

The Art of the Pencil.

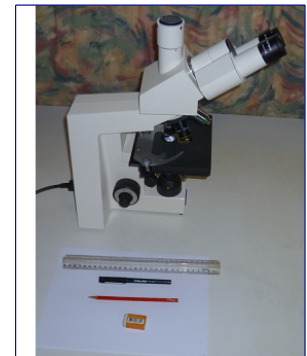
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With the advent of the microscope's trinocular head, mounted cameras and video capacity, the art of drawing protozoa and algae from life has been largely lost. And yet the benefits for the microscopic explorer are enormous. While not denigrating the use of photomicroscopy, I can't help but feel the benefits of line drawings can not be understated. (A modern 'integrated photomicroscopy system' courtesy of [Linden Gledhill](#) is shown left below.)

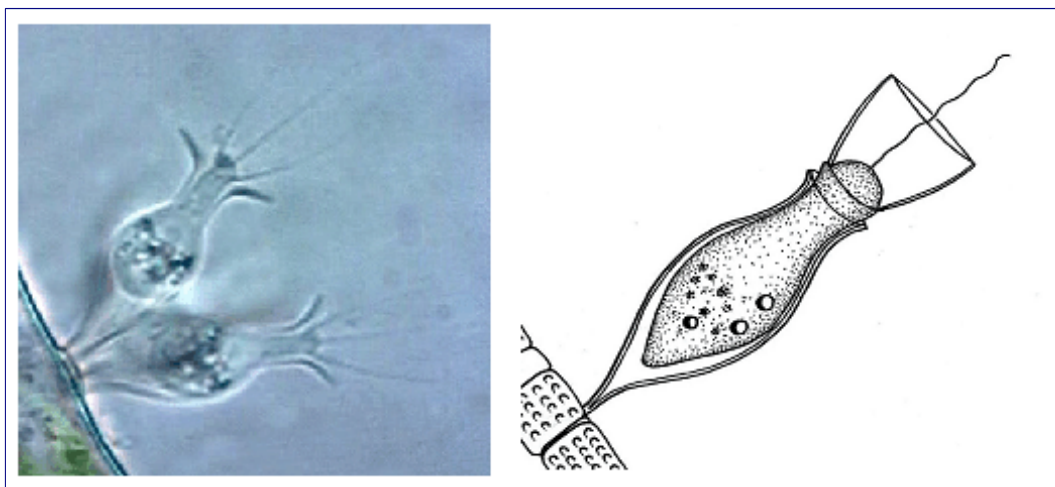


With the camera one has merely to find, focus and shoot. That is of course an over simplification. However to draw what you find, you really have to not just see but actually look and take note of details of what you have. Not only at the colour, size, shape, movement and proportions but also look for specific identification features such as, in the case of protozoa, its type of locomotion and thus whether it belongs to the flagellates, rhizopods or ciliates or in the case of the algae, colour, shape and form.

With the complexity of photography, in all its variable forms, sometimes the associated cost may be prohibitive or at the very least, extremely expensive. Whereas all you need to draw is paper, a pencil and a rubber (my Zeiss Axiostar setup is shown right). The results are instant and you can change inaccuracies as you go. That is not to say that drawing is easy and the results will be spectacular. To see some of the efforts published in scientific papers and identification guides attests to the truth of this but the satisfaction of creating a drawn image yourself is both greatly rewarding and satisfying.



Details of small organisms are very often difficult to discern in photographs. Without the restrictions of fields of focus, back ground distraction etc, a lot more detail can be emphasised in a drawing. Take for example the specimens of the *Salpingoeca* species below.



The greatest infraction in drawing from life is to add details that you think should be there or that you imagine are there. If you can't see a nucleus or a flagellum, don't draw it. Always draw what you see, not what you would like to see.

With living protozoa, movement is part of life and while it may be important to discern its type (pseudopodia, flagella or cilia) it is often unhelpful when attempting to draw the organism. The majority of algae don't move at all while others such as diatoms move very slowly. Amoebae and most flagellates move at a moderately slow pace and present no real problems in drawing. However many of the ciliates do not and one must exercise great patience when attempting to capture these on paper.

A 2-3% solution of Methyl Cellulose (Protoslo) will slow down protozoan. Physically compressing the water by the use of a commercially made microcompressor is another alternative. Cotton fibres placed in the water before covering with a cover slip can trap protozoa and act to restrict movements. Lowering the temperature with a spell in the refrigerator may also be helpful. Or you can just wait until the slide starts to dry out and the water level drops sufficiently to inhibit movement. But whatever method is used, time and patience is the key.

When dealing with larger protists, the pencil has one great advantage over the camera - depth of field. A photograph, by its very nature, is two dimensional whereas a good drawing can be three. Such as this example of the ciliate *Colpoda*.



Finally I would like to close by saying that the quality of drawings I am able to produce did not happen overnight. While there are drawing attachments, I have never used them preferring to draw directly from the microscope. I have

been looking down a microscope and drawing what I have seen for nearly 60 years and while I too have dabbled in photomicroscopy, I inevitably return to the pencil and paper.

Editor's note: In [part 2](#) also shared this month, the author shares his drawing techniques, materials used and is illustrated with a gallery of protists. The author offered a summary of his microscopy and drawing interests which is shared below.

Almost 25 years ago I bought an old school bus and converted it into a mobile home and 'lab' and since then I have been traveling around S. E. Australia, including Tasmania, examining and drawing the biodiversity of Australia's protists. Because many of the sights have been relatively isolated, I needed a system that was both simple and robust and settled on a Zeiss Axiostar with a 12 volt attachment.

I have used various Universities and Research Centres as bases from which to work (mostly as a guest researcher) and my studies have resulted in quite a few reports, a number of identification guides and a couple of journal publications.

The old bus, like me, is currently retired (and still home) but I still cannot pass a likely looking pond or wetland without stopping and taking samples.

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(Email in anti-spam format, replace capitals with appropriate characters, remove spacing and copy to email software.)

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