Opinion

When the Best Microscopes Create the Worst Images

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Microscopists have produced some of the most important images in the history of science. Yet, for all the sophistication of today's instrumentation, examples persist of the worst possible microscopical results. Microscopy is often taught as a vocation, rather than as a discipline, so there is no general qualification in the subject, and there are no set standards with which instructors must comply. Microscopists with a proven track record were once recognized by election to Fellowship of the Royal Microscopical Society (FRMS), but by the 1970s the society's fellows were being admitted without evidence of expertise, and the distinction FRMS was abandoned.

There are many universities and independent institutes that provide courses. There are full semester college courses, two-year college degrees, short courses, workshops, and tutorials at microscopy meetings. However, except in a very few cases, there is no generally accepted certification for microscopists.

Formal qualifications are not obligatory for employment in many industries that employ microscopists. In consequence, microscopy standards are variable. Frequently they are excellent, often they are good, sometimes they are poor, and occasionally they are bewilderingly bad. Microscope images are only rarely featured in the media, so the public is disenfranchised and unfamiliar with the subject.

Sometimes organizations subcontract the production of promotional materials and unwittingly exhibit microscope images that could be misleading. Visuals for websites can be of particular concern. More importantly, there are websites and commercial entities that occasionally use poor images from microscopes to sell products.

The lack of microscopy expertise in such situations is a clear pointer to dubious professional standards. You can find micrographs where the lighting is poorly adjusted, the optics are set up incorrectly, and the results are unbelievably inferior. What makes it worse is that the dreadful results these people obtain can be produced from high-quality modern equipment. We were always raised to believe that "you get what you pay for." That may be true in some sectors of activity, but it does not necessarily apply to microscopy. It is all too easy to pay large sums for results that are worse than the pioneers of microscopy produced in the seventeenth century.

We should move toward generally recognized standards in microscopy, perhaps backed by formal qualifications. Although we revel in our discipline and enjoy its disclosures, some folk abuse our beloved microscope and compromise how it is perceived. When the producers set up an instrument wrongly in a *CSI*-type television series, we can chuckle with amusement. But when poor standards of microscopy are being perpetuated in the public or commercial spheres, it is no laughing matter.

The public needs to embrace our sector of science. There should be a move to guarantee that no child is allowed to reach the age of ten without having looked at pond life under a microscope. It's easy enough to do, and this could change their lives forever. If that were done, everyone would be familiar with what microscopy can do—and we might trigger a whole new generation of microscopists (and scientists) for the future.

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