DE, UK. ISBN 0 85198 300 6.